Appendix C

Simulation Results for
Various UCL Computation Methods and Distributions
Percent Coverage and UCL95 Values

Type 1 Left Censored Datasets

Table 1a. N(100,30) Detection Limit Fixed at 25 (Censoring Level = 0.62%)

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	115.0792	116.8887	N/A	N/A	133.5915	126.8832
15	112.4554	113.3638	N/A	N/A	125.6725	122.1312
20	111.1800	111.7664	N/A	N/A	120.1796	118.4600
25	109.7994	110.1909	N/A	N/A	117.1497	115.8969
30	109.0708	109.3607	N/A	N/A	115.2742	114.3469
35	108.3274	108.5463	N/A	N/A	113.8147	113.1232
40	107.9333	108.1041	N/A	N/A	112.3108	111.8333
50	106.9528	107.0686	N/A	N/A	110.6030	110.2742
75	105.6642	105.7034	N/A	N/A	108.2283	108.0614
100	104.9893	105.0030	N/A	N/A	106.8591	106.7571

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	116.6995	116.6751	116.8638	116.7881	116.7972
15	113.2396	113.2175	113.3527	113.2943	113.2951
20	111.6419	111.6267	111.7261	111.6823	111.6823
25	110.0932	110.0823	110.1659	110.1277	110.1277
30	109.2717	109.2642	109.3330	109.3005	109.3005
35	108.4636	108.4571	108.5191	108.4895	108.4895
40	108.0346	108.0302	108.0814	108.0562	108.0562
50	106.9958	106.9928	107.0387	107.0151	107.0151
75	105.6481	105.6469	105.6816	105.6625	105.6625
100	104.9522	104.9520	104.9794	104.9634	104.9634

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	116.0066	115.9860	116.1539	116.0800	116.0889
15	112.8927	112.8732	112.9988	112.9424	112.9432
20	111.4197	111.4059	111.5002	111.4575	111.4575
25	109.9297	109.9198	110.0000	109.9625	109.9625
30	109.1466	109.1396	109.2061	109.1742	109.1742
35	108.3612	108.3551	108.4154	108.3861	108.3861
40	107.9515	107.9473	107.9973	107.9724	107.9724
50	106.9311	106.9283	106.9733	106.9500	106.9500
75	105.6071	105.6061	105.6403	105.6213	105.6213
100	104.9222	104.9220	104.9492	104.9333	104.9333

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	116.7386	116.7107	116.9053	116.8270	116.8074	116.7665
15	113.2532	113.2307	113.3681	113.3096	113.3030	113.2982
20	111.6491	111.6336	111.7346	111.6906	111.6873	111.7030
25	110.0955	110.0844	110.1695	110.1310	110.1281	110.1560
30	109.2735	109.2657	109.3357	109.3031	109.3000	109.3326
35	108.4638	108.4571	108.5202	108.4903	108.4866	108.5263
40	108.0364	108.0317	108.0838	108.0585	108.0546	108.0926
50	106.9959	106.9928	107.0394	107.0157	107.0108	107.0546
75	105.6470	105.6458	105.6810	105.6617	105.6544	105.7036
100	104.9515	104.9513	104.9791	104.9630	104.9546	105.0014

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.50%	137.7709	0.53%	124.4370	0.51%	125.1142
15	0.89%	125.7211	0.89%	118.1729	0.89%	118.7169
20	0.99%	121.1480	0.99%	115.4460	0.99%	115.9122
25	1.25%	118.2687	1.25%	113.2997	1.25%	113.7387
30	1.07%	116.4019	1.07%	112.0477	1.07%	112.4518
35	1.52%	115.0304	1.52%	110.9278	1.52%	111.3148
40	1.66%	113.8179	1.66%	110.3525	1.66%	110.6890
50	1.94%	112.3995	1.94%	108.9885	1.94%	109.3320
75	3.17%	110.2641	3.17%	107.2276	3.17%	107.5453
100	4.16%	109.0458	4.16%	106.3275	4.16%	106.6192

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	114.278	116.855	114.632	114.385	114.361	114.415	114.556
15	111.989	112.172	112.341	112.043	112.061	112.071	112.128
20	110.852	137.535	113.599	110.891	110.923	110.896	110.944
25	109.535	109.655	109.689	109.566	109.609	109.563	109.625
30	108.845	108.917	108.929	108.879	108.920	108.874	108.936
35	108.132	108.178	108.193	108.151	108.206	108.159	108.222
40	107.768	107.798	107.805	107.784	107.833	107.785	107.844
50	106.803	106.830	106.831	106.821	106.873	106.817	106.891
75	105.541	105.556	105.570	105.558	105.610	105.555	105.629
100	104.881	104.895	104.905	104.896	104.942	104.896	104.967

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	117.671	117.481	117.653	117.658	117.772	117.617	117.019
15	113.555	113.513	113.624	113.565	113.695	113.541	113.289
20	111.810	111.856	111.909	111.862	111.941	111.839	111.708
25	110.219	110.233	110.237	110.241	110.322	110.215	110.161
30	109.365	109.367	109.390	109.375	109.448	109.377	109.364
35	108.543	108.555	108.569	108.564	108.635	108.558	108.572
40	108.094	108.108	108.115	108.111	108.176	108.114	108.123
50	107.038	107.041	107.060	107.056	107.119	107.052	107.098
75	105.674	105.680	105.700	105.689	105.747	105.684	105.745
100	104.971	104.985	104.990	104.985	105.026	104.985	105.048

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	114.223	114.380	114.387	114.216	114.353	114.256	115.524
15	111.952	112.001	112.019	111.935	112.058	111.945	112.608
20	110.816	110.837	110.835	110.819	110.927	110.817	111.240
25	109.498	109.506	109.517	109.501	109.599	109.503	109.820
30	108.827	108.828	108.826	108.834	108.919	108.815	109.086
35	108.110	108.104	108.117	108.111	108.207	108.105	108.342
40	107.738	107.741	107.748	107.747	107.834	107.743	107.939
50	106.775	106.788	106.792	106.791	106.875	106.789	106.945
75	105.520	105.529	105.529	105.536	105.610	105.528	105.658
100	104.867	104.874	104.880	104.879	104.946	104.873	104.990

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	114.213	114.530	114.520	114.131	114.400	114.196	117.059
15	111.906	112.053	112.073	111.898	112.079	111.877	113.426
20	110.777	110.828	110.832	110.760	110.950	110.762	111.760
25	109.473	109.458	109.466	109.457	109.633	109.438	110.186
30	108.781	108.787	108.781	108.788	108.950	108.768	109.344
35	108.078	108.075	108.075	108.063	108.225	108.073	108.542
40	107.707	107.702	107.720	107.706	107.860	107.704	108.091
50	106.757	106.742	106.754	106.754	106.877	106.754	107.058
75	105.494	105.499	105.501	105.506	105.626	105.499	105.730
100	104.844	104.845	104.846	104.851	104.957	104.843	105.031

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

n	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan--Meier
10	140.0590	139.9928	140.4005	140.3029	140.3145	139.7459
15	132.9570	132.8833	133.2003	133.1055	133.1062	132.7211
20	129.0479	128.9932	129.2307	129.1583	129.1583	128.8855
25	125.8163	125.7741	125.9748	125.9112	125.9112	125.7015
30	123.7005	123.6691	123.8340	123.7799	123.7799	123.6231
35	121.8770	121.8482	121.9974	121.9482	121.9482	121.8125
40	120.5964	120.5751	120.6974	120.6558	120.6558	120.5563
50	118.2962	118.2794	118.3881	118.3496	118.3496	118.2756
75	114.9157	114.9053	114.9860	114.9556	114.9556	114.9212
100	113.0102	113.0038	113.0661	113.0412	113.0412	113.0290

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	114.2663	117.5278	114.2256	114.2158	116.8529
15	112.0067	113.5084	111.9351	111.8745	113.3429
20	110.8770	111.8071	110.8061	110.7596	111.7064
25	109.5626	110.2224	109.4896	109.4593	110.1504
30	108.8704	109.3835	108.8249	108.7661	109.3178
35	108.1522	108.5540	108.1111	108.0488	108.5036
40	107.7803	108.1042	107.7403	107.7080	108.0691
50	106.8211	107.0569	106.7809	106.7538	107.0251
75	105.5583	105.6812	105.5286	105.5014	105.6684
100	104.8942	104.9809	104.8708	104.8444	104.9681

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	116.807	116.931	117.394	116.852	116.826	116.882	116.784
15	113.303	113.462	113.533	113.329	113.332	113.344	113.309
20	111.687	111.754	111.741	111.707	111.724	111.715	111.711
25	110.128	110.147	110.140	110.145	110.166	110.150	110.165
30	109.300	109.315	109.312	109.314	109.335	109.318	109.340
35	108.487	108.502	108.500	108.501	108.525	108.504	108.533
40	108.055	108.068	108.067	108.067	108.089	108.069	108.097
50	107.011	107.024	107.025	107.024	107.046	107.025	107.062
75	105.654	105.668	105.670	105.668	105.689	105.668	105.711
100	104.955	104.968	104.970	104.968	104.984	104.968	105.012

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	94.77	94.79	94.89	94.85	94.87	93.94	93.94	94.18	94.06	94.06
15	94.55	94.51	94.75	94.69	94.69	94.08	94.04	94.30	94.16	94.16
20	95.21	95.17	95.41	95.33	95.33	94.83	94.75	94.99	94.89	94.89
25	94.95	94.93	95.07	94.99	94.99	94.63	94.59	94.77	94.71	94.71
30	94.93	94.93	95.13	95.05	95.05	94.71	94.71	94.87	94.73	94.73
35	94.77	94.77	94.89	94.81	94.81	94.63	94.63	94.71	94.69	94.69
40	95.13	95.09	95.23	95.19	95.19	94.91	94.87	95.03	94.97	94.97
50	95.09	95.09	95.17	95.13	95.13	94.87	94.87	94.99	94.93	94.93
75	95.11	95.13	95.21	95.19	95.19	94.85	94.85	95.09	94.89	94.89
100	95.23	95.23	95.33	95.29	95.29	95.13	95.13	95.23	95.19	95.19

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	93.01	94.85	N/A	N/A	98.34	97.11
15	93.66	94.79	N/A	N/A	98.12	97.27
20	94.40	95.39	N/A	N/A	98.63	97.88
25	94.61	95.15	N/A	N/A	98.06	97.39
30	94.79	95.27	N/A	N/A	98.38	97.90
35	94.63	94.87	N/A	N/A	98.08	97.58
40	95.07	95.45	N/A	N/A	98.28	97.94
50	94.99	95.15	N/A	N/A	98.08	97.82
75	95.25	95.27	N/A	N/A	98.14	98.00
100	95.43	95.33	N/A	N/A	98.16	98.04

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	94.79	94.73	94.89	94.83	94.83	94.81
15	94.65	94.63	94.83	94.79	94.77	94.75
20	95.17	95.13	95.37	95.31	95.27	95.33
25	94.97	94.97	95.15	95.03	95.01	95.07
30	94.93	94.91	95.11	95.03	95.01	95.15
35	94.77	94.77	94.85	94.79	94.79	94.89
40	95.07	95.07	95.23	95.15	95.15	95.21
50	95.03	95.03	95.15	95.09	95.07	95.15
75	95.05	95.05	95.19	95.13	95.05	95.23
100	95.23	95.23	95.35	95.27	95.23	95.37

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.50%	97.87	0.53%	97.09	0.51%	97.67
15	0.89%	98.18	0.89%	97.46	0.89%	98.02
20	0.99%	98.84	0.99%	98.06	0.99%	98.52
25	1.25%	98.62	1.25%	97.71	1.25%	98.16
30	1.07%	98.96	1.07%	97.90	1.07%	98.40
35	1.52%	98.79	1.52%	97.67	1.52%	98.31
40	1.66%	98.97	1.66%	97.93	1.66%	98.55
50	1.94%	99.11	1.94%	98.04	1.94%	98.59
75	3.17%	99.10	3.17%	97.81	3.17%	98.47
100	4.16%	99.36	4.16%	98.26	4.16%	98.82

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	92.18	92.00	92.44	92.24	92.30	92.32	92.16	92.42
15	92.87	93.19	93.11	93.07	93.11	93.17	92.89	93.11
20	93.90	94.12	94.08	94.10	94.12	94.02	94.00	94.20
25	94.06	94.24	94.26	94.18	94.26	94.22	94.12	94.24
30	94.20	94.40	94.46	94.28	94.42	94.22	94.32	94.53
35	94.24	94.24	94.22	94.16	94.44	94.24	94.28	94.46
40	94.46	94.65	94.57	94.61	94.71	94.61	94.59	94.81
50	94.65	94.73	94.71	94.73	94.85	94.69	94.75	94.69
75	94.57	94.79	94.87	94.75	94.97	94.69	94.77	94.95
100	94.89	95.07	95.15	94.97	95.23	95.05	95.07	95.31

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.91	94.44	94.67	95.01	95.07	94.91	94.79	94.28
15	94.48	94.28	94.65	94.38	94.93	94.51	94.50	94.42
20	95.11	95.05	95.09	95.25	95.35	95.25	94.97	95.09
25	94.91	94.85	94.97	94.99	95.03	94.87	94.87	94.75
30	95.19	95.17	95.23	95.15	95.50	95.11	95.21	95.37
35	95.03	94.91	95.11	95.17	95.39	95.05	95.03	95.17
40	95.13	95.17	95.25	95.27	95.43	95.27	95.29	95.35
50	95.05	95.09	95.27	95.11	95.21	95.07	95.01	95.29
75	94.95	94.99	95.25	94.99	95.39	95.21	94.99	95.11
100	95.09	95.21	95.39	95.33	95.60	95.29	95.17	95.52

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.94	92.08	92.10	91.78	92.06	91.88	91.74	93.64
15	92.63	92.95	93.17	92.85	93.01	92.81	92.69	93.78
20	93.88	93.96	93.82	93.78	94.18	94.02	93.84	94.50
25	93.96	93.90	93.82	93.92	94.28	94.00	93.72	94.65
30	94.14	94.18	94.18	94.16	94.42	94.20	94.28	94.85
35	94.10	94.14	94.14	93.94	94.34	94.04	94.02	94.73
40	94.51	94.30	94.32	94.36	94.83	94.28	94.44	95.07
50	94.48	94.63	94.57	94.63	94.77	94.73	94.67	94.89
75	94.67	94.69	94.48	94.87	95.13	94.81	94.73	94.99
100	94.87	94.93	94.83	95.05	95.23	94.71	95.03	95.49

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.74	92.36	92.36	91.74	92.14	91.90	91.80	95.05
15	92.71	92.73	93.01	92.38	92.99	92.59	92.42	94.87
20	93.60	93.86	93.66	93.70	94.00	93.76	93.52	95.25
25	93.78	93.62	93.90	93.58	94.18	93.45	93.90	94.99
30	94.08	94.02	94.02	93.96	94.51	93.92	94.06	95.33
35	93.96	93.84	93.90	94.08	94.28	93.92	93.72	95.21
40	94.18	94.50	94.28	94.24	94.99	94.44	94.40	95.33
50	94.44	94.55	94.51	94.55	94.57	94.36	94.44	95.17
75	94.16	94.30	94.61	94.44	94.99	94.36	94.73	95.47
100	94.87	94.69	94.87	94.79	95.19	94.89	94.63	95.45

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.80	99.80	99.80	99.80	99.80	99.80
15	99.98	99.98	99.98	99.98	99.98	99.98
20	99.96	99.96	99.98	99.96	99.96	99.96
25	100.00	100.00	100.00	100.00	100.00	100.00
30	100.00	100.00	100.00	100.00	100.00	100.00
35	100.00	100.00	100.00	100.00	100.00	100.00
40	100.00	100.00	100.00	100.00	100.00	100.00
50	100.00	100.00	100.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00
100	100.00	100.00	100.00	100.00	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.83	94.61	94.61	94.89	94.87	94.89	94.83	94.81
15	94.77	94.79	94.71	94.83	94.79	94.83	94.79	94.79
20	95.27	95.35	95.33	95.35	95.37	95.37	95.35	95.35
25	95.01	95.07	95.05	95.07	95.09	95.07	95.07	95.13
30	95.01	95.09	95.09	95.09	95.11	95.09	95.09	95.15
35	94.79	94.83	94.83	94.83	94.85	94.83	94.83	95.03
40	95.15	95.17	95.17	95.17	95.15	95.17	95.17	95.33
50	95.07	95.09	95.09	95.09	95.19	95.09	95.09	95.19
75	95.05	95.17	95.17	95.17	95.21	95.17	95.17	95.39
100	95.23	95.27	95.27	95.29	95.35	95.29	95.29	95.47

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 25.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribuition Check: Average of means: 100.053785
Distribution Check: Average of stdvs: 29.909858
Average of NDs per 100 observations: 0.604000

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	25.000000	0.067327	4724	312	14	0	0	0	0	0	0	0
15	25.000000	0.101188	4562	465	23	0	0	0	0	0	0	0
20	25.000000	0.129505	4438	572	38	2	0	0	0	0	0	0
25	25.000000	0.164950	4283	704	60	3	0	0	0	0	0	0
30	25.000000	0.187525	4178	803	63	6	0	0	0	0	0	0
35	25.000000	0.223762	4035	904	107	4	0	0	0	0	0	0
40	25.000000	0.229901	4000	949	91	10	0	0	0	0	0	0
50	25.000000	0.307723	3708	1151	171	19	1	0	0	0	0	0
75	25.000000	0.474653	3139	1484	374	47	6	0	0	0	0	0
100	25.000000	0.617426	2728	1678	522	99	17	5	1	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	0	0	0	0	0	0
15	0	0	0	0	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	25	27	26	5050	5050	0	0
15	45	45	45	5050	5050	0	0
20	50	50	50	5050	5050	0	0
25	63	63	63	5050	5050	0	0
30	54	54	54	5050	5050	0	0
35	77	77	77	5050	5050	0	0
40	84	84	84	5050	5050	0	0
50	98	98	98	5050	5050	0	0
75	160	160	160	5050	5050	0	0
100	210	210	210	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 1b. N(100,30) Detection Limit Fixed at 50 (% Censoring = 4.79)

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	115.3743	117.9329	N/A	N/A	197.5856	171.5526
15	112.7431	113.8396	N/A	N/A	177.2221	164.2174
20	111.3187	111.9566	N/A	N/A	157.7360	151.8958
25	110.2388	110.5603	N/A	N/A	147.5438	143.5986
30	109.3037	109.5004	N/A	N/A	140.6224	137.8531
35	108.6326	108.7078	N/A	N/A	135.2387	133.2990
40	108.1913	108.2014	N/A	N/A	131.4510	130.1057
50	107.4594	107.3707	N/A	N/A	125.7193	124.8718
75	106.2053	105.9776	N/A	N/A	117.7149	117.3457
100	105.3308	105.0341	N/A	N/A	113.4018	113.1972

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	116.7814	116.6539	117.6364	117.1299	117.1320
15	113.1665	113.1154	113.7272	113.3996	113.3996
20	111.3870	111.3620	111.7974	111.5601	111.5601
25	110.1221	110.1085	110.4475	110.2566	110.2566
30	109.0877	109.0794	109.3550	109.1967	109.1967
35	108.3486	108.3439	108.5740	108.4385	108.4385
40	107.8678	107.8649	108.0620	107.9437	107.9437
50	107.0836	107.0833	107.2324	107.1395	107.1395
75	105.7790	105.7811	105.8692	105.8101	105.8101
100	104.8779	104.8806	104.9404	104.8977	104.8977

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	115.4341	115.3009	116.1743	115.6584	115.6608
15	112.3667	112.3239	112.8788	112.5608	112.5608
20	110.8197	110.8002	111.2029	110.9726	110.9726
25	109.6600	109.6502	109.9671	109.7813	109.7813
30	108.7042	108.6987	108.9586	108.8039	108.8039
35	108.0122	108.0095	108.2277	108.0950	108.0950
40	107.5677	107.5665	107.7543	107.6382	107.6382
50	106.8329	106.8337	106.9765	106.8850	106.8850
75	105.5969	105.5994	105.6846	105.6262	105.6262
100	104.7279	104.7308	104.7889	104.7466	104.7466

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	116.5674	116.4261	117.4373	116.9245	116.9201	116.7894
15	113.0479	112.9935	113.6279	113.2983	113.2344	113.3283
20	111.3034	111.2765	111.7299	111.4903	111.3739	111.5736
25	110.0546	110.0396	110.3936	110.2004	110.0336	110.3084
30	109.0330	109.0235	109.3115	109.1511	108.9505	109.2670
35	108.3028	108.2972	108.5378	108.4003	108.1712	108.5142
40	107.8237	107.8199	108.0261	107.9061	107.6531	108.0274
50	107.0473	107.0464	107.2022	107.1079	106.8173	107.2200
75	105.7542	105.7559	105.8479	105.7880	105.4444	105.8719
100	104.8577	104.8601	104.9225	104.8793	104.4990	104.9503

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.57%	187.8918	0.71%	118.9056	0.59%	122.1128
15	0.61%	155.9747	0.63%	114.2833	0.61%	116.8925
20	0.87%	144.5191	0.87%	112.1359	0.87%	114.3812
25	1.13%	138.9787	1.13%	110.6827	1.13%	112.7535
30	1.23%	134.6531	1.23%	109.5027	1.23%	111.3968
35	1.49%	131.8893	1.49%	108.7076	1.49%	110.4872
40	1.70%	130.0266	1.70%	108.1513	1.70%	109.8513
50	2.12%	126.9845	2.12%	107.3316	2.12%	108.8851
75	3.35%	122.3044	3.35%	105.9769	3.35%	107.2789
100	4.12%	119.8065	4.12%	105.0952	4.12%	106.2699

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	114.303	162.447	120.114	114.800	114.905	114.999	115.053
15	111.877	112.361	112.545	112.242	112.408	112.312	112.519
20	110.509	110.901	112.940	110.828	111.047	110.852	111.171
25	109.418	109.776	128.647	109.741	109.963	109.749	110.133
30	108.490	108.823	108.880	108.819	109.024	108.817	109.223
35	107.804	108.141	108.190	108.143	108.335	108.135	108.564
40	107.355	107.701	107.744	107.705	107.899	107.701	108.136
50	106.604	106.965	107.003	106.972	107.138	106.963	107.424
75	105.333	105.718	105.746	105.721	105.847	105.714	106.184
100	104.424	104.840	104.862	104.843	104.944	104.836	105.318

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	117.389	117.224	117.525	117.806	118.215	117.666	118.188
15	113.163	113.367	113.483	113.637	113.871	113.535	113.994
20	111.245	111.574	111.677	111.675	111.918	111.646	112.083
25	109.912	110.291	110.369	110.361	110.545	110.316	110.799
30	108.831	109.236	109.307	109.268	109.429	109.249	109.732
35	108.073	108.491	108.557	108.516	108.647	108.494	108.997
40	107.546	107.976	108.042	107.998	108.133	107.976	108.471
50	106.733	107.173	107.227	107.179	107.292	107.175	107.666
75	105.386	105.845	105.875	105.851	105.914	105.828	106.326
100	104.460	104.926	104.945	104.929	104.980	104.921	105.414

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	114.178	115.117	115.220	114.319	114.972	114.365	116.284
15	111.743	112.286	112.360	111.932	112.486	111.902	113.235
20	110.405	110.749	110.799	110.634	111.103	110.598	111.650
25	109.334	109.626	109.673	109.592	110.017	109.549	110.505
30	108.402	108.690	108.731	108.693	109.094	108.664	109.528
35	107.739	108.019	108.067	108.043	108.399	108.010	108.812
40	107.281	107.599	107.639	107.612	107.955	107.589	108.354
50	106.550	106.877	106.925	106.900	107.190	106.877	107.593
75	105.282	105.658	105.687	105.675	105.881	105.659	106.290
100	104.391	104.796	104.823	104.806	104.972	104.794	105.397

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	114.150	115.483	115.507	114.132	115.451	114.237	118.107
15	111.687	112.437	112.484	111.793	112.831	111.729	114.314
20	110.349	110.716	110.759	110.493	111.411	110.427	112.403
25	109.256	109.525	109.539	109.477	110.269	109.404	111.075
30	108.363	108.577	108.621	108.600	109.312	108.540	109.980
35	107.691	107.918	107.945	107.953	108.611	107.895	109.201
40	107.236	107.508	107.528	107.518	108.135	107.485	108.693
50	106.503	106.796	106.813	106.819	107.354	106.782	107.856
75	105.257	105.590	105.617	105.624	105.990	105.589	106.457
100	104.360	104.745	104.767	104.762	105.050	104.736	105.522

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	139.3353	139.1555	141.1193	140.5278	140.5291	138.3612
15	132.5373	132.3817	133.7469	133.2594	133.2594	131.9212
20	128.4473	128.3401	129.3458	128.9707	128.9707	128.0595
25	125.6408	125.5659	126.3552	126.0508	126.0508	125.3835
30	123.3276	123.2717	123.9139	123.6614	123.6614	123.1580
35	121.6513	121.6103	122.1441	121.9290	121.9290	121.5469
40	120.3304	120.2942	120.7529	120.5664	120.5664	120.2674
50	118.3135	118.2894	118.6337	118.4892	118.4892	118.3176
75	115.0095	115.0006	115.1987	115.1095	115.1095	115.1127
100	112.9023	112.8978	113.0302	112.9676	112.9676	113.0626

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	114.7947	117.6002	114.2708	114.0860	117.2691
15	112.2644	113.5384	111.8943	111.7117	113.5132
20	110.8432	111.6490	110.5911	110.4318	111.6450
25	109.7472	110.3103	109.5538	109.4187	110.3273
30	108.8123	109.2346	108.6596	108.5255	109.2572
35	108.1334	108.4828	108.0155	107.9029	108.4929
40	107.6977	107.9802	107.5858	107.4815	107.9911
50	106.9592	107.1730	106.8744	106.7869	107.1777
75	105.7130	105.8369	105.6553	105.5998	105.8358
100	104.8366	104.9202	104.7977	104.7353	104.9179

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	116.920	116.681	116.900	117.099	117.158	124.762	116.909
15	113.234	113.420	113.327	113.433	113.503	113.513	113.464
20	111.374	111.621	111.557	111.602	111.675	111.645	111.726
25	110.034	110.301	110.262	110.298	110.364	110.327	110.488
30	108.951	109.238	109.213	109.237	109.296	109.257	109.463
35	108.171	108.479	108.460	108.478	108.528	108.493	108.738
40	107.653	107.980	107.966	107.980	108.034	107.991	108.258
50	106.817	107.170	107.160	107.171	107.213	107.178	107.480
75	105.444	105.832	105.827	105.833	105.854	105.836	106.188
100	104.499	104.915	104.912	104.917	104.933	104.918	105.301

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	94.61	94.44	95.60	95.07	95.07	92.75	92.59	94.02	93.17	93.17
15	95.01	94.93	95.80	95.39	95.39	93.49	93.43	94.51	93.74	93.74
20	94.97	94.95	95.68	95.29	95.29	93.66	93.56	94.57	94.06	94.06
25	94.81	94.81	95.50	95.21	95.21	93.80	93.78	94.34	93.96	93.96
30	94.48	94.46	95.13	94.71	94.71	93.27	93.29	93.94	93.56	93.56
35	94.69	94.71	95.35	94.87	94.87	93.76	93.80	94.30	93.94	93.94
40	95.13	95.11	95.62	95.23	95.23	94.06	94.08	94.61	94.18	94.18
50	95.03	95.03	95.31	95.15	95.15	94.18	94.22	94.63	94.32	94.32
75	94.85	94.85	95.21	94.89	94.89	94.32	94.32	94.44	94.34	94.34
100	94.50	94.50	94.69	94.53	94.53	93.94	93.94	94.28	94.02	94.02

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	93.50	95.41	N/A	N/A	99.43	98.75
15	94.67	95.56	N/A	N/A	99.45	99.23
20	95.27	95.68	N/A	N/A	99.50	99.47
25	95.41	95.43	N/A	N/A	99.54	99.50
30	95.37	95.09	N/A	N/A	99.70	99.66
35	95.68	95.58	N/A	N/A	99.88	99.82
40	96.38	95.94	N/A	N/A	99.88	99.88
50	96.20	95.64	N/A	N/A	99.98	99.98
75	96.59	95.52	N/A	N/A	99.98	99.98
100	96.22	94.97	N/A	N/A	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	94.06	93.92	95.28	94.65	94.77	94.53
15	94.65	94.53	95.62	95.15	94.95	95.23
20	94.83	94.81	95.58	95.21	94.83	95.29
25	94.55	94.55	95.37	94.85	94.38	95.15
30	94.30	94.26	94.97	94.55	93.70	94.79
35	94.59	94.57	95.07	94.75	94.04	95.11
40	94.85	94.83	95.37	95.11	94.12	95.45
50	94.93	94.93	95.33	95.05	93.86	95.25
75	94.71	94.73	95.03	94.75	93.52	95.13
100	94.46	94.46	94.59	94.46	92.85	94.83

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.57%	98.96	0.71%	93.72	0.59%	97.33
15	0.61%	99.30	0.63%	93.98	0.61%	97.55
20	0.87%	99.50	0.87%	94.47	0.87%	97.64
25	1.13%	99.52	1.13%	94.15	1.13%	97.54
30	1.23%	99.72	1.23%	93.83	1.23%	97.67
35	1.49%	99.88	1.49%	94.43	1.49%	97.91
40	1.70%	99.92	1.70%	94.52	1.70%	98.11
50	2.12%	99.98	2.12%	94.74	2.12%	97.98
75	3.35%	99.98	3.35%	94.94	3.35%	98.16
100	4.12%	100.00	4.12%	94.84	4.12%	98.18

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.94	92.73	93.11	92.79	93.13	93.29	92.97	93.35
15	92.81	93.98	94.16	93.98	94.30	94.04	93.96	94.44
20	93.31	94.14	94.46	94.20	94.73	94.28	94.16	94.99
25	93.11	94.38	94.53	94.26	94.83	94.32	94.24	95.25
30	92.67	93.84	94.16	94.16	94.55	93.98	93.78	95.25
35	93.29	94.24	94.40	94.28	94.79	94.30	94.38	95.58
40	93.47	94.61	94.77	94.81	95.35	94.57	94.71	96.26
50	93.27	94.81	94.89	94.83	95.21	94.75	94.77	96.22
75	92.99	94.79	94.77	94.67	95.23	94.75	94.73	96.53
100	92.48	94.40	94.50	94.46	94.83	94.48	94.44	96.22

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.28	93.26	93.64	94.77	95.21	94.69	94.48	95.27
15	94.02	94.63	94.53	95.11	95.39	94.93	94.93	96.00
20	94.28	95.07	95.15	95.33	95.64	95.19	95.15	96.10
25	93.70	94.85	94.97	95.19	95.49	94.73	94.93	96.16
30	93.09	94.55	94.75	94.67	95.03	94.75	94.53	95.82
35	93.58	95.05	95.15	95.05	95.27	94.97	94.95	96.36
40	93.54	95.13	95.39	95.11	95.72	95.09	95.17	96.71
50	93.37	95.19	95.23	95.09	95.47	95.03	95.33	96.73
75	93.27	95.07	95.13	95.07	95.35	95.01	95.05	97.01
100	92.50	94.63	94.61	94.59	94.89	94.65	94.57	96.44

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.56	93.21	93.25	91.98	93.29	92.18	92.06	94.42
15	92.59	94.00	94.12	93.17	94.34	93.11	93.07	95.50
20	93.13	93.92	94.28	93.72	94.69	93.66	93.66	95.60
25	92.75	94.12	94.00	93.84	94.79	93.76	93.74	95.72
30	92.48	93.58	93.60	93.58	94.69	93.43	93.49	95.84
35	92.93	94.08	94.00	93.80	94.73	93.82	93.88	96.28
40	92.97	94.38	94.46	94.22	95.45	94.32	94.18	96.63
50	92.99	94.50	94.73	94.61	95.41	94.50	94.36	96.48
75	93.01	94.51	94.48	94.67	95.13	94.48	94.59	96.71
100	92.14	94.26	94.20	94.14	94.89	94.30	94.16	96.50

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.62	93.47	93.49	91.72	93.56	91.92	91.72	95.86
15	92.40	94.04	93.84	92.59	94.83	92.51	92.46	96.53
20	92.97	93.90	93.88	93.58	95.47	93.33	93.17	96.44
25	92.50	93.43	93.62	93.45	95.19	93.33	93.41	96.65
30	92.36	93.15	93.21	93.33	95.25	92.93	92.91	96.53
35	92.73	93.82	93.74	93.72	95.62	93.56	93.70	96.87
40	92.97	93.78	93.94	94.02	95.92	93.70	93.92	97.15
50	93.05	93.86	94.08	94.24	95.88	94.00	94.24	96.81
75	92.83	94.44	94.48	94.48	95.74	94.46	94.14	96.97
100	91.96	93.94	94.08	93.98	95.05	93.94	93.86	96.63

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.92	99.92	99.92	99.92	99.92	99.88
15	99.96	99.94	99.96	99.96	99.96	99.94
20	100.00	100.00	100.00	100.00	100.00	100.00
25	100.00	100.00	100.00	100.00	100.00	100.00
30	100.00	100.00	100.00	100.00	100.00	100.00
35	100.00	100.00	100.00	100.00	100.00	100.00
40	100.00	100.00	100.00	100.00	100.00	100.00
50	100.00	100.00	100.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00
100	100.00	100.00	100.00	100.00	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 50.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.77	94.49	93.94	95.31	95.01	95.19	95.09	94.73
15	94.95	95.37	95.07	95.39	95.41	95.54	95.54	95.50
20	94.83	95.41	95.31	95.39	95.43	95.52	95.52	95.72
25	94.38	95.25	95.15	95.25	95.29	95.29	95.29	95.52
30	93.70	94.91	94.83	94.91	94.91	94.95	94.95	95.62
35	94.04	95.01	94.95	95.01	95.07	95.05	95.05	95.88
40	94.12	95.33	95.27	95.37	95.58	95.39	95.39	96.40
50	93.86	95.25	95.25	95.25	95.27	95.25	95.25	96.16
75	93.52	95.05	95.01	95.07	95.15	95.09	95.09	96.50
100	92.85	94.61	94.59	94.57	94.81	94.61	94.61	96.08

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 50.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 99.983257
Distribution Check: Average of stdvs: 29.915100
Average of NDs per 100 observations: 4.778400

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	50.000000	0.471287	3124	1535	336	47	8	0	0	0	0	0
15	50.000000	0.716238	2431	1811	645	139	21	3	0	0	0	0
20	50.000000	0.943762	1890	1961	874	253	63	8	1	0	0	0
25	50.000000	1.204158	1510	1793	1135	460	126	23	2	1	0	0
30	50.000000	1.435644	1149	1753	1312	567	189	69	8	1	2	0
35	50.000000	1.680594	910	1585	1346	789	293	99	20	8	0	0
40	50.000000	1.928713	694	1428	1420	862	443	135	45	16	6	1
50	50.000000	2.415842	451	1041	1327	1094	684	299	105	37	6	5
75	50.000000	3.562772	121	472	946	1059	992	743	416	187	75	28
100	50.000000	4.773465	25	197	465	798	944	881	718	502	278	136

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0
50	1	0	0	0	0	0	0	0	0	0	0	0	0
75	10	1	0	0	0	0	0	0	0	0	0	0	0
100	60	29	9	5	3	0	0	0	0	0	0	0	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	3	0	3	0	0	3	0	3	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	3	0	3	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	3	0	3	0	0	0
15	0	0	0	0	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	3	0	3	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	3	0	3	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	29	36	30	5050	5050	0	0
15	31	32	31	5050	5050	0	0
20	44	44	44	5050	5050	0	0
25	57	57	57	5050	5050	0	0
30	62	62	62	5050	5050	0	0
35	75	75	75	5050	5050	0	0
40	86	86	86	5050	5050	0	0
50	107	107	107	5050	5050	0	0
75	169	169	169	5050	5050	0	0
100	208	208	208	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	20	0	19	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 2a. N(100,30) 10% Type 1 Censoring

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	115.9115	120.0533	N/A	N/A	287.4146	233.7656
15	113.2010	114.5136	N/A	N/A	223.9528	202.2917
20	111.7974	112.3528	N/A	N/A	182.8354	174.2300
25	110.8149	110.9622	N/A	N/A	163.6097	158.2341
30	109.7633	109.7205	N/A	N/A	150.6167	147.1128
35	109.1291	108.9022	N/A	N/A	142.1444	139.7993
40	108.7917	108.4538	N/A	N/A	136.1196	134.5643
50	108.0301	107.5568	N/A	N/A	128.1365	127.2080
75	106.8029	106.1029	N/A	N/A	118.3095	117.9302
100	106.0814	105.2488	N/A	N/A	113.8113	113.6049

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	117.1240	116.9041	118.7226	123.4174	117.6468
15	113.2152	113.1454	114.1580	113.5349	113.5349
20	111.4173	111.3906	112.0467	111.6358	111.6358
25	110.2140	110.2013	110.6885	110.3732	110.3732
30	109.0419	109.0348	109.4143	109.1605	109.1605
35	108.3299	108.3260	108.6331	108.4224	108.4224
40	107.9299	107.9281	108.1837	108.0039	108.0039
50	107.1155	107.1166	107.3016	107.1658	107.1658
75	105.7874	105.7900	105.8958	105.8116	105.8116
100	105.0048	105.0085	105.0794	105.0188	105.0188

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	114.8676	114.6238	116.2202	120.8225	115.1107
15	111.8040	111.7455	112.6410	112.0347	112.0347
20	110.3941	110.3773	110.9665	110.5692	110.5692
25	109.3686	109.3626	109.8055	109.4999	109.4999
30	108.3107	108.3084	108.6564	108.4096	108.4096
35	107.6838	107.6834	107.9670	107.7617	107.7617
40	107.3458	107.3469	107.5838	107.4083	107.4083
50	106.6269	106.6301	106.8027	106.6697	106.6697
75	105.4175	105.4212	105.5209	105.4382	105.4382
100	104.6949	104.6992	104.7664	104.7067	104.7067

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	116.5136	116.2738	118.1090	117.0373	116.9408	116.9218
15	112.8723	112.7997	113.8372	113.2185	112.8987	113.3204
20	111.1878	111.1599	111.8387	111.4284	110.9549	111.5864
25	110.0300	110.0163	110.5225	110.2065	109.6067	110.3786
30	108.8873	108.8793	109.2746	109.0197	108.3168	109.1901
35	108.1975	108.1929	108.5133	108.3014	107.5214	108.4636
40	107.8106	107.8081	108.0749	107.8941	107.0596	108.0559
50	107.0169	107.0173	107.2107	107.0739	106.1550	107.2260
75	105.7166	105.7190	105.8295	105.7447	104.6881	105.8581
100	104.9452	104.9485	105.0227	104.9616	103.8150	105.0616

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.36%	253.0380	1.05%	116.2048	0.38%	121.5354
15	0.73%	191.2116	0.87%	112.3023	0.73%	116.4281
20	1.11%	170.2548	1.11%	110.6418	1.11%	114.0786
25	1.27%	160.4076	1.27%	109.5161	1.27%	112.5857
30	1.45%	153.6375	1.45%	108.4141	1.45%	111.2137
35	1.64%	149.0085	1.64%	107.7973	1.64%	110.3763
40	1.84%	145.7993	1.84%	107.4364	1.84%	109.8608
50	2.04%	140.4546	2.04%	106.7799	2.04%	108.9224
75	3.29%	133.3759	3.29%	105.6472	3.29%	107.3921
100	3.96%	129.7450	3.96%	105.0095	3.96%	106.5416

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	114.093	118.193	179.003	115.125	115.487	129.669	115.778
15	111.450	120.908	120.351	112.411	112.763	112.554	113.088
20	110.045	140.889	111.145	110.949	111.296	111.009	111.719
25	108.956	116.412	113.696	109.899	110.218	109.906	110.754
30	107.825	108.829	108.890	108.814	109.120	108.807	109.718
35	107.133	108.155	108.218	108.153	108.440	108.137	109.093
40	106.745	107.787	107.840	107.788	108.051	107.772	108.766
50	105.929	107.011	107.056	107.020	107.261	107.000	108.013
75	104.564	105.730	105.767	105.738	105.910	105.724	106.790
100	103.733	104.966	104.995	104.973	105.122	104.959	106.074

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	116.628	116.852	117.089	117.869	118.299	14267.542	119.631
15	112.464	113.174	113.245	113.677	113.889	113.556	114.825
20	110.551	111.541	111.592	111.738	111.925	111.675	112.802
25	109.266	110.382	110.412	110.474	110.610	110.397	111.557
30	108.016	109.180	109.240	109.229	109.365	109.181	110.314
35	107.273	108.462	108.519	108.484	108.609	108.450	109.576
40	106.834	108.040	108.091	108.064	108.173	108.033	109.175
50	105.968	107.205	107.247	107.213	107.318	107.185	108.297
75	104.568	105.847	105.885	105.853	105.921	105.835	106.960
100	103.727	105.047	105.077	105.057	105.116	105.037	106.197

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	113.932	116.091	116.340	114.411	115.702	114.529	117.312
15	111.272	112.739	112.887	111.900	112.869	111.826	114.023
20	109.887	110.999	111.104	110.613	111.399	110.550	112.365
25	108.827	109.768	109.865	109.646	110.333	109.586	111.272
30	107.700	108.629	108.711	108.605	109.213	108.545	110.129
35	107.018	107.970	108.048	107.980	108.522	107.924	109.443
40	106.646	107.616	107.684	107.635	108.136	107.588	109.067
50	105.852	106.875	106.934	106.906	107.322	106.863	108.247
75	104.504	105.646	105.683	105.659	105.952	105.633	106.947
100	103.690	104.901	104.935	104.916	105.150	104.889	106.187

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	113.887	116.412	116.591	114.151	116.768	114.382	119.465
15	111.166	113.041	113.150	111.644	113.589	111.559	115.350
20	109.793	111.026	111.134	110.402	111.974	110.289	113.325
25	108.759	109.638	109.730	109.465	110.798	109.359	112.007
30	107.637	108.473	108.558	108.454	109.618	108.355	110.757
35	106.977	107.803	107.888	107.846	108.885	107.761	109.960
40	106.590	107.474	107.533	107.526	108.456	107.421	109.523
50	105.798	106.749	106.808	106.788	107.576	106.726	108.608
75	104.473	105.548	105.591	105.588	106.122	105.544	107.189
100	103.653	104.827	104.857	104.852	105.290	104.818	106.366

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	139.3238	139.1084	142.4845	141.2931	141.2967	137.8448
15	132.3327	132.1666	134.2973	133.4382	133.4382	131.4172
20	128.2893	128.1772	129.6258	129.0212	129.0212	127.7055
25	125.5631	125.4867	126.5729	126.1048	126.1048	125.1867
30	123.1841	123.1288	123.9745	123.5998	123.5998	122.9519
35	121.5265	121.4860	122.1677	121.8585	121.8585	121.4070
40	120.3502	120.3163	120.8837	120.6219	120.6219	120.3202
50	118.2483	118.2241	118.6350	118.4398	118.4398	118.3496
75	114.9761	114.9665	115.1947	115.0777	115.0777	115.2972
100	113.0016	112.9960	113.1481	113.0659	113.0659	113.4593

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	115.2931	117.5686	114.3134	114.0422	117.8833
15	112.4689	113.5579	111.8226	111.5089	113.7253
20	110.9671	111.6662	110.5417	110.2725	111.7840
25	109.9049	110.3926	109.5857	109.3456	110.4916
30	108.8046	109.1854	108.5405	108.3500	109.2668
35	108.1398	108.4561	107.9436	107.7636	108.5149
40	107.7731	108.0342	107.5901	107.4368	108.0861
50	106.9977	107.1861	106.8648	106.7491	107.2336
75	105.7230	105.8375	105.6318	105.5376	105.8588
100	104.9611	105.0418	104.8928	104.8169	105.0547

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	116.941	2457.945	2457.281	117.446	117.677	697.606	117.291
15	112.899	113.578	113.304	113.531	113.687	115.910	113.776
20	110.955	111.705	111.560	111.682	111.806	111.784	112.088
25	109.607	110.431	110.337	110.424	110.524	110.492	110.963
30	108.317	109.222	109.155	109.220	109.314	109.267	109.830
35	107.521	108.481	108.430	108.479	108.561	108.515	109.151
40	107.060	108.059	108.019	108.059	108.136	108.086	108.781
50	106.155	107.215	107.189	107.218	107.293	107.234	107.991
75	104.688	105.850	105.836	105.852	105.902	105.859	106.740
100	103.815	105.049	105.041	105.052	105.099	105.055	106.020

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	95.54	95.39	97.13	96.18	96.18	92.21	91.78	94.29	92.34	92.34
15	94.95	94.91	96.08	95.35	95.35	91.84	91.72	93.64	92.10	92.10
20	95.19	95.11	96.36	95.50	95.50	92.81	92.81	93.92	93.09	93.09
25	95.15	95.11	96.00	95.37	95.37	92.93	92.93	93.84	93.15	93.15
30	95.47	95.45	96.14	95.58	95.58	92.93	92.97	94.06	93.11	93.11
35	94.85	94.85	95.37	95.03	95.03	93.09	93.05	93.80	93.25	93.25
40	95.45	95.45	95.84	95.54	95.54	93.43	93.47	94.12	93.47	93.47
50	94.55	94.50	95.07	94.61	94.61	92.91	92.87	93.37	92.95	92.95
75	94.83	94.79	95.11	94.89	94.89	93.43	93.47	93.76	93.45	93.45
100	95.11	95.17	95.43	95.13	95.13	93.70	93.66	93.98	93.70	93.70

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	94.63	95.87	N/A	N/A	99.80	99.66
15	95.49	95.27	N/A	N/A	99.90	99.84
20	96.48	95.56	N/A	N/A	99.88	99.86
25	96.61	95.35	N/A	N/A	99.98	99.98
30	97.27	95.82	N/A	N/A	100.00	100.00
35	96.77	95.64	N/A	N/A	100.00	100.00
40	97.45	96.32	N/A	N/A	100.00	100.00
50	97.43	95.17	N/A	N/A	100.00	100.00
75	98.04	95.39	N/A	N/A	100.00	100.00
100	98.46	95.74	N/A	N/A	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	94.61	94.28	96.47	95.19	94.91	95.09
15	94.22	94.12	95.62	94.79	93.82	94.85
20	94.65	94.57	95.76	94.97	93.58	95.23
25	94.50	94.48	95.58	94.75	93.11	95.33
30	94.77	94.73	95.66	95.03	92.59	95.43
35	94.36	94.36	95.13	94.55	91.94	94.93
40	94.99	94.97	95.58	95.09	91.94	95.49
50	94.20	94.22	94.79	94.40	90.51	94.44
75	94.59	94.55	94.87	94.65	89.58	94.91
100	94.83	94.85	95.11	94.87	87.88	95.23

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.36%	99.70	1.05%	91.47	0.38%	97.40
15	0.73%	99.86	0.87%	91.05	0.73%	97.53
20	1.11%	99.86	1.11%	92.55	1.11%	97.78
25	1.27%	99.98	1.27%	92.72	1.27%	97.77
30	1.45%	100.00	1.45%	92.91	1.45%	98.07
35	1.64%	100.00	1.64%	93.09	1.64%	97.64
40	1.84%	100.00	1.84%	93.93	1.84%	98.49
50	2.04%	100.00	2.04%	93.31	2.04%	98.06
75	3.29%	100.00	3.29%	94.43	3.29%	98.30
100	3.96%	100.00	3.96%	95.30	3.96%	98.70

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.37	93.72	93.82	93.64	93.98	94.00	93.62	94.69
15	91.01	94.16	94.10	93.90	94.20	94.14	94.08	95.37
20	92.06	94.85	94.89	94.53	95.07	94.71	94.63	96.48
25	91.58	94.81	94.93	94.75	95.13	94.67	94.67	96.57
30	91.21	94.99	95.13	94.89	95.66	94.97	95.05	97.07
35	90.81	94.63	94.69	94.65	95.11	94.55	94.63	96.73
40	90.61	95.03	95.19	94.99	95.43	95.13	95.13	97.56
50	89.86	94.36	94.44	94.30	94.81	94.36	94.26	97.49
75	88.79	94.75	94.83	94.61	95.15	94.59	94.63	98.02
100	87.23	95.05	95.19	95.07	95.54	94.95	95.05	98.44

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	92.85	92.62	93.06	94.87	95.31	94.85	94.67	96.99
15	92.63	94.16	93.92	95.41	95.29	94.95	95.11	97.09
20	92.63	94.95	94.93	95.52	95.56	95.23	95.29	97.29
25	92.20	94.99	95.07	95.47	95.43	95.33	95.33	97.37
30	91.58	95.66	95.60	95.54	95.72	95.37	95.62	97.84
35	91.21	94.93	95.03	95.13	95.27	95.05	94.89	97.23
40	90.81	95.45	95.43	95.49	95.56	95.31	95.45	98.12
50	90.14	94.81	94.93	94.81	94.67	94.79	94.61	97.84
75	89.01	94.95	94.97	94.91	95.19	95.01	95.11	98.32
100	87.17	95.19	95.37	95.25	95.47	95.19	95.17	98.65

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.33	94.89	95.17	92.83	94.44	92.77	92.53	96.16
15	90.69	94.40	94.61	92.87	94.61	92.69	92.67	96.44
20	91.64	94.73	94.93	93.92	95.35	93.78	93.60	97.03
25	91.23	94.48	94.51	93.94	95.31	93.64	93.86	97.25
30	91.13	94.12	94.55	94.30	95.74	94.06	94.18	97.60
35	90.57	94.20	94.24	94.00	95.27	93.94	94.00	97.21
40	90.26	94.61	94.73	94.63	95.84	94.48	94.59	97.94
50	89.60	93.92	94.04	93.90	95.01	93.84	93.84	97.72
75	88.87	94.24	94.57	94.24	95.27	94.30	94.26	98.26
100	86.67	94.65	94.79	94.61	95.60	94.81	94.63	98.61

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.19	94.30	94.38	92.46	95.72	92.32	91.86	97.37
15	90.61	94.24	94.32	92.38	95.50	92.16	91.92	97.72
20	91.43	94.46	94.81	93.27	96.61	92.95	93.09	97.74
25	91.17	94.08	94.34	93.37	96.18	93.07	93.01	97.82
30	90.46	93.78	93.90	93.62	96.67	93.45	93.68	98.36
35	89.98	93.80	93.96	93.68	96.12	93.39	93.50	97.90
40	89.96	94.14	94.20	94.36	96.40	93.96	93.98	98.40
50	89.49	93.60	93.80	93.47	95.62	93.37	93.37	98.30
75	88.26	93.88	94.14	94.08	95.78	94.02	94.02	98.53
100	86.46	94.50	94.28	94.44	95.96	93.98	94.00	98.85

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.96	99.94	100.00	99.96	99.96	99.82
15	99.98	99.96	99.98	99.98	99.98	99.90
20	100.00	100.00	100.00	100.00	100.00	99.98
25	100.00	100.00	100.00	100.00	100.00	100.00
30	100.00	100.00	100.00	100.00	100.00	99.98
35	99.98	99.98	99.98	99.98	99.98	99.98
40	99.98	99.98	100.00	100.00	100.00	99.98
50	99.96	99.96	99.96	99.96	99.96	99.96
75	100.00	100.00	100.00	100.00	100.00	100.00
100	100.00	100.00	100.00	100.00	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 61.5534531
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.91	94.75	92.75	96.83	95.58	96.44	96.34	95.80
15	93.82	95.01	94.38	95.24	95.15	95.54	95.52	96.00
20	93.58	95.54	95.33	95.50	95.66	95.74	95.74	96.65
25	93.11	95.43	95.19	95.41	95.35	95.50	95.50	96.73
30	92.59	95.68	95.52	95.68	95.82	95.84	95.84	97.27
35	91.94	95.11	95.03	95.13	95.31	95.21	95.21	96.89
40	91.94	95.70	95.62	95.70	95.72	95.76	95.76	97.45
50	90.51	94.77	94.65	94.77	94.85	94.83	94.83	97.23
75	89.58	95.03	94.95	94.99	95.09	95.05	95.05	97.94
100	87.88	95.23	95.23	95.25	95.37	95.33	95.33	98.44

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 61.5534531
Averaged Percentage Non-detects: 10.00%
Distribution Check: Average of means: 100.004624
Distribution Check: Average of stdvs: 29.909129
Average of NDs per 100 observations: 9.967800

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	61.553453	1.008515	1752	1935	1009	284	62	8	0	0	0	0
15	61.553453	1.517228	998	1760	1357	635	232	54	13	1	0	0
20	61.553453	1.970099	632	1348	1513	938	404	157	49	6	3	0
25	61.553453	2.488317	349	1051	1343	1125	688	333	105	42	13	1
30	61.553453	3.022574	218	659	1164	1207	919	519	226	92	32	11
35	61.553453	3.533267	118	454	939	1125	1026	717	393	172	77	21
40	61.553453	4.033069	68	327	719	974	1043	872	519	306	146	49
50	61.553453	4.993267	32	137	378	743	919	893	779	544	338	168
75	61.553453	7.474257	1	19	66	183	349	569	721	729	709	623
100	61.553453	10.037426	0	2	9	24	92	177	302	428	554	655

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	3	0	0	0	0	0	0	0	0	0	0	0	0
35	8	0	0	0	0	0	0	0	0	0	0	0	0
40	16	9	2	0	0	0	0	0	0	0	0	0	0
50	73	33	8	4	1	0	0	0	0	0	0	0	0
75	442	299	168	96	40	24	6	4	0	1	1	0	0
100	673	612	501	371	270	167	103	52	24	21	10	3	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	6	0	6	0	0	6	0	6	0	0
15	1	0	1	0	0	1	0	1	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	6	0	6	1	0	0	0	8
15	1	0	1	0	0	0	0	1
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	6	0	6	1	0	0
15	1	0	1	0	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	6	0	6	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	6	0	6	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	18	53	19	5050	5050	0	0
15	37	44	37	5050	5050	0	0
20	56	56	56	5050	5050	0	0
25	64	64	64	5050	5050	0	0
30	73	73	73	5050	5050	0	0
35	83	83	83	5050	5050	0	0
40	93	93	93	5050	5050	0	0
50	103	103	103	5050	5050	0	0
75	166	166	166	5050	5050	0	0
100	200	200	200	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	63	0	62	0	0	0	0
15	0	4	0	4	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 2b. N(100,30) 15% Type 1 Censoring

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	116.2272	122.5232	N/A	N/A	352.2535	278.4452
15	113.8091	115.6502	N/A	N/A	245.5058	219.8347
20	112.3869	112.8726	N/A	N/A	190.9989	181.4816
25	111.4945	111.4689	N/A	N/A	167.3442	161.6413
30	110.4638	110.1525	N/A	N/A	152.6348	148.9893
35	109.9495	109.3431	N/A	N/A	143.2297	140.8320
40	109.4243	108.6830	N/A	N/A	136.5890	135.0138
50	108.5556	107.5715	N/A	N/A	128.0848	127.1530
75	107.4547	106.1725	N/A	N/A	118.3399	117.9606
100	106.8256	105.3745	N/A	N/A	113.9456	113.7391

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	117.4244	117.0148	119.5432	118.0358	117.9035
15	113.5067	113.3532	114.7347	113.7790	113.7790
20	111.5588	111.5203	112.3543	111.7676	111.7676
25	110.4400	110.4228	111.0144	110.5864	110.5864
30	109.2182	109.2076	109.6701	109.3218	109.3218
35	108.6079	108.5995	108.9703	108.6842	108.6842
40	108.0046	108.0027	108.3072	108.0657	108.0657
50	107.0089	107.0090	107.2332	107.0472	107.0472
75	105.7654	105.7674	105.8957	105.7808	105.7808
100	105.0655	105.0671	105.1551	105.0727	105.0727

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	114.3921	113.8890	116.1451	114.3596	114.3816
15	111.4731	111.3248	112.5379	111.5878	111.5878
20	110.0610	110.0348	110.7681	110.1994	110.1994
25	109.2223	109.2141	109.7404	109.3255	109.3255
30	108.1413	108.1378	108.5522	108.2138	108.2138
35	107.6619	107.6580	107.9938	107.7153	107.7153
40	107.1418	107.1443	107.4204	107.1852	107.1852
50	106.2657	106.2688	106.4737	106.2921	106.2921
75	105.2016	105.2050	105.3240	105.2113	105.2113
100	104.5971	104.5995	104.6819	104.6009	104.6009

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	116.3943	115.9449	118.4582	116.8249	116.5156	116.7651
15	112.8883	112.7316	114.1184	113.1759	112.4211	113.3873
20	111.1485	111.1105	111.9566	111.3780	110.3714	111.5978
25	110.1220	110.1044	110.7095	110.2855	109.0882	110.5143
30	108.9389	108.9277	109.4017	109.0561	107.6806	109.2917
35	108.3740	108.3656	108.7461	108.4616	106.9958	108.6605
40	107.7914	107.7892	108.1024	107.8621	106.2900	108.0690
50	106.8290	106.8289	107.0597	106.8744	105.1484	107.0557
75	105.6330	105.6347	105.7670	105.6523	103.7138	105.7898
100	104.9578	104.9593	105.0499	104.9676	102.9140	105.0720

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.50%	303.9522	2.42%	114.6938	0.63%	120.9805
15	0.48%	220.7150	0.81%	111.3838	0.48%	116.3582
20	0.91%	190.5489	0.99%	110.0417	0.91%	114.0708
25	1.15%	176.6933	1.17%	109.2162	1.15%	112.7368
30	1.33%	167.7297	1.33%	108.1865	1.33%	111.3671
35	1.31%	160.9951	1.31%	107.7846	1.31%	110.6374
40	1.52%	156.8297	1.52%	107.3426	1.52%	110.0106
50	2.32%	149.8953	2.32%	106.6027	2.32%	108.9260
75	3.37%	140.7374	3.37%	105.7323	3.37%	107.5375
100	3.78%	135.9410	3.78%	105.2759	3.78%	106.7897

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	113.420	217.000	124.819	115.023	115.699	115.873	116.260
15	110.898	132.679	224.819	112.695	113.232	112.934	113.806
20	109.423	127.440	141.520	111.115	111.573	111.214	112.363
25	108.412	110.261	126.960	110.147	110.575	110.164	111.480
30	107.167	113.270	114.043	109.001	109.415	109.000	110.450
35	106.594	108.463	108.534	108.431	108.782	108.420	109.939
40	105.964	107.878	107.935	107.875	108.215	107.852	109.418
50	104.915	106.909	106.970	106.919	107.214	106.895	108.550
75	103.584	105.712	105.754	105.719	105.942	105.697	107.455
100	102.831	105.028	105.061	105.034	105.209	105.015	106.825

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	115.339	116.703	116.919	117.375	117.705	122.809	120.645
15	111.751	113.080	113.017	113.772	113.904	113.628	115.708
20	109.855	111.533	111.511	111.834	111.942	111.743	113.565
25	108.641	110.508	110.525	110.631	110.737	110.561	112.311
30	107.303	109.308	109.340	109.362	109.474	109.305	111.095
35	106.696	108.708	108.748	108.736	108.825	108.697	110.488
40	106.016	108.097	108.149	108.112	108.224	108.078	109.860
50	104.939	107.087	107.123	107.098	107.189	107.059	108.888
75	103.571	105.816	105.848	105.821	105.893	105.794	107.649
100	102.816	105.104	105.134	105.108	105.161	105.087	106.966

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	113.323	116.900	117.239	114.292	116.119	114.520	118.023
15	110.680	113.567	113.823	111.951	113.339	111.847	114.916
20	109.234	111.365	111.515	110.641	111.700	110.537	113.135
25	108.249	110.078	110.224	109.778	110.688	109.708	112.084
30	107.028	108.820	108.930	108.701	109.514	108.624	110.958
35	106.465	108.247	108.331	108.196	108.876	108.125	110.360
40	105.850	107.664	107.753	107.666	108.307	107.597	109.785
50	104.828	106.728	106.806	106.753	107.284	106.704	108.843
75	103.520	105.593	105.639	105.607	105.991	105.575	107.640
100	102.783	104.941	104.974	104.952	105.246	104.927	106.964

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	113.374	116.707	117.030	114.096	117.843	114.678	120.390
15	110.539	114.044	114.254	111.662	114.481	111.543	116.429
20	109.122	111.475	111.638	110.410	112.548	110.242	114.213
25	108.160	109.988	110.110	109.588	111.363	109.432	112.951
30	106.962	108.679	108.781	108.526	110.106	108.395	111.692
35	106.411	108.072	108.171	108.038	109.387	107.925	110.972
40	105.792	107.495	107.583	107.511	108.756	107.410	110.334
50	104.773	106.580	106.650	106.631	107.667	106.543	109.294
75	103.481	105.474	105.532	105.523	106.248	105.467	107.945
100	102.748	104.853	104.894	104.879	105.437	104.829	107.182

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	138.6670	138.4584	142.6732	141.1026	141.0962	136.8456
15	132.3135	132.1009	134.7471	133.5803	133.5803	131.1167
20	128.2709	128.1572	129.8800	129.0850	129.0850	127.5747
25	125.6208	125.5383	126.7893	126.1982	126.1982	125.1968
30	123.2171	123.1516	124.1301	123.6535	123.6535	123.0073
35	121.6804	121.6377	122.4101	122.0206	122.0206	121.6504
40	120.3001	120.2628	120.9053	120.5768	120.5768	120.3993
50	118.0912	118.0672	118.5333	118.2841	118.2841	118.4144
75	114.8950	114.8834	115.1442	114.9944	114.9944	115.5532
100	113.0164	113.0103	113.1833	113.0781	113.0781	113.8746

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	115.3619	117.1346	114.1623	113.9381	118.3583
15	112.8008	113.6246	111.8159	111.4696	114.1071
20	111.1524	111.7488	110.5380	110.2173	111.9925
25	110.1514	110.5704	109.6928	109.4448	110.7672
30	108.9893	109.3069	108.6424	108.3940	109.4818
35	108.4207	108.6930	108.1318	107.9390	108.8165
40	107.8505	108.0735	107.5991	107.4219	108.1886
50	106.8906	107.0650	106.7027	106.5378	107.1477
75	105.6962	105.7981	105.5697	105.4672	105.8500
100	105.0166	105.0888	104.9279	104.8379	105.1232

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	116.516	114.709	113.862	117.510	117.971	1094.090	117.447
15	112.421	113.647	113.182	113.764	114.080	120.779	114.272
20	110.371	111.918	111.665	111.813	112.019	111.997	112.577
25	109.088	110.668	110.508	110.655	110.831	110.767	111.561
30	107.681	109.407	109.289	109.401	109.573	109.482	110.460
35	106.996	108.765	108.678	108.754	108.877	108.817	109.916
40	106.290	108.142	108.073	108.142	108.277	108.189	109.362
50	105.148	107.116	107.069	107.116	107.232	107.148	108.470
75	103.714	105.834	105.811	105.836	105.924	105.850	107.361
100	102.914	105.113	105.099	105.114	105.179	105.123	106.739

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	96.71	96.32	97.90	97.09	97.09	91.47	90.67	94.70	91.15	91.17
15	95.15	94.99	97.27	95.58	95.58	90.99	90.79	92.97	91.01	91.01
20	95.31	95.27	96.59	95.60	95.60	91.35	91.33	93.07	91.58	91.58
25	96.10	96.08	97.03	96.24	96.24	92.59	92.63	93.94	92.73	92.73
30	95.17	95.17	96.10	95.39	95.39	91.68	91.60	92.97	91.76	91.76
35	95.25	95.17	96.04	95.33	95.33	92.55	92.59	93.41	92.57	92.57
40	95.35	95.33	96.00	95.39	95.39	92.59	92.65	93.45	92.61	92.61
50	95.09	95.05	95.64	95.11	95.11	92.14	92.12	92.83	92.18	92.18
75	94.87	94.85	95.31	94.89	94.89	92.26	92.30	92.73	92.26	92.26
100	95.50	95.49	95.80	95.52	95.52	93.13	93.01	93.33	93.07	93.07

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	96.06	95.82	N/A	N/A	99.98	99.94
15	96.53	95.86	N/A	N/A	99.96	99.96
20	97.17	95.33	N/A	N/A	99.98	99.98
25	98.16	96.30	N/A	N/A	100.00	100.00
30	98.06	96.02	N/A	N/A	100.00	100.00
35	98.20	95.84	N/A	N/A	100.00	100.00
40	98.44	96.10	N/A	N/A	100.00	100.00
50	98.79	95.82	N/A	N/A	100.00	100.00
75	98.87	95.23	N/A	N/A	100.00	100.00
100	99.52	95.78	N/A	N/A	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	95.00	94.38	97.26	95.32	94.44	95.49
15	93.80	93.66	95.74	94.08	92.14	94.53
20	94.22	94.16	95.82	94.59	91.47	94.89
25	95.11	95.09	96.34	95.41	91.39	95.72
30	94.44	94.42	95.29	94.50	89.62	95.03
35	94.51	94.46	95.39	94.57	89.05	94.95
40	94.44	94.42	95.33	94.55	88.40	95.13
50	94.24	94.22	94.99	94.32	86.10	94.93
75	94.10	94.04	94.57	94.08	83.17	94.40
100	94.93	94.87	95.41	94.93	80.48	94.87

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.50%	99.94	2.42%	90.58	0.63%	97.73
15	0.48%	99.96	0.81%	90.54	0.48%	97.69
20	0.91%	99.98	0.99%	91.58	0.91%	97.66
25	1.15%	100.00	1.17%	92.95	1.15%	98.38
30	1.33%	100.00	1.33%	92.66	1.33%	98.09
35	1.31%	100.00	1.31%	93.76	1.31%	98.15
40	1.52%	100.00	1.52%	94.01	1.52%	98.51
50	2.32%	100.00	2.32%	94.41	2.32%	98.36
75	3.37%	100.00	3.37%	95.66	3.37%	98.18
100	3.78%	100.00	3.78%	97.00	3.78%	99.09

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.64	94.51	94.53	93.41	94.53	94.53	93.88	96.20
15	89.45	95.05	95.13	94.24	94.95	94.73	94.44	96.55
20	89.29	95.03	95.17	94.55	95.13	94.89	94.77	97.13
25	89.43	95.82	95.92	95.49	96.04	95.52	95.50	98.22
30	87.88	95.05	95.21	94.67	95.56	94.85	94.73	98.00
35	87.66	95.07	95.19	95.01	95.60	94.93	94.93	98.16
40	87.03	95.23	95.27	94.99	95.76	95.17	94.91	98.48
50	85.01	94.95	95.07	94.99	95.39	94.73	94.69	98.71
75	82.36	94.55	94.81	94.69	95.07	94.55	94.51	98.77
100	80.02	95.11	95.37	95.31	95.39	95.21	95.17	99.56

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.13	91.95	91.77	94.51	94.71	94.10	94.26	97.80
15	90.89	93.48	93.05	95.27	95.09	94.99	94.93	97.74
20	90.34	94.77	94.63	95.58	95.11	95.64	95.54	98.30
25	90.04	95.78	95.90	96.20	95.96	96.20	96.04	98.77
30	88.30	95.05	95.01	95.47	95.07	95.27	95.17	98.63
35	87.98	95.41	95.47	95.39	95.29	95.41	95.27	98.71
40	87.29	95.52	95.45	95.45	95.60	95.37	95.33	98.81
50	85.41	95.15	95.23	95.09	95.15	94.91	94.95	98.99
75	82.22	94.93	95.01	94.93	94.83	94.59	94.67	98.93
100	79.74	95.37	95.45	95.60	95.11	95.43	95.52	99.62

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.96	96.10	96.46	92.65	95.64	93.37	92.38	97.21
15	89.09	95.37	95.90	92.73	95.19	92.59	92.50	97.84
20	89.01	95.03	95.15	93.70	95.29	93.19	93.25	97.98
25	89.15	95.45	95.88	94.51	96.28	94.42	94.44	98.65
30	87.60	94.38	94.73	93.96	95.70	93.66	93.76	98.40
35	87.29	94.48	94.75	94.08	95.66	94.08	94.16	98.51
40	86.46	94.42	94.71	94.32	95.98	94.12	94.18	98.71
50	84.57	94.16	94.46	94.30	95.66	94.12	94.02	98.99
75	81.90	94.04	94.38	94.10	95.25	93.90	93.98	98.99
100	79.56	94.79	95.03	94.75	95.54	94.83	94.89	99.58

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.32	93.76	94.04	92.50	97.23	93.54	92.59	98.22
15	88.75	95.45	95.68	92.28	97.09	92.10	91.84	98.59
20	88.12	94.55	94.93	92.93	96.50	92.73	92.38	98.55
25	88.91	95.13	95.19	93.96	97.43	93.60	93.76	99.03
30	87.52	94.14	94.32	93.47	96.85	93.09	92.89	98.81
35	87.03	93.88	94.36	93.66	96.77	93.62	93.70	98.93
40	86.40	93.92	94.24	93.98	97.13	93.80	93.64	99.11
50	84.36	93.52	93.88	93.96	96.44	93.31	93.60	99.23
75	81.45	93.52	93.92	93.72	96.04	93.54	93.58	99.17
100	79.09	94.40	94.42	94.46	96.48	94.22	94.38	99.68

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.82	99.80	99.94	99.90	99.90	99.70
15	99.94	99.96	100.00	99.98	99.98	99.92
20	100.00	100.00	100.00	100.00	100.00	100.00
25	100.00	100.00	100.00	100.00	100.00	100.00
30	100.00	100.00	100.00	100.00	100.00	100.00
35	100.00	100.00	100.00	100.00	100.00	100.00
40	100.00	100.00	100.00	100.00	100.00	100.00
50	100.00	100.00	100.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00
100	100.00	100.00	100.00	100.00	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.9069984
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.44	95.13	91.07	99.04	96.26	97.15	97.13	96.67
15	92.14	95.09	93.86	95.75	95.82	96.26	96.26	96.83
20	91.47	95.62	95.05	95.58	95.54	96.00	96.00	97.35
25	91.39	96.34	95.86	96.26	96.26	96.61	96.61	98.06
30	89.62	95.50	95.21	95.49	95.68	95.72	95.72	97.98
35	89.05	95.56	95.23	95.52	95.58	95.66	95.66	98.14
40	88.40	95.56	95.39	95.54	95.88	95.66	95.66	98.38
50	86.10	95.33	95.15	95.23	95.41	95.43	95.43	98.71
75	83.17	95.13	94.97	95.19	95.19	95.13	95.13	98.63
100	80.48	95.66	95.56	95.54	95.31	95.66	95.66	99.43

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 68.9069984
Averaged Percentage Non-detects: 15.00%
Distribution Check: Average of means: 99.990531
Distribution Check: Average of stdvs: 29.904043
Average of NDs per 100 observations: 14.990900

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	68.906998	1.488317	980	1774	1432	627	188	49	0	0	0	0
15	68.906998	2.288713	435	1122	1408	1167	599	218	81	14	5	1
20	68.906998	2.960792	212	735	1162	1195	896	501	258	64	21	5
25	68.906998	3.678812	105	361	868	1123	1066	763	465	189	79	22
30	68.906998	4.518020	37	221	504	836	999	946	733	433	210	85
35	68.906998	5.199604	19	125	325	618	891	943	805	633	356	191
40	68.906998	5.992277	5	45	200	413	664	855	896	758	551	325
50	68.906998	7.551287	5	16	51	153	323	532	709	815	737	628
75	68.906998	11.284554	0	0	2	8	46	77	177	240	410	543
100	68.906998	14.967327	0	0	0	1	5	6	19	44	71	134

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	1	0	0	0	0	0	0	0	0	0	0	0	0
25	9	0	0	0	0	0	0	0	0	0	0	0	0
30	33	8	4	1	0	0	0	0	0	0	0	0	0
35	92	33	13	3	2	0	1	0	0	0	0	0	0
40	191	77	44	19	6	1	0	0	0	0	0	0	0
50	462	273	175	84	46	24	12	3	2	0	0	0	0
75	539	670	631	491	451	301	202	115	80	44	12	11	0
100	201	357	397	540	582	546	518	447	370	255	213	344	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	9	0	9	0	0	9	0	9	0	0
15	1	0	1	0	0	1	0	1	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	9	0	9	4	0	0	0	49
15	1	0	1	0	0	0	0	20
20	0	0	0	0	0	0	0	1
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	9	0	9	4	0	0
15	1	0	1	0	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	9	0	9	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	9	0	9	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	25	122	32	5050	5050	0	0
15	24	41	24	5050	5050	0	0
20	46	50	46	5050	5050	0	0
25	58	59	58	5050	5050	0	0
30	67	67	67	5050	5050	0	0
35	66	66	66	5050	5050	0	0
40	77	77	77	5050	5050	0	0
50	117	117	117	5050	5050	0	0
75	170	170	170	5050	5050	0	0
100	191	191	191	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	146	0	145	0	0	0	0
15	0	18	0	18	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 2c. N(100,30) 20% Type 1 Censoring

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	116.8551	126.6783	N/A	N/A	404.7699	314.4939
15	114.7243	116.8850	N/A	N/A	254.6465	227.2951
20	113.0487	113.8486	N/A	N/A	194.0101	184.1390
25	112.0148	111.7911	N/A	N/A	167.9114	162.1223
30	111.2581	110.5092	N/A	N/A	152.9687	149.2974
35	110.5265	109.4908	N/A	N/A	143.0117	140.6112
40	110.1583	108.9321	N/A	N/A	136.5993	135.0226
50	109.5506	108.0057	N/A	N/A	128.4564	127.5214
75	108.2124	106.2242	N/A	N/A	118.3175	117.9382
100	107.6505	105.5169	N/A	N/A	114.0425	113.8359

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	118.0594	117.4857	120.7227	138.2797	118.5013
15	114.0758	113.8807	115.5887	114.3674	114.3176
20	111.7423	111.6492	112.7256	111.8876	111.8876
25	110.3356	110.3160	111.0515	110.4623	110.4623
30	109.4178	109.4087	109.9631	109.5060	109.5060
35	108.5117	108.5049	108.9550	108.5728	108.5728
40	108.0715	108.0696	108.4380	108.1159	108.1159
50	107.3430	107.3427	107.6113	107.3678	107.3678
75	105.7620	105.7623	105.9211	105.7668	105.7668
100	105.1056	105.1083	105.2152	105.1045	105.1045

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	114.1333	113.3916	116.2900	132.8263	113.8279
15	111.3953	111.1969	112.6818	112.5240	111.4042
20	109.7069	109.6248	110.5641	109.7405	109.7405
25	108.6367	108.6312	109.2700	108.6989	108.6989
30	107.9695	107.9701	108.4573	108.0139	108.0139
35	107.2085	107.2088	107.6079	107.2365	107.2365
40	106.8992	106.9039	107.2314	106.9179	106.9179
50	106.3517	106.3556	106.5973	106.3598	106.3598
75	104.9905	104.9928	105.1382	104.9870	104.9870
100	104.4642	104.4683	104.5668	104.4581	104.4581

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	116.5034	115.8559	119.0258	116.7946	116.0962	116.8299
15	113.1369	112.9365	114.6148	113.3683	112.0350	113.6605
20	111.0784	110.9867	112.0527	111.2321	109.5131	111.5560
25	109.8084	109.7904	110.5228	109.9460	107.9418	110.2654
30	108.9853	108.9771	109.5324	109.0836	106.8940	109.3611
35	108.1310	108.1251	108.5766	108.2006	105.8434	108.4546
40	107.7303	107.7285	108.0994	107.7820	105.3003	108.0535
50	107.0634	107.0632	107.3345	107.0940	104.4546	107.3150
75	105.5491	105.5495	105.7101	105.5572	102.5989	105.7136
100	104.9298	104.9324	105.0408	104.9310	101.8094	105.0742

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.44%	352.2978	5.58%	114.1336	0.91%	120.8606
15	0.81%	242.8185	2.14%	111.3618	0.81%	116.6048
20	0.95%	207.1755	1.45%	109.7927	0.95%	114.1048
25	1.23%	189.4764	1.33%	108.9082	1.23%	112.6380
30	1.45%	177.4945	1.49%	108.3349	1.45%	111.5772
35	1.50%	169.6481	1.52%	107.7301	1.50%	110.6234
40	1.70%	164.3660	1.72%	107.4787	1.70%	110.1372
50	2.06%	156.0792	2.06%	107.0967	2.06%	109.3362
75	3.23%	144.9594	3.23%	106.1124	3.23%	107.7341
100	4.30%	139.4247	4.30%	105.7722	4.30%	107.0689

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	112.654	136.621	125.719	115.015	116.058	163.926	117.052
15	110.438	127.516	191.582	113.192	113.881	116.013	114.843
20	108.514	152.416	337.509	111.278	111.879	111.437	113.100
25	107.237	192.510	174.381	110.060	110.606	110.100	112.051
30	106.359	185.110	109.421	109.217	109.693	109.210	111.280
35	105.418	108.424	108.491	108.348	108.787	108.336	110.542
40	104.957	113.306	108.046	107.956	108.384	107.927	110.183
50	104.215	107.258	107.322	107.252	107.619	107.225	109.561
75	102.468	105.706	105.758	105.714	105.990	105.684	108.218
100	101.724	105.072	105.116	105.080	105.324	105.054	107.653

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	113.995	115.904	116.043	116.788	117.194	81552.514	121.678
15	111.283	113.242	113.063	114.166	114.145	658.189	117.002
20	108.944	111.443	111.319	111.842	111.905	111.752	114.393
25	107.496	110.247	110.212	110.479	110.542	110.388	112.982
30	106.524	109.432	109.431	109.534	109.608	109.459	111.985
35	105.555	108.562	108.585	108.613	108.679	108.545	111.141
40	105.031	108.127	108.152	108.153	108.262	108.100	110.645
50	104.244	107.401	107.437	107.409	107.501	107.358	109.927
75	102.465	105.796	105.838	105.804	105.873	105.776	108.442
100	101.709	105.133	105.168	105.139	105.220	105.114	107.805

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	112.822	118.079	118.577	114.406	116.812	114.733	119.072
15	110.236	114.750	115.085	112.243	114.015	112.154	116.117
20	108.328	111.997	112.201	110.606	112.000	110.461	114.002
25	107.076	110.282	110.440	109.558	110.716	109.436	112.765
30	106.234	109.111	109.259	108.811	109.781	108.711	111.860
35	105.309	108.142	108.269	108.018	108.885	107.937	111.038
40	104.852	107.700	107.805	107.661	108.483	107.578	110.606
50	104.126	107.022	107.114	107.042	107.686	106.968	109.899
75	102.404	105.555	105.614	105.572	106.039	105.524	108.439
100	101.672	104.956	105.003	104.973	105.365	104.933	107.811

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	113.080	195.443	118.096	114.466	119.484	115.332	121.705
15	110.114	115.380	115.713	111.982	115.654	111.896	117.809
20	108.239	112.299	112.565	110.366	113.224	110.170	115.250
25	107.005	110.361	110.539	109.350	111.722	109.159	113.766
30	106.160	109.033	109.166	108.633	110.634	108.471	112.707
35	105.254	108.008	108.110	107.863	109.605	107.721	111.757
40	104.789	107.547	107.648	107.519	109.121	107.387	111.250
50	104.071	106.869	106.965	106.910	108.202	106.804	110.388
75	102.371	105.438	105.499	105.487	106.413	105.410	108.772
100	101.630	104.862	104.902	104.895	105.632	104.842	108.064

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	138.4921	138.2000	143.2749	141.2757	141.2169	136.2397
15	132.5428	132.3144	135.3806	133.9083	133.9078	131.1897
20	128.1956	128.0424	130.0682	129.0421	129.0421	127.4289
25	125.3948	125.3014	126.7606	125.9981	125.9981	125.0381
30	123.2830	123.2189	124.3235	123.7295	123.7295	123.2156
35	121.4711	121.4249	122.3106	121.8176	121.8176	121.6524
40	120.2246	120.1794	120.9151	120.5017	120.5017	120.5724
50	118.3014	118.2729	118.8016	118.4920	118.4920	118.9288
75	114.8186	114.8055	115.1052	114.9140	114.9140	115.9272
100	112.9857	112.9768	113.1781	113.0433	113.0433	114.3580

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	115.5024	116.5227	114.2241	114.2510	119.2889
15	113.3904	114.0037	112.0756	111.7358	114.7787
20	111.3451	111.7453	110.4614	110.1199	112.2266
25	110.0732	110.4043	109.4177	109.1645	110.7310
30	109.2063	109.4604	108.7211	108.4554	109.7236
35	108.3311	108.5525	107.9323	107.7155	108.7606
40	107.9251	108.0987	107.5756	107.3797	108.2884
50	107.2247	107.3660	106.9696	106.8216	107.5020
75	105.6836	105.7765	105.5265	105.4017	105.8585
100	105.0548	105.1109	104.9317	104.8351	105.1766

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	116.096	113.006	111.907	117.898	118.621	1963.816	117.925
15	112.035	114.230	113.543	114.222	114.688	394.298	115.089
20	109.513	112.076	111.671	111.934	112.283	114.513	113.152
25	107.942	110.602	110.333	110.544	110.840	110.731	112.001
30	106.894	109.603	109.418	109.594	109.830	109.724	111.194
35	105.843	108.670	108.528	108.659	108.865	108.761	110.434
40	105.300	108.216	108.105	108.215	108.435	108.288	110.046
50	104.455	107.454	107.381	107.453	107.625	107.502	109.429
75	102.599	105.834	105.797	105.832	105.963	105.859	108.092
100	101.809	105.161	105.139	105.164	105.293	105.177	107.545

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	96.89	96.55	98.18	97.15	97.13	90.52	89.31	94.55	89.33	89.56
15	96.57	96.46	98.04	96.67	96.67	90.44	90.04	93.56	90.10	90.12
20	95.88	95.76	97.52	96.16	96.16	90.75	90.61	93.09	90.73	90.73
25	95.52	95.49	97.03	95.64	95.64	90.53	90.53	92.46	90.51	90.51
30	95.66	95.66	96.81	95.80	95.80	90.75	90.87	92.50	90.73	90.73
35	95.15	95.07	96.18	95.17	95.17	91.09	91.05	92.44	91.01	91.01
40	95.33	95.21	96.55	95.35	95.35	90.91	90.85	92.00	90.91	90.91
50	96.10	96.20	96.79	96.12	96.12	92.16	92.16	93.11	92.12	92.12
75	94.67	94.63	95.43	94.65	94.65	91.15	91.11	91.82	91.05	91.05
100	95.03	95.01	95.58	95.01	95.01	91.88	91.94	92.38	91.86	91.86

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	96.14	96.39	N/A	N/A	100.00	100.00
15	97.50	96.07	N/A	N/A	100.00	100.00
20	98.12	96.04	N/A	N/A	100.00	100.00
25	98.57	95.91	N/A	N/A	100.00	100.00
30	98.91	96.32	N/A	N/A	100.00	100.00
35	98.95	95.21	N/A	N/A	100.00	100.00
40	99.19	95.49	N/A	N/A	100.00	100.00
50	99.37	96.36	N/A	N/A	100.00	100.00
75	99.74	95.39	N/A	N/A	100.00	99.98
100	99.88	95.74	N/A	N/A	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	94.75	94.04	97.25	94.80	93.11	95.11
15	94.31	94.04	96.63	94.53	90.51	95.07
20	94.20	94.14	95.98	94.26	88.91	95.07
25	94.06	93.98	95.50	94.14	86.97	94.22
30	94.26	94.26	95.66	94.34	85.92	94.75
35	93.92	93.88	94.93	93.98	84.04	94.26
40	93.64	93.62	94.99	93.66	82.93	94.63
50	95.05	95.15	95.80	95.05	81.82	95.47
75	93.66	93.72	94.28	93.64	73.86	93.78
100	94.06	94.04	94.63	94.02	70.02	94.57

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.44%	100.00	5.58%	91.40	0.91%	97.24
15	0.81%	100.00	2.14%	91.56	0.81%	97.78
20	0.95%	100.00	1.45%	92.67	0.95%	97.94
25	1.23%	100.00	1.33%	93.28	1.23%	98.18
30	1.45%	100.00	1.49%	94.07	1.45%	98.17
35	1.50%	100.00	1.52%	94.37	1.50%	97.93
40	1.70%	100.00	1.72%	94.98	1.70%	98.33
50	2.06%	100.00	2.06%	96.74	2.06%	98.75
75	3.23%	100.00	3.23%	97.59	3.23%	99.06
100	4.30%	100.00	4.30%	98.30	4.30%	99.28

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.31	94.67	94.32	93.46	94.51	93.86	93.35	96.48
15	87.45	96.29	96.22	95.38	96.00	96.16	95.52	97.76
20	86.26	96.30	96.22	95.31	95.88	95.74	95.43	98.20
25	84.93	95.74	95.88	94.73	95.58	95.01	95.05	98.63
30	83.60	95.52	95.52	95.23	95.90	95.29	95.35	98.99
35	82.26	95.15	95.17	94.53	95.49	94.79	94.59	98.97
40	81.47	95.13	95.35	95.07	95.66	94.91	94.79	99.19
50	80.53	95.92	96.18	96.00	96.48	95.90	95.86	99.39
75	72.89	94.53	94.67	94.59	95.13	94.46	94.46	99.72
100	69.23	94.97	95.11	94.71	95.41	94.81	94.75	99.88

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.64	90.13	89.85	92.51	92.91	91.90	92.26	97.66
15	89.72	93.08	92.43	95.74	95.09	95.78	95.62	98.63
20	87.80	94.22	94.10	95.84	95.33	95.47	95.56	98.85
25	86.12	94.53	94.32	95.25	94.93	95.25	95.25	99.05
30	84.83	95.56	95.45	95.66	95.19	95.50	95.52	99.31
35	83.23	95.17	94.93	95.19	94.85	94.93	95.09	99.31
40	81.98	95.35	95.27	95.23	94.93	95.17	95.13	99.39
50	81.03	96.14	96.30	96.00	96.08	96.10	95.82	99.49
75	73.31	94.79	94.89	94.77	94.55	94.65	94.73	99.82
100	69.07	95.09	95.29	94.89	95.13	95.01	94.81	99.88

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.44	96.73	97.07	93.09	96.10	93.60	92.59	97.50
15	87.25	96.95	97.21	93.43	96.12	93.23	93.15	98.61
20	85.74	96.28	96.44	93.76	96.20	93.25	93.62	98.77
25	84.65	95.19	95.52	93.66	95.66	93.25	93.47	99.07
30	83.39	94.67	95.21	94.04	95.92	93.76	93.84	99.23
35	81.84	94.28	94.73	93.92	95.66	93.80	93.45	99.39
40	81.05	94.18	94.40	93.82	95.78	93.47	93.56	99.45
50	80.28	95.29	95.50	95.33	96.50	94.87	94.85	99.47
75	72.38	93.80	94.04	94.04	95.21	93.70	93.90	99.86
100	68.48	94.30	94.53	94.42	95.52	94.24	94.16	99.90

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.10	92.79	92.91	93.94	98.10	94.75	93.58	98.59
15	87.15	96.53	96.79	93.23	98.22	93.35	92.87	99.11
20	85.62	96.16	96.48	93.64	97.90	93.09	92.83	99.27
25	84.32	95.09	95.64	93.23	97.70	92.63	92.87	99.47
30	83.43	94.34	94.89	93.76	97.50	93.23	93.21	99.49
35	81.17	94.08	94.32	93.45	97.01	93.19	92.91	99.58
40	80.93	93.47	94.06	93.52	97.25	92.99	93.17	99.64
50	79.58	94.55	94.99	94.63	97.66	94.48	94.28	99.60
75	72.32	93.50	93.68	93.41	96.65	93.29	93.19	99.74
100	68.53	94.08	94.00	93.98	96.59	94.02	93.76	99.90

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.78	99.80	99.96	99.84	99.84	99.74
15	99.90	99.92	99.98	99.94	99.94	99.90
20	99.98	99.96	99.98	99.98	99.98	99.98
25	99.98	99.98	99.98	99.98	99.98	99.98
30	100.00	100.00	100.00	100.00	100.00	100.00
35	99.98	99.98	99.98	99.98	99.98	99.98
40	100.00	100.00	100.00	100.00	100.00	100.00
50	99.98	99.98	100.00	99.98	99.98	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00
100	100.00	100.00	100.00	100.00	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 74.7513630
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	93.11	94.58	88.24	101.29	96.55	97.50	97.47	96.69
15	90.51	96.19	94.30	96.97	96.38	97.13	97.11	97.62
20	88.91	95.93	94.99	95.99	96.34	96.73	96.73	98.10
25	86.97	95.80	94.77	95.72	95.62	96.36	96.36	98.50
30	85.92	95.84	95.21	95.82	96.02	96.14	96.14	98.71
35	84.04	95.29	94.89	95.29	95.52	95.72	95.72	98.83
40	82.93	95.72	95.15	95.60	95.72	96.02	96.02	99.05
50	81.82	96.40	96.20	96.32	96.46	96.55	96.55	99.31
75	73.86	94.97	94.71	94.97	94.99	95.11	95.11	99.72
100	70.02	95.23	95.09	95.09	95.41	95.25	95.25	99.82

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 74.7513630
Averaged Percentage Non-detects: 20.00%
Distribution Check: Average of means: 99.997953
Distribution Check: Average of stdvs: 29.916077
Average of NDs per 100 observations: 19.997500

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	74.751363	1.981188	519	1403	1524	1011	444	149	0	0	0	0
15	74.751363	3.010891	202	647	1150	1248	934	549	230	68	21	1
20	74.751363	4.007525	61	270	694	1091	1074	856	542	299	103	41
25	74.751363	5.032277	20	114	355	675	943	982	816	567	311	177
30	74.751363	5.986733	7	43	186	400	671	878	896	735	565	361
35	74.751363	7.033861	5	20	80	230	404	608	824	840	671	579
40	74.751363	8.021386	1	7	31	102	236	432	592	815	776	720
50	74.751363	9.920990	1	1	10	18	78	138	275	478	637	685
75	74.751363	15.078614	0	0	0	0	2	9	13	35	65	123
100	74.751363	20.039604	0	0	0	0	0	0	1	2	1	9

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	33
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	16	3	0	0	0	0	0	0	0	0	0	0	0
25	64	16	10	0	0	0	0	0	0	0	0	0	0
30	184	85	31	6	1	1	0	0	0	0	0	0	0
35	392	210	108	48	27	2	0	2	0	0	0	0	0
40	515	373	210	126	68	26	10	9	1	0	0	0	0
50	679	635	497	374	257	144	69	48	13	7	5	1	0
75	220	318	398	496	568	597	505	475	404	270	205	347	0
100	16	34	64	101	146	251	306	408	442	515	479	2275	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	37	0	37	0	0	37	0	37	0	0
15	6	0	6	0	0	6	0	6	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	37	0	37	13	0	0	0	149
15	6	0	6	2	0	0	0	90
20	0	0	0	0	0	0	0	19
25	0	0	0	0	0	0	0	10
30	0	0	0	0	0	0	0	1
35	0	0	0	0	0	0	0	2
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	37	0	37	13	0	0
15	6	0	6	2	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	37	0	37	0	0	0	0
15	0	6	0	6	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	37	0	37	0	0	0	0
15	0	6	0	6	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	22	282	46	5050	5050	0	0
15	41	108	41	5050	5050	0	0
20	48	73	48	5050	5050	0	0
25	62	67	62	5050	5050	0	0
30	73	75	73	5050	5050	0	0
35	76	77	76	5050	5050	0	0
40	86	87	86	5050	5050	0	0
50	104	104	104	5050	5050	0	0
75	163	163	163	5050	5050	0	0
100	217	217	217	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	250	0	249	0	0	0	0
15	0	36	0	36	0	0	0	0
20	0	7	0	7	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 2d. N(100,30) 25% Type 1 Censoring

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	117.8781	130.4676	N/A	N/A	443.4920	341.1491
15	115.3315	118.1288	N/A	N/A	259.7045	231.3668
20	113.8657	115.2261	N/A	N/A	194.6727	184.7153
25	112.8111	112.4478	N/A	N/A	168.1141	162.3001
30	111.9914	111.0939	N/A	N/A	152.8604	149.1855
35	111.3389	109.9032	N/A	N/A	143.0709	140.6673
40	111.1240	109.4793	N/A	N/A	136.7060	135.1268
50	110.2700	108.0756	N/A	N/A	128.1616	127.2279
75	109.1906	106.4851	N/A	N/A	118.4452	118.0654
100	108.5626	105.6184	N/A	N/A	114.0487	113.8421

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	119.2177	118.3805	122.3561	134.9999	119.5025
15	114.4774	114.1012	116.2814	114.5474	114.5447
20	112.1096	111.9684	113.2872	112.1885	112.1901
25	110.5859	110.5288	111.4462	110.6542	110.6542
30	109.5064	109.4815	110.1693	109.5568	109.5568
35	108.6782	108.6717	109.2110	108.7186	108.7186
40	108.3349	108.3320	108.7800	108.3601	108.3601
50	107.2573	107.2547	107.5893	107.2643	107.2643
75	105.9216	105.9217	106.1164	105.9138	105.9138
100	105.1411	105.1419	105.2764	105.1299	105.1299

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	114.4619	113.3259	116.9593	128.2398	113.6720
15	111.1571	110.7387	112.6675	110.8686	110.8645
20	109.5489	109.4122	110.5608	109.4669	109.4710
25	108.4471	108.4036	109.1981	108.4222	108.4222
30	107.6525	107.6395	108.2377	107.6404	107.6404
35	107.0310	107.0343	107.5055	107.0266	107.0266
40	106.8374	106.8427	107.2365	106.8276	106.8276
50	105.9647	105.9672	106.2653	105.9483	105.9483
75	104.9336	104.9365	105.1129	104.9145	104.9145
100	104.3149	104.3174	104.4406	104.2968	104.2968

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	117.1327	116.1721	120.0317	117.1264	115.8754	117.2888
15	113.1587	112.7636	114.8781	113.1543	111.0986	113.5857
20	111.1771	111.0367	112.3177	111.2422	108.7010	111.6262
25	109.8302	109.7765	110.6694	109.8964	107.0097	110.2849
30	108.8706	108.8479	109.5207	108.9228	105.7565	109.2827
35	108.1263	108.1215	108.6509	108.1699	104.8101	108.4871
40	107.8392	107.8376	108.2785	107.8676	104.3839	108.1726
50	106.8370	106.8354	107.1656	106.8468	103.1109	107.0934
75	105.6064	105.6070	105.8002	105.6007	101.5162	105.7929
100	104.8793	104.8803	105.0141	104.8695	100.5792	105.0255

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.53%	392.9043	10.00%	114.4778	1.29%	121.2382
15	0.57%	259.8468	5.09%	111.4256	0.71%	116.5545
20	0.89%	217.9681	2.63%	110.0566	0.91%	114.2618
25	1.35%	196.4467	2.14%	109.2185	1.37%	112.7661
30	1.37%	183.1537	1.80%	108.5845	1.37%	111.6415
35	1.47%	174.4321	1.72%	108.1318	1.47%	110.8082
40	1.60%	168.3245	1.66%	108.0618	1.60%	110.4803
50	2.14%	158.5482	2.14%	107.4588	2.14%	109.3954
75	2.46%	146.2718	2.46%	106.8050	2.46%	108.0662
100	4.42%	139.8185	4.42%	106.4424	4.42%	107.3146

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	112.038	407.962	211.904	115.261	116.747	153.672	118.225
15	109.417	339.945	163.177	113.364	114.278	114.009	115.579
20	107.666	155.613	161.709	111.598	112.302	111.814	113.998
25	106.288	110.827	121.435	110.295	110.946	110.371	112.900
30	105.205	132.116	124.896	109.305	109.912	109.316	112.059
35	104.379	129.389	108.763	108.528	109.068	108.511	111.390
40	104.025	108.302	117.337	108.220	108.734	108.187	111.163
50	102.859	107.195	137.782	107.174	107.612	107.140	110.299
75	101.378	105.872	105.936	105.878	106.229	105.839	109.206
100	100.492	105.110	105.160	105.118	105.405	105.083	108.574

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	112.844	116.313	116.493	116.451	116.991	26113.492	123.429
15	110.273	113.042	112.767	114.095	114.024	116.319	117.765
20	108.197	111.538	111.360	112.065	112.027	111.972	115.398
25	106.627	110.333	110.224	110.605	110.653	110.519	113.873
30	105.441	109.418	109.367	109.553	109.616	109.467	112.804
35	104.553	108.652	108.641	108.732	108.794	108.657	112.005
40	104.162	108.344	108.352	108.385	108.466	108.320	111.671
50	102.945	107.277	107.311	107.294	107.372	107.246	110.694
75	101.417	105.942	105.984	105.951	106.043	105.905	109.445
100	100.508	105.160	105.199	105.168	105.253	105.129	108.737

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	112.582	119.637	120.257	114.939	117.887	115.421	120.473
15	109.266	115.824	116.278	112.220	114.398	112.130	116.971
20	107.502	112.843	113.143	110.736	112.408	110.574	115.004
25	106.160	110.925	111.141	109.636	111.039	109.489	113.687
30	105.095	109.400	109.576	108.782	109.991	108.643	112.700
35	104.270	108.377	108.531	108.095	109.153	107.979	111.943
40	103.935	107.981	108.108	107.845	108.812	107.736	111.659
50	102.786	106.880	106.999	106.888	107.687	106.790	110.684
75	101.335	105.670	105.744	105.697	106.275	105.626	109.446
100	100.443	104.959	105.014	104.971	105.449	104.929	108.756

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	113.137	117.911	118.631	115.329	121.546	116.678	123.316
15	109.203	351.391	117.042	112.051	116.666	112.023	118.846
20	107.409	113.484	113.774	110.559	114.020	110.314	116.404
25	106.070	111.209	111.421	109.436	112.367	109.224	114.801
30	105.026	109.465	109.633	108.618	111.121	108.432	113.634
35	104.213	108.336	108.460	107.965	110.118	107.785	112.747
40	103.876	107.855	107.992	107.717	109.679	107.554	112.353
50	102.722	106.749	106.852	106.782	108.405	106.641	111.243
75	101.283	105.561	105.640	105.609	106.766	105.516	109.828
100	100.421	104.878	104.934	104.918	105.832	104.836	109.039

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	138.8153	138.4671	144.2056	141.8012	141.7652	136.2544
15	132.2683	131.9498	135.4724	133.6576	133.6496	130.7826
20	128.2623	128.0883	130.3847	129.1205	129.1140	127.5471
25	125.3067	125.1906	126.8542	125.9010	125.9010	125.1120
30	123.1182	123.0364	124.3077	123.5598	123.5598	123.2887
35	121.3814	121.3260	122.3335	121.7260	121.7260	121.8436
40	120.3506	120.3053	121.1412	120.6255	120.6255	121.0445
50	118.1053	118.0766	118.6862	118.2913	118.2913	119.1864
75	114.8679	114.8520	115.1988	114.9574	114.9574	116.5175
100	112.9314	112.9211	113.1553	112.9833	112.9833	114.9320

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	115.8607	116.1857	114.6799	115.1096	120.7682
15	113.6794	113.9116	112.0011	111.7814	115.2584
20	111.7208	111.9785	110.5651	110.2816	112.6400
25	110.3275	110.5226	109.4780	109.2319	111.0270
30	109.3026	109.4664	108.6496	108.4173	109.8630
35	108.5142	108.6519	107.9845	107.7819	108.9724
40	108.1862	108.3132	107.7422	107.5611	108.5868
50	107.1347	107.2393	106.7943	106.6441	107.4437
75	105.8436	105.9112	105.6315	105.5148	106.0357
100	105.0846	105.1298	104.9300	104.8423	105.2225

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	115.875	110.758	109.280	118.699	119.792	6065.098	118.847
15	111.099	113.649	112.713	114.432	115.141	2404.613	115.602
20	108.701	112.719	112.135	112.211	112.693	121.560	113.897
25	107.010	110.903	110.516	110.751	111.163	111.027	112.742
30	105.756	109.715	109.439	109.671	110.045	109.863	111.878
35	104.810	108.841	108.634	108.828	109.145	108.972	111.198
40	104.384	108.483	108.320	108.476	108.777	108.587	110.969
50	103.111	107.372	107.261	107.365	107.615	107.444	110.114
75	101.516	105.999	105.945	105.997	106.202	106.036	109.052
100	100.579	105.200	105.166	105.199	105.377	105.222	108.438

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	98.04	97.62	99.00	98.16	98.10	91.61	89.92	95.65	89.60	89.88
15	97.58	97.29	98.83	97.70	97.70	89.72	88.99	93.97	88.71	88.73
20	97.09	96.99	98.48	97.15	97.15	90.02	89.82	93.37	89.62	89.64
25	96.38	96.30	97.70	96.40	96.40	90.12	90.18	92.50	89.94	89.94
30	95.92	95.90	97.09	95.88	95.88	89.62	89.58	91.86	89.47	89.47
35	96.08	96.08	97.29	96.08	96.08	90.63	90.53	92.28	90.36	90.36
40	96.46	96.46	97.19	96.34	96.34	91.47	91.45	93.11	91.31	91.31
50	95.39	95.43	96.34	95.35	95.35	90.53	90.46	91.88	90.24	90.24
75	95.60	95.58	96.36	95.56	95.56	91.54	91.56	92.51	91.39	91.39
100	95.23	95.21	95.86	95.17	95.17	91.39	91.27	92.22	91.19	91.19

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	97.45	96.74	N/A	N/A	100.00	100.00
15	98.50	96.47	N/A	N/A	100.00	100.00
20	99.03	95.92	N/A	N/A	100.00	100.00
25	99.19	95.87	N/A	N/A	100.00	100.00
30	99.41	95.95	N/A	N/A	100.00	100.00
35	99.47	95.76	N/A	N/A	100.00	100.00
40	99.80	96.95	N/A	N/A	100.00	100.00
50	99.78	95.50	N/A	N/A	100.00	100.00
75	99.90	95.68	N/A	N/A	100.00	100.00
100	99.98	95.62	N/A	N/A	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	95.77	94.95	98.12	95.49	92.46	95.70
15	94.70	94.14	97.34	94.47	87.90	95.15
20	94.81	94.61	96.97	94.73	86.06	95.15
25	93.98	94.00	96.02	93.92	82.75	94.83
30	94.08	94.02	95.58	93.98	81.43	94.44
35	94.20	94.16	95.70	94.18	79.03	94.44
40	94.91	94.89	95.82	94.89	78.26	95.31
50	93.41	93.47	94.67	93.37	73.11	94.18
75	94.36	94.38	94.99	94.32	64.36	94.55
100	94.14	94.08	94.63	94.02	56.30	93.80

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.53%	100.00	10.00%	94.81	1.29%	98.01
15	0.57%	100.00	5.09%	93.85	0.71%	98.17
20	0.89%	100.00	2.63%	95.14	0.91%	98.28
25	1.35%	100.00	2.14%	95.31	1.37%	98.07
30	1.37%	99.98	1.80%	95.70	1.37%	97.99
35	1.47%	100.00	1.72%	96.70	1.47%	98.41
40	1.60%	100.00	1.66%	97.22	1.60%	98.83
50	2.14%	100.00	2.14%	97.79	2.14%	98.77
75	2.46%	100.00	2.46%	98.96	2.46%	99.17
100	4.42%	100.00	4.42%	99.27	4.42%	99.27

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	85.60	95.94	95.09	93.93	95.31	94.34	93.41	97.78
15	83.94	97.42	97.15	96.01	96.63	96.81	96.42	98.57
20	82.89	97.60	97.49	96.34	96.63	96.91	96.75	99.11
25	80.24	97.09	97.03	96.08	96.48	96.18	96.14	99.23
30	79.25	96.36	96.40	95.50	95.88	95.60	95.70	99.49
35	76.87	96.26	96.36	95.60	96.12	95.56	95.70	99.49
40	76.32	96.50	96.63	96.30	96.85	96.24	96.14	99.80
50	71.56	95.31	95.54	95.19	95.94	95.03	95.11	99.80
75	62.93	95.54	95.72	95.58	96.04	95.49	95.50	99.90
100	55.13	95.11	95.27	95.13	95.43	95.01	95.09	99.98

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.77	89.33	89.37	90.63	92.50	89.80	90.18	98.40
15	86.61	92.97	91.88	96.16	95.25	95.94	95.88	99.11
20	85.11	94.57	93.96	96.73	95.58	96.61	96.63	99.58
25	82.02	95.01	94.59	95.94	95.33	95.88	96.08	99.52
30	80.48	95.39	95.09	95.76	95.11	95.62	95.66	99.66
35	78.38	95.49	95.41	95.88	95.03	95.58	95.74	99.58
40	77.35	96.06	95.88	96.18	96.06	95.94	95.98	99.82
50	72.26	95.21	95.19	95.13	95.15	94.91	95.03	99.88
75	63.49	95.62	95.74	95.62	95.43	95.50	95.49	99.92
100	55.33	95.15	95.29	95.23	94.71	95.13	95.15	99.98

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.32	97.47	97.80	94.26	96.99	94.85	93.98	98.46
15	83.84	97.72	98.20	93.88	96.99	93.74	93.41	99.01
20	83.05	97.23	97.47	94.51	96.71	93.94	94.08	99.37
25	79.72	96.40	96.81	94.22	96.51	93.90	93.86	99.39
30	78.89	95.49	95.90	94.16	96.00	93.82	93.84	99.66
35	76.53	94.93	95.62	94.16	96.38	94.12	93.96	99.62
40	75.68	95.58	96.06	95.23	96.91	94.77	94.71	99.84
50	70.93	94.20	94.59	94.10	96.00	93.49	93.82	99.86
75	62.61	94.77	95.01	94.99	96.12	94.67	94.63	99.90
100	54.71	94.44	94.81	94.65	95.56	94.51	94.50	99.98

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.59	90.40	90.50	95.90	98.87	96.61	95.72	99.13
15	83.64	96.67	96.97	94.08	98.89	94.48	93.56	99.47
20	82.48	97.41	97.49	94.53	98.73	94.06	93.72	99.70
25	79.66	96.65	96.81	94.16	98.51	93.41	93.49	99.64
30	78.32	95.15	95.66	93.88	98.02	93.15	93.25	99.82
35	76.26	95.13	95.21	94.42	98.12	93.58	93.37	99.74
40	75.31	95.37	95.66	94.85	98.30	94.44	94.50	99.88
50	70.57	93.78	94.14	93.80	97.70	93.27	93.33	99.90
75	62.06	94.42	94.91	94.69	97.23	94.42	94.24	99.96
100	54.30	94.20	94.51	94.32	96.87	94.02	94.08	99.98

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.88	99.84	99.96	99.94	99.94	99.74
15	99.90	99.92	99.98	99.94	99.94	99.92
20	100.00	100.00	100.00	100.00	100.00	100.00
25	100.00	100.00	100.00	100.00	100.00	100.00
30	99.98	99.98	100.00	99.98	99.98	100.00
35	99.98	99.98	100.00	100.00	100.00	100.00
40	100.00	100.00	100.00	100.00	100.00	100.00
50	100.00	100.00	100.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00
100	100.00	100.00	100.00	100.00	100.00	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 79.7653075
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	92.46	95.32	85.49	105.85	97.37	98.28	98.32	97.92
15	87.90	96.38	93.43	98.49	97.37	98.10	98.12	98.44
20	86.06	96.81	95.39	96.99	96.85	97.82	97.82	98.95
25	82.75	96.49	95.60	96.51	96.61	97.11	97.11	99.11
30	81.43	96.08	95.31	95.94	95.98	96.42	96.42	99.29
35	79.03	96.34	95.47	96.12	96.14	96.75	96.75	99.43
40	78.26	96.63	96.18	96.63	96.93	96.89	96.89	99.78
50	73.11	95.64	95.21	95.52	95.92	95.84	95.84	99.78
75	64.36	95.82	95.64	95.80	95.92	96.00	96.00	99.88
100	56.30	95.41	95.19	95.41	95.31	95.49	95.49	99.98

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 79.7653075
Averaged Percentage Non-detects: 25.00%
Distribution Check: Average of means: 100.018641
Distribution Check: Average of stdvs: 29.938142
Average of NDs per 100 observations: 25.038700

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	79.765308	2.445743	286	942	1446	1317	729	330	0	0	0	0
15	79.765308	3.744356	64	329	789	1116	1214	795	476	190	57	19
20	79.765308	4.961188	24	95	335	705	941	1067	843	546	311	136
25	79.765308	6.219604	0	30	146	313	647	853	880	810	620	371
30	79.765308	7.500990	0	9	45	141	315	509	709	850	822	657
35	79.765308	8.745941	0	2	19	50	130	271	467	665	753	814
40	79.765308	9.960198	0	0	4	18	62	145	270	441	632	658
50	79.765308	12.532079	0	0	1	3	9	19	63	138	238	333
75	79.765308	18.780198	0	0	0	0	0	1	1	3	4	11
100	79.765308	25.046139	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	108
15	1	0	0	0	0	0	0	0	0	0	0	0	1
20	37	7	3	0	0	0	0	0	0	0	0	0	0
25	226	88	45	17	3	1	0	0	0	0	0	0	0
30	460	289	141	71	22	6	1	2	1	0	0	0	0
35	694	496	334	182	101	46	22	3	1	0	0	0	0
40	734	657	534	387	250	134	74	31	12	5	1	1	0
50	490	619	649	635	563	451	311	244	139	72	41	32	0
75	29	67	106	157	259	329	416	477	570	525	472	1623	0
100	0	1	3	8	17	31	64	79	135	161	246	4305	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	56	0	56	0	0	56	0	56	0	0
15	11	0	11	0	0	11	0	11	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	56	0	56	21	0	0	0	330
15	11	0	11	1	0	0	0	267
20	0	0	0	0	0	0	0	47
25	0	0	0	0	0	0	0	66
30	0	0	0	0	0	0	0	10
35	0	0	0	0	0	0	0	4
40	0	0	0	0	0	0	0	2
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	56	0	56	21	0	0
15	11	0	11	1	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	56	0	56	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	56	0	56	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	27	505	65	5050	5050	0	0
15	29	257	36	5050	5050	0	0
20	45	133	46	5050	5050	0	0
25	68	108	69	5050	5050	0	0
30	69	91	69	5050	5050	0	0
35	74	87	74	5050	5050	0	0
40	81	84	81	5050	5050	0	0
50	108	108	108	5050	5050	0	0
75	124	124	124	5050	5050	0	0
100	223	223	223	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	418	0	418	0	0	0	0
15	0	73	0	73	0	0	0	0
20	0	7	0	7	0	0	0	0
25	0	4	0	4	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 2e. N(100,30) 40% Type 1 Censoring

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	121.6685	143.0468	N/A	N/A	508.6537	386.2818
15	118.3680	123.7123	N/A	N/A	262.8939	233.7187
20	116.9108	125.5099	N/A	N/A	194.8065	184.7408
25	116.0727	116.9278	N/A	N/A	168.0216	162.1701
30	115.3345	118.2917	N/A	N/A	152.4854	148.7944
35	114.7529	113.4533	N/A	N/A	142.8529	140.4447
40	114.3621	114.2836	N/A	N/A	136.3009	134.7192
50	113.7091	112.1055	N/A	N/A	128.0433	127.1077
75	112.6819	107.9690	N/A	N/A	118.3773	117.9967
100	112.1434	106.8535	N/A	N/A	114.1180	113.9108

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	123.2763	122.1001	127.5663	173.1844	123.3694
15	117.2900	116.0754	120.4008	362.2483	116.5969
20	114.0829	113.3210	116.1924	113.4850	113.4850
25	112.0698	111.7701	113.6390	111.7901	111.8065
30	110.6551	110.5132	111.9039	110.4926	110.4926
35	109.7040	109.6469	110.7080	109.6001	109.6001
40	109.0624	109.0122	109.9051	108.9524	108.9524
50	107.9852	107.9865	108.6175	107.9141	107.9141
75	106.4442	106.4468	106.8220	106.3784	106.3784
100	105.6081	105.6123	105.8733	105.5508	105.5508

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	116.5325	114.8952	119.8432	163.3921	114.9675
15	111.4434	109.8799	113.9607	1095.3708	109.5905
20	109.4784	108.5673	111.2413	108.2989	108.2994
25	108.1853	107.8740	109.5230	107.6364	107.6478
30	107.2214	107.0879	108.3001	106.8868	106.8868
35	106.6796	106.6384	107.5555	106.4569	106.4569
40	106.3107	106.2725	107.0518	106.1084	106.1084
50	105.6250	105.6385	106.1877	105.4967	105.4967
75	104.6415	104.6499	104.9839	104.5479	104.5479
100	104.1033	104.1115	104.3464	104.0292	104.0292

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	119.8044	118.4512	123.5658	119.2597	115.9636	119.5172
15	114.1175	112.7211	116.8989	112.8247	107.7791	113.7253
20	111.6976	110.8518	113.6252	110.8029	105.0414	111.6706
25	110.1241	109.8207	111.5765	109.7366	103.4696	110.4791
30	108.9626	108.8264	110.1262	108.7281	102.0785	109.3249
35	108.2380	108.1896	109.1785	108.0859	101.1288	108.6583
40	107.7407	107.6970	108.5334	107.5943	100.4342	108.1071
50	106.8625	106.8697	107.4605	106.7699	99.2649	107.1978
75	105.5954	105.6008	105.9557	105.5196	97.5217	105.8095
100	104.9006	104.9067	105.1549	104.8375	96.5587	105.0851

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.40%	463.5989	32.91%	118.5212	3.19%	123.3774
15	0.73%	268.1067	34.08%	114.9136	1.54%	117.1466
20	0.85%	216.7035	28.38%	113.4728	0.97%	114.8501
25	1.01%	191.9206	24.02%	112.6635	1.03%	113.5900
30	1.35%	175.2260	20.59%	111.9312	1.35%	112.4954
35	1.45%	164.9842	19.66%	111.5968	1.47%	111.7597
40	1.80%	157.6752	16.50%	111.2315	1.80%	111.2426
50	2.50%	146.6698	13.58%	110.7883	2.50%	110.3748
75	3.19%	132.7781	8.99%	110.0928	3.19%	109.0493
100	4.50%	125.7427	8.28%	109.8179	4.50%	108.3850

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	110.943	451.768	230.171	116.898	119.111	239.686	122.324
15	105.632	407.384	496.599	114.064	115.999	1769.298	119.141
20	103.888	587.015	343.481	112.760	114.137	113.356	117.458
25	102.692	206.827	224.818	111.535	112.692	111.813	116.444
30	101.496	165.407	170.370	110.358	111.359	110.473	115.605
35	100.663	163.805	207.629	109.539	110.471	109.558	114.959
40	100.059	139.129	121.193	108.920	109.792	108.906	114.536
50	99.001	119.027	258.090	107.923	108.686	107.865	113.824
75	97.373	106.446	106.541	106.411	107.008	106.344	112.742
100	96.464	105.591	105.680	105.593	106.122	105.529	112.182

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	110.228	117.519	117.978	116.252	116.872	177645.814	129.370
15	106.623	113.388	113.068	113.936	113.797	90969055.285	121.750
20	105.001	111.991	111.627	112.687	112.522	112.602	118.890
25	103.586	110.734	110.473	111.445	111.420	111.628	117.462
30	102.221	109.874	109.665	110.287	110.257	110.198	116.419
35	101.234	109.196	109.071	109.492	109.543	109.400	115.598
40	100.541	108.735	108.652	108.888	108.953	108.797	115.063
50	99.350	107.823	107.820	107.901	107.998	107.800	114.232
75	97.586	106.388	106.447	106.403	106.523	106.318	112.991
100	96.614	105.578	105.644	105.583	105.738	105.519	112.360

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	112.824	124.382	125.293	117.705	121.595	118.479	125.004
15	106.123	121.020	121.932	112.797	116.659	112.933	121.064
20	103.949	117.944	118.546	111.121	114.170	110.877	118.856
25	102.693	115.276	115.737	110.154	112.633	109.880	117.537
30	101.492	112.672	113.030	109.219	111.324	108.961	116.500
35	100.658	110.911	111.201	108.600	110.466	108.365	115.722
40	100.043	109.599	109.890	108.119	109.794	107.906	115.209
50	98.987	107.739	107.960	107.304	108.710	107.134	114.350
75	97.366	106.011	106.153	106.016	107.049	105.886	113.081
100	96.452	105.270	105.391	105.303	106.156	105.201	112.436

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	114.763	122.549	183.163	119.497	128.374	121.941	128.487
15	106.622	120.351	121.690	113.671	121.975	114.659	123.599
20	103.998	118.878	119.604	111.461	117.848	111.434	120.700
25	102.645	116.832	117.285	110.370	115.464	110.074	119.000
30	101.462	114.174	114.478	109.379	113.756	109.081	117.756
35	100.631	111.914	112.191	108.730	112.534	108.438	116.780
40	100.026	110.271	110.512	108.225	111.639	107.955	116.137
50	98.966	108.041	108.247	107.380	110.224	107.158	115.092
75	97.328	106.020	106.162	106.069	108.099	105.893	113.584
100	96.430	105.276	105.384	105.338	106.966	105.196	112.814

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	140.2681	139.8148	146.9284	143.3943	143.3604	137.4014
15	132.6537	131.7918	137.3704	133.7217	133.7437	131.2097
20	128.3951	127.7666	131.6192	128.8896	128.8896	128.2400
25	125.4997	125.1957	127.8984	125.9303	125.9324	126.3689
30	123.2734	123.1019	125.1696	123.6173	123.6173	124.8614
35	121.5064	121.4057	123.0238	121.7849	121.7849	123.5796
40	120.2500	120.1646	121.5161	120.4549	120.4549	122.6964
50	118.1327	118.0970	119.0699	118.2785	118.2785	121.2047
75	114.8605	114.8438	115.4048	114.9126	114.9126	118.8538
100	112.9565	112.9463	113.3301	112.9759	112.9759	117.5132

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	117.5990	115.9778	117.3345	119.3976	125.4785
15	114.9111	113.8699	112.3841	113.2758	118.8276
20	113.1915	112.6194	110.7657	111.0558	114.8170
25	111.7334	111.3766	109.8634	109.9955	112.7628
30	110.4442	110.1985	108.9482	109.0493	111.2304
35	109.5621	109.4113	108.3674	108.4192	110.2071
40	108.9057	108.7928	107.9093	107.9537	109.4692
50	107.8647	107.7999	107.1282	107.1472	108.3188
75	106.3448	106.3245	105.8921	105.8903	106.6362
100	105.5301	105.5186	105.2011	105.1891	105.7435

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	115.964	105.730	103.403	121.727	123.694	11332.104	122.367
15	107.779	110.630	108.655	116.144	118.074	94463.217	118.497
20	105.041	113.137	111.741	113.502	114.892	6495.266	116.813
25	103.470	1415.365	1414.348	111.948	113.059	3677.599	115.880
30	102.079	111.562	110.778	110.662	111.602	217.131	115.102
35	101.129	110.042	109.457	109.795	110.640	110.207	114.505
40	100.434	109.365	108.899	109.146	109.918	109.469	114.116
50	99.265	108.131	107.812	108.105	108.767	108.319	113.470
75	97.522	106.537	106.378	106.529	107.035	106.636	112.476
100	96.559	105.683	105.584	105.680	106.130	105.744	111.969

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	99.94	99.94	99.96	99.94	99.94	98.28	97.98	99.70	97.25	97.80
15	99.80	99.78	99.94	99.84	99.84	89.53	86.95	96.51	85.37	85.49
20	99.54	99.39	99.94	99.49	99.49	89.29	87.58	95.09	86.16	86.16
25	98.85	98.79	99.94	98.71	98.73	88.61	88.30	93.32	87.01	87.03
30	98.38	98.28	99.72	98.14	98.14	87.92	87.90	92.00	86.50	86.50
35	97.96	97.94	99.39	97.54	97.54	87.66	87.68	91.78	86.61	86.61
40	97.82	97.80	99.15	97.47	97.47	88.26	88.26	91.58	87.37	87.37
50	97.27	97.27	98.53	96.93	96.93	87.92	87.82	90.83	87.29	87.29
75	96.46	96.44	97.66	96.26	96.26	88.69	88.53	90.53	88.02	88.02
100	96.04	96.10	97.09	95.80	95.80	88.34	88.08	89.84	87.84	87.84

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	99.90	98.42	N/A	N/A	100.00	100.00
15	99.92	98.90	N/A	N/A	100.00	100.00
20	99.94	98.18	N/A	N/A	100.00	100.00
25	100.00	98.43	N/A	N/A	100.00	100.00
30	100.00	97.34	N/A	N/A	100.00	100.00
35	100.00	98.29	N/A	N/A	100.00	100.00
40	100.00	97.81	N/A	N/A	100.00	100.00
50	100.00	97.54	N/A	N/A	100.00	100.00
75	100.00	96.75	N/A	N/A	100.00	100.00
100	100.00	96.19	N/A	N/A	99.98	99.98

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	99.70	99.58	99.92	99.60	94.06	99.49
15	94.89	93.47	99.42	92.74	77.25	94.59
20	94.67	93.62	98.03	92.87	72.65	94.18
25	93.84	93.43	97.25	92.71	66.93	93.72
30	93.01	92.79	96.14	92.00	62.10	92.79
35	92.87	92.77	95.80	92.16	57.31	93.13
40	93.19	93.07	95.92	92.50	53.62	93.03
50	92.77	92.85	95.27	92.14	45.25	93.47
75	92.97	93.05	94.50	92.63	28.93	92.44
100	92.55	92.73	93.86	92.20	19.25	92.08

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.40%	100.00	32.91%	100.00	3.19%	99.86
15	0.73%	99.98	34.08%	99.97	1.54%	98.85
20	0.85%	99.18	28.38%	100.00	0.97%	98.38
25	1.01%	99.26	24.02%	100.00	1.03%	98.64
30	1.35%	99.34	20.59%	100.00	1.35%	98.55
35	1.45%	99.22	19.66%	100.00	1.47%	98.81
40	1.80%	99.27	16.50%	100.00	1.80%	99.21
50	2.50%	98.96	13.58%	100.00	2.50%	99.15
75	3.19%	98.61	8.99%	100.00	3.19%	99.65
100	4.50%	98.26	8.28%	100.00	4.50%	99.83

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.90	99.43	97.56	100.51	98.69	98.59	98.73	99.92
15	70.99	98.84	97.78	96.51	97.58	96.65	96.48	99.92
20	67.90	99.62	99.25	97.69	98.30	98.06	97.98	99.98
25	63.60	99.58	99.58	98.18	98.34	98.48	98.46	100.00
30	58.89	99.39	99.37	97.58	97.78	98.20	98.16	100.00
35	54.40	99.31	99.33	97.68	97.86	98.00	97.72	100.00
40	51.31	98.99	98.97	97.68	97.72	97.78	97.68	100.00
50	43.54	97.82	98.24	97.07	97.23	96.97	96.79	100.00
75	28.02	96.61	96.89	96.14	96.67	96.24	96.20	100.00
100	18.28	96.08	96.36	96.02	96.53	95.78	95.80	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	76.46	91.77	94.00	92.75	93.03	90.50	91.09	99.96
15	74.81	90.05	89.71	92.79	92.73	92.75	92.87	99.94
20	73.90	93.54	92.69	96.65	95.45	96.61	96.65	99.98
25	68.53	94.12	93.68	97.58	95.41	97.23	97.39	100.00
30	62.93	95.01	94.40	96.93	95.01	96.97	96.93	100.00
35	57.68	95.50	95.09	97.21	95.80	97.01	96.93	100.00
40	54.20	96.20	96.14	97.19	95.43	97.09	96.95	100.00
50	45.56	96.50	96.32	96.83	95.60	96.55	96.73	100.00
75	29.27	96.20	96.26	96.02	94.99	96.10	95.94	100.00
100	19.23	95.74	96.02	95.86	95.09	95.43	95.56	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.44	99.86	99.90	99.47	99.82	99.56	99.45	99.96
15	72.85	99.41	99.54	95.82	99.17	95.96	94.53	99.96
20	68.46	99.41	99.52	95.07	98.61	94.73	94.30	99.98
25	63.94	99.21	99.41	95.27	98.10	94.26	94.36	100.00
30	58.67	98.28	98.57	94.57	97.50	93.98	93.74	100.00
35	54.16	97.92	98.16	94.87	97.62	94.16	93.98	100.00
40	51.09	97.33	98.24	95.31	97.64	94.38	94.48	100.00
50	43.60	96.10	96.67	95.19	97.09	94.50	94.59	100.00
75	28.06	95.17	95.50	94.87	96.63	94.65	94.44	100.00
100	18.10	94.71	95.17	94.55	96.63	94.38	94.30	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	95.56	85.49	85.29	99.82	99.98	99.88	99.82	99.96
15	74.89	92.25	92.21	99.21	99.96	99.45	99.17	99.98
20	68.63	97.17	97.15	97.37	99.94	97.47	96.34	99.98
25	63.60	99.05	99.05	96.71	99.80	95.88	95.72	100.00
30	58.71	99.01	99.35	95.96	99.70	95.37	95.17	100.00
35	54.22	98.81	98.89	95.88	99.66	95.09	95.11	100.00
40	50.99	98.28	98.67	96.22	99.64	95.31	95.31	100.00
50	43.13	97.03	97.45	95.58	99.27	95.05	95.11	100.00
75	27.92	95.60	95.96	95.66	98.91	94.97	94.99	100.00
100	18.26	95.15	95.47	95.15	98.53	94.53	94.22	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	100.00	100.00	100.00	100.00	100.00	100.00
15	99.98	100.00	100.00	100.00	100.00	100.00
20	99.98	99.98	100.00	99.98	99.98	99.98
25	100.00	100.00	100.00	100.00	100.00	100.00
30	100.00	100.00	100.00	100.00	100.00	100.00
35	99.98	99.96	100.00	99.96	99.96	100.00
40	99.96	99.96	100.00	99.96	99.96	100.00
50	99.98	99.98	100.00	99.98	99.98	100.00
75	99.96	99.96	99.98	99.96	99.96	100.00
100	99.98	99.98	99.98	99.98	99.98	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 92.3995869
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.06	97.20	80.93	117.39	99.88	99.84	99.96	99.90
15	77.25	97.21	87.07	107.95	99.56	99.90	99.88	99.92
20	72.65	98.27	93.45	101.89	99.27	99.92	99.86	99.96
25	66.93	98.21	95.56	99.18	98.89	99.70	99.68	100.00
30	62.10	98.04	95.96	97.86	97.94	99.21	99.21	100.00
35	57.31	98.00	96.32	98.04	98.14	98.79	98.79	100.00
40	53.62	98.02	96.65	97.90	98.02	98.59	98.59	100.00
50	45.25	97.45	96.51	97.31	97.41	97.90	97.90	100.00
75	28.93	96.59	96.08	96.51	96.77	96.99	96.99	100.00
100	19.25	96.20	95.88	96.18	96.61	96.55	96.55	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 92.3995869
Averaged Percentage Non-detects: 40.00%
Distribution Check: Average of means: 99.989067
Distribution Check: Average of stdvs: 29.921505
Average of NDs per 100 observations: 40.024300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	92.399587	3.515248	42	224	780	1235	1582	1187	0	0	0	0
15	92.399587	5.965347	0	27	107	330	642	896	1102	899	607	315
20	92.399587	7.966139	0	0	15	78	151	390	634	882	913	774
25	92.399587	9.935248	0	0	3	8	30	98	243	427	632	711
30	92.399587	12.011287	0	0	0	2	7	13	78	113	249	410
35	92.399587	13.975050	0	0	0	0	1	1	12	34	71	179
40	92.399587	15.976040	0	0	0	0	0	1	6	8	15	35
50	92.399587	20.008119	0	0	0	0	0	0	0	0	1	2
75	92.399587	29.996436	0	0	0	0	0	0	0	0	0	0
100	92.399587	39.969307	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	1010
15	125	0	0	0	0	0	0	0	0	0	0	0	42
20	592	358	162	62	30	9	0	0	0	0	0	0	1
25	901	706	548	382	200	91	49	15	5	1	0	0	0
30	584	670	816	695	505	423	237	153	56	18	19	2	0
35	288	412	589	637	710	598	552	401	246	160	97	62	0
40	93	204	292	389	566	649	632	620	520	394	249	377	0
50	8	18	34	74	143	204	316	393	497	558	581	2221	0
75	0	0	0	0	0	0	0	4	6	16	27	4997	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	102	0	102	0	0	102	0	102	0	0
15	64	0	64	0	0	64	0	64	0	0
20	19	0	19	0	0	19	0	19	0	0
25	2	0	2	0	0	2	0	2	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	102	0	102	28	0	0	0	1187
15	64	0	64	9	0	0	0	1946
20	19	0	19	0	0	0	0	1213
25	2	0	2	1	0	0	0	1291
30	0	0	0	0	0	0	0	908
35	0	0	0	0	0	0	0	966
40	0	0	0	0	0	0	0	626
50	0	0	0	0	0	0	0	503
75	0	0	0	0	0	0	0	315
100	0	0	0	0	0	0	0	143

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	102	0	102	28	0	0
15	64	0	64	9	0	0
20	19	0	19	0	0	0
25	2	0	2	1	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	102	0	102	0	0	0	0
15	0	64	0	64	0	0	0	0
20	0	19	0	19	0	0	0	0
25	0	2	0	2	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	102	0	102	0	0	0	0
15	0	64	0	64	0	0	0	0
20	0	19	0	19	0	0	0	0
25	0	2	0	2	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	7	0	7	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	1	0	1	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	8	0	7	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	1	0	1	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	20	1662	161	5050	5050	0	0
15	37	1721	78	5050	5050	0	0
20	43	1433	49	5050	5050	0	0
25	51	1213	52	5050	5050	0	0
30	68	1040	68	5050	5050	0	0
35	73	993	74	5050	5050	0	0
40	91	833	91	5050	5050	0	0
50	126	686	126	5050	5050	0	0
75	161	454	161	5050	5050	0	0
100	227	418	227	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	759	0	759	0	0	0	0
15	0	398	0	398	0	0	0	0
20	0	141	0	141	0	0	0	0
25	0	35	0	35	0	0	0	0
30	0	6	0	6	0	0	0	0
35	0	4	0	4	0	0	0	0
40	0	2	0	2	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 2f. N(100,30) 50% Type 1 Censoring

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	125.0758	148.6458	N/A	N/A	534.4188	404.9240
15	121.4544	127.7755	N/A	N/A	265.1945	235.6622
20	119.8056	133.2532	N/A	N/A	195.4270	185.1567
25	119.1290	121.3757	N/A	N/A	167.8696	161.9311
30	118.3222	125.9226	N/A	N/A	152.4911	148.7668
35	117.6674	117.9056	N/A	N/A	142.4775	140.0522
40	117.3474	121.2903	N/A	N/A	136.0805	134.4893
50	116.7420	118.9664	N/A	N/A	127.8289	126.8877
75	115.7204	111.9705	N/A	N/A	118.0782	117.6969
100	115.1719	112.3277	N/A	N/A	113.9120	113.7044

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	126.8612	125.5487	131.6000	170.9393	126.8619
15	120.9062	118.8781	124.9887	481.3264	119.4997
20	116.8107	115.2584	119.8866	144.5838	115.4113
25	114.2974	113.3770	116.6754	139.1197	113.3375
30	112.5194	111.8823	114.3850	111.7624	111.7624
35	111.0936	110.7597	112.6260	110.6114	110.6114
40	110.2494	110.0752	111.5404	109.9142	109.9142
50	108.9604	108.9073	109.9412	108.7437	108.7437
75	107.0777	107.0854	107.6744	106.9446	106.9446
100	106.1214	106.1317	106.5425	106.0109	106.0109

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	119.3605	117.5239	122.9748	159.7327	117.4418
15	113.3170	110.5855	116.5789	1710.6044	109.9061
20	110.2655	108.2711	112.8157	295.4488	107.6065
25	108.6370	107.5306	110.6552	191.4543	106.9765
30	107.6524	106.9430	109.2586	106.4761	106.4761
35	106.7539	106.3983	108.0878	106.0029	106.0029
40	106.3189	106.1485	107.4517	105.7959	105.7959
50	105.5816	105.5416	106.4530	105.2522	105.2522
75	104.4977	104.5149	105.0378	104.3138	104.3138
100	103.9793	103.9961	104.3649	103.8381	103.8381

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	122.7394	121.2272	126.8062	121.8942	117.0491	122.2102
15	116.1566	113.7315	119.7277	113.5378	106.0317	114.8300
20	112.6940	110.8517	115.4647	110.4572	102.1080	111.7948
25	110.7975	109.7507	112.9772	109.3751	100.5552	110.4808
30	109.5568	108.8772	111.2806	108.5336	99.1621	109.5665
35	108.4747	108.1286	109.9001	107.8230	98.0708	108.6289
40	107.9003	107.7294	109.1057	107.4478	97.4777	108.2067
50	106.9491	106.9052	107.8711	106.6631	96.3419	107.2656
75	105.5488	105.5629	106.1145	105.3846	94.4527	105.7716
100	104.8501	104.8646	105.2515	104.7207	93.4540	105.0486

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.32%	488.6203	54.14%	122.9769	6.10%	125.9786
15	0.53%	248.1028	62.14%	119.1789	2.51%	118.5249
20	0.73%	190.7976	62.42%	117.5432	1.56%	115.5679
25	1.07%	167.4150	60.46%	116.8877	1.23%	114.3279
30	1.17%	151.9544	61.50%	116.3046	1.21%	113.3144
35	1.52%	141.9717	61.64%	115.8231	1.52%	112.4214
40	1.66%	135.6241	60.91%	115.5802	1.66%	112.0235
50	2.12%	125.5759	60.50%	115.0605	2.12%	111.1506
75	3.03%	112.5787	60.53%	114.2534	3.03%	109.8060
100	4.46%	106.2984	62.04%	113.9101	4.46%	109.1376

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	111.262	1003.719	786.447	119.293	121.755	227.827	125.841
15	103.333	566.886	414.067	115.131	117.911	2827.291	122.633
20	100.717	467.151	1070.547	113.750	115.955	409.081	120.800
25	99.700	303.006	2001.265	112.810	114.538	237.559	119.865
30	98.563	252.087	217.507	111.694	113.188	111.895	118.872
35	97.603	621.560	602.164	110.639	111.936	110.720	118.090
40	97.097	186.414	244.938	110.001	111.210	109.990	117.681
50	96.074	489.569	116.178	108.848	109.909	108.784	116.978
75	94.307	112.191	114.545	107.051	107.874	106.945	115.839
100	93.362	106.156	106.294	106.107	106.853	106.008	115.247

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	109.398	119.309	119.993	117.552	118.418	111915.659	133.524
15	103.702	115.027	115.058	114.123	114.277	86889806.575	125.302
20	102.067	112.934	112.665	113.057	113.030	7286745.945	122.239
25	101.066	111.718	111.433	112.278	112.202	715010.729	120.840
30	99.717	110.804	110.610	111.287	111.326	111.125	119.524
35	98.583	109.885	109.741	110.330	110.308	110.228	118.649
40	97.908	109.391	109.298	109.722	109.823	109.607	118.136
50	96.691	108.470	108.463	108.669	108.765	108.542	117.325
75	94.688	106.905	106.978	106.937	107.076	106.835	116.060
100	93.622	106.024	106.128	106.037	106.233	105.937	115.405

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	114.139	128.044	129.056	120.792	124.955	121.688	128.610
15	104.673	125.663	126.841	114.424	119.572	114.967	124.987
20	101.222	123.224	124.218	111.828	116.377	111.691	122.541
25	99.903	120.589	121.395	110.753	114.505	110.367	121.260
30	98.669	118.001	118.549	109.868	113.080	109.466	119.999
35	97.680	115.142	115.615	109.094	111.827	108.740	119.032
40	97.157	113.232	113.637	108.667	111.129	108.347	118.504
50	96.126	110.155	110.484	107.821	109.883	107.549	117.631
75	94.335	106.646	106.882	106.406	107.889	106.194	116.255
100	93.372	105.618	105.806	105.640	106.876	105.473	115.552

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	116.891	328.818	126.597	123.536	133.384	126.624	132.246
15	105.944	122.389	124.578	116.486	127.380	118.873	127.929
20	101.564	206.302	164.366	113.004	122.298	113.796	124.873
25	99.979	122.413	123.414	111.550	119.022	111.475	123.113
30	98.683	120.457	121.155	110.478	116.694	110.117	121.513
35	97.687	117.825	118.174	109.608	114.897	109.235	120.300
40	97.160	115.537	115.957	109.119	113.829	108.727	119.614
50	96.115	111.681	111.994	108.183	112.095	107.861	118.515
75	94.333	107.037	107.268	106.642	109.455	106.392	116.852
100	93.367	105.792	105.984	105.816	108.090	105.622	116.002

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	141.9864	141.4454	149.0372	145.0527	144.9791	139.1162
15	133.9331	132.4759	139.7112	134.5070	134.5184	132.6882
20	129.0742	127.7748	133.4251	128.9015	128.8999	129.6346
25	126.1726	125.3414	129.5362	126.0359	126.0340	128.1731
30	123.6850	123.1043	126.3096	123.5685	123.5685	126.5723
35	121.6665	121.3388	123.8095	121.6482	121.6482	125.3378
40	120.3620	120.1660	122.1561	120.3877	120.3877	124.5857
50	118.2183	118.1390	119.5637	118.2515	118.2515	123.2811
75	114.8291	114.8175	115.6250	114.8268	114.8268	121.1056
100	112.8924	112.8877	113.4425	112.8668	112.8668	119.8456

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	119.9315	117.1921	120.3726	123.5441	129.5514
15	116.2738	114.0874	113.8146	115.9317	123.4958
20	114.5119	112.9966	111.2630	112.4506	118.0134
25	113.2069	112.1588	110.2765	111.0578	115.0710
30	111.8987	111.1630	109.4308	110.0088	113.1557
35	110.7205	110.2278	108.7286	109.1967	111.6870
40	110.0157	109.6115	108.3407	108.7274	110.8207
50	108.7858	108.5472	107.5477	107.8459	109.4288
75	106.9474	106.8280	106.2000	106.3993	107.3667
100	106.0101	105.9396	105.4747	105.6190	106.3201

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	117.049	103.913	101.187	124.859	127.256	16716.441	125.677
15	106.032	104.083	101.651	118.746	121.728	119842.513	121.587
20	102.108	110.248	108.193	115.312	117.799	113245.892	119.717
25	100.555	112.825	111.171	113.480	115.467	18107.023	118.921
30	99.162	112.478	111.204	112.051	113.738	19487.530	118.073
35	98.071	111.821	110.775	110.889	112.328	492.879	117.401
40	97.478	111.132	110.294	110.215	111.523	110.821	117.076
50	96.342	109.648	109.060	109.025	110.133	109.429	116.472
75	94.453	107.184	106.888	107.171	108.004	107.367	115.485
100	93.454	106.206	106.022	106.205	106.940	106.320	114.972

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.25	100.00
15	100.00	100.00	100.00	100.00	100.00	93.39	89.96	100.00	88.83	89.07
20	100.00	100.00	100.00	99.92	100.00	90.25	86.59	96.69	84.67	84.69
25	100.00	100.00	100.00	99.96	100.00	88.47	86.34	94.76	83.68	83.70
30	100.00	100.00	100.00	99.96	99.96	88.07	87.03	93.75	84.18	84.18
35	99.41	99.33	100.00	99.05	99.05	86.91	86.48	92.85	84.00	84.00
40	99.27	99.17	100.00	98.75	98.75	87.15	86.75	92.32	84.83	84.83
50	98.14	98.16	99.58	97.68	97.68	86.71	86.81	90.77	85.01	85.01
75	97.86	97.86	98.79	97.45	97.45	86.83	86.85	90.12	85.64	85.64
100	97.23	97.25	98.34	96.73	96.73	86.83	86.91	89.50	85.76	85.76

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	100.00	100.00	N/A	N/A	100.00	100.00
15	100.00	100.00	N/A	N/A	100.00	100.00
20	100.00	100.00	N/A	N/A	100.00	100.00
25	100.00	100.00	N/A	N/A	100.00	100.00
30	100.00	100.00	N/A	N/A	100.00	100.00
35	100.00	100.00	N/A	N/A	100.00	100.00
40	100.00	100.00	N/A	N/A	100.00	100.00
50	100.00	100.00	N/A	N/A	100.00	100.00
75	100.00	100.00	N/A	N/A	99.96	99.96
100	100.00	100.00	N/A	N/A	99.88	99.86

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	100.00	100.00	100.00	100.00	98.04	100.00
15	99.35	99.15	100.00	95.19	71.37	96.12
20	94.84	93.07	99.18	89.77	59.50	92.79
25	92.96	91.84	98.19	89.08	53.27	91.82
30	92.41	91.86	97.24	90.44	46.40	92.38
35	92.23	91.70	96.32	90.46	39.23	91.11
40	92.24	92.04	95.88	90.53	35.23	91.58
50	91.47	91.45	94.63	90.08	27.03	91.35
75	91.43	91.50	93.64	90.55	11.21	90.69
100	91.19	91.19	93.07	90.32	5.45	90.69

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.32%	100.00	54.14%	100.00	6.10%	100.00
15	0.53%	100.00	62.14%	100.00	2.51%	99.82
20	0.73%	95.47	62.42%	100.00	1.56%	98.69
25	1.07%	93.92	60.46%	100.00	1.23%	98.34
30	1.17%	92.71	61.50%	100.00	1.21%	98.56
35	1.52%	91.57	61.64%	100.00	1.52%	98.41
40	1.66%	90.01	60.91%	100.00	1.66%	99.11
50	2.12%	86.51	60.50%	100.00	2.12%	98.87
75	3.03%	77.95	60.53%	100.00	3.03%	99.59
100	4.46%	68.17	62.04%	100.00	4.46%	99.79

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.89	100.00	97.07	103.02	100.00	99.25	100.00	100.00
15	61.17	99.84	97.62	100.69	98.38	98.85	98.77	100.00
20	53.78	99.60	98.50	98.52	98.30	98.26	97.19	100.00
25	49.37	99.74	99.13	98.74	98.83	98.30	98.06	100.00
30	43.07	99.90	99.84	99.09	98.79	98.99	98.97	100.00
35	36.50	99.88	99.84	98.85	98.51	98.89	98.71	100.00
40	33.17	99.86	99.90	99.03	98.77	98.97	98.89	100.00
50	25.66	99.58	99.68	97.90	97.74	97.80	97.72	100.00
75	10.63	98.83	98.91	97.66	97.82	97.62	97.49	100.00
100	5.29	97.50	97.98	97.09	97.27	96.77	96.91	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	74.55	99.94	99.98	99.90	98.04	99.17	100.00	100.00
15	63.72	91.22	92.74	90.26	92.12	90.06	90.44	100.00
20	61.78	92.11	92.46	94.30	93.74	94.67	94.46	100.00
25	56.77	93.88	94.06	97.17	95.17	97.07	97.09	100.00
30	48.97	94.81	94.92	97.98	95.86	97.62	97.70	100.00
35	41.54	95.68	95.58	97.78	95.13	97.70	97.68	100.00
40	36.89	96.06	96.02	98.08	96.24	98.00	98.06	100.00
50	28.28	96.02	96.28	97.09	95.37	96.77	96.91	100.00
75	11.72	97.17	97.35	97.31	95.43	96.95	97.15	100.00
100	5.84	96.83	97.09	96.73	95.25	96.55	96.53	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	96.02	100.00	100.00	100.00	100.00	100.00	100.00	100.00
15	67.17	100.00	100.00	100.00	100.00	99.92	99.90	100.00
20	55.84	99.72	99.86	96.53	99.82	96.51	94.93	100.00
25	50.08	99.52	99.76	95.45	99.35	94.46	94.18	100.00
30	43.31	99.60	99.72	95.50	98.89	94.46	94.36	100.00
35	37.09	98.95	99.41	95.54	98.50	94.38	94.50	100.00
40	33.35	99.05	99.43	95.62	98.57	94.99	94.57	100.00
50	25.88	97.60	98.32	95.11	97.78	94.26	94.40	100.00
75	10.67	96.20	96.99	95.54	97.84	94.55	94.57	100.00
100	5.13	95.29	95.94	95.27	97.29	94.36	94.57	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.09	85.92	88.83	100.00	100.00	100.00	100.00	100.00
15	74.26	85.03	85.04	100.00	100.00	100.00	100.00	100.00
20	55.96	92.09	92.19	99.96	100.00	99.94	99.88	100.00
25	49.68	96.75	96.77	98.40	100.00	98.81	97.41	100.00
30	43.56	98.51	98.55	97.84	100.00	97.33	96.67	100.00
35	36.85	99.29	99.29	97.15	99.92	96.55	96.44	100.00
40	32.99	99.66	99.72	97.33	99.88	96.46	96.30	100.00
50	25.64	99.07	99.31	96.67	99.56	95.62	95.78	100.00
75	10.77	97.37	98.06	96.55	99.41	95.78	96.00	100.00
100	5.09	96.04	96.87	96.06	99.13	95.45	95.56	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	100.00	100.00	100.00	100.00	100.00	100.00
15	100.00	100.00	100.00	100.00	100.00	100.00
20	100.00	100.00	100.00	100.00	100.00	100.00
25	100.00	100.00	100.00	99.98	99.98	100.00
30	99.96	99.94	100.00	99.94	99.94	100.00
35	99.98	99.96	100.00	99.90	99.90	100.00
40	100.00	99.98	100.00	99.96	99.96	100.00
50	99.94	99.92	100.00	99.92	99.92	100.00
75	99.96	99.96	100.00	99.94	99.94	100.00
100	99.96	99.96	99.96	99.94	99.94	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 100.0000000
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	98.04	98.08	78.59	124.63	100.00	99.92	100.00	100.00
15	71.37	97.32	80.85	118.80	100.00	99.96	99.90	100.00
20	59.50	98.06	88.75	108.95	99.92	100.00	99.90	100.00
25	53.27	98.57	93.76	103.44	99.64	100.00	99.90	100.00
30	46.40	98.95	96.10	101.17	99.25	100.00	100.00	100.00
35	39.23	99.38	96.95	99.70	98.97	100.00	99.98	100.00
40	35.23	99.05	97.56	99.33	99.07	99.90	99.90	100.00
50	27.03	98.20	96.67	98.00	98.22	99.07	99.07	100.00
75	11.21	97.96	97.17	97.86	98.14	98.40	98.40	100.00
100	5.45	97.39	96.61	97.33	97.58	97.74	97.74	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 100.0000000
Averaged Percentage Non-detects: 50.00%
Distribution Check: Average of means: 100.006481
Distribution Check: Average of stdvs: 29.912499
Average of NDs per 100 observations: 49.935300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	100.000000	4.028317	5	74	333	981	1625	2032	0	0	0	0
15	100.000000	7.245941	0	2	17	88	223	523	784	1029	1067	828
20	100.000000	9.975842	0	0	1	2	27	62	196	358	617	797
25	100.000000	12.480198	0	0	0	0	0	8	29	66	145	330
30	100.000000	14.993861	0	0	0	0	0	0	5	7	23	64
35	100.000000	17.503564	0	0	0	0	0	0	0	0	7	15
40	100.000000	19.948713	0	0	0	0	0	0	0	0	1	2
50	100.000000	24.947723	0	0	0	0	0	0	0	0	0	0
75	100.000000	37.530297	0	0	0	0	0	0	0	0	0	0
100	100.000000	49.980792	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3198
15	489	0	0	0	0	0	0	0	0	0	0	0	371
20	940	802	618	381	165	84	0	0	0	0	0	0	34
25	523	660	770	838	654	437	309	172	65	34	10	0	1
30	127	241	411	605	699	752	683	532	414	244	134	109	0
35	23	69	131	221	334	481	571	639	641	635	507	776	0
40	6	13	25	57	114	188	326	411	496	571	640	2200	0
50	0	0	0	5	9	10	23	47	67	146	228	4515	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	148	0	148	0	0	148	0	148	0	0
15	120	0	120	0	0	120	0	120	0	0
20	66	0	66	0	0	66	0	66	0	0
25	35	0	35	0	0	35	0	35	0	0
30	6	0	6	0	0	6	0	6	0	0
35	2	0	2	0	0	2	0	2	0	0
40	1	0	1	0	0	1	0	1	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	148	0	148	35	0	0	0	2032
15	120	0	120	23	0	0	0	3413
20	66	0	66	4	0	0	0	2990
25	35	0	35	2	0	0	0	3289
30	6	0	6	0	0	0	0	2868
35	2	0	2	0	0	0	0	3198
40	1	0	1	0	0	0	0	2840
50	0	0	0	0	0	0	0	2784
75	0	0	0	0	0	0	0	2980
100	0	0	0	0	0	0	0	2736

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	148	0	148	35	0	0
15	120	0	120	23	0	0
20	66	0	66	4	0	0
25	35	0	35	2	0	0
30	6	0	6	0	0	0
35	2	0	2	0	0	0
40	1	0	1	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	148	0	148	0	0	0	0
15	0	120	0	120	0	0	0	0
20	0	66	0	66	0	0	0	0
25	0	35	0	35	0	0	0	0
30	0	6	0	6	0	0	0	0
35	0	2	0	2	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	148	0	148	0	0	0	0
15	0	120	0	120	0	0	0	0
20	0	66	0	66	0	0	0	0
25	0	35	0	35	0	0	0	0
30	0	6	0	6	0	0	0	0
35	0	2	0	2	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	25	0	26	0	0	0	0
20	0	16	0	16	0	0	0	0
25	0	6	0	6	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	1	0	1	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	26	0	24	0	0	0	0
20	0	16	0	16	0	0	0	0
25	0	6	0	6	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	1	0	1	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	16	2734	308	5050	5050	0	0
15	27	3138	127	5050	5050	0	0
20	37	3152	79	5050	5050	0	0
25	54	3053	62	5050	5050	0	0
30	59	3106	61	5050	5050	0	0
35	77	3113	77	5050	5050	0	0
40	84	3076	84	5050	5050	0	0
50	107	3055	107	5050	5050	0	0
75	153	3057	153	5050	5050	0	0
100	225	3133	225	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	998	0	998	0	0	0	0
15	0	799	0	799	0	0	0	0
20	0	415	0	415	0	0	0	0
25	0	169	0	169	0	0	0	0
30	0	75	0	75	0	0	0	0
35	0	31	0	31	0	0	0	0
40	0	9	0	9	0	0	0	0
50	0	1	0	1	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 2g. N(100,30) 60% Type 1 Censoring

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	129.4716	154.5481	N/A	N/A	560.0108	424.0532
15	125.5128	132.2898	N/A	N/A	270.3810	240.2547
20	123.7912	138.5220	N/A	N/A	197.5097	186.9610
25	122.7338	126.8414	N/A	N/A	168.5539	162.4819
30	121.9861	132.1637	N/A	N/A	152.5525	148.7322
35	121.4789	123.6640	N/A	N/A	142.5597	140.0765
40	121.0699	130.0268	N/A	N/A	135.8659	134.2504
50	120.4248	125.1942	N/A	N/A	127.3647	126.4141
75	119.5610	118.1367	N/A	N/A	117.7598	117.3750
100	119.0457	120.5865	N/A	N/A	113.5577	113.3489

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	131.2250	129.9825	136.0867	178.4418	131.2661
15	125.6038	123.0063	130.5138	731.0760	123.7420
20	121.6559	118.8881	125.7338	255.3501	119.1887
25	118.3064	116.0930	121.6130	692.5543	116.1650
30	115.9313	114.2102	118.6228	939.3843	114.5896
35	114.0118	112.8551	116.2664	1850.8714	113.3232
40	112.6778	111.9226	114.5997	111.6241	111.6241
50	110.6724	110.3694	112.1756	110.0633	110.0633
75	108.3190	108.2862	109.2541	108.0294	108.0294
100	107.0667	107.0837	107.7380	106.8672	106.8672

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	123.5112	121.7688	127.1940	166.3921	121.6001
15	116.5216	112.9551	120.4149	2517.7310	111.9225
20	113.0295	109.1926	116.4010	2113.7277	108.0230
25	110.5640	107.6609	113.3761	4345.9271	106.6425
30	109.0725	106.8930	111.4037	5943.3810	106.1881
35	107.8354	106.4078	109.8132	9552.7122	105.8695
40	107.0728	106.2055	108.7729	105.5377	105.5377
50	105.7864	105.4725	107.1337	104.9205	104.9205
75	104.5884	104.5669	105.4416	104.1943	104.1943
100	103.9607	103.9886	104.5795	103.7014	103.7014

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	126.8380	125.4135	130.9590	125.9858	119.5853	126.2643
15	119.3666	116.1867	123.6192	115.6931	105.2820	117.1727
20	115.3962	111.8426	119.0739	110.9806	99.7971	112.7758
25	112.6443	109.8922	115.7027	109.0339	97.2584	110.8998
30	110.9235	108.8331	113.4493	108.0795	95.7885	109.5916
35	109.5173	108.1374	111.6527	107.4686	94.8535	108.8006
40	108.6220	107.7780	110.4501	107.1866	94.2073	108.3470
50	107.1256	106.8156	108.5665	106.3139	92.9445	107.2808
75	105.6084	105.5843	106.5108	105.2351	91.2831	105.8277
100	104.8014	104.8269	105.4513	104.5537	90.2336	105.0319

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.24%	507.8670	71.78%	128.6879	9.80%	129.7781
15	0.67%	221.4532	84.24%	124.2744	5.56%	120.9948
20	0.71%	157.4058	87.56%	122.8826	2.87%	117.0745
25	1.05%	132.8826	90.18%	122.0375	2.40%	115.3190
30	1.54%	119.7503	91.15%	121.4524	2.10%	114.1131
35	1.35%	111.9670	93.07%	121.1693	1.68%	113.3699
40	1.60%	106.8566	93.60%	120.7567	1.68%	112.9265
50	2.14%	98.1626	95.09%	120.2978	2.16%	111.9769
75	2.87%	88.3271	97.37%	119.8228	2.89%	110.7564
100	4.06%	83.0722	98.75%	119.4342	4.06%	110.0637

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	113.170	257.449	248.124	123.242	125.777	239.075	130.266
15	101.932	375.873	487.719	117.329	120.630	4149.903	126.969
20	97.964	2447.003	559.740	115.290	118.284	3149.325	125.265
25	96.184	456.069	681.292	114.378	117.046	6123.345	124.062
30	95.101	440.794	407.306	113.407	115.588	8008.115	123.026
35	94.366	305.669	747.995	112.487	114.381	12527.592	122.308
40	93.825	13480.514	553.943	111.752	113.451	111.682	121.736
50	92.674	310.511	239.537	110.286	111.773	110.143	120.898
75	91.143	223.291	218.401	108.238	109.408	108.065	119.798
100	90.142	113.050	111.831	107.053	108.097	106.895	119.197

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	110.302	124.171	125.222	120.944	121.927	122667.526	140.449
15	101.153	118.075	118.650	115.351	115.802	236399005.147	130.192
20	98.706	116.192	116.486	113.719	113.800	141164487.585	126.767
25	97.612	113.872	113.939	113.181	113.299	2008204938.885	124.649
30	96.611	112.774	112.803	112.443	112.419	3405175620.644	123.401
35	95.746	111.581	111.593	111.725	111.663	10109939942.389	122.612
40	95.049	110.849	110.877	111.135	111.127	110.839	121.972
50	93.606	109.459	109.545	109.815	109.900	109.548	121.056
75	91.726	107.839	108.001	107.966	108.097	107.755	119.931
100	90.562	106.816	106.986	106.863	107.086	106.685	119.292

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	116.814	132.414	133.407	125.152	129.361	126.134	133.026
15	104.210	130.590	132.036	117.425	123.498	118.361	129.536
20	99.185	129.216	130.583	113.758	119.937	114.045	127.368
25	96.796	127.615	128.801	111.966	117.656	111.661	125.789
30	95.442	125.249	126.191	110.863	115.725	110.384	124.440
35	94.574	122.833	123.592	110.097	114.334	109.611	123.499
40	93.989	120.118	120.791	109.634	113.377	109.133	122.768
50	92.793	116.033	116.510	108.601	111.746	108.151	121.726
75	91.212	109.112	109.498	107.174	109.424	106.852	120.316
100	90.189	106.666	106.964	106.276	108.147	106.011	119.587

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	120.291	237.945	238.690	128.452	138.443	131.879	136.666
15	106.784	124.562	127.568	120.768	133.464	124.516	132.852
20	100.431	988.731	186.731	116.081	128.532	118.727	130.111
25	97.271	542.096	184.169	113.566	124.413	114.589	128.079
30	95.634	126.376	127.849	112.121	121.147	112.206	126.352
35	94.635	125.682	126.694	111.146	118.852	110.883	125.121
40	94.035	123.844	124.663	110.520	117.226	110.066	124.169
50	92.815	120.131	120.585	109.335	114.868	108.874	122.831
75	91.214	111.061	111.341	107.689	111.647	107.340	121.047
100	90.208	107.404	107.762	106.687	109.891	106.397	120.130

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	144.7285	144.2452	151.7823	147.6608	147.6027	142.1084
15	136.2132	134.2269	142.8755	136.2433	136.2582	135.2567
20	131.0073	128.5494	136.5212	129.5899	129.6841	132.1599
25	127.2873	125.2009	131.7606	125.7599	125.9417	130.2563
30	124.6202	122.9708	128.2526	123.2715	123.8976	128.9216
35	122.4303	121.3106	125.4591	121.4668	122.2333	127.9361
40	120.8659	120.1370	123.4308	120.2080	120.2080	127.1662
50	118.2890	117.9807	120.2683	117.9531	117.9531	125.9206
75	114.8778	114.8273	116.0748	114.7269	114.7269	124.1265
100	112.8701	112.8712	113.7112	112.7593	112.7593	123.0204

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	123.8356	120.5452	124.7303	128.5285	134.1643
15	118.8349	115.2870	116.7104	120.0799	129.8051
20	116.3868	113.4972	113.0100	115.3485	123.8872
25	115.0131	112.9808	111.2465	112.8104	119.2876
30	113.7203	112.4886	110.1880	111.4498	116.3321
35	112.5690	111.9578	109.5216	110.5330	114.5194
40	111.7287	110.8589	109.1062	109.9802	113.1443
50	110.1536	109.5630	108.1571	108.8655	111.2317
75	108.0695	107.7578	106.8525	107.3322	108.7396
100	106.8971	106.6969	106.0162	106.4089	107.3805

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	119.585	518.735	515.715	129.049	131.734	17875.649	129.995
15	105.282	97.787	94.952	122.592	126.433	341114.974	125.705
20	99.797	135.408	132.923	118.682	122.331	348935.531	123.820
25	97.258	107.439	105.308	116.081	119.419	304236.196	122.671
30	95.788	24607.459	24604.554	114.259	117.031	202700.816	121.812
35	94.853	113.433	111.822	112.943	115.338	136106.069	121.264
40	94.207	265.311	264.026	112.032	114.179	113.144	120.830
50	92.945	111.444	110.477	110.489	112.321	111.232	120.170
75	91.283	108.468	107.954	108.382	109.751	108.740	119.322
100	90.234	107.175	106.851	107.168	108.356	107.381	118.828

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.05	100.00
15	100.00	100.00	100.00	100.00	100.00	99.94	99.84	100.00	97.88	98.36
20	100.00	100.00	100.00	99.80	100.00	92.41	89.01	99.81	83.47	83.62
25	100.00	100.00	100.00	99.94	100.00	88.84	85.37	97.35	80.61	80.63
30	100.00	100.00	100.00	99.96	100.00	87.91	84.95	95.63	81.15	81.19
35	100.00	100.00	100.00	99.98	100.00	86.40	84.38	94.25	80.91	80.93
40	100.00	100.00	100.00	100.00	100.00	86.85	85.60	93.27	82.59	82.59
50	99.66	99.64	100.00	99.47	99.47	85.09	84.53	91.13	82.04	82.04
75	98.51	98.53	99.50	98.08	98.08	85.03	85.09	89.29	82.53	82.53
100	98.04	98.04	99.03	97.60	97.60	84.97	85.33	88.81	83.33	83.33

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	100.00	100.00	N/A	N/A	100.00	100.00
15	100.00	100.00	N/A	N/A	100.00	100.00
20	100.00	100.00	N/A	N/A	100.00	100.00
25	100.00	100.00	N/A	N/A	100.00	100.00
30	100.00	100.00	N/A	N/A	100.00	100.00
35	100.00	100.00	N/A	N/A	100.00	100.00
40	100.00	100.00	N/A	N/A	100.00	100.00
50	100.00	100.00	N/A	N/A	100.00	100.00
75	100.00	100.00	N/A	N/A	99.70	99.66
100	100.00	100.00	N/A	N/A	99.21	99.09

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	100.00	100.00	100.00	100.00	99.96	100.00
15	100.00	100.00	100.00	99.96	68.75	99.03
20	96.42	94.26	100.00	90.80	48.00	92.65
25	93.60	90.73	99.45	87.04	36.61	90.77
30	92.28	90.04	97.83	86.61	29.50	89.01
35	91.11	89.56	96.88	86.43	24.16	88.65
40	91.00	90.08	96.33	87.62	19.25	89.19
50	89.05	88.77	94.42	86.73	11.41	88.20
75	88.69	88.69	92.53	87.29	3.41	86.91
100	88.77	88.89	92.18	87.49	0.77	86.63

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.24%	100.00	71.78%	100.00	9.80%	100.00
15	0.67%	100.00	84.24%	100.00	5.56%	100.00
20	0.71%	82.71	87.56%	100.00	2.87%	99.55
25	1.05%	75.41	90.18%	100.00	2.40%	98.80
30	1.54%	68.79	91.15%	100.00	2.10%	98.26
35	1.35%	62.26	93.07%	100.00	1.68%	98.53
40	1.60%	58.12	93.60%	100.00	1.68%	98.87
50	2.14%	46.03	95.09%	100.00	2.16%	99.03
75	2.87%	24.10	97.37%	100.00	2.89%	99.49
100	4.06%	10.40	98.75%	100.00	4.06%	99.57

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	95.88	100.00	97.17	102.91	100.00	99.05	100.00	100.00
15	54.57	100.00	95.52	104.68	99.80	99.35	99.88	100.00
20	41.49	99.96	96.24	102.28	98.59	98.24	96.93	100.00
25	32.89	99.86	97.74	100.43	99.07	98.06	97.17	100.00
30	26.77	99.90	98.71	99.64	99.03	98.12	97.74	100.00
35	22.16	99.90	99.13	99.94	99.25	98.53	98.40	100.00
40	18.02	99.88	99.64	99.70	99.09	98.93	98.91	100.00
50	10.57	99.98	99.98	99.41	98.79	98.61	98.63	100.00
75	3.27	99.74	99.84	98.32	97.80	97.94	97.84	100.00
100	0.73	98.87	99.19	97.96	97.54	97.45	97.45	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.14	99.88	100.00	100.00	100.00	99.05	100.00	100.00
15	52.42	96.79	99.44	98.36	94.36	95.11	96.12	100.00
20	48.65	93.25	95.31	92.95	91.88	91.92	92.38	100.00
25	41.58	93.32	95.04	95.47	93.76	93.96	94.24	100.00
30	33.84	94.75	95.87	96.85	94.40	95.80	95.88	100.00
35	27.37	95.31	96.23	98.08	95.13	96.85	96.83	100.00
40	21.64	95.73	96.54	98.71	96.36	97.49	97.68	100.00
50	13.05	95.74	96.57	98.24	95.60	97.35	97.47	100.00
75	3.90	96.75	97.21	97.47	95.01	96.81	97.01	100.00
100	0.83	97.11	97.62	97.25	95.23	96.61	96.81	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.86	100.00	100.00	100.00	100.00	100.00	100.00	100.00
15	65.64	100.00	100.00	100.00	100.00	100.00	100.00	100.00
20	44.40	100.00	100.00	100.00	100.00	99.94	99.58	100.00
25	33.74	99.90	99.98	98.50	99.96	97.62	96.73	100.00
30	27.60	99.94	99.94	96.75	99.90	95.82	95.29	100.00
35	22.46	99.80	99.90	96.40	99.66	95.21	94.65	100.00
40	18.44	99.62	99.74	96.50	99.52	95.11	95.11	100.00
50	10.73	99.27	99.66	96.06	98.89	94.67	94.71	100.00
75	3.33	97.58	98.46	95.56	98.10	94.50	94.71	100.00
100	0.73	96.30	97.27	95.50	97.74	94.69	94.75	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	100.00	93.23	99.86	100.00	100.00	100.00	100.00	100.00
15	83.43	78.48	82.23	100.00	100.00	100.00	100.00	100.00
20	48.14	82.28	82.90	100.00	100.00	100.00	100.00	100.00
25	34.63	88.02	88.26	100.00	100.00	100.00	99.94	100.00
30	27.56	93.74	93.78	99.43	100.00	99.86	98.75	100.00
35	22.85	96.47	96.51	98.83	100.00	98.83	97.88	100.00
40	18.04	98.22	98.26	98.53	100.00	97.86	97.49	100.00
50	10.93	99.58	99.62	97.64	100.00	96.77	96.55	100.00
75	3.47	99.01	99.45	97.19	99.80	96.40	96.69	100.00
100	0.75	97.76	98.40	97.11	99.39	95.92	96.08	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	100.00	100.00	100.00	100.00	100.00	100.00
15	100.00	100.00	100.00	100.00	100.00	100.00
20	100.00	100.00	100.00	100.00	100.00	100.00
25	100.00	100.00	100.00	100.00	100.00	100.00
30	99.98	99.92	100.00	99.84	99.84	100.00
35	99.88	99.74	100.00	99.68	99.68	100.00
40	99.92	99.88	100.00	99.76	99.76	100.00
50	99.88	99.86	100.00	99.86	99.86	100.00
75	99.78	99.78	99.98	99.76	99.76	100.00
100	99.86	99.86	99.96	99.84	99.84	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 107.6004131
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.96	97.74	75.45	129.55	100.00	99.88	100.00	100.00
15	68.75	96.31	71.80	134.13	100.00	99.90	99.84	100.00
20	48.00	97.29	78.81	123.32	100.00	99.96	99.86	100.00
25	36.61	97.58	85.15	114.41	99.96	99.96	99.94	100.00
30	29.50	98.07	91.33	107.13	99.72	99.98	99.94	100.00
35	24.16	98.74	94.51	103.91	99.64	99.94	99.92	100.00
40	19.25	99.21	96.87	101.65	99.52	99.92	99.92	100.00
50	11.41	99.28	97.72	99.84	99.13	99.88	99.88	100.00
75	3.41	98.67	97.62	98.55	98.65	98.95	98.95	100.00
100	0.77	98.26	97.45	98.18	98.00	98.53	98.53	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 107.6004131
Averaged Percentage Non-detects: 60.00%
Distribution Check: Average of means: 99.960327
Distribution Check: Average of stdvs: 29.883107
Average of NDs per 100 observations: 60.109000

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	107.600413	4.358614	1	20	145	589	1541	2754	0	0	0	0
15	107.600413	8.295248	0	0	4	7	47	163	366	786	1121	1367
20	107.600413	11.732673	0	0	0	1	1	7	35	73	215	389
25	107.600413	14.919604	0	0	0	0	0	0	1	6	16	54
30	107.600413	17.986139	0	0	0	0	0	0	0	0	0	1
35	107.600413	20.964554	0	0	0	0	0	0	0	0	0	0
40	107.600413	23.919604	0	0	0	0	0	0	0	0	0	0
50	107.600413	29.987327	0	0	0	0	0	0	0	0	0	0
75	107.600413	44.968119	0	0	0	0	0	0	0	0	0	0
100	107.600413	60.022178	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	8733
15	1189	0	0	0	0	0	0	0	0	0	0	0	1376
20	637	825	922	884	650	411	0	0	0	0	0	0	290
25	119	222	393	531	742	868	786	584	409	223	96	0	47
30	8	24	63	134	264	394	565	684	777	692	550	894	8
35	0	2	9	22	38	72	170	311	404	540	618	2864	1
40	0	0	1	0	3	8	25	52	116	203	269	4373	0
50	0	0	0	0	0	0	0	1	1	2	8	5038	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	143	0	143	0	0	143	0	143	0	0
15	226	0	226	0	0	226	0	226	0	0
20	190	0	190	0	0	190	0	190	0	0
25	111	0	111	0	0	111	0	111	0	0
30	62	0	62	0	0	62	0	62	0	0
35	42	0	42	0	0	42	0	42	0	0
40	14	0	14	0	0	14	0	14	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	143	0	143	46	0	0	0	2754
15	226	0	226	32	0	0	0	4463
20	190	0	190	15	0	0	0	4329
25	111	0	111	4	0	0	0	4632
30	62	0	62	2	0	0	0	4556
35	42	0	42	1	0	0	0	4737
40	14	0	14	0	0	0	0	4642
50	0	0	0	0	0	0	0	4750
75	0	0	0	0	0	0	0	4921
100	0	0	0	0	0	0	0	4969

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	143	0	143	46	0	0
15	226	0	226	32	0	0
20	190	0	190	15	0	0
25	111	0	111	4	0	0
30	62	0	62	2	0	0
35	42	0	42	1	0	0
40	14	0	14	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	143	0	143	0	0	0	0
15	0	226	0	226	0	0	0	0
20	0	190	0	190	0	0	0	0
25	0	111	0	111	0	0	0	0
30	0	62	0	62	0	0	0	0
35	0	42	0	42	0	0	0	0
40	0	14	0	14	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	143	0	143	0	0	0	0
15	0	226	0	226	0	0	0	0
20	0	190	0	190	0	0	0	0
25	0	111	0	111	0	0	0	0
30	0	62	0	62	0	0	0	0
35	0	42	0	42	0	0	0	0
40	0	14	0	14	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	49	0	49	0	0	0	0
20	0	56	0	55	0	0	0	0
25	0	34	0	34	0	0	0	0
30	0	19	0	20	0	0	0	0
35	0	14	0	15	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	49	0	47	0	0	0	0
20	0	56	0	56	0	0	0	0
25	0	34	0	34	0	0	0	0
30	0	19	0	19	0	0	0	0
35	0	14	0	14	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	12	3625	495	5050	5050	0	0
15	34	4254	281	5050	5050	0	0
20	36	4422	145	5050	5050	0	0
25	53	4554	121	5050	5050	0	0
30	78	4603	106	5050	5050	0	0
35	68	4700	85	5050	5050	0	0
40	81	4727	85	5050	5050	0	0
50	108	4802	109	5050	5050	0	0
75	145	4917	146	5050	5050	0	0
100	205	4987	205	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1152	0	1152	0	0	0	0
15	0	1285	0	1285	0	0	0	0
20	0	955	0	955	0	0	0	0
25	0	636	0	636	0	0	0	0
30	0	336	0	336	0	0	0	0
35	0	191	0	191	0	0	0	0
40	0	89	0	89	0	0	0	0
50	0	17	0	17	0	0	0	0
75	0	3	0	3	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 2h. N(100,30) 70% Type 1 Censoring

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	134.9978	158.4008	N/A	N/A	589.6426	446.3711
15	131.0382	137.9471	N/A	N/A	281.2319	249.9945
20	128.9076	142.0979	N/A	N/A	201.7483	191.0304
25	127.7384	130.5190	N/A	N/A	170.5600	164.2536
30	126.8894	147.5559	N/A	N/A	153.6293	149.6058
35	126.3890	126.0336	N/A	N/A	142.9216	140.3089
40	126.0540	134.1318	N/A	N/A	135.8459	134.1419
50	125.3596	127.5661	N/A	N/A	126.9174	125.9291
75	124.5036	-1.#IND	N/A	N/A	117.1850	116.7911
100	123.9983	-1.#IND	N/A	N/A	112.9888	112.7761

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	136.8962	135.5611	141.7307	172.0132	136.8026
15	131.8435	128.8571	137.2095	1066.2387	129.6802
20	128.2786	124.3534	133.1081	1533.5236	125.4669
25	124.7571	121.2102	129.0672	1618.0571	121.8442
30	122.4687	118.7286	126.1462	1937.9464	120.6468
35	119.5652	116.8236	122.7628	2944.7176	116.7210
40	117.8465	115.4324	120.6238	2790.5891	115.2408
50	114.7790	113.3082	116.9850	112.8389	112.8389
75	110.8884	110.4599	112.3140	110.0441	110.0441
100	109.0696	108.9425	110.1087	108.5986	108.5986

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	129.2230	127.3316	132.8670	160.3253	127.1005
15	121.9172	117.7703	126.1524	3833.0690	116.4708
20	117.9685	112.3142	121.9572	14669.4688	110.8102
25	114.3340	109.2216	118.0327	12571.1225	107.6907
30	112.7207	107.5220	115.9564	21786.7526	106.5822
35	110.4518	106.7342	113.3183	8529.1367	105.4640
40	109.4894	106.2916	112.0038	6703.4005	105.1725
50	107.4620	105.6765	109.4904	104.7197	104.7197
75	105.2571	104.7839	106.5885	104.1369	104.1369
100	104.3843	104.2550	105.3628	103.7739	103.7739

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	132.3923	130.8556	136.4515	131.3198	123.3578	131.5589
15	124.6081	120.9128	129.2377	120.1865	106.7374	121.7252
20	120.0708	114.8060	124.4520	113.4692	98.6723	115.7946
25	116.1470	111.2533	120.2314	109.7364	94.7212	112.0969
30	114.2440	109.2116	117.8185	107.7831	92.5111	109.9779
35	111.8410	108.2078	115.0053	106.9306	91.3897	108.9291
40	110.7518	107.6051	113.5187	106.4805	90.6826	108.2411
50	108.5319	106.7713	110.7539	105.8593	89.5018	107.2092
75	106.0497	105.5780	107.4906	104.9501	87.9055	105.8662
100	105.0193	104.8883	106.0692	104.4174	86.9905	105.0443

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.36%	529.7704	85.03%	135.5554	16.40%	135.0773
15	0.59%	201.5936	94.51%	130.6018	9.96%	125.3783
20	0.71%	125.7757	97.82%	128.6514	6.97%	120.0032
25	1.09%	99.0608	98.53%	127.7446	4.63%	117.0837
30	1.11%	86.2187	99.25%	127.9715	3.19%	115.3692
35	1.62%	79.9511	99.78%	126.2014	3.13%	114.4731
40	1.76%	76.1940	99.56%	127.3058	2.75%	113.9164
50	2.18%	70.2457	99.80%	127.3305	2.50%	113.0065
75	3.37%	63.4621	100.00%	N/A	3.39%	111.8633
100	3.50%	60.1711	99.98%	125.9607	3.50%	111.1869

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	116.307	181.843	182.442	128.547	130.950	215.465	135.780
15	102.756	297.471	289.033	121.697	125.245	6350.061	132.626
20	96.236	1750.770	1991.594	118.252	122.055	21723.368	130.786
25	93.172	1600.528	686.583	116.579	120.061	17739.233	129.676
30	91.510	1700.727	2471.681	115.573	118.728	29359.980	128.703
35	90.732	1544.662	2072.948	114.927	117.695	11354.069	127.957
40	90.218	691.572	1084.069	114.276	116.735	8742.460	127.380
50	89.224	929.889	2363.871	112.879	114.901	112.225	126.348
75	87.770	414.412	293.579	110.323	111.922	109.810	125.021
100	86.903	153.395	430.880	108.833	110.201	108.453	124.316

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	112.463	128.996	130.066	125.747	126.788	59580.009	145.138
15	100.672	123.053	124.080	118.935	119.649	243575231.172	136.430
20	95.637	121.195	122.496	115.697	116.163	6349824261.685	132.612
25	93.666	117.591	118.485	114.310	114.337	7446146626.879	130.004
30	92.641	116.838	117.681	113.629	113.445	12847810047.276	128.619
35	92.179	114.927	115.519	113.308	113.067	6305724142.548	127.709
40	91.696	114.118	114.564	112.890	112.591	4033208815.218	127.122
50	90.543	112.127	112.564	111.836	111.547	110.897	126.110
75	88.608	109.593	109.964	109.689	109.641	109.085	124.898
100	87.491	108.336	108.664	108.389	108.447	107.954	124.265

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	120.763	137.893	138.884	130.748	134.777	131.589	138.440
15	105.940	136.491	138.007	122.541	129.135	123.773	135.359
20	98.431	135.807	137.492	117.687	125.428	118.722	133.230
25	94.606	135.100	136.633	114.857	122.673	115.074	131.792
30	92.404	133.727	135.159	113.056	120.528	112.854	130.547
35	91.283	132.471	133.759	112.002	118.750	111.480	129.520
40	90.593	130.864	131.899	111.300	117.376	110.682	128.743
50	89.444	126.869	127.743	110.216	115.164	109.539	127.438
75	87.892	118.037	118.598	108.559	112.102	108.040	125.737
100	86.992	111.419	111.926	107.566	110.374	107.158	124.822

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	124.881	464.774	200.041	134.539	144.484	138.112	142.068
15	109.799	128.016	131.578	126.696	140.238	131.916	138.698
20	100.938	124.084	888.542	121.056	135.919	126.437	136.268
25	96.066	205.680	209.398	117.561	132.650	121.733	134.622
30	93.216	166.211	169.423	115.310	129.151	117.880	133.006
35	91.706	129.471	131.827	113.865	125.997	114.858	131.685
40	90.805	130.460	132.342	112.917	123.610	113.181	130.675
50	89.546	130.376	131.491	111.470	119.919	111.046	128.924
75	87.928	123.399	124.031	109.452	115.265	108.964	126.689
100	87.016	114.907	115.383	108.268	112.849	107.874	125.509

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	148.8418	148.3460	155.7205	151.5958	151.5106	146.3930
15	140.2567	137.9608	147.3623	139.8665	139.9078	139.5874
20	134.3521	130.6694	140.7196	131.5506	132.4410	135.8248
25	129.9478	126.2295	135.6917	126.4999	127.2248	133.8966
30	127.1070	123.1772	132.0218	123.1518	125.3023	132.4748
35	124.2504	121.3106	128.5349	121.1474	121.4862	131.5925
40	122.5919	119.9764	126.2936	119.7519	120.0410	130.9686
50	119.4156	117.9125	122.3282	117.6264	117.6264	129.8033
75	115.2145	114.7740	117.0406	114.4795	114.4795	128.1875
100	113.0261	112.8878	114.3268	112.6258	112.6258	127.2168

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	129.0560	125.3324	130.3306	134.6633	139.8132
15	123.4780	118.7272	121.7608	126.0374	137.8491
20	119.7084	115.4072	116.8188	120.1969	131.6451
25	117.4459	113.8492	113.8504	116.6155	126.2503
30	115.8069	113.7499	112.0202	114.3862	121.9700
35	114.7853	112.4272	111.1080	113.0193	119.3540
40	113.8939	112.0683	110.4835	112.0959	117.0846
50	112.3272	110.9419	109.5074	110.8254	114.4484
75	109.8339	109.0948	108.0394	108.9618	111.0755
100	108.4616	107.9572	107.1593	107.8717	109.3368

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	123.358	102.457	99.586	134.428	137.186	19149.531	135.439
15	106.737	92.739	89.815	128.235	132.820	465583.241	131.281
20	98.672	1612.500	1609.292	123.887	128.867	941366.753	129.121
25	94.721	164.505	162.062	120.763	125.474	1154359.452	127.904
30	92.511	103.251	101.105	118.393	122.833	796647.276	126.986
35	91.390	106.767	104.865	116.622	120.524	473976.809	126.387
40	90.683	342.264	340.276	115.314	118.829	249337.739	125.982
50	89.502	164.193	162.773	113.316	116.239	95614.362	125.233
75	87.905	112.266	111.418	110.518	112.700	111.076	124.315
100	86.991	109.091	108.559	108.995	110.790	109.337	123.808

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.17	100.00
15	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.25	99.72
20	100.00	100.00	100.00	99.80	100.00	98.51	98.14	100.00	92.02	92.28
25	100.00	100.00	100.00	99.86	100.00	93.24	90.06	99.54	82.61	82.75
30	100.00	100.00	100.00	99.82	100.00	89.31	84.61	97.27	78.44	78.61
35	100.00	100.00	100.00	99.94	100.00	87.61	83.54	95.76	78.08	78.14
40	100.00	100.00	100.00	99.94	100.00	86.64	82.83	94.48	77.33	77.37
50	100.00	100.00	100.00	100.00	100.00	84.41	82.61	91.85	78.24	78.24
75	99.68	99.54	99.98	99.37	99.37	83.77	83.52	89.45	79.78	79.78
100	98.99	98.91	99.68	98.55	98.55	82.73	82.57	87.92	79.66	79.66

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	100.00	100.00	N/A	N/A	100.00	100.00
15	100.00	100.00	N/A	N/A	100.00	100.00
20	100.00	100.00	N/A	N/A	100.00	100.00
25	100.00	100.00	N/A	N/A	100.00	100.00
30	100.00	100.00	N/A	N/A	100.00	100.00
35	100.00	100.00	N/A	N/A	100.00	100.00
40	100.00	100.00	N/A	N/A	100.00	100.00
50	100.00	100.00	N/A	N/A	99.96	99.90
75	100.00	N/A	N/A	N/A	99.21	98.95
100	100.00	N/A	N/A	N/A	97.41	97.17

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	100.00	100.00	100.00	100.00	100.00	100.00
15	100.00	100.00	100.00	100.00	81.07	99.94
20	99.77	99.70	100.00	97.89	39.50	96.46
25	95.57	93.25	99.96	88.37	24.08	90.57
30	92.27	88.46	98.77	82.82	15.33	86.24
35	90.53	86.87	97.45	82.21	10.55	85.96
40	89.64	85.82	96.33	81.61	8.16	83.62
50	87.26	85.68	94.50	81.78	3.68	84.20
75	86.34	85.96	91.71	83.01	0.65	83.39
100	85.15	85.07	90.32	82.38	0.06	82.18

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.36%	100.00	85.03%	100.00	16.40%	100.00
15	0.59%	100.00	94.51%	100.00	9.96%	100.00
20	0.71%	65.92	97.82%	100.00	6.97%	100.00
25	1.09%	41.58	98.53%	100.00	4.63%	99.56
30	1.11%	29.74	99.25%	100.00	3.19%	98.43
35	1.62%	21.48	99.78%	100.00	3.13%	97.79
40	1.76%	16.91	99.56%	100.00	2.75%	97.66
50	2.18%	7.67	99.80%	100.00	2.50%	97.99
75	3.37%	1.39	100.00%	N/A	3.39%	98.91
100	3.50%	0.10	99.98%	100.00	3.50%	99.47

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.98	100.00	96.77	103.34	100.00	99.17	100.00	100.00
15	57.49	100.00	94.06	106.32	100.00	99.25	99.78	100.00
20	30.67	100.00	93.13	107.38	99.76	99.39	99.72	100.00
25	20.48	99.98	93.80	105.91	98.99	98.79	97.76	100.00
30	13.31	99.79	96.30	101.87	98.63	97.80	96.63	100.00
35	9.41	99.86	96.97	101.47	98.79	97.80	97.03	100.00
40	7.31	99.86	97.56	100.79	98.87	97.80	97.37	100.00
50	3.39	99.94	99.31	100.00	99.17	98.48	98.28	100.00
75	0.63	100.00	99.90	99.41	98.48	98.36	98.28	100.00
100	0.06	99.94	100.00	98.53	98.02	97.54	97.49	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	95.37	99.98	99.98	100.00	100.00	99.11	100.00	100.00
15	48.32	99.85	99.96	99.92	98.02	99.21	99.66	100.00
20	34.12	96.51	99.26	98.06	93.92	93.29	94.40	100.00
25	27.56	94.00	97.00	94.59	91.60	90.91	91.64	100.00
30	19.60	93.85	96.05	94.77	91.50	90.97	91.64	100.00
35	13.58	94.61	96.49	96.00	93.41	93.15	93.52	100.00
40	10.38	95.15	96.76	97.01	93.52	93.86	94.16	100.00
50	4.73	95.81	97.09	98.36	94.95	96.20	96.26	100.00
75	0.81	96.97	97.98	98.44	94.53	96.69	96.57	100.00
100	0.10	96.89	97.60	97.64	94.16	96.24	96.20	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
15	79.17	100.00	100.00	100.00	100.00	100.00	100.00	100.00
20	37.60	100.00	100.00	100.00	100.00	100.00	100.00	100.00
25	22.22	100.00	100.00	99.94	100.00	99.90	99.52	100.00
30	14.30	99.88	99.98	98.93	100.00	98.30	97.23	100.00
35	9.80	99.94	99.98	98.08	99.98	97.29	96.42	100.00
40	7.66	99.76	99.88	97.41	99.90	96.42	95.94	100.00
50	3.43	99.84	99.88	97.31	99.76	95.90	95.80	100.00
75	0.65	99.58	99.82	96.83	98.91	95.27	95.49	100.00
100	0.06	98.65	99.07	96.10	98.51	95.05	95.21	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	100.00	99.86	99.98	100.00	100.00	100.00	100.00	100.00
15	97.47	80.25	92.12	100.00	100.00	100.00	100.00	100.00
20	51.09	72.83	78.56	100.00	100.00	100.00	100.00	100.00
25	23.84	75.83	77.87	100.00	100.00	100.00	99.98	100.00
30	14.46	81.16	81.73	99.98	100.00	100.00	99.82	100.00
35	10.00	87.24	87.48	99.88	100.00	99.96	99.54	100.00
40	7.70	90.64	90.80	99.41	100.00	99.60	98.59	100.00
50	3.76	95.62	95.64	98.97	100.00	98.91	98.36	100.00
75	0.63	99.47	99.52	98.50	99.98	97.76	97.56	100.00
100	0.08	99.47	99.58	97.54	99.84	96.71	97.03	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	100.00	100.00	100.00	100.00	100.00	100.00
15	100.00	100.00	100.00	100.00	100.00	100.00
20	100.00	100.00	100.00	100.00	100.00	100.00
25	100.00	100.00	100.00	100.00	100.00	100.00
30	100.00	100.00	100.00	99.98	100.00	100.00
35	99.82	99.72	100.00	99.66	99.68	100.00
40	99.70	99.37	100.00	99.25	99.23	100.00
50	99.54	99.31	99.98	99.09	99.09	100.00
75	99.52	99.35	99.86	99.25	99.25	100.00
100	99.39	99.35	99.80	99.23	99.23	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 115.7320154
Percentage Non-detects: 70.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	100.00	98.90	72.97	135.53	100.00	99.86	100.00	100.00
15	81.07	97.12	64.14	151.42	100.00	99.78	99.66	100.00
20	39.50	97.01	64.91	149.50	100.00	99.88	99.62	100.00
25	24.08	96.02	70.16	136.82	100.00	99.90	99.80	100.00
30	15.33	97.05	77.47	125.28	99.94	99.90	99.80	100.00
35	10.55	97.51	83.88	116.23	99.90	99.92	99.78	100.00
40	8.16	97.80	87.68	111.33	99.72	99.88	99.86	100.00
50	3.68	98.78	94.12	104.73	99.56	99.80	99.80	100.00
75	0.65	99.42	98.48	99.90	98.93	99.43	99.43	100.00
100	0.06	98.91	98.04	98.93	98.46	98.91	98.91	100.00

NORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 100.00
Stdv Value: 30.00
Population Mean: 100.0000000
Number of Test Runs: 5050
Detection Limit: 115.7320154
Averaged Percentage Non-detects: 70.00%
Distribution Check: Average of means: 99.977702
Distribution Check: Average of stdvs: 29.942249
Average of NDs per 100 observations: 70.002700

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	115.732015	4.611683	0	7	42	283	1241	3477	0	0	0	0
15	115.732015	8.987723	0	0	0	1	6	32	128	365	876	1550
20	115.732015	13.162970	0	0	0	0	0	0	0	11	32	79
25	115.732015	17.109505	0	0	0	0	0	0	0	0	0	1
30	115.732015	20.862970	0	0	0	0	0	0	0	0	0	0
35	115.732015	24.440000	0	0	0	0	0	0	0	0	0	0
40	115.732015	27.947525	0	0	0	0	0	0	0	0	0	0
50	115.732015	34.994455	0	0	0	0	0	0	0	0	0	0
75	115.732015	52.484950	0	0	0	0	0	0	0	0	0	0
100	115.732015	69.921980	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	28757
15	2092	0	0	0	0	0	0	0	0	0	0	0	5352
20	207	426	758	1105	1268	1164	0	0	0	0	0	0	1553
25	10	18	69	162	297	483	733	913	990	790	584	0	534
30	0	2	2	7	14	66	115	216	390	570	748	2920	182
35	0	0	0	0	1	4	7	21	43	102	173	4699	63
40	0	0	0	0	0	0	0	3	4	11	25	5007	12
50	0	0	0	0	0	0	0	0	0	0	0	5050	1
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	163	0	163	0	0	163	0	163	0	0
15	300	0	300	0	0	300	0	300	0	0
20	347	0	347	0	0	347	0	347	0	0
25	313	0	313	0	0	313	0	313	0	0
30	185	0	185	0	0	185	0	185	0	0
35	149	0	149	0	0	149	0	149	0	0
40	119	0	119	0	0	119	0	119	0	0
50	33	0	33	0	0	33	0	33	0	0
75	5	0	5	0	0	5	0	5	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	163	0	163	40	0	0	0	3477
15	300	0	300	38	0	0	0	4883
20	347	0	347	31	0	0	0	4928
25	313	0	313	10	0	0	0	5021
30	185	0	185	9	0	0	0	5025
35	149	0	149	3	0	0	0	5038
40	119	0	119	3	0	0	0	5032
50	33	0	33	0	0	0	0	5045
75	5	0	5	0	0	0	0	5050
100	0	0	0	0	0	0	0	5050

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	163	0	163	40	0	0
15	300	0	300	38	0	0
20	347	0	347	31	0	0
25	313	0	313	10	0	0
30	185	0	185	9	0	0
35	149	0	149	3	0	0
40	119	0	119	3	0	0
50	33	0	33	0	0	0
75	5	0	5	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	163	0	163	0	0	0	0
15	0	300	0	300	0	0	0	0
20	0	347	0	347	0	0	0	0
25	0	313	0	313	0	0	0	0
30	0	186	0	186	0	0	0	0
35	0	150	0	150	0	0	0	0
40	0	119	0	119	0	0	0	0
50	0	33	0	33	0	0	0	0
75	0	5	0	5	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	163	0	163	0	0	0	0
15	0	300	0	300	0	0	0	0
20	0	347	0	347	0	0	0	0
25	0	313	0	313	0	0	0	0
30	0	186	0	186	0	0	0	0
35	0	150	0	150	0	0	0	0
40	0	119	0	119	0	0	0	0
50	0	33	0	33	0	0	0	0
75	0	5	0	5	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	59	0	57	0	0	0	0
20	0	110	0	110	0	0	0	0
25	0	99	0	99	0	0	0	0
30	0	70	0	69	0	0	0	0
35	0	64	0	64	0	0	0	0
40	0	48	0	49	0	0	0	0
50	0	9	0	9	0	0	0	0
75	0	2	0	2	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	58	0	60	0	0	0	0
20	0	110	0	110	0	0	0	0
25	0	98	0	97	0	0	0	0
30	0	71	0	70	0	0	0	0
35	0	66	0	65	0	0	0	0
40	0	48	0	48	0	0	0	0
50	0	9	0	9	0	0	0	0
75	0	2	0	2	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	18	4294	828	5050	5050	0	0
15	30	4773	503	5050	5050	0	0
20	36	4940	352	5050	5050	0	0
25	55	4976	234	5050	5050	0	0
30	56	5012	161	5050	5050	0	0
35	82	5039	158	5050	5050	0	0
40	89	5028	139	5050	5050	0	0
50	110	5040	126	5050	5050	0	0
75	170	5050	171	5050	5050	0	0
100	177	5049	177	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1324	0	1324	0	0	0	0
15	0	1715	0	1715	0	0	0	0
20	0	1672	0	1672	0	0	0	0
25	0	1359	0	1359	0	0	0	0
30	0	1019	0	1019	0	0	0	0
35	0	705	0	705	0	0	0	0
40	0	514	0	514	0	0	0	0
50	0	230	0	230	0	0	0	0
75	0	25	0	25	0	0	0	0
100	0	9	0	9	0	0	0	0

Table 3a. Ln(5,0.75) 10% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	275.8759	269.4325	N/A	N/A	875.4300	658.3437
15	264.2786	246.1062	N/A	N/A	576.4614	501.9556
20	255.8489	234.0978	N/A	N/A	461.8602	430.3131
25	251.2409	227.3669	N/A	N/A	409.3839	388.7421
30	247.0954	223.0836	N/A	N/A	375.2739	361.1109
35	243.2409	218.5094	N/A	N/A	351.1517	341.2628
40	240.7037	215.9171	N/A	N/A	334.3229	327.4735
50	236.1048	211.6775	N/A	N/A	311.2412	306.8367
75	229.8230	205.0545	N/A	N/A	282.8912	280.7815
100	225.9384	201.5275	N/A	N/A	267.4568	266.1917

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	277.5116	277.4585	285.5344	280.4524	288.2418
15	260.5267	260.1234	265.4089	262.5079	269.8011
20	250.0038	249.2913	253.4672	251.1547	258.7894
25	244.2493	243.2300	246.8998	245.0879	252.8489
30	239.5458	238.3599	241.6299	240.1700	247.9257
35	235.2527	233.8966	236.9597	235.7381	243.5109
40	232.4558	230.9810	233.8937	232.8475	240.5750
50	227.5534	225.9095	228.6196	227.8182	235.4707
75	220.4890	218.4680	221.1258	220.6129	228.6168
100	216.4298	214.2338	216.8679	216.5003	224.4109

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	264.1767	263.6014	270.8506	265.9697	274.2103
15	251.8189	250.9981	256.0823	259.8185	260.8582
20	243.2267	242.1703	246.3203	244.0948	251.9092
25	238.5900	237.2645	240.9912	239.2404	247.1441
30	234.6891	233.2388	236.5950	235.1800	243.0515
35	230.9285	229.3370	232.5005	231.3135	239.1837
40	228.5654	226.8792	229.8972	228.8786	236.6896
50	224.2787	222.4597	225.2744	224.4917	232.2084
75	217.9592	215.8034	218.5608	218.0575	226.1051
100	214.3616	212.0588	214.7786	214.4168	222.3588

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	277.9541	278.0444	286.0645	281.0813	282.0678	279.5574
15	261.8668	261.6682	266.9487	263.7952	266.2846	261.6054
20	251.5279	251.0409	255.1682	252.8459	256.1700	250.0186
25	245.8294	245.0472	248.6292	246.8022	250.7207	243.4253
30	241.1004	240.1368	243.3057	241.8312	246.0911	238.0343
35	236.7818	235.6458	238.5898	237.3548	241.8916	233.2067
40	233.9535	232.6922	235.4778	234.4192	239.1403	229.9875
50	228.9523	227.5082	230.0825	229.2712	234.2571	224.4272
75	221.6950	219.8512	222.3678	221.8490	227.5788	216.0832
100	217.5350	215.4987	217.9970	217.6253	223.5843	211.4319

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1200.4522	0.00%	322.6342	0.00%	399.2365
15	0.00%	637.1324	0.00%	277.9488	0.00%	322.7484
20	0.00%	509.2425	0.00%	258.1044	0.00%	293.3341
25	0.00%	448.8630	0.00%	247.9182	0.00%	277.7484
30	0.00%	411.7839	0.00%	241.3066	0.00%	267.7619
35	0.00%	389.2545	0.00%	235.3697	0.00%	259.5768
40	0.00%	372.1189	0.00%	231.9215	0.00%	254.3913
50	0.00%	348.4664	0.00%	226.0960	0.00%	245.9626
75	0.00%	321.0267	0.00%	218.3679	0.00%	235.2866
100	0.00%	305.1326	0.00%	214.2619	0.00%	229.2807

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	268.984	265.946	1171.038	264.424	263.272	265.482	275.169
15	259.374	296.662	255.507	252.940	251.066	268.707	263.334
20	251.704	246.172	246.925	244.198	241.743	245.972	255.052
25	247.491	241.140	241.867	238.881	236.085	240.946	250.570
30	243.647	237.034	237.651	234.656	231.540	236.863	246.559
35	239.964	233.031	233.610	230.525	227.192	232.912	242.784
40	237.547	230.532	231.028	227.942	224.369	230.405	240.295
50	233.100	225.954	226.324	223.229	219.403	225.825	235.804
75	226.926	219.130	219.419	216.098	211.721	219.031	229.619
100	223.165	215.290	215.515	212.178	207.557	215.207	225.798

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	372.984	350.187	355.715	347.604	342.143	349.584	391.036
15	319.479	302.832	304.961	298.265	292.376	7699.717	325.573
20	294.489	280.156	281.584	274.916	269.029	279.521	298.576
25	282.173	267.693	269.051	262.110	256.697	267.417	285.864
30	270.602	257.575	258.538	252.484	247.061	257.270	273.701
35	262.933	250.433	251.211	245.250	239.855	250.087	265.835
40	257.342	245.333	246.063	240.447	235.053	245.246	260.162
50	248.252	237.071	237.555	232.457	227.223	236.943	250.916
75	236.638	226.022	226.358	221.504	216.235	225.887	239.381
100	230.301	220.361	220.556	216.097	210.828	220.219	232.978

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	274.220	272.709	274.038	269.736	271.920	270.028	285.518
15	263.298	258.761	259.813	257.345	257.282	257.937	270.307
20	254.971	249.334	250.236	248.062	246.728	249.053	260.397
25	250.438	244.081	244.908	242.460	240.462	243.834	255.045
30	246.297	239.677	240.342	237.793	235.343	239.500	250.338
35	242.249	235.551	236.110	233.419	230.643	235.335	246.085
40	239.707	232.717	233.286	230.498	227.416	232.645	243.212
50	234.845	227.815	228.181	225.418	221.989	227.661	238.184
75	228.191	220.490	220.759	217.694	213.565	220.452	231.232
100	224.198	216.429	216.598	213.430	209.001	216.344	227.072

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	276.412	273.973	274.938	269.239	276.728	269.105	300.444
15	265.181	257.940	258.784	256.467	259.430	256.551	279.499
20	256.743	248.209	249.011	247.077	248.132	247.697	267.005
25	252.067	242.991	243.794	241.612	241.270	242.840	260.077
30	247.545	238.753	239.419	237.230	236.165	238.536	254.420
35	243.470	234.621	235.254	232.882	231.201	234.304	249.454
40	240.701	231.935	232.568	230.104	228.049	231.851	246.062
50	235.696	227.160	227.648	225.069	222.269	227.080	240.414
75	228.838	220.028	220.387	217.497	213.833	220.040	232.589
100	224.606	216.086	216.293	213.277	209.180	216.007	228.100

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	401.5599	404.0163	417.6600	410.5905	417.6670	400.8710
15	370.0689	372.5353	380.4514	375.7281	382.7676	370.5888
20	348.8275	351.0368	356.3103	352.8195	360.0282	349.9984
25	335.3476	337.2217	341.1000	338.3619	345.7518	337.1241
30	323.8695	325.4719	328.3798	326.1882	333.6100	326.0422
35	314.3095	315.6537	317.9873	316.1673	323.6350	316.8370
40	307.1013	308.2185	310.1851	308.6367	316.0833	309.9563
50	294.8556	295.5968	297.1141	295.9466	303.3538	298.2103
75	276.7970	276.8853	278.1000	277.3806	285.1785	281.3275
100	265.7693	265.4434	266.6434	266.1401	273.8763	270.9360

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	269.0527	374.6782	274.0898	276.5233	282.5592
15	259.3445	320.1144	263.1465	265.1633	266.6419
20	251.7398	294.9771	254.9698	256.7874	256.7123
25	247.5780	282.7968	250.3664	251.8608	251.1581
30	243.8113	271.2374	246.1624	247.4644	246.5442
35	240.1032	263.3103	242.2031	243.5010	242.3802
40	237.6918	257.8349	239.6530	240.6731	239.5930
50	233.2379	248.4209	234.8379	235.7166	234.5125
75	227.0605	236.7968	228.2371	228.7406	227.7449
100	223.2398	230.3206	224.1611	224.5731	223.6111

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	282.068	276.230	274.549	274.256	273.096	285.250	283.358
15	266.285	259.548	259.015	256.913	254.173	417.007	267.875
20	256.170	249.002	248.769	246.148	242.592	249.273	257.965
25	250.721	242.872	242.771	239.683	235.885	243.036	252.643
30	246.091	238.207	238.145	235.083	230.944	238.322	248.092
35	241.892	233.899	233.859	230.655	226.308	233.982	243.964
40	239.140	231.162	231.136	227.926	223.426	231.227	241.263
50	234.257	226.297	226.282	223.063	218.389	226.338	236.446
75	227.579	219.191	219.186	215.826	210.765	219.212	229.939
100	223.584	215.266	215.266	211.903	206.724	215.278	225.984

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	84.06	84.02	86.24	84.87	86.26	79.76	79.49	82.12	80.28	82.50
15	83.86	83.78	85.88	84.55	86.46	80.04	79.76	82.00	80.61	83.45
20	83.90	83.74	85.31	84.30	86.69	80.22	79.90	81.94	80.73	84.14
25	85.21	84.79	86.51	85.60	88.38	81.76	81.13	83.27	82.20	85.78
30	85.58	85.07	86.95	85.98	89.25	82.32	81.47	83.64	82.59	87.35
35	85.35	84.55	86.24	85.54	89.15	82.06	81.09	83.43	82.46	87.13
40	84.42	83.72	85.37	84.65	88.89	81.58	80.51	82.73	81.80	86.81
50	84.73	83.56	85.49	84.91	89.52	81.49	80.20	82.59	81.68	87.64
75	84.75	82.61	85.37	84.85	91.07	81.78	79.33	82.48	81.94	89.37
100	83.88	81.05	84.34	83.90	91.13	80.75	77.78	81.47	80.85	89.37

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	83.33	79.61	N/A	N/A	98.26	97.21
15	85.19	76.23	N/A	N/A	99.17	98.75
20	85.88	74.51	N/A	N/A	99.45	99.31
25	87.98	73.84	N/A	N/A	99.64	99.60
30	89.11	72.85	N/A	N/A	99.88	99.78
35	89.39	71.31	N/A	N/A	99.82	99.72
40	89.41	70.06	N/A	N/A	99.90	99.82
50	90.18	67.82	N/A	N/A	99.70	99.66
75	92.30	62.69	N/A	N/A	99.90	99.86
100	92.48	58.87	N/A	N/A	99.72	99.66

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	83.25	83.15	85.60	84.14	84.20	83.90
15	83.70	83.66	85.64	84.41	85.19	83.56
20	83.92	83.74	85.47	84.44	85.52	83.19
25	85.43	85.24	86.63	85.74	87.43	84.28
30	86.02	85.64	87.27	86.42	88.42	83.90
35	85.68	84.99	86.77	86.00	88.24	83.21
40	84.95	84.36	85.90	85.23	87.80	82.20
50	85.43	84.51	86.28	85.52	88.77	81.13
75	85.70	83.76	86.32	85.80	90.20	79.01
100	84.59	82.44	85.21	84.63	90.38	76.04

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	98.36	0.00%	86.06	0.00%	93.33
15	0.00%	99.13	0.00%	85.33	0.00%	93.07
20	0.00%	99.43	0.00%	84.32	0.00%	93.29
25	0.00%	99.68	0.00%	85.50	0.00%	94.69
30	0.00%	99.78	0.00%	85.29	0.00%	94.38
35	0.00%	99.92	0.00%	85.07	0.00%	94.51
40	0.00%	99.92	0.00%	84.30	0.00%	94.48
50	0.00%	100.00	0.00%	83.64	0.00%	94.22
75	0.00%	100.00	0.00%	82.63	0.00%	94.97
100	0.00%	100.00	0.00%	81.90	0.00%	94.51

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.77	80.65	81.25	80.22	79.86	80.69	80.53	82.99
15	82.71	81.34	82.06	80.71	79.96	81.27	82.67	84.61
20	84.00	81.90	82.18	81.29	79.84	81.90	83.88	85.47
25	86.02	83.33	83.70	82.38	80.63	83.35	85.96	87.76
30	87.29	83.88	84.30	82.79	80.28	83.94	87.47	89.13
35	87.47	83.74	84.22	82.50	79.29	83.66	87.50	89.15
40	86.99	83.23	83.54	81.56	78.26	83.05	87.17	89.09
50	88.06	83.31	83.47	81.11	76.53	83.17	88.06	90.06
75	89.78	82.95	83.25	79.58	73.19	82.97	89.88	92.18
100	89.98	82.22	82.46	77.98	69.68	81.92	90.08	92.36

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.79	85.98	86.63	86.99	85.45	86.57	88.08	90.00
15	89.82	87.60	87.70	87.37	85.35	87.88	89.45	90.85
20	89.84	87.94	87.88	86.81	84.99	87.64	89.88	91.27
25	91.25	88.67	88.77	87.47	85.21	88.55	91.23	92.65
30	92.16	89.41	89.58	88.12	84.67	89.60	92.20	93.35
35	92.08	89.07	89.21	87.23	83.72	88.87	92.73	93.78
40	91.84	87.88	88.30	86.30	82.16	87.96	92.20	93.37
50	92.46	87.84	88.36	86.02	80.89	88.02	92.77	93.74
75	93.70	87.68	88.12	84.16	77.60	87.68	94.00	95.27
100	92.91	86.50	86.83	82.32	73.96	86.71	93.23	94.67

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.58	82.55	82.97	80.79	82.32	80.75	81.17	85.39
15	83.80	82.55	83.07	81.94	82.14	81.96	83.60	86.73
20	84.71	82.71	83.25	82.00	81.82	82.44	84.51	87.05
25	86.75	84.38	84.77	83.70	82.71	84.24	86.59	89.31
30	88.22	84.61	85.23	83.92	82.46	84.79	87.94	90.32
35	88.18	84.67	84.93	83.56	81.45	84.69	88.14	90.42
40	87.72	84.10	84.48	82.83	80.12	83.94	87.76	90.26
50	88.51	84.02	84.67	82.71	78.63	83.98	88.69	90.87
75	90.48	84.34	84.57	81.37	76.00	84.08	90.42	92.95
100	90.50	83.35	83.58	79.50	71.86	83.23	90.50	93.03

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.86	82.87	83.35	80.14	83.82	80.24	82.00	88.40
15	84.24	82.12	82.02	81.45	83.68	81.19	83.92	88.75
20	84.75	81.76	82.55	81.66	83.19	81.78	85.07	88.97
25	86.93	83.62	83.76	82.97	83.82	83.41	86.83	90.50
30	88.42	84.06	84.73	83.50	82.99	83.58	88.30	91.49
35	88.12	83.68	84.22	82.85	82.14	83.45	88.38	91.37
40	88.08	83.47	83.92	82.44	81.01	83.05	87.80	91.09
50	88.77	83.54	84.08	82.10	79.47	83.11	88.87	91.60
75	90.51	83.47	83.70	80.85	76.04	83.74	90.51	93.64
100	90.87	82.73	82.95	79.15	72.20	82.65	90.50	93.33

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	97.37	97.41	98.10	97.88	97.88	97.15
15	98.36	98.44	98.75	98.61	98.61	98.26
20	98.95	98.97	99.15	99.03	99.05	98.95
25	99.39	99.41	99.54	99.49	99.50	99.39
30	99.56	99.60	99.62	99.60	99.60	99.60
35	99.52	99.56	99.68	99.60	99.60	99.56
40	99.60	99.60	99.62	99.60	99.68	99.60
50	99.64	99.66	99.68	99.66	99.70	99.68
75	99.86	99.86	99.86	99.86	99.92	99.92
100	99.90	99.90	99.90	99.90	99.94	99.94

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 56.7602540
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.20	83.50	82.48	83.38	83.01	84.40	84.36	84.97
15	85.19	83.32	82.99	82.27	81.13	83.66	85.33	86.00
20	85.52	83.23	82.99	82.26	80.42	83.39	86.48	86.53
25	87.43	84.55	84.42	83.05	80.30	84.71	88.24	88.46
30	88.42	84.65	84.55	82.93	79.21	84.73	89.03	89.58
35	88.24	84.32	84.24	82.53	78.77	84.36	89.35	89.58
40	87.80	83.62	83.47	81.74	77.37	83.76	89.29	89.58
50	88.77	83.70	83.54	80.91	75.35	83.80	89.78	90.26
75	90.20	83.07	83.03	79.35	71.70	83.09	90.99	92.32
100	90.38	82.14	82.18	77.60	68.14	82.16	90.48	92.46

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Detection Limit: 56.7602540
Averaged Percentage Non-detects: 10.00%
Distribution Check: Average of means: 196.537905
Distribution Check: Average of stdvs: 167.023642
Average of NDs per 100 observations: 9.973400

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	56.760254	0.998020	1767	1960	961	298	56	8	0	0	0	0
15	56.760254	1.480990	1059	1740	1350	646	188	55	10	2	0	0
20	56.760254	2.009901	604	1353	1438	983	453	164	48	5	1	1
25	56.760254	2.495842	356	1048	1300	1117	751	318	118	34	7	1
30	56.760254	2.970099	236	745	1174	1158	841	487	269	108	27	3
35	56.760254	3.495842	149	471	883	1191	1002	698	394	162	62	30
40	56.760254	3.979604	65	343	757	1016	1032	799	537	289	125	56
50	56.760254	4.967327	21	145	428	668	984	898	775	513	328	177
75	56.760254	7.576040	1	14	57	156	324	556	725	767	716	601
100	56.760254	9.997030	0	2	9	34	74	164	286	436	598	632

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	2	0	0	0	0	0	0	0	0	0	0	0	0
35	6	2	0	0	0	0	0	0	0	0	0	0	0
40	23	6	2	0	0	0	0	0	0	0	0	0	0
50	74	24	6	6	3	0	0	0	0	0	0	0	0
75	457	296	193	97	51	18	15	4	2	0	0	0	0
100	713	621	505	383	262	140	90	57	21	14	6	3	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	1	0	1	0	0	1	0	1	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	0	0	0	0	0	0	0	8
15	1	0	1	1	0	0	0	2
20	0	0	0	0	0	0	0	0
25	0	1	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	0	0	0	0	0	0
15	1	0	1	1	0	0
20	0	0	0	0	0	0
25	0	1	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	7	0	7	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 3b. Ln(5,0.75) 15% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	279.2016	268.2729	N/A	N/A	1125.9018	812.3520
15	264.8966	239.7646	N/A	N/A	688.7758	585.6163
20	258.6124	228.7293	N/A	N/A	526.9049	485.3933
25	251.5524	220.3206	N/A	N/A	454.2553	427.6671
30	248.6214	216.1775	N/A	N/A	410.4455	392.5727
35	243.9496	211.2035	N/A	N/A	380.6086	368.1321
40	241.8225	208.3906	N/A	N/A	359.0686	350.5306
50	237.6576	204.2631	N/A	N/A	331.1332	325.6858
75	230.4126	197.5508	N/A	N/A	292.9030	290.4199
100	226.5401	193.8411	N/A	N/A	275.0353	273.5503

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	280.3801	280.2890	292.0251	284.1970	296.0441
15	259.1555	258.6202	265.9892	261.1679	272.9727
20	250.1466	249.1466	254.7415	251.3837	263.0638
25	241.5579	240.2157	244.9704	242.3834	254.2030
30	237.7903	236.1714	240.4314	238.3842	250.0116
35	232.2704	230.4373	234.4378	232.7058	244.6130
40	229.6621	227.6427	231.4719	229.9976	241.9337
50	224.8230	222.5144	226.1667	225.0337	237.0557
75	216.6792	213.9602	217.4671	216.7596	228.7436
100	212.1525	209.1532	212.7016	212.1857	224.3871

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	261.7410	260.8472	271.2619	263.6888	276.3903
15	246.5962	245.4153	252.4634	247.8294	260.1241
20	240.4678	238.9287	244.5098	241.2747	253.2837
25	233.4282	231.6116	236.4718	233.9711	246.0498
30	230.8217	228.7887	233.2027	231.2190	243.0499
35	225.9481	223.7374	227.9151	226.2332	238.3156
40	223.9368	221.5745	225.5893	224.1551	236.2417
50	219.9387	217.3350	221.1768	220.0716	232.2115
75	212.9862	210.0486	213.7223	213.0290	225.0879
100	209.0610	205.8813	209.5782	209.0713	221.3281

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	277.9302	277.9573	289.3760	281.7615	283.6808	279.3500
15	258.4609	258.0914	265.3583	260.6283	264.8940	257.1749
20	250.2087	249.4316	254.9135	251.5873	257.0037	247.2522
25	241.8356	240.7148	245.3431	242.7723	249.0454	237.6205
30	238.3093	236.9169	241.0353	238.9954	245.6765	233.3605
35	232.7757	231.1631	235.0122	233.2856	240.5380	227.0425
40	230.2549	228.4544	232.1247	230.6534	238.2179	224.0352
50	225.4674	223.3683	226.8569	225.7247	233.7998	218.4131
75	217.3202	214.7864	218.1346	217.4268	226.1896	209.2334
100	212.7530	209.9218	213.3200	212.8036	222.1255	203.8958

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1607.2860	0.02%	305.7684	0.00%	411.9652
15	0.00%	798.5639	0.00%	264.5924	0.00%	324.1299
20	0.00%	612.8280	0.00%	250.7239	0.00%	295.9141
25	0.00%	527.1534	0.00%	240.0670	0.00%	278.1987
30	0.00%	476.0582	0.00%	235.1976	0.00%	268.0636
35	0.00%	447.9127	0.00%	229.3936	0.00%	259.8574
40	0.00%	425.6520	0.00%	226.6583	0.00%	254.7427
50	0.00%	393.4954	0.00%	221.9095	0.00%	246.6123
75	0.00%	353.1254	0.00%	214.5662	0.00%	234.5475
100	0.00%	334.2273	0.00%	210.8862	0.00%	228.6179

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	270.176	1336.999	297.881	262.938	261.097	264.488	278.868
15	257.937	495.836	252.323	248.366	245.399	250.488	264.087
20	252.498	244.267	245.280	241.507	237.946	243.943	257.872
25	245.851	236.654	237.500	233.712	229.620	236.379	250.930
30	243.256	233.553	234.267	230.424	226.064	233.309	248.110
35	238.592	228.397	229.049	225.104	220.399	228.183	243.467
40	236.611	226.104	226.695	222.656	217.698	225.890	241.418
50	232.650	221.642	222.136	218.055	212.630	221.473	237.377
75	225.558	214.087	214.407	210.207	204.264	213.920	230.211
100	221.716	209.841	210.121	205.832	199.423	209.729	226.396

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	371.611	340.537	346.591	337.384	325.472	339.096	400.469
15	316.014	290.082	292.589	284.543	274.037	289.392	327.161
20	294.546	272.498	274.073	265.727	256.553	271.835	302.284
25	277.701	257.298	258.397	250.615	242.034	256.687	284.395
30	269.763	250.434	251.331	243.725	235.839	250.000	275.839
35	260.403	241.916	242.599	235.540	227.714	241.510	265.984
40	255.547	237.686	238.353	231.370	223.821	237.344	260.964
50	247.411	230.408	230.949	224.481	216.971	230.205	252.429
75	235.207	219.561	219.927	213.971	206.752	219.368	240.072
100	228.800	213.707	214.000	208.396	201.050	213.574	233.642

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	275.688	274.717	276.437	269.390	273.076	269.659	290.016
15	261.893	255.612	257.116	252.976	253.157	253.719	271.499
20	255.756	247.513	248.655	245.279	243.714	246.676	263.678
25	248.624	239.414	240.345	236.988	234.286	238.944	255.450
30	245.831	236.068	236.855	233.380	230.025	235.641	252.084
35	240.792	230.512	231.369	227.718	223.777	230.271	246.963
40	238.717	228.132	228.792	225.093	220.739	227.878	244.518
50	234.344	223.398	223.987	220.107	215.085	223.236	239.855
75	226.793	215.385	215.734	211.736	206.025	215.225	231.923
100	222.725	210.881	211.168	206.946	200.806	210.770	227.700

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	278.495	276.670	277.915	268.931	284.198	269.243	306.607
15	263.802	254.953	256.269	252.122	259.283	251.619	281.732
20	257.510	245.662	246.893	244.495	247.436	244.472	270.826
25	250.179	237.768	238.665	236.592	237.440	237.110	261.065
30	247.072	234.587	235.339	232.985	232.378	234.074	256.449
35	241.925	229.283	229.971	227.401	225.825	228.781	250.709
40	239.773	226.874	227.535	224.827	222.459	226.632	247.706
50	235.298	222.519	223.154	220.049	216.475	222.296	242.358
75	227.447	214.821	215.241	211.791	206.994	214.632	233.458
100	223.070	210.449	210.760	207.111	201.610	210.306	228.838

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	406.5240	409.7726	428.7687	418.3781	429.0424	404.4858
15	370.2517	373.3205	383.9968	377.2335	388.1569	370.0063
20	351.1400	353.9083	360.5326	355.7798	366.7141	352.2187
25	333.6914	336.0241	340.6592	337.0167	348.1785	335.8363
30	323.8192	325.7497	329.2147	326.3394	337.3898	326.8141
35	312.5927	314.1879	316.9786	314.5743	325.9361	316.3702
40	305.8690	307.1627	309.5125	307.4791	318.9085	310.2886
50	293.9917	294.7891	296.6620	295.1210	306.6943	299.4729
75	274.0116	273.9485	275.5282	274.5942	286.2185	281.2730
100	262.4566	261.8408	263.4844	262.8190	274.7054	270.9798

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	270.1250	376.0152	275.4874	278.3350	284.3669
15	257.8647	317.6383	261.5492	263.8829	266.0587
20	252.5472	295.8522	255.5065	257.3347	258.0612
25	246.0030	279.2513	248.4526	249.9146	250.3990
30	243.4176	271.3017	245.5090	246.7922	246.7262
35	238.8232	261.8665	240.6704	241.7780	241.5272
40	236.8707	256.9450	238.5223	239.4625	239.3520
50	232.9529	248.6033	234.2605	235.0036	234.9118
75	225.8563	236.0895	226.7495	227.1212	227.1921
100	221.9607	229.4201	222.6708	222.9729	222.9471

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	283.681	275.055	271.469	272.789	272.243	1619.339	286.134
15	264.894	255.122	253.578	251.668	248.569	256.370	267.932
20	257.004	246.461	245.678	242.651	238.297	247.015	260.322
25	249.045	237.887	237.380	234.068	229.030	238.276	252.614
30	245.676	234.238	233.914	230.279	224.847	234.496	249.341
35	240.538	228.776	228.523	224.774	218.935	228.977	244.414
40	238.218	226.291	226.102	222.223	216.152	226.445	242.150
50	233.800	221.663	221.543	217.544	211.073	221.765	237.816
75	226.190	213.898	213.844	209.705	202.926	213.947	230.416
100	222.126	209.649	209.617	205.410	198.286	209.680	226.495

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	85.08	84.93	88.02	85.96	87.13	78.84	78.40	82.21	79.21	82.42
15	84.30	84.22	86.63	85.03	87.47	78.24	77.72	81.09	78.69	83.15
20	84.77	84.44	86.65	85.37	88.10	78.95	78.10	81.47	79.21	84.44
25	84.18	83.70	85.92	84.61	88.71	78.83	77.98	80.69	79.11	85.13
30	84.97	84.04	86.48	85.25	89.56	80.44	79.29	82.06	80.65	86.57
35	83.74	82.69	85.13	84.06	89.43	78.97	77.39	80.34	79.11	86.00
40	82.59	81.25	84.26	82.73	88.77	77.72	75.76	79.03	77.98	86.06
50	82.53	80.95	83.84	82.67	90.59	77.84	75.64	78.87	77.96	87.68
75	79.41	76.34	80.34	79.45	89.82	74.50	70.48	75.49	74.53	87.13
100	77.25	72.65	78.40	77.23	91.19	71.74	66.12	72.75	71.74	88.69

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	84.14	78.95	N/A	N/A	99.17	98.81
15	85.96	74.03	N/A	N/A	99.76	99.68
20	87.80	71.43	N/A	N/A	99.92	99.84
25	88.93	68.65	N/A	N/A	99.98	99.96
30	90.16	67.15	N/A	N/A	99.94	99.90
35	90.26	64.42	N/A	N/A	99.84	99.82
40	90.02	60.95	N/A	N/A	99.92	99.88
50	91.76	58.10	N/A	N/A	99.92	99.92
75	92.14	48.77	N/A	N/A	99.78	99.76
100	93.54	42.06	N/A	N/A	99.82	99.80

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	83.34	83.25	86.69	84.53	84.67	83.86
15	83.22	83.08	86.08	83.86	85.25	82.61
20	84.12	83.78	86.12	84.71	86.53	82.55
25	83.68	83.29	85.47	84.06	86.71	80.93
30	84.32	83.84	86.16	84.81	88.12	81.49
35	83.47	82.59	84.77	83.58	87.39	79.09
40	82.26	81.13	83.92	82.61	87.11	77.13
50	82.61	81.17	83.86	82.89	88.59	76.00
75	79.54	76.81	80.63	79.64	88.06	68.38
100	77.86	73.60	78.81	77.92	89.33	61.78

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.23	0.02%	83.40	0.00%	93.03
15	0.00%	99.78	0.00%	82.44	0.00%	93.72
20	0.00%	99.88	0.00%	82.59	0.00%	94.42
25	0.00%	100.00	0.00%	82.20	0.00%	93.92
30	0.00%	100.00	0.00%	82.95	0.00%	94.57
35	0.00%	100.00	0.00%	81.72	0.00%	94.14
40	0.00%	100.00	0.00%	80.61	0.00%	94.20
50	0.00%	100.00	0.00%	80.59	0.00%	94.81
75	0.00%	100.00	0.00%	78.06	0.00%	94.36
100	0.00%	100.00	0.00%	77.09	0.00%	95.03

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.07	81.16	81.29	80.23	79.68	80.20	80.83	84.22
15	82.93	81.41	81.64	79.96	78.75	80.73	82.48	85.80
20	84.87	81.62	82.12	80.42	78.24	81.43	84.48	87.64
25	85.43	81.45	82.06	79.56	76.97	81.25	85.19	88.67
30	87.03	82.44	82.71	80.75	77.23	82.12	86.93	90.04
35	86.63	80.99	81.37	78.57	74.50	80.87	86.46	90.06
40	86.44	79.94	80.22	77.35	72.00	79.68	86.55	89.78
50	88.04	79.80	80.42	76.73	69.88	79.76	88.18	91.72
75	87.52	76.06	76.50	70.91	60.95	75.84	87.84	92.18
100	88.97	73.23	73.96	66.08	52.89	73.29	89.39	93.47

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.18	84.07	84.49	85.66	82.53	84.93	87.13	91.05
15	89.84	85.86	85.70	85.56	81.47	85.90	88.83	91.98
20	90.85	87.01	87.17	85.72	81.64	87.07	89.74	92.95
25	91.31	86.73	86.65	85.25	79.70	86.40	90.67	93.52
30	91.94	87.01	86.97	84.93	79.82	86.77	91.37	94.20
35	91.60	85.82	85.80	82.93	76.99	85.23	91.49	93.82
40	91.39	84.71	84.99	81.64	74.61	84.42	91.39	94.00
50	92.57	84.36	84.85	81.01	72.73	84.26	93.09	95.19
75	91.58	80.77	80.87	74.73	63.68	80.42	92.61	94.89
100	92.40	78.34	79.23	69.68	55.84	78.28	93.78	95.94

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.74	83.52	84.10	80.87	82.75	80.59	81.60	86.95
15	83.74	82.51	83.21	80.73	81.84	81.15	83.52	87.96
20	85.58	82.67	83.19	81.41	80.99	81.98	85.25	88.99
25	85.98	82.16	82.65	80.87	79.39	82.04	85.84	90.04
30	87.47	83.23	83.62	81.90	79.80	82.83	87.21	91.11
35	87.35	81.80	82.32	80.22	77.03	81.68	87.03	91.19
40	87.13	80.81	81.23	78.44	74.42	80.32	86.83	90.89
50	88.73	80.89	80.85	78.34	72.46	80.79	88.65	92.65
75	88.06	77.54	77.62	72.79	63.98	77.37	87.88	92.93
100	89.72	74.91	75.41	67.82	55.74	74.51	89.39	94.20

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.57	83.80	84.38	80.42	85.76	80.53	82.18	89.76
15	84.12	82.40	82.71	80.77	84.91	79.90	83.90	90.12
20	85.90	81.80	82.46	81.23	83.70	80.65	86.24	90.89
25	86.48	80.77	81.70	80.73	82.02	80.50	86.22	91.66
30	87.82	82.51	82.75	81.35	82.18	81.66	87.84	92.67
35	87.94	81.03	80.87	79.78	79.60	80.18	87.21	92.34
40	87.52	79.47	80.73	78.53	77.05	79.47	86.99	91.92
50	88.85	79.60	80.75	78.02	74.97	79.78	88.83	93.64
75	88.40	76.53	76.93	72.77	65.50	76.28	87.86	93.58
100	89.56	74.12	74.73	68.51	57.66	74.00	89.33	94.85

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	97.52	97.47	98.28	98.00	98.02	97.19
15	98.49	98.59	99.05	98.87	98.89	98.30
20	99.09	99.13	99.43	99.23	99.25	99.09
25	99.37	99.37	99.49	99.37	99.43	99.39
30	99.45	99.50	99.54	99.50	99.56	99.54
35	99.45	99.49	99.52	99.50	99.54	99.50
40	99.60	99.62	99.66	99.62	99.66	99.68
50	99.78	99.78	99.80	99.78	99.80	99.80
75	99.68	99.68	99.76	99.68	99.78	99.86
100	99.76	99.74	99.78	99.76	99.86	99.92

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 68.2157147
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.67	83.45	81.49	83.27	83.13	85.21	84.73	85.90
15	85.25	82.65	81.47	81.42	80.16	83.41	85.76	86.75
20	86.53	82.99	82.26	81.27	78.65	83.47	87.03	88.14
25	86.71	82.32	81.78	80.10	76.50	82.65	88.16	89.19
30	88.12	82.83	82.32	80.38	75.90	83.07	88.97	90.16
35	87.39	81.29	80.95	78.44	72.99	81.60	88.55	90.32
40	87.11	80.16	79.78	76.77	70.26	80.46	89.13	90.08
50	88.59	80.04	79.82	76.00	67.68	80.26	90.24	91.80
75	88.06	75.82	75.72	70.24	58.67	75.90	90.08	92.10
100	89.33	72.97	72.87	65.37	50.51	73.03	90.87	93.50

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Detection Limit: 68.2157147
Averaged Percentage Non-detects: 15.00%
Distribution Check: Average of means: 196.634694
Distribution Check: Average of stdvs: 167.077704
Average of NDs per 100 observations: 15.016000

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	68.215715	1.470297	1010	1782	1386	665	159	48	0	0	0	0
15	68.215715	2.279604	406	1155	1426	1160	597	225	60	17	3	1
20	68.215715	2.989109	190	685	1202	1216	911	508	221	92	21	4
25	68.215715	3.768317	76	381	827	1081	1054	804	482	212	84	31
30	68.215715	4.446931	36	215	548	854	1093	911	657	403	183	98
35	68.215715	5.324158	12	97	307	568	857	975	852	626	397	195
40	68.215715	6.040792	7	49	183	413	657	845	855	756	575	369
50	68.215715	7.507723	1	18	61	145	327	531	734	789	735	662
75	68.215715	11.223366	0	0	7	10	33	80	144	277	450	505
100	68.215715	15.011683	0	0	0	1	2	5	15	31	63	143

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	7
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	12	3	3	0	0	0	0	0	0	0	0	0	0
30	31	16	3	2	0	0	0	0	0	0	0	0	0
35	97	43	15	6	2	1	0	0	0	0	0	0	0
40	182	98	40	17	3	1	0	0	0	0	0	0	0
50	449	278	189	72	35	18	4	1	1	0	0	0	0
75	598	670	621	509	400	301	205	108	62	32	25	13	0
100	256	301	448	497	530	563	564	451	351	284	208	337	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	2	0	2	0	0	2	0	2	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	2	0	2	0	0	0	0	48
15	1	2	0	1	0	0	0	21
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	3
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	2	0	2	0	0	0
15	1	2	0	1	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	2	0	2	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	2	0	2	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	1	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	24	0	24	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 3c. Ln(5,0.75) 20% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	282.8413	278.9195	N/A	N/A	1354.4485	947.1066
15	266.4612	236.3456	N/A	N/A	776.2424	648.4767
20	259.0741	224.2077	N/A	N/A	571.8379	522.3390
25	254.3507	215.1245	N/A	N/A	491.6156	459.7765
30	249.4742	209.5856	N/A	N/A	438.5386	417.2064
35	246.2026	205.9567	N/A	N/A	403.2125	388.5959
40	244.4409	203.5165	N/A	N/A	379.6489	369.6268
50	239.4223	198.7795	N/A	N/A	344.5596	338.3202
75	232.7028	191.6303	N/A	N/A	303.3569	300.4825
100	228.7148	188.2197	N/A	N/A	281.7250	280.0442

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	284.3416	283.7680	300.2668	376.3594	305.4205
15	258.7754	258.0468	267.5570	260.8314	276.8401
20	247.9422	246.7523	253.6913	249.1599	264.5409
25	240.8121	239.1409	245.1206	241.5815	257.6294
30	234.6696	232.7027	238.0138	235.1803	251.2564
35	230.3660	228.1256	233.0903	230.7202	246.9912
40	227.8545	225.3714	230.1300	228.1129	244.4541
50	222.0145	219.2246	223.6893	222.1538	238.2752
75	213.2805	209.8652	214.2932	213.3001	230.3115
100	208.5304	204.8078	209.2319	208.5150	225.5809

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	258.8865	256.9755	271.6792	347.0159	278.3881
15	241.9995	240.3670	249.4260	242.9007	259.7389
20	235.1307	233.2124	240.1204	235.7440	251.6489
25	229.8078	227.4696	233.6014	230.1758	246.6447
30	225.1168	222.5580	228.0925	225.3445	241.7614
35	221.7923	219.0131	224.2356	221.9331	238.4937
40	220.0607	217.0837	222.1153	220.1531	236.7399
50	215.4205	212.2127	216.9478	215.4504	231.7596
75	208.1037	204.3577	209.0407	208.0682	225.2069
100	204.2322	200.2388	204.8872	204.1835	221.3414

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	277.7794	276.9982	292.9465	281.4602	284.9332	278.0982
15	255.6983	255.0741	264.2955	257.7694	264.0715	253.0024
20	246.2322	245.1999	251.9679	247.5207	255.1423	241.7419
25	239.5985	238.0928	243.9153	240.4320	249.4525	233.5026
30	233.7840	232.0030	237.1449	234.3502	244.0782	226.6003
35	229.6696	227.5943	232.4120	230.0711	240.4381	221.7259
40	227.3626	225.0525	229.6587	227.6639	238.4534	218.7598
50	221.7372	219.1166	223.4308	221.9096	233.1615	212.3972
75	213.1469	209.8845	214.1712	213.1854	225.9294	202.1544
100	208.4853	204.9036	209.1953	208.4828	221.7662	196.7361

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	2053.3560	0.04%	291.6494	0.00%	429.0019
15	0.00%	926.4144	0.00%	255.8284	0.00%	324.4288
20	0.00%	695.8020	0.00%	243.3343	0.00%	294.9235
25	0.00%	596.1599	0.00%	235.6993	0.00%	279.4047
30	0.00%	531.9306	0.00%	229.9876	0.00%	268.1046
35	0.00%	494.6761	0.00%	226.3094	0.00%	260.5725
40	0.00%	470.1708	0.00%	224.3137	0.00%	256.1017
50	0.00%	428.2035	0.00%	219.4328	0.00%	246.6420
75	0.00%	382.5030	0.00%	213.0469	0.00%	235.2236
100	0.00%	358.9966	0.00%	209.9197	0.00%	229.2067

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	270.765	767.371	777.710	259.816	257.367	476.846	282.953
15	257.050	308.120	295.592	244.298	240.102	246.788	265.879
20	250.636	240.395	241.464	236.681	231.991	239.554	258.412
25	246.233	234.086	235.018	230.243	225.010	233.573	253.780
30	241.599	228.731	229.567	224.908	219.151	228.374	248.979
35	238.466	224.924	225.632	220.991	214.982	224.625	245.780
40	236.851	222.777	223.443	218.759	212.406	222.527	244.079
50	231.998	217.562	218.105	213.358	206.763	217.315	239.109
75	225.282	209.424	209.831	204.859	197.292	209.247	232.523
100	221.362	205.146	205.473	200.471	192.433	205.003	228.575

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	372.863	327.082	335.357	320.456	303.583	466961.404	423.840
15	314.260	278.379	280.991	272.023	257.246	279.079	332.134
20	291.396	262.000	263.324	254.159	241.862	261.020	303.161
25	279.180	250.937	251.953	242.753	231.571	250.048	289.357
30	267.323	241.719	242.505	234.126	223.482	240.931	276.448
35	260.209	235.305	236.016	228.097	217.890	234.766	268.932
40	255.525	231.716	232.374	224.642	214.790	231.265	263.839
50	246.807	224.356	224.854	217.586	208.291	223.911	254.672
75	235.012	213.378	213.858	207.015	197.672	213.182	242.668
100	228.495	207.933	208.249	201.848	192.495	207.739	235.971

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	277.085	277.504	280.128	268.097	274.234	268.968	295.575
15	260.900	254.145	256.071	249.337	250.085	250.096	273.853
20	253.879	243.512	245.093	240.394	238.776	241.919	264.465
25	249.146	236.480	237.866	233.411	230.303	235.697	258.759
30	244.109	230.798	231.938	227.670	223.335	230.297	253.123
35	240.734	226.796	227.739	223.418	218.437	226.380	249.358
40	238.986	224.493	225.327	220.868	215.374	224.151	247.303
50	233.767	219.070	219.714	215.092	208.973	218.690	241.765
75	226.590	210.580	211.018	206.113	198.761	210.330	234.347
100	222.346	206.051	206.391	201.405	193.525	205.836	230.002

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	280.881	282.951	282.863	270.598	293.164	272.465	313.995
15	262.897	255.409	256.356	250.219	262.191	249.028	284.992
20	255.491	242.333	243.478	240.542	247.142	239.893	272.182
25	250.532	235.071	236.159	234.064	237.166	234.116	264.927
30	245.321	229.422	230.491	228.143	229.135	228.865	258.038
35	241.847	225.753	226.582	224.107	223.460	225.159	253.511
40	239.944	223.381	224.232	221.569	219.497	223.016	250.777
50	234.573	218.243	218.914	215.770	212.346	217.882	244.493
75	227.144	210.207	210.636	206.831	201.398	209.999	236.112
100	222.787	205.833	206.166	202.079	195.621	205.722	231.282

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	412.0754	415.1490	440.8220	425.8749	441.4742	408.0468
15	371.1549	374.7424	387.7699	378.9490	393.6448	370.3110
20	349.7269	352.7946	360.8193	354.7450	369.0389	350.8782
25	335.4552	338.0598	343.7415	339.0255	354.0794	338.4565
30	322.2390	324.3502	328.6389	324.8881	340.0650	326.6117
35	312.5272	314.2311	317.7038	314.5902	330.0250	318.1139
40	306.0482	307.4132	310.3554	307.7180	323.2801	312.6084
50	292.4960	293.2557	295.6268	293.6427	309.0830	300.5444
75	272.3852	272.1056	274.2111	272.9640	289.3942	283.4548
100	260.1815	259.2434	261.4138	260.5302	277.0945	272.9079

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	270.5136	382.8458	276.7171	281.1430	285.3873
15	256.9371	317.3959	260.5444	262.9725	265.5078
20	250.5172	293.6380	253.2830	255.3866	256.6664
25	246.2346	281.4953	248.5665	250.2503	251.0614
30	241.7677	269.6953	243.6523	245.0440	246.3955
35	238.7071	262.7736	240.2594	241.5081	243.4337
40	237.1489	258.0860	238.5098	239.5874	241.5097
50	232.3822	249.1517	233.3650	234.1795	237.2361
75	225.8140	237.1193	226.3541	226.6470	229.2077
100	221.8675	230.1731	222.2248	222.4206	224.4205

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	284.933	272.404	265.815	270.858	272.718	6223.354	289.111
15	264.071	251.637	248.611	247.761	245.081	266.096	268.961
20	255.142	241.827	240.234	237.550	233.052	242.936	260.362
25	249.452	234.729	233.664	230.211	224.745	235.447	255.055
30	244.078	229.093	228.339	224.611	218.257	229.604	249.890
35	240.438	225.005	224.430	220.517	213.738	225.394	246.404
40	238.453	222.669	222.235	218.060	210.804	222.966	244.558
50	233.162	217.272	216.991	212.661	205.018	217.469	239.409
75	225.929	209.050	208.905	204.283	195.724	209.153	232.572
100	221.766	204.825	204.737	200.015	191.061	204.889	228.571

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	86.25	85.88	90.12	87.21	88.26	77.09	76.24	82.52	76.95	81.86
15	84.69	84.46	88.02	85.37	88.06	75.92	75.27	80.29	76.34	83.13
20	84.44	84.18	86.87	84.95	88.18	76.65	75.92	79.96	76.87	83.84
25	84.14	83.54	86.55	84.34	89.41	76.24	74.81	79.05	76.36	85.09
30	82.16	81.21	84.57	82.36	88.97	74.85	73.15	77.37	74.95	84.53
35	81.19	80.08	83.50	81.52	89.05	74.14	71.50	76.44	74.14	84.77
40	81.60	79.76	83.76	81.76	90.04	73.25	70.71	75.49	73.27	85.78
50	79.09	76.63	80.57	79.13	89.60	71.94	68.65	73.68	71.90	85.62
75	74.95	70.75	76.36	74.93	90.22	67.47	62.00	68.93	67.45	86.85
100	71.80	65.21	73.03	71.72	91.23	63.56	55.94	65.09	63.47	87.84

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	85.29	79.22	N/A	N/A	99.78	99.60
15	87.33	72.18	N/A	N/A	99.92	99.82
20	88.36	68.01	N/A	N/A	100.00	99.96
25	90.46	65.08	N/A	N/A	100.00	99.98
30	90.55	60.37	N/A	N/A	99.94	99.84
35	91.23	57.01	N/A	N/A	99.98	99.96
40	92.20	55.54	N/A	N/A	100.00	99.98
50	92.57	50.34	N/A	N/A	99.86	99.86
75	93.56	39.09	N/A	N/A	99.92	99.90
100	94.77	31.33	N/A	N/A	99.92	99.92

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	83.55	82.99	87.98	84.16	84.59	83.66
15	82.52	82.31	85.92	82.98	85.21	81.47
20	82.71	82.36	85.35	83.13	85.98	80.38
25	82.63	81.92	84.93	83.03	87.15	78.69
30	80.95	80.00	83.21	81.17	86.65	75.66
35	80.00	78.75	82.22	80.40	86.91	73.60
40	80.42	78.57	82.46	80.63	87.74	71.84
50	78.14	75.82	79.64	78.16	87.11	68.36
75	74.32	70.18	75.64	74.30	87.58	58.00
100	71.07	64.95	72.51	71.05	88.28	48.53

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.74	0.04%	81.16	0.00%	93.78
15	0.00%	99.92	0.00%	80.06	0.00%	93.92
20	0.00%	100.00	0.00%	80.53	0.00%	93.54
25	0.00%	99.98	0.00%	80.53	0.00%	94.48
30	0.00%	100.00	0.00%	79.01	0.00%	94.16
35	0.00%	100.00	0.00%	78.95	0.00%	94.48
40	0.00%	100.00	0.00%	79.62	0.00%	94.71
50	0.00%	100.00	0.00%	77.84	0.00%	94.42
75	0.00%	100.00	0.00%	76.73	0.00%	94.24
100	0.00%	100.00	0.00%	75.96	0.00%	94.63

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.77	81.04	81.58	78.22	77.64	79.21	80.18	85.70
15	83.05	80.67	81.54	78.31	76.04	79.58	82.44	87.29
20	84.48	80.93	81.56	78.71	75.78	80.24	83.66	88.20
25	85.78	80.24	80.75	78.24	74.16	80.00	85.11	90.32
30	85.52	78.30	79.03	75.58	70.81	78.10	84.97	90.34
35	85.66	77.43	77.62	73.96	68.42	76.93	85.50	91.01
40	87.09	76.99	77.62	73.15	66.61	76.75	86.57	91.96
50	86.40	74.71	75.39	70.32	62.18	74.40	86.61	92.50
75	87.05	69.66	70.16	62.87	49.84	69.35	87.60	93.35
100	88.02	65.92	66.32	56.75	39.84	65.35	88.87	94.69

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.98	81.49	82.29	82.59	78.42	82.42	86.55	92.32
15	89.84	83.34	83.34	82.69	76.89	83.68	88.38	93.43
20	89.88	84.12	84.18	82.87	76.38	84.06	88.59	93.03
25	91.39	84.83	84.63	81.80	74.44	84.08	89.82	94.16
30	91.01	82.81	83.09	79.35	71.23	82.53	89.82	93.80
35	91.03	81.62	81.94	77.49	68.89	81.27	90.57	94.87
40	91.76	81.41	82.20	76.79	67.11	81.33	91.50	95.37
50	91.50	78.97	79.49	73.35	62.53	78.69	91.41	95.29
75	91.41	73.86	74.73	65.58	50.00	73.66	92.81	95.82
100	91.47	69.88	70.55	59.39	40.51	69.72	93.88	96.65

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.02	84.73	85.64	80.24	83.43	80.85	81.68	88.55
15	83.80	82.87	83.68	79.94	81.29	79.88	83.35	89.39
20	85.23	81.90	82.81	79.88	79.70	80.59	84.42	89.94
25	86.73	80.93	81.72	79.21	77.54	80.32	86.00	91.68
30	86.44	79.19	79.88	77.07	73.56	78.73	85.66	91.56
35	86.69	78.28	78.77	75.62	70.97	77.86	85.72	92.28
40	87.60	77.82	78.51	74.51	69.37	77.35	86.99	93.15
50	87.21	76.10	76.26	71.76	64.38	75.23	86.61	93.41
75	87.94	71.09	71.54	64.57	52.10	70.69	87.33	94.12
100	88.67	67.25	67.80	58.69	42.26	66.57	88.00	95.47

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	83.09	85.37	85.72	80.77	88.08	81.33	83.17	91.58
15	83.92	83.35	83.90	79.94	86.71	79.54	84.32	91.92
20	85.45	81.60	82.02	80.00	84.81	79.86	85.25	91.68
25	86.93	80.00	80.57	79.33	83.19	79.13	86.93	93.35
30	86.53	78.30	78.93	77.70	79.47	77.66	86.12	92.87
35	87.03	77.07	77.66	75.96	76.87	76.95	86.22	93.56
40	88.22	76.83	77.56	75.47	75.03	76.34	87.49	94.36
50	87.82	74.83	75.39	72.65	69.21	74.53	87.13	94.34
75	88.10	70.30	71.11	65.62	57.15	69.98	87.17	94.81
100	88.53	66.83	66.99	59.76	46.34	66.50	88.02	95.96

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	98.21	98.20	98.79	98.49	98.50	97.78
15	98.63	98.71	99.11	98.87	98.87	98.50
20	98.99	99.01	99.29	99.17	99.19	98.97
25	99.19	99.23	99.47	99.27	99.35	99.27
30	99.17	99.21	99.37	99.21	99.21	99.25
35	99.62	99.64	99.66	99.64	99.64	99.66
40	99.70	99.76	99.80	99.78	99.78	99.80
50	99.64	99.64	99.66	99.66	99.68	99.72
75	99.62	99.62	99.68	99.62	99.72	99.88
100	99.64	99.60	99.74	99.66	99.84	100.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 78.9475789
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.59	84.06	79.19	84.32	83.80	86.50	83.92	86.75
15	85.21	82.00	79.84	80.17	79.25	83.72	85.05	87.94
20	85.98	81.76	80.20	79.47	76.89	82.55	85.52	88.61
25	87.15	80.83	79.92	78.18	74.30	81.39	86.63	90.51
30	86.65	78.65	77.82	75.43	69.92	79.15	87.17	90.53
35	86.91	77.25	76.48	73.23	66.93	77.84	87.72	91.17
40	87.74	76.77	76.28	72.59	64.87	77.41	88.97	92.06
50	87.11	74.50	74.10	69.62	59.76	74.63	89.03	92.55
75	87.58	69.11	68.91	61.78	46.87	69.19	89.80	93.39
100	88.28	64.93	64.71	55.80	37.35	65.05	90.50	94.65

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Detection Limit: 78.9475789
Averaged Percentage Non-detects: 20.00%
Distribution Check: Average of means: 196.817759
Distribution Check: Average of stdvs: 166.890489
Average of NDs per 100 observations: 19.963300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	78.947579	1.976634	544	1399	1495	1001	465	146	0	0	0	0
15	78.947579	3.003762	196	667	1122	1305	905	519	250	64	18	4
20	78.947579	3.970099	50	312	672	1066	1121	897	507	275	104	35
25	78.947579	5.006931	15	134	326	709	921	1023	822	544	312	143
30	78.947579	5.994653	8	49	179	383	725	813	890	793	569	323
35	78.947579	7.010297	5	15	70	218	446	663	779	807	751	529
40	78.947579	7.995248	1	3	32	105	254	410	640	739	798	729
50	78.947579	9.924158	0	0	6	33	71	138	307	466	600	667
75	78.947579	15.088515	0	0	0	0	1	7	20	21	49	129
100	78.947579	20.066139	0	0	0	0	0	0	0	3	1	5

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	30
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	9	2	0	0	0	0	0	0	0	0	0	0	0
25	71	23	4	3	0	0	0	0	0	0	0	0	0
30	174	92	32	15	4	1	0	0	0	0	0	0	0
35	361	219	102	49	22	10	4	0	0	0	0	0	0
40	550	373	190	131	61	20	9	4	1	0	0	0	0
50	745	597	491	367	247	163	86	35	19	11	1	0	0
75	215	305	447	511	565	586	510	484	376	284	213	327	0
100	18	32	58	101	169	212	323	402	433	539	515	2239	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	9	0	9	0	0	9	0	9	0	0
15	1	0	1	0	0	1	0	1	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	9	5	9	11	0	0	0	146
15	3	2	2	3	0	0	0	86
20	0	0	0	0	0	0	0	11
25	0	0	0	0	0	0	0	7
30	0	1	0	0	0	0	0	1
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	9	5	9	11	0	0
15	3	2	2	3	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	1	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	9	0	9	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	9	0	9	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	2	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	88	0	88	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 3d. Ln(5,0.75) 25% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	286.0806	291.2903	N/A	N/A	1522.6751	1044.8665
15	268.2796	237.4836	N/A	N/A	852.6021	702.0548
20	263.2085	225.3535	N/A	N/A	627.0748	567.4432
25	255.9023	212.3977	N/A	N/A	521.7802	485.1235
30	251.2310	205.8619	N/A	N/A	462.2353	437.7892
35	248.6230	202.1358	N/A	N/A	423.5188	406.8158
40	246.4304	198.9640	N/A	N/A	395.4897	384.1395
50	242.1749	193.5894	N/A	N/A	358.4806	351.3591
75	234.7018	186.9808	N/A	N/A	309.6792	306.5056
100	231.0294	183.3277	N/A	N/A	286.3345	284.4840

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	288.1288	287.3160	307.5619	351.7432	312.7271
15	258.5693	257.7984	269.7746	260.6775	281.2042
20	248.2392	246.8325	255.7818	249.3968	270.5725
25	238.4587	236.6148	243.8946	239.1197	259.7033
30	231.9922	229.7266	236.2034	232.3930	253.0246
35	227.9955	225.4374	231.4305	228.2422	249.0602
40	224.7302	221.9153	227.6168	224.8788	245.9699
50	218.7105	215.3871	220.8842	218.7468	240.4103
75	209.2116	205.3110	210.4982	209.1538	231.0472
100	204.3329	199.9755	205.2289	204.2555	226.4149

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	256.9071	254.4327	272.3238	315.9495	279.4706
15	236.6611	234.7606	246.0111	237.1166	258.9619
20	230.8497	228.4201	237.3135	231.1151	253.2093
25	224.1278	221.4162	228.8622	224.2268	245.4843
30	219.5375	216.4814	223.2476	219.5456	240.7128
35	216.8095	213.5409	219.8617	216.7608	238.0266
40	214.5168	211.0439	217.0994	214.4331	235.9151
50	209.8437	205.9328	211.8085	209.7232	231.6999
75	202.4350	198.0859	203.6169	202.3006	224.3952
100	198.6818	193.9480	199.5131	198.5578	220.8652

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	277.5581	276.4083	295.7388	281.0012	285.6278	277.0002
15	252.2686	251.4666	262.9276	254.1170	262.8843	248.1694
20	243.9843	242.6149	251.2629	245.0976	256.2900	237.2111
25	235.2226	233.4904	240.5008	235.8617	248.0925	227.1196
30	229.4017	227.1684	233.5381	229.8000	242.9520	220.0005
35	225.7903	223.3083	229.1736	226.0422	239.9304	215.5672
40	222.8248	220.1359	225.6707	223.0014	237.5079	211.7033
50	217.1452	213.9115	219.2941	217.1903	232.8759	204.8848
75	208.1070	204.2920	209.3844	208.0563	224.9563	194.2906
100	203.4872	199.2246	204.3787	203.4154	221.1103	188.7270

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	2376.5699	0.06%	282.7562	0.02%	428.9137
15	0.00%	1064.4017	0.00%	248.6658	0.00%	326.3898
20	0.00%	780.5449	0.00%	239.7337	0.00%	298.5071
25	0.00%	649.3612	0.00%	231.7271	0.00%	279.1469
30	0.00%	573.9059	0.00%	226.6699	0.00%	267.5334
35	0.00%	533.7731	0.00%	224.2054	0.00%	261.1326
40	0.00%	502.0624	0.00%	222.2607	0.00%	256.2140
50	0.00%	456.6043	0.00%	218.1419	0.00%	247.3456
75	0.00%	401.0601	0.00%	212.4256	0.00%	235.2576
100	0.00%	373.8360	0.00%	209.7544	0.00%	229.2232

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	270.987	682.810	351.416	258.063	255.336	404.949	286.694
15	255.768	647.974	484.704	239.928	234.821	242.493	268.094
20	251.685	302.807	239.487	232.695	226.313	236.165	262.700
25	244.825	385.300	386.939	225.380	218.671	229.051	255.408
30	240.492	224.366	225.312	219.821	212.636	223.778	250.785
35	237.956	221.146	221.960	216.624	209.364	220.675	248.208
40	235.904	218.385	219.084	213.794	206.003	217.940	246.062
50	231.723	212.871	213.491	208.056	199.940	212.521	241.893
75	224.324	204.488	204.951	199.555	190.570	204.216	234.527
100	220.698	200.137	200.486	194.986	185.421	199.924	230.880

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	364.394	309.726	318.956	304.222	283.804	328430.068	433.750
15	312.781	266.240	269.122	259.361	242.354	265.304	338.510
20	294.539	252.922	254.492	244.391	228.642	251.603	312.159
25	277.380	241.537	242.360	233.228	219.589	240.529	292.078
30	266.818	233.570	234.307	225.382	212.108	232.619	279.856
35	259.954	228.675	229.384	220.883	208.557	227.931	272.249
40	254.542	224.733	225.306	217.244	204.997	223.989	266.256
50	247.113	217.461	218.088	210.145	198.566	216.989	258.513
75	233.874	207.039	207.485	200.386	189.157	206.726	244.666
100	227.891	201.841	202.208	195.287	184.057	201.591	238.535

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	277.834	280.440	283.903	267.652	275.826	268.499	300.093
15	259.829	254.013	256.353	245.471	247.448	246.221	276.863
20	255.079	242.211	244.223	237.015	235.581	238.744	269.472
25	247.708	232.562	234.123	228.393	225.174	230.724	260.730
30	243.043	226.148	227.485	222.285	217.558	225.193	255.286
35	240.232	222.458	223.637	218.514	213.021	221.808	252.197
40	237.982	219.639	220.621	215.535	209.115	219.033	249.513
50	233.529	213.987	214.736	209.409	202.147	213.508	244.733
75	225.598	205.190	205.761	200.372	191.695	204.928	236.428
100	221.698	200.742	201.185	195.609	186.163	200.505	232.383

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	282.719	289.056	289.198	273.077	304.687	276.196	320.819
15	261.744	260.038	260.648	249.105	267.018	248.396	288.875
20	256.966	244.482	244.995	240.536	251.209	239.390	278.404
25	249.121	232.948	234.184	231.030	237.164	230.514	267.550
30	244.188	225.880	226.955	224.786	227.777	224.846	260.852
35	241.368	222.146	223.026	220.676	221.745	221.460	256.799
40	238.947	219.233	220.189	217.389	216.845	218.664	253.495
50	234.365	213.807	214.709	211.362	208.418	213.451	247.823
75	226.138	205.363	205.898	201.916	196.181	205.080	238.389
100	222.105	200.986	201.393	196.893	189.681	200.736	233.784

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	414.2655	417.5752	448.3139	429.7215	448.5129	408.8800
15	371.5857	375.0987	391.6426	380.0156	398.8704	370.1517
20	353.5888	356.6599	367.1671	359.0866	378.6068	355.6006
25	334.0301	336.7104	343.8223	337.7699	357.0961	338.5279
30	321.0462	323.0875	328.6323	323.8052	343.1783	327.4183
35	311.9235	313.6167	318.0735	314.0600	333.6979	319.9129
40	304.3020	305.6536	309.4290	306.0035	325.9858	313.7136
50	291.3052	291.9602	295.1094	292.4676	313.1507	303.1641
75	269.3200	268.7862	271.5025	269.8764	290.9384	284.7314
100	257.1613	255.8693	258.6443	257.4850	278.9225	274.8635

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	270.5372	376.3587	277.3080	283.1627	286.6203
15	255.4944	317.1373	259.1145	261.7141	264.5801
20	251.4506	298.2079	254.2021	256.6080	259.3820
25	244.7533	280.9115	246.8346	248.7154	251.8473
30	240.4887	270.2134	242.1805	243.5787	248.1408
35	238.0893	263.3435	239.4278	240.8974	245.9649
40	236.1698	258.1266	237.1364	238.2915	245.9768
50	232.2109	250.9579	232.8142	233.5673	241.5518
75	225.0860	237.5599	225.1522	225.2170	238.0538
100	221.5411	231.2077	221.3951	221.3587	231.1458

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	285.628	271.229	261.454	271.303	275.078	7619.252	291.680
15	262.884	249.060	243.786	244.731	243.535	261.872	270.176
20	256.290	239.380	236.316	234.489	230.764	241.354	264.059
25	248.093	230.628	228.660	225.875	220.553	231.898	256.224
30	242.952	224.444	223.074	219.613	213.126	225.310	251.288
35	239.930	220.923	219.884	216.126	208.917	221.588	248.558
40	237.508	218.163	217.341	213.308	205.317	218.689	246.297
50	232.876	212.405	211.841	207.423	198.746	212.767	241.963
75	224.956	204.032	203.749	199.048	189.145	204.215	234.446
100	221.110	199.722	199.548	194.585	184.046	199.836	230.798

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	87.73	87.37	91.54	88.46	89.01	76.50	75.29	83.07	75.96	82.36
15	85.30	85.09	89.54	85.82	89.09	73.20	72.18	78.71	73.19	81.43
20	83.80	83.25	87.21	84.12	88.51	72.51	71.01	77.35	72.63	82.67
25	83.03	82.16	86.22	83.33	88.95	72.10	70.18	75.66	71.96	83.54
30	81.13	80.06	84.12	81.39	88.53	70.69	68.14	73.68	70.63	83.19
35	79.98	78.34	83.01	80.18	88.75	69.17	66.20	72.08	69.01	83.88
40	80.12	78.00	82.65	80.18	90.30	68.93	65.25	71.98	68.81	85.64
50	76.26	72.95	78.61	76.26	89.68	65.23	60.81	67.82	64.99	85.15
75	69.37	63.70	71.54	69.31	90.71	58.51	50.83	60.44	58.20	86.02
100	64.06	56.12	65.72	63.78	90.77	53.03	43.62	54.73	52.65	86.63

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	86.89	80.72	N/A	N/A	99.92	99.88
15	88.77	73.40	N/A	N/A	100.00	100.00
20	89.66	67.75	N/A	N/A	100.00	99.98
25	91.25	62.48	N/A	N/A	100.00	99.96
30	91.72	56.54	N/A	N/A	99.96	99.94
35	91.94	53.30	N/A	N/A	100.00	100.00
40	93.45	49.77	N/A	N/A	99.98	99.96
50	93.54	43.84	N/A	N/A	99.92	99.92
75	95.60	31.54	N/A	N/A	99.96	99.96
100	96.16	22.55	N/A	N/A	99.96	99.96

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	83.87	83.30	88.45	84.30	85.13	83.41
15	81.35	81.02	85.78	81.90	84.87	79.60
20	80.69	80.02	84.14	81.08	85.43	76.51
25	79.46	78.67	83.36	79.69	86.10	74.34
30	78.08	76.94	81.43	78.30	86.00	70.83
35	77.33	75.38	80.24	77.43	86.26	67.66
40	77.36	75.39	80.15	77.38	87.98	65.62
50	73.56	70.51	76.13	73.56	87.35	58.91
75	67.41	61.83	69.35	67.29	87.21	43.78
100	61.94	54.27	63.68	61.82	87.39	34.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.90	0.06%	80.07	0.02%	93.70
15	0.00%	99.98	0.00%	77.94	0.00%	93.70
20	0.00%	100.00	0.00%	78.65	0.00%	93.88
25	0.00%	100.00	0.00%	78.85	0.00%	94.42
30	0.00%	100.00	0.00%	78.20	0.00%	94.42
35	0.00%	100.00	0.00%	78.50	0.00%	93.98
40	0.00%	100.00	0.00%	79.80	0.00%	94.73
50	0.00%	100.00	0.00%	78.00	0.00%	94.16
75	0.00%	100.00	0.00%	77.11	0.00%	94.83
100	0.00%	100.00	0.00%	76.73	0.00%	94.28

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.97	81.76	82.69	78.13	77.70	78.93	80.42	87.39
15	82.04	80.29	81.60	76.89	73.94	77.98	80.91	88.85
20	83.72	78.91	79.66	75.70	71.33	77.19	82.73	89.74
25	84.63	77.43	78.32	73.96	69.41	76.65	83.88	91.07
30	84.65	75.64	76.36	71.98	65.72	74.95	83.72	91.72
35	85.29	74.18	74.83	70.42	62.48	73.74	84.67	91.86
40	87.07	74.22	74.87	69.21	60.28	73.78	86.51	93.35
50	86.46	69.64	70.46	64.02	53.43	69.49	86.02	93.54
75	86.71	62.04	63.01	52.95	37.88	61.78	87.41	95.60
100	87.13	55.84	56.63	45.17	27.49	55.35	88.16	96.16

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.54	78.46	79.50	79.43	73.82	79.58	86.08	93.31
15	89.03	79.70	79.86	79.94	70.91	80.28	86.75	93.64
20	89.98	80.14	80.40	78.00	69.07	79.92	87.62	94.10
25	90.46	79.76	80.02	76.36	67.62	79.43	88.67	94.91
30	90.51	79.21	79.39	74.18	63.39	78.48	88.46	95.33
35	90.28	77.37	77.98	72.61	60.55	77.07	88.69	95.33
40	91.58	77.86	77.96	71.74	57.96	77.25	90.44	95.80
50	91.13	73.01	73.94	65.70	51.72	72.65	90.50	96.02
75	91.13	65.56	66.12	54.93	36.61	65.17	92.55	97.11
100	90.87	58.97	59.76	46.50	26.20	58.28	93.31	97.56

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.91	86.65	87.60	81.13	85.07	81.29	82.34	89.78
15	83.17	84.14	85.07	78.51	81.07	78.34	82.26	90.97
20	84.53	80.46	81.60	76.89	76.51	77.74	83.45	91.56
25	85.58	78.48	79.96	75.47	73.41	76.61	84.59	92.67
30	85.41	76.00	77.23	73.33	70.00	75.25	84.61	92.99
35	86.12	74.16	75.70	71.50	65.82	73.76	85.09	92.97
40	88.02	74.57	76.00	70.57	62.85	74.10	86.50	94.18
50	87.23	70.34	71.25	65.25	55.90	69.80	86.00	94.46
75	87.54	63.25	64.02	54.75	39.92	62.46	86.73	95.78
100	87.66	56.99	58.06	46.67	28.81	56.59	86.83	96.53

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.42	87.37	87.47	82.91	90.53	83.78	85.09	92.77
15	83.29	85.25	85.62	79.62	89.27	79.27	83.80	92.87
20	84.81	81.54	82.14	78.85	85.98	78.71	84.71	93.11
25	86.08	78.87	80.30	77.54	83.76	77.09	85.23	94.34
30	85.92	76.34	77.03	75.13	79.78	75.35	85.58	94.51
35	86.32	74.26	75.31	73.62	76.83	73.74	85.96	94.24
40	87.88	74.46	75.62	72.81	73.43	73.49	86.44	95.19
50	87.74	69.90	71.45	67.92	64.67	69.74	86.77	95.23
75	87.82	63.33	64.28	57.41	46.69	62.53	86.57	96.44
100	88.04	57.19	58.20	49.21	34.46	56.97	86.44	96.93

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	98.35	98.29	98.97	98.69	98.69	97.94
15	98.63	98.65	99.23	98.89	98.89	98.42
20	99.07	99.11	99.52	99.27	99.31	99.01
25	99.11	99.13	99.50	99.29	99.31	99.25
30	99.52	99.56	99.70	99.56	99.64	99.66
35	99.74	99.74	99.76	99.74	99.74	99.78
40	99.45	99.48	99.66	99.48	99.54	99.76
50	99.60	99.62	99.72	99.62	99.74	99.86
75	99.58	99.56	99.76	99.64	99.80	99.96
100	99.58	99.54	99.64	99.60	99.84	99.96

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4905191
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	85.13	84.51	77.60	85.87	85.80	88.12	83.90	87.74
15	84.87	81.76	77.94	79.94	79.96	84.59	83.86	88.89
20	85.43	79.68	77.03	76.57	75.07	81.13	84.69	89.66
25	86.10	77.37	75.56	74.44	70.83	78.97	85.25	91.15
30	86.00	76.06	74.36	71.62	66.18	76.93	85.09	91.50
35	86.26	74.18	72.99	69.76	61.78	74.97	86.06	91.74
40	87.98	73.88	72.97	68.44	58.38	74.59	87.54	93.29
50	87.35	69.09	68.20	63.25	51.21	69.49	87.56	93.47
75	87.21	61.17	60.83	52.26	35.47	61.70	88.79	95.41
100	87.39	55.19	54.87	44.12	24.81	55.39	89.76	96.02

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Detection Limit: 89.4905191
Averaged Percentage Non-detects: 25.00%
Distribution Check: Average of means: 196.586485
Distribution Check: Average of stdvs: 167.026923
Average of NDs per 100 observations: 24.978600

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	89.490519	2.416040	303	1013	1387	1279	763	305	0	0	0	0
15	89.490519	3.792673	71	314	746	1140	1142	847	504	204	68	12
20	89.490519	5.001980	12	114	340	696	962	973	841	571	338	136
25	89.490519	6.255248	4	25	127	332	594	855	923	795	614	402
30	89.490519	7.483762	1	3	39	130	327	541	731	836	814	658
35	89.490519	8.767525	0	2	4	39	139	302	496	651	742	761
40	89.490519	9.988713	0	3	3	25	57	134	276	424	626	694
50	89.490519	12.529505	0	0	1	1	11	25	63	140	257	347
75	89.490519	18.804950	0	0	0	0	0	0	2	0	10	11
100	89.490519	24.925743	0	0	0	0	0	0	0	0	0	1

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	118
15	2	0	0	0	0	0	0	0	0	0	0	0	1
20	51	10	4	2	0	0	0	0	0	0	0	0	0
25	225	94	40	14	6	0	0	0	0	0	0	0	0
30	451	275	137	61	30	12	3	1	0	0	0	0	0
35	690	519	323	192	109	46	30	3	1	1	0	0	0
40	691	700	508	388	228	150	78	43	13	6	0	3	0
50	485	582	658	607	592	414	332	220	157	79	36	43	0
75	22	54	120	166	258	362	399	458	536	529	509	1614	0
100	0	2	5	12	22	27	46	88	124	184	258	4281	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	12	0	12	0	0	12	0	12	0	0
15	1	0	1	0	0	1	0	1	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	16	7	12	12	0	0	0	305
15	5	8	1	6	0	0	0	286
20	2	9	1	3	0	0	0	67
25	2	5	1	2	0	0	0	60
30	0	2	0	0	0	0	0	16
35	0	1	0	0	0	0	0	5
40	1	3	1	2	0	0	0	3
50	1	1	1	1	0	0	0	0
75	0	1	0	0	0	0	0	0
100	0	1	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	16	7	12	12	0	0
15	5	8	1	6	0	0
20	2	9	1	3	0	0
25	2	5	1	2	0	0
30	0	2	0	0	0	0
35	0	1	0	0	0	0
40	1	3	1	2	0	0
50	1	1	1	1	0	0
75	0	1	0	0	0	0
100	0	1	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	12	0	12	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	12	0	12	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	3	1	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	130	0	130	0	0	0	0
15	0	16	0	16	0	0	0	0
20	0	1	0	1	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 3e. Ln(5,0.75) 40% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	300.1408	341.2331	N/A	N/A	1904.0225	1260.4743
15	281.8793	258.3853	N/A	N/A	1052.2752	836.7300
20	272.4612	254.8795	N/A	N/A	733.5286	650.8479
25	265.5712	222.1341	N/A	N/A	600.8570	550.1763
30	261.6497	225.0819	N/A	N/A	522.2260	488.9830
35	258.9531	206.7865	N/A	N/A	473.8107	451.0067
40	255.8574	207.0907	N/A	N/A	432.9008	417.8151
50	251.6103	197.1993	N/A	N/A	385.1547	375.8556
75	244.6483	182.1917	N/A	N/A	323.0921	319.0856
100	241.1062	177.0063	N/A	N/A	293.8705	291.5717

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	304.9403	302.9884	335.0702	364.1623	336.4721
15	268.4653	265.5636	290.6464	273.4208	304.5125
20	247.2154	245.0352	262.6575	254.9267	283.9818
25	233.8446	231.7331	244.9945	233.6581	270.0932
30	225.6465	223.1966	234.3977	225.3558	262.2232
35	219.0463	216.1490	226.3853	218.6681	257.3351
40	214.0645	210.8130	220.1712	213.6199	251.8581
50	206.3957	202.5408	210.9960	205.8982	244.9750
75	194.9523	190.2224	197.7195	194.4842	233.9219
100	188.2382	182.8340	190.2070	187.8245	228.6969

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	255.8160	251.0672	279.0817	306.2133	283.4569
15	225.2048	219.6641	243.1666	311.4082	260.9166
20	212.4395	208.3457	225.1734	260.3275	249.9474
25	205.2726	201.6239	214.7503	203.5444	242.4535
30	200.6758	196.8141	208.2539	199.3296	238.2291
35	196.1606	191.9034	202.5657	194.9821	235.4256
40	193.4636	188.9333	198.8278	192.4065	232.1279
50	188.6450	183.6429	192.7461	187.7353	228.0174
75	181.3589	175.7271	183.8711	180.6901	220.9311
100	176.7669	170.5759	178.5741	176.2294	217.7297

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	281.6178	278.5779	308.4579	283.2161	290.8298	277.4780
15	247.3864	243.3380	266.3537	245.6200	264.0928	234.7671
20	231.4209	228.7103	244.5154	230.6548	252.9629	216.3255
25	221.1184	218.6899	230.9292	220.5567	245.4423	205.2605
30	214.7291	212.0675	222.6638	214.0865	240.9992	197.3155
35	209.1378	206.0933	215.8242	208.5525	237.7816	189.7665
40	204.9754	201.6643	210.6562	204.3696	234.5374	185.0922
50	198.6166	194.5043	202.9437	197.9515	229.9124	176.9024
75	189.0093	184.0454	191.6189	188.4600	222.5214	165.1882
100	183.1411	177.5580	185.0364	182.6761	218.6451	157.9906

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	3149.0049	0.59%	270.9628	0.00%	430.3956
15	0.00%	1258.3496	0.30%	243.5246	0.00%	338.6060
20	0.00%	865.0389	0.06%	234.9088	0.00%	301.5171
25	0.00%	705.1570	0.00%	229.7495	0.00%	281.0694
30	0.00%	613.8414	0.00%	227.0380	0.00%	269.8665
35	0.00%	558.2217	0.00%	225.0293	0.00%	262.7036
40	0.00%	518.4002	0.00%	223.2561	0.00%	256.2646
50	0.00%	463.2947	0.00%	220.6760	0.00%	247.5478
75	0.00%	398.0919	0.00%	217.1634	0.00%	235.6262
100	0.00%	367.0600	0.00%	215.4110	0.00%	229.6577

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	274.098	551.418	389.211	255.506	253.273	391.128	302.284
15	256.116	1308.186	790.377	228.035	221.445	402.993	283.849
20	248.200	830.682	510.996	216.662	207.355	298.575	273.405
25	242.156	530.240	290.865	210.153	198.923	213.450	265.869
30	238.515	2136.607	823.069	205.193	192.878	209.164	261.720
35	235.805	272.529	311.784	200.340	186.790	204.706	258.920
40	232.899	240.412	319.494	197.107	183.263	201.759	255.759
50	228.746	218.102	234.399	191.468	176.734	196.550	251.463
75	221.890	188.982	189.902	183.166	167.903	188.403	244.509
100	218.235	183.571	184.270	177.602	162.024	183.111	241.009

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	348.671	274.350	285.163	266.619	243.643	152615.098	482.083
15	311.167	234.658	239.760	227.991	210.467	594893.596	372.169
20	290.648	221.221	223.937	216.385	201.716	194053.766	329.431
25	273.952	213.964	215.816	207.509	188.914	211.934	304.501
30	264.798	209.251	210.748	202.294	182.486	207.347	292.646
35	258.830	204.834	206.017	197.600	177.230	203.323	285.715
40	252.414	201.559	202.733	193.951	173.418	200.090	278.162
50	243.788	196.150	197.152	188.189	166.936	195.052	268.514
75	231.321	187.860	188.630	180.521	160.167	187.269	254.992
100	225.459	182.346	182.984	174.721	155.161	181.817	248.964

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	283.818	296.454	301.727	271.100	286.227	273.308	318.868
15	261.400	270.858	274.900	238.813	249.245	240.698	295.518
20	251.879	248.193	251.287	224.227	228.471	225.997	281.928
25	245.145	230.115	232.620	214.928	215.144	216.845	272.595
30	241.066	218.792	220.999	208.518	206.125	211.023	267.286
35	238.171	209.912	211.821	202.814	198.454	205.751	263.813
40	235.049	204.557	206.387	198.967	193.296	202.035	260.000
50	230.570	197.226	198.741	192.295	184.396	195.982	254.944
75	223.186	187.941	189.076	183.030	171.924	187.284	246.819
100	219.254	182.610	183.415	177.346	164.440	182.020	242.816

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	294.272	316.639	314.826	290.908	344.255	299.885	346.003
15	265.205	914.787	299.917	257.644	295.397	263.185	313.267
20	253.812	4847.442	273.355	239.639	263.824	241.041	294.418
25	246.581	249.232	249.775	227.468	244.143	227.301	282.071
30	242.362	233.420	233.645	219.303	231.326	219.533	274.955
35	239.326	220.237	220.983	212.387	220.525	212.867	270.341
40	236.119	212.739	213.188	207.077	212.767	208.170	265.626
50	231.455	202.481	203.680	199.026	200.817	200.957	259.323
75	223.722	190.996	191.824	187.434	183.394	190.452	249.684
100	219.638	184.938	185.784	180.843	173.417	184.463	244.925

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	426.0217	428.3839	474.0917	444.9965	470.0402	416.7209
15	378.9354	379.4705	412.6950	387.3384	422.3974	379.6025
20	350.6760	352.2588	373.8056	356.2542	391.1296	359.0581
25	330.0947	332.2264	347.3581	334.0538	368.3945	343.6673
30	316.6863	318.2316	329.9314	319.3682	353.8601	333.8647
35	305.6926	307.0185	316.7421	307.8095	344.2668	327.1504
40	295.9513	296.7012	305.0929	297.5874	333.6244	319.7883
50	281.3434	281.4786	288.1601	282.3495	319.2426	309.4414
75	257.3840	256.3061	261.3835	257.7375	295.3693	292.2695
100	243.3497	241.2603	246.1360	243.4749	282.7150	282.9002

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	272.4923	366.5032	282.9250	296.9763	291.8044
15	255.4641	320.3577	259.5775	266.0630	274.5246
20	247.4433	297.5941	249.6371	253.7597	269.3125
25	241.4772	280.2461	242.6635	245.8289	266.8477
30	238.0843	271.4771	238.6967	241.2444	270.7352
35	235.6778	266.6209	235.7287	237.9260	275.4222
40	232.8768	260.1033	232.7004	234.4530	277.7013
50	229.4291	252.6872	228.3673	229.5286	282.5136
75	223.2529	240.6240	221.3449	221.7617	300.6696
100	220.4294	235.5788	217.8780	217.7276	300.7084

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	290.830	266.924	246.838	277.961	291.881	27399.233	304.099
15	264.093	252.096	235.793	246.495	255.381	88272.489	282.214
20	252.963	236.129	225.160	229.456	232.278	113019.358	271.850
25	245.442	223.584	216.217	218.650	217.434	470.611	264.607
30	240.999	216.492	211.104	211.564	207.761	219.748	260.650
35	237.782	210.521	206.232	205.657	200.035	213.123	257.912
40	234.537	206.092	202.727	201.348	194.477	208.138	254.819
50	229.912	199.211	196.906	194.314	185.041	200.576	250.644
75	222.521	189.559	188.380	184.586	172.231	190.255	243.901
100	218.645	183.851	183.095	178.770	164.726	184.293	240.478

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	94.98	94.53	97.03	95.19	95.17	79.32	76.97	89.42	76.95	82.28
15	90.80	90.18	95.31	90.85	91.47	64.98	62.24	76.61	62.06	79.29
20	84.56	83.68	92.94	84.36	89.58	60.44	57.64	69.48	58.48	78.89
25	80.91	79.94	89.01	80.59	88.79	55.06	52.14	64.90	53.72	77.58
30	76.83	75.17	84.59	76.40	88.00	52.55	49.05	59.81	51.60	78.38
35	72.22	69.94	80.12	71.62	88.28	48.26	44.26	54.99	47.25	78.55
40	68.67	65.76	76.08	68.20	87.58	45.47	40.73	51.43	44.42	78.32
50	61.78	57.31	68.50	61.11	87.29	39.47	33.94	43.82	38.75	78.99
75	46.18	38.87	50.48	45.47	86.24	27.49	21.70	30.36	27.03	79.50
100	33.39	25.43	36.36	32.65	87.23	18.40	12.73	20.40	17.96	80.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	93.96	87.75	N/A	N/A	100.00	100.00
15	93.64	83.62	N/A	N/A	100.00	100.00
20	94.53	77.15	N/A	N/A	100.00	100.00
25	95.47	70.36	N/A	N/A	100.00	100.00
30	96.16	65.54	N/A	N/A	100.00	100.00
35	96.85	58.74	N/A	N/A	100.00	100.00
40	97.27	53.33	N/A	N/A	100.00	99.96
50	97.98	41.80	N/A	N/A	99.96	99.96
75	99.11	21.76	N/A	N/A	100.00	99.98
100	99.52	12.23	N/A	N/A	99.98	99.98

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	89.47	88.44	94.88	89.29	89.27	87.92
15	78.16	76.33	88.05	76.84	84.40	71.92
20	73.18	71.80	81.16	72.26	83.13	64.14
25	69.64	68.27	77.29	69.16	84.14	56.79
30	65.98	64.13	73.07	65.31	84.61	50.77
35	61.58	59.05	68.06	60.91	84.81	43.90
40	58.35	55.13	64.22	57.59	85.09	38.81
50	51.57	46.45	56.89	51.01	85.11	28.93
75	38.16	30.99	41.55	37.42	85.29	13.62
100	26.48	19.77	29.25	25.90	84.63	6.36

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.59%	84.42	0.00%	95.80
15	0.00%	99.98	0.30%	79.27	0.00%	94.50
20	0.00%	99.60	0.06%	79.26	0.00%	94.26
25	0.00%	99.66	0.00%	80.73	0.00%	94.26
30	0.00%	99.76	0.00%	81.58	0.00%	94.26
35	0.00%	99.82	0.00%	82.71	0.00%	94.99
40	0.00%	99.84	0.00%	83.25	0.00%	94.87
50	0.00%	99.88	0.00%	84.81	0.00%	94.67
75	0.00%	99.98	0.00%	87.52	0.00%	95.17
100	0.00%	99.96	0.00%	88.81	0.00%	95.07

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.28	87.21	88.61	80.14	78.85	80.83	82.48	94.44
15	81.23	81.92	85.21	69.97	66.42	70.40	79.62	94.46
20	81.31	77.47	81.19	66.35	60.81	67.72	79.90	95.35
25	82.65	73.34	75.78	63.40	55.31	65.94	79.78	95.76
30	83.29	68.11	70.20	59.28	50.08	63.39	80.42	96.22
35	83.70	62.42	64.14	55.25	44.00	59.88	81.49	97.07
40	83.96	58.83	60.42	51.09	39.66	56.91	81.01	97.37
50	84.24	51.21	52.75	43.76	30.10	50.00	81.88	98.04
75	84.18	36.99	38.32	29.07	15.11	36.53	83.37	99.05
100	84.20	25.52	26.34	17.96	6.73	25.11	84.73	99.56

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.29	71.20	73.49	70.59	65.27	69.66	83.54	96.48
15	88.04	66.71	67.15	66.32	55.47	65.64	83.09	96.59
20	88.87	64.90	65.81	63.72	51.09	64.95	82.89	97.13
25	89.72	64.55	65.16	60.55	46.38	63.35	82.48	97.74
30	89.58	62.33	62.65	57.15	42.65	61.13	83.03	97.72
35	90.32	59.23	59.49	53.03	36.91	58.50	83.98	98.30
40	90.06	56.91	57.58	49.37	32.55	55.43	82.95	98.71
50	90.14	50.50	51.01	41.72	24.34	49.39	84.04	98.91
75	90.02	36.81	37.60	27.98	11.68	35.56	84.91	99.58
100	88.97	25.43	25.86	17.33	5.35	24.50	87.23	99.64

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.23	93.76	94.63	86.79	91.80	87.58	87.17	95.98
15	83.17	90.17	91.50	74.83	82.87	75.35	81.35	96.12
20	82.59	84.89	86.57	69.19	74.40	69.88	80.36	96.55
25	83.66	77.96	79.54	65.45	66.20	66.89	81.13	97.05
30	84.32	69.90	72.00	60.26	58.16	62.69	81.39	97.13
35	84.75	62.38	64.59	54.59	49.68	58.04	81.33	97.74
40	85.05	57.70	59.58	50.38	43.70	54.55	81.62	98.16
50	85.17	48.95	51.23	42.30	32.18	47.78	81.58	98.59
75	85.50	34.97	36.28	28.44	15.33	33.94	81.54	99.37
100	85.01	24.69	25.33	17.35	7.07	23.82	81.76	99.60

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.42	89.76	89.76	92.16	97.35	93.07	92.36	97.19
15	84.95	92.49	92.55	84.26	94.75	85.94	85.49	97.56
20	83.27	91.40	91.52	79.11	91.17	80.10	83.35	97.84
25	83.90	86.55	86.89	75.31	87.21	75.09	84.08	98.10
30	84.59	79.45	80.20	70.40	82.85	70.73	83.03	98.16
35	85.17	72.20	73.23	65.56	76.08	66.18	83.52	98.42
40	85.47	65.52	67.01	60.65	70.06	61.58	83.09	98.63
50	85.49	55.50	57.29	51.31	55.66	54.00	82.71	99.05
75	85.68	38.24	40.44	33.09	26.53	38.20	82.18	99.49
100	85.15	26.71	28.40	20.61	11.62	26.08	81.35	99.72

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.04	98.97	99.54	99.30	99.31	98.61
15	99.06	98.81	99.68	99.09	99.11	98.97
20	98.94	98.73	99.66	99.03	99.15	99.41
25	99.38	99.40	99.80	99.44	99.70	99.82
30	99.12	99.08	99.62	99.20	99.33	99.72
35	99.08	99.14	99.64	99.12	99.25	99.86
40	98.97	99.00	99.54	99.01	99.37	99.88
50	99.05	99.07	99.54	99.07	99.49	99.96
75	98.49	98.47	98.97	98.49	99.54	100.00
100	97.41	96.85	98.20	97.41	99.37	100.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 122.7303500
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.27	90.26	74.00	97.45	93.33	95.37	85.25	94.26
15	84.40	85.77	71.35	85.22	87.66	92.06	82.71	93.58
20	83.13	80.19	69.45	75.91	78.38	86.61	81.56	94.08
25	84.14	74.69	66.91	70.46	69.60	79.19	80.83	95.05
30	84.61	69.37	63.25	63.81	61.52	73.07	80.79	95.70
35	84.81	63.74	58.99	58.16	51.98	67.17	81.68	96.55
40	85.09	59.70	55.41	53.11	45.39	62.65	81.19	97.05
50	85.11	51.88	48.83	44.53	32.32	53.72	82.06	97.86
75	85.29	36.79	34.93	29.05	14.48	37.72	82.14	98.93
100	84.63	25.45	24.53	18.16	6.42	25.82	84.04	99.37

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Detection Limit: 122.7303500
Averaged Percentage Non-detects: 40.00%
Distribution Check: Average of means: 196.622642
Distribution Check: Average of stdvs: 166.939990
Average of NDs per 100 observations: 40.065200

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	122.730350	3.514257	30	259	713	1318	1542	1188	0	0	0	0
15	122.730350	5.943564	1	23	102	334	677	916	1054	918	593	316
20	122.730350	7.996238	0	3	15	56	196	398	640	854	878	776
25	122.730350	9.987129	0	0	1	10	29	92	249	362	641	793
30	122.730350	11.978218	0	0	0	3	2	16	61	138	258	425
35	122.730350	14.082574	0	0	0	0	2	4	8	29	88	148
40	122.730350	16.026139	0	0	0	0	0	0	2	4	23	54
50	122.730350	20.027327	0	0	0	0	0	0	0	1	0	3
75	122.730350	30.014851	0	0	0	0	0	0	0	0	0	0
100	122.730350	40.059802	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	1050
15	116	0	0	0	0	0	0	0	0	0	0	0	51
20	534	359	201	89	43	8	0	0	0	0	0	0	0
25	820	721	568	377	211	115	35	21	5	0	0	0	0
30	596	704	713	709	577	375	231	135	57	34	11	5	0
35	255	390	547	687	686	652	525	429	274	178	78	70	0
40	109	165	279	443	529	571	654	617	531	401	293	375	0
50	4	12	34	73	124	216	303	438	513	519	575	2235	0
75	0	0	0	0	0	0	0	3	12	16	20	4999	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	30	0	30	0	0	30	0	30	0	0
15	18	0	18	0	0	18	0	18	0	0
20	4	0	4	0	0	4	0	4	0	0
25	1	0	1	0	0	1	0	1	0	0
30	1	0	1	0	0	1	0	1	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	37	16	30	25	0	0	0	1188
15	74	82	39	106	0	0	0	1943
20	73	96	39	104	0	0	0	1234
25	44	58	17	57	0	0	0	1332
30	27	48	19	34	0	0	0	848
35	29	49	22	36	0	0	0	1029
40	13	40	11	18	0	0	0	668
50	8	21	7	8	0	0	0	500
75	5	10	3	5	0	0	0	331
100	0	8	0	0	0	0	0	129

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	37	16	30	25	0	0
15	74	82	39	106	0	0
20	73	96	39	104	0	0
25	44	58	17	57	0	0
30	27	48	19	34	0	0
35	29	49	22	36	0	0
40	13	40	11	18	0	0
50	8	21	7	8	0	0
75	5	10	3	5	0	0
100	0	8	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	30	0	30	0	0	0	0
15	0	18	0	18	0	0	0	0
20	0	4	0	4	0	0	0	0
25	0	1	0	1	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	30	0	30	0	0	0	0
15	0	18	0	18	0	0	0	0
20	0	4	0	4	0	0	0	0
25	0	1	0	1	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	4	0	4	0	0	0	0
20	0	1	0	2	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	4	0	4	0	0	0	0
20	0	2	0	1	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	30	0	5050	5050	0	0
15	0	15	0	5050	5050	0	0
20	0	3	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	377	0	377	0	0	0	0
15	0	146	0	146	0	0	0	0
20	0	48	0	48	0	0	0	0
25	0	9	0	9	0	0	0	0
30	0	2	0	2	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 3f. Ln(5,0.75) 50% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	323.3589	386.6769	N/A	N/A	2143.2097	1402.1594
15	293.9640	277.4726	N/A	N/A	1159.1122	906.1102
20	284.6136	305.9796	N/A	N/A	803.2196	704.1632
25	278.4378	245.8596	N/A	N/A	650.9338	590.3224
30	273.1361	262.5429	N/A	N/A	557.2201	517.9162
35	270.4045	226.6917	N/A	N/A	498.7310	472.2077
40	266.6384	240.3861	N/A	N/A	450.7296	433.3739
50	262.1656	225.7603	N/A	N/A	395.9464	385.3647
75	256.0111	199.0738	N/A	N/A	328.2616	323.7319
100	251.8063	199.0940	N/A	N/A	294.1430	291.5922

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	330.8095	327.8831	368.3925	353.5764	365.7587
15	280.8945	276.1052	313.2951	996.2954	323.5610
20	253.6625	249.8780	278.4141	2225.8802	302.0670
25	235.9150	232.9065	254.5116	1368.4485	285.2504
30	223.1027	220.5649	237.7243	221.5462	272.9949
35	214.2977	211.3796	226.4924	212.8181	266.1795
40	207.6012	204.5811	217.7457	206.3463	258.4568
50	197.4581	193.8189	205.2023	196.2482	249.4148
75	183.6736	178.8363	188.3964	182.6584	237.4656
100	175.1252	169.7131	178.4948	174.2704	230.3635

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	269.4038	262.8949	298.1342	280.7730	298.9240
15	218.5528	209.9335	244.5047	3048.0931	261.0652
20	199.6007	192.7403	219.7575	20207.0047	249.3923
25	191.0243	185.7035	206.2100	5139.3239	242.4227
30	184.0666	179.7144	196.3933	180.4589	236.5023
35	178.9299	174.3044	189.3395	175.9364	233.2872
40	175.9740	171.3458	184.7640	173.5628	229.0545
50	170.0962	165.0132	176.9123	168.1208	224.1273
75	162.6519	156.5507	166.9179	161.2545	218.0810
100	157.5049	150.9841	160.5937	156.4105	214.1345

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	298.9183	294.2098	331.6147	298.6411	307.8954	291.8487
15	244.7928	237.7717	271.2059	239.1243	265.0224	224.8632
20	224.5223	219.5092	243.3639	220.3711	252.5524	199.9558
25	212.5358	208.8792	226.9945	209.6997	245.8826	187.7491
30	202.9150	200.0852	214.6935	201.0599	240.2027	177.4817
35	195.9712	193.0677	206.0783	194.2774	237.1103	168.5897
40	191.0239	187.8887	199.6299	189.6490	233.3115	163.7126
50	183.1370	179.5576	189.6918	181.7244	228.3634	153.5334
75	172.0143	167.1908	176.3406	170.8426	221.9505	139.7305
100	165.0184	159.6045	168.1575	164.0542	217.3833	131.2818

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	3783.0437	1.68%	284.6494	0.12%	453.6286
15	0.00%	1224.5145	1.76%	248.5658	0.04%	345.6257
20	0.00%	810.2941	0.55%	240.3524	0.00%	306.6800
25	0.00%	648.2434	0.20%	236.7934	0.00%	286.3578
30	0.00%	554.7768	0.06%	233.9977	0.00%	272.2405
35	0.00%	500.5313	0.00%	232.4214	0.00%	264.3375
40	0.00%	461.9026	0.00%	230.8271	0.00%	257.2000
50	0.00%	408.4100	0.00%	228.7384	0.00%	247.7869
75	0.00%	349.4634	0.00%	226.5601	0.00%	236.4957
100	0.00%	319.5507	0.00%	224.9541	0.00%	229.8904

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	288.745	1567.544	527.827	267.144	265.653	313.934	326.552
15	255.877	3339.681	2265.688	220.244	215.169	4976.615	298.361
20	247.305	597.944	505.724	204.116	196.677	29864.460	288.007
25	242.426	976.900	506.528	197.609	186.796	7330.599	280.444
30	237.683	543.896	651.891	192.023	177.582	194.063	274.314
35	235.126	672.463	513.804	186.299	170.317	189.203	271.096
40	231.692	411.005	226.351	183.541	165.823	187.024	267.102
50	227.179	252.430	189.502	177.425	157.858	181.783	262.378
75	221.295	176.132	178.056	169.110	146.591	174.643	256.045
100	216.967	170.141	171.643	163.424	139.897	169.190	251.780

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	355.985	272.640	284.585	261.159	239.726	16264.464	542.271
15	304.824	219.318	227.069	210.657	201.381	327590407.388	396.441
20	289.139	202.663	207.267	199.571	204.489	18698808475.131	352.496
25	276.108	198.071	200.926	196.388	194.825	804768000.060	325.138
30	264.927	191.133	194.607	187.283	172.976	187.769	307.619
35	259.247	186.094	189.375	181.910	166.965	183.095	300.203
40	251.797	183.770	187.236	177.439	157.070	180.814	290.609
50	242.647	178.500	180.972	171.935	149.555	176.222	279.927
75	231.245	171.670	173.354	163.768	135.763	170.189	267.094
100	224.044	166.435	167.870	158.256	129.615	165.395	259.546

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	301.169	320.877	327.914	287.631	307.691	290.733	345.659
15	263.026	291.806	297.598	236.919	256.571	240.239	312.915
20	251.761	272.476	276.996	218.252	232.912	220.160	299.052
25	245.749	249.399	252.544	208.193	216.478	209.571	288.905
30	240.476	229.803	232.979	200.440	204.367	201.697	281.397
35	237.625	214.121	216.293	194.203	195.355	195.747	277.061
40	233.867	202.915	205.335	189.835	188.778	191.619	272.302
50	229.046	189.208	191.310	182.154	177.572	184.499	266.498
75	222.631	175.896	177.686	171.437	161.681	174.734	258.835
100	217.991	169.321	170.725	164.595	151.858	168.441	253.906

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	316.489	350.777	347.993	319.116	385.687	333.777	378.688
15	270.440	404.017	407.055	266.545	317.142	280.073	336.132
20	254.910	317.327	322.479	242.947	279.849	250.882	316.141
25	247.526	294.885	295.862	228.303	253.815	231.835	301.731
30	241.836	270.094	270.402	217.321	236.444	218.994	291.499
35	238.756	248.466	248.108	209.200	223.165	210.878	285.693
40	234.942	229.813	229.788	203.252	213.949	204.475	279.658
50	229.984	205.435	206.136	192.855	199.009	194.448	272.222
75	223.147	182.760	183.902	179.008	178.596	181.286	262.503
100	218.401	174.325	175.311	170.573	165.727	173.472	256.616

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	453.1669	454.5009	510.2237	473.6760	501.9970	441.3557
15	381.5589	378.7299	428.0890	387.8785	435.0493	387.0533
20	350.3330	349.3033	384.2139	354.1825	404.5367	367.3356
25	328.8836	328.9945	353.7298	331.9042	380.8440	353.7271
30	311.7008	312.5582	331.1562	314.0583	362.0789	342.1819
35	299.1793	299.7364	315.5868	300.9310	351.1960	335.7003
40	288.0991	288.7464	301.7502	289.5177	338.1725	327.4636
50	271.5345	271.5510	281.7967	272.2343	321.8912	317.0518
75	246.2448	244.9866	252.5268	246.2160	298.3525	301.7657
100	229.9770	227.9186	234.3476	229.7923	283.4393	291.5421

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	286.5708	375.7424	300.4542	321.1070	311.0702
15	254.9069	315.7229	260.5861	272.7548	287.6575
20	246.4571	300.1521	248.4574	255.7711	289.9504
25	242.1843	287.4676	242.2091	247.0326	299.7558
30	237.7755	276.9259	236.6815	240.1956	311.6379
35	235.0886	271.2216	233.8448	237.1314	317.8648
40	231.7024	263.0424	229.9768	232.8080	330.4983
50	227.8785	255.2389	225.3748	227.3221	352.2794
75	223.4173	245.4738	219.5583	220.2072	415.3415
100	220.4651	239.7121	215.5114	215.3241	454.6625

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	307.895	276.491	248.860	297.669	318.127	49707.801	326.728
15	265.022	248.888	223.116	255.124	274.851	372965.665	293.514
20	252.552	243.861	223.666	234.315	246.635	433515.500	283.166
25	245.883	229.492	214.821	220.856	227.526	76521.648	276.688
30	240.203	217.743	206.689	210.788	212.442	2414.534	271.288
35	237.110	208.118	199.351	203.039	202.043	213.639	268.612
40	233.312	202.428	195.526	197.561	194.164	206.580	264.926
50	228.363	193.123	188.303	188.488	181.381	196.092	260.617
75	221.951	180.751	178.275	175.948	163.575	182.230	254.786
100	217.383	173.160	171.589	168.241	152.829	174.083	250.825

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	98.70	98.48	99.56	98.91	98.91	89.96	88.57	96.69	87.72	88.50
15	96.41	95.62	99.06	96.44	96.40	60.52	55.60	79.72	54.18	77.78
20	91.69	90.99	98.13	91.13	92.71	50.65	46.85	64.23	46.89	76.26
25	83.71	82.50	95.70	82.04	90.46	44.70	41.56	56.35	41.90	75.66
30	75.02	73.58	89.84	73.82	88.61	39.41	36.46	49.53	37.66	74.83
35	67.98	65.41	82.81	66.30	87.25	34.18	30.83	42.55	32.69	74.34
40	62.06	58.85	74.34	60.42	86.63	30.55	26.67	37.35	28.85	72.32
50	49.94	45.66	60.59	48.75	84.53	23.72	19.82	28.81	22.30	72.38
75	29.92	24.99	35.68	28.79	82.44	12.61	9.33	15.17	11.98	73.03
100	16.87	12.22	20.32	16.08	82.24	5.94	3.86	6.97	5.70	74.42

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	98.20	92.51	N/A	N/A	100.00	100.00
15	97.43	90.99	N/A	N/A	100.00	100.00
20	98.10	89.25	N/A	N/A	100.00	100.00
25	98.36	86.73	N/A	N/A	100.00	100.00
30	98.65	83.53	N/A	N/A	100.00	100.00
35	99.47	78.37	N/A	N/A	100.00	100.00
40	99.31	77.20	N/A	N/A	100.00	100.00
50	99.64	68.44	N/A	N/A	100.00	99.98
75	99.98	47.79	N/A	N/A	100.00	100.00
100	99.92	36.97	N/A	N/A	99.92	99.92

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	96.45	95.93	98.60	96.22	94.83	95.45
15	77.90	74.59	93.07	74.35	86.04	67.66
20	67.15	64.51	81.36	64.81	83.25	54.18
25	61.25	58.81	73.36	59.02	83.74	45.86
30	55.01	52.67	65.79	53.67	84.18	38.08
35	48.60	46.11	58.39	47.28	83.70	30.20
40	43.98	40.82	52.88	42.50	83.43	24.61
50	34.36	30.86	41.00	33.11	83.23	15.74
75	19.84	15.75	23.35	19.06	84.06	5.62
100	10.18	7.17	12.06	9.66	83.54	1.47

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	1.68%	95.07	0.12%	98.47
15	0.00%	100.00	1.76%	88.65	0.04%	95.88
20	0.00%	98.81	0.55%	87.46	0.00%	95.07
25	0.00%	98.32	0.20%	89.74	0.00%	95.05
30	0.00%	98.34	0.06%	90.39	0.00%	94.51
35	0.00%	98.38	0.00%	92.34	0.00%	95.27
40	0.00%	98.30	0.00%	93.25	0.00%	94.99
50	0.00%	98.32	0.00%	94.48	0.00%	94.61
75	0.00%	98.61	0.00%	97.52	0.00%	95.47
100	0.00%	98.77	0.00%	98.55	0.00%	95.35

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.44	94.91	95.29	89.79	86.18	90.34	88.93	98.51
15	82.22	85.95	89.52	66.17	64.44	66.06	80.02	98.22
20	80.63	80.27	85.98	58.33	54.63	58.61	79.15	98.69
25	81.88	74.90	80.79	55.25	48.68	56.06	79.68	98.99
30	82.77	68.03	72.78	51.26	41.63	53.19	78.93	99.07
35	82.63	59.27	63.42	45.50	35.74	48.40	78.77	99.52
40	82.32	52.45	55.94	42.32	31.03	46.10	78.04	99.43
50	82.53	40.50	42.88	33.13	21.87	37.33	77.58	99.64
75	83.27	23.68	25.03	17.84	8.87	22.83	79.13	99.98
100	83.11	12.50	13.49	8.51	2.85	12.00	81.25	99.92

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.55	73.82	79.29	72.53	66.97	69.13	80.87	99.11
15	86.08	58.52	60.24	58.12	47.76	55.49	79.17	98.63
20	87.72	53.70	55.55	52.93	41.29	52.15	79.45	99.01
25	89.56	51.86	53.05	50.18	37.33	50.77	79.31	99.27
30	89.45	50.02	51.27	46.77	31.40	48.59	78.36	99.45
35	90.00	46.08	47.09	41.26	27.21	44.59	78.04	99.76
40	89.23	44.11	44.77	38.91	23.09	42.75	76.79	99.66
50	89.01	36.24	36.75	30.22	15.81	35.16	76.38	99.74
75	89.17	21.90	22.38	16.24	6.28	21.11	77.60	100.00
100	88.50	11.47	12.08	7.56	1.72	10.99	79.27	99.94

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	93.62	98.08	98.38	95.43	97.49	95.54	95.17	99.23
15	85.23	94.85	95.69	76.30	88.97	78.46	83.43	98.93
20	82.61	91.38	92.69	64.02	78.55	64.94	79.80	99.17
25	83.29	84.74	86.13	58.22	67.04	58.78	79.58	99.37
30	84.04	74.03	76.59	52.06	55.95	53.29	79.76	99.49
35	83.64	61.41	64.22	44.84	46.36	46.83	78.73	99.74
40	83.41	52.05	54.59	41.30	38.25	43.03	78.10	99.64
50	83.64	37.49	39.15	30.58	25.12	33.69	77.62	99.74
75	84.38	20.34	21.60	15.86	8.89	19.39	78.28	100.00
100	84.02	10.77	11.47	7.33	2.73	9.96	78.73	99.92

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	96.02	89.01	88.99	98.02	99.66	98.51	98.04	99.58
15	88.28	91.73	91.83	90.50	97.37	93.17	89.68	99.35
20	84.06	94.71	94.83	81.29	92.99	84.47	84.42	99.50
25	84.28	94.53	94.59	75.98	88.16	77.93	83.64	99.62
30	84.26	91.27	91.54	70.82	84.27	72.33	82.08	99.76
35	84.40	83.01	83.98	63.62	78.29	64.94	82.61	99.90
40	83.64	73.00	74.08	56.66	71.74	58.18	80.18	99.78
50	83.84	52.50	54.02	42.50	55.93	44.80	79.64	99.88
75	84.55	25.72	27.54	21.31	21.39	24.02	79.05	99.98
100	84.28	13.37	14.65	10.10	6.87	12.91	77.76	99.98

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.88	99.86	99.94	99.90	99.90	99.84
15	99.61	99.39	99.90	99.54	99.56	99.62
20	99.25	98.93	99.86	99.11	99.31	99.78
25	98.93	98.84	99.86	98.94	99.21	99.88
30	98.86	98.81	99.76	98.89	99.17	99.92
35	98.76	98.76	99.80	98.77	99.41	99.98
40	98.36	98.45	99.52	98.48	99.19	99.98
50	97.70	97.74	99.34	97.76	99.11	100.00
75	95.17	94.77	97.51	94.97	98.97	100.00
100	90.54	89.23	93.51	90.18	98.14	100.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.83	95.70	77.58	108.24	98.30	99.05	87.88	98.46
15	86.04	92.04	68.65	99.55	94.77	98.38	83.27	97.50
20	83.25	88.17	66.42	85.96	86.83	96.34	81.56	98.04
25	83.74	80.34	62.53	74.12	77.25	90.87	80.36	98.30
30	84.18	71.01	57.68	64.42	66.20	80.93	79.60	98.55
35	83.70	62.21	50.97	55.61	56.06	70.69	79.05	99.39
40	83.43	55.11	47.72	49.33	46.06	61.41	78.18	99.23
50	83.23	42.42	37.17	36.93	30.71	46.32	76.50	99.54
75	84.06	24.04	21.74	18.50	10.50	25.39	77.33	99.96
100	83.54	12.69	11.68	8.71	2.85	13.27	78.75	99.92

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 0.75
Population Mean: 196.6154912
Number of Test Runs: 5050
Detection Limit: 148.4131591
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 196.487730
Distribution Check: Average of stdvs: 167.047797
Average of NDs per 100 observations: 50.077600

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	148.413159	4.012277	6	78	338	983	1666	1979	0	0	0	0
15	148.413159	7.241584	0	2	22	62	220	525	800	1084	1051	803
20	148.413159	10.000990	0	0	1	4	21	71	167	418	582	811
25	148.413159	12.470495	0	0	0	0	3	9	28	79	162	311
30	148.413159	14.999802	0	0	0	0	0	0	4	8	24	69
35	148.413159	17.516634	0	0	0	0	0	0	0	0	3	12
40	148.413159	19.965347	0	0	0	0	0	0	0	0	1	2
50	148.413159	25.031683	0	0	0	0	0	0	0	0	0	0
75	148.413159	37.436832	0	0	0	0	0	0	0	0	0	0
100	148.413159	49.937624	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3013
15	481	0	0	0	0	0	0	0	0	0	0	0	311
20	890	793	599	417	203	73	0	0	0	0	0	0	21
25	508	671	764	806	640	491	320	149	63	36	10	0	0
30	156	230	422	552	702	731	700	548	388	260	140	116	0
35	22	51	122	200	369	464	625	654	694	556	467	811	0
40	7	13	20	50	135	176	290	403	551	598	630	2174	0
50	0	0	0	0	8	16	24	41	73	137	204	4547	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	38	0	37	0	0	38	0	37	0	0
15	60	0	60	0	0	60	0	60	0	0
20	21	0	21	0	0	21	0	21	0	0
25	5	0	5	0	0	5	0	5	0	0
30	1	0	1	0	0	1	0	1	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	42	14	37	20	0	0	0	1979
15	186	167	98	254	0	0	0	3419
20	234	271	109	327	0	0	0	2975
25	193	240	113	255	0	0	0	3279
30	145	193	89	194	0	0	0	2883
35	136	196	92	171	0	0	0	3182
40	102	146	69	130	0	0	0	2804
50	88	138	57	100	0	0	0	2826
75	39	77	31	44	0	0	0	2972
100	19	54	15	21	0	0	0	2683

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	42	14	37	20	0	0
15	186	167	98	254	0	0
20	234	271	109	327	0	0
25	193	240	113	255	0	0
30	145	193	89	194	0	0
35	136	196	92	171	0	0
40	102	146	69	130	0	0
50	88	138	57	100	0	0
75	39	77	31	44	0	0
100	19	54	15	21	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	38	0	37	0	0	0	0
15	0	60	0	60	0	0	0	0
20	0	22	0	22	0	1	0	0
25	0	6	0	6	1	2	0	0
30	0	2	2	1	3	2	0	0
35	0	0	1	0	0	2	0	0
40	0	1	2	0	4	2	0	0
50	0	0	1	0	3	1	0	0
75	0	0	0	0	2	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	38	0	37	0	0	0	0
15	0	60	0	60	0	0	0	0
20	0	22	0	22	0	1	0	0
25	0	6	0	6	1	2	0	0
30	0	2	2	2	3	2	0	0
35	0	0	1	0	1	2	0	0
40	0	1	2	0	4	2	0	0
50	0	0	1	0	3	1	0	0
75	0	0	0	0	2	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	19	0	19	0	0	0	0
20	0	4	0	3	0	1	0	0
25	0	4	0	4	1	2	0	0
30	0	1	2	0	3	2	0	0
35	0	0	1	0	0	2	0	0
40	0	1	2	0	4	2	0	0
50	0	0	1	0	3	1	0	0
75	0	0	0	0	2	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	19	0	19	0	0	0	0
20	0	3	0	3	0	1	0	0
25	0	4	0	4	1	2	0	0
30	0	1	2	0	3	2	0	0
35	0	0	1	0	1	2	0	0
40	0	1	2	0	4	2	0	0
50	0	0	1	0	3	1	0	0
75	0	0	0	0	2	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	85	6	5050	5050	0	0
15	0	89	2	5050	5050	0	0
20	0	28	0	5050	5050	0	0
25	0	10	0	5050	5050	0	0
30	0	3	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	537	0	537	0	0	0	0
15	0	389	0	389	0	0	0	0
20	0	171	0	171	0	0	0	0
25	0	66	0	66	0	0	0	0
30	0	14	0	14	0	0	0	0
35	0	4	0	4	0	0	0	0
40	0	2	0	2	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 4. Ln(5,1) Detection Limit Fixed at 30 (Censoring Level = 5.50%)

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	381.5306	365.9297	N/A	N/A	943.0884	731.5210
15	358.9826	333.0572	N/A	N/A	643.7528	569.1914
20	348.0719	313.8220	N/A	N/A	529.1392	497.0306
25	334.8083	300.5804	N/A	N/A	472.9739	451.7001
30	331.1973	294.4414	N/A	N/A	444.1732	429.0549
35	324.5372	285.5956	N/A	N/A	418.4055	407.7425
40	320.2763	280.8963	N/A	N/A	400.8660	393.4065
50	313.4951	274.3349	N/A	N/A	376.3844	371.5590
75	302.0945	263.1522	N/A	N/A	344.2728	341.9589
100	294.3792	255.8750	N/A	N/A	326.6245	325.2268

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	382.8683	382.7465	391.0263	386.1502	395.7508
15	353.2577	352.4434	358.4853	355.3185	364.3752
20	339.3141	337.8018	343.3725	340.8758	350.3094
25	325.1790	323.3619	328.3502	326.3693	335.5957
30	320.6191	318.4011	323.3023	321.6012	331.0969
35	313.4455	310.8708	315.7305	314.2589	323.9278
40	308.8717	306.0511	310.8430	309.5534	319.3414
50	301.9704	298.8737	303.4765	302.4680	312.0718
75	290.2184	286.5145	291.1490	290.4914	300.2881
100	282.4211	278.3467	283.0684	282.5906	292.5204

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	364.9602	364.0603	371.8028	367.1728	377.2720
15	341.9635	340.5849	346.5655	343.5394	352.8844
20	330.4149	328.4029	334.0698	331.6691	341.3284
25	318.0966	315.8756	320.9945	319.0810	328.4797
30	314.3912	311.8106	316.8670	315.2180	324.8610
35	307.9160	305.0092	310.0393	308.6088	318.4074
40	303.8798	300.7574	305.7217	304.4653	314.3681
50	297.8427	294.5003	299.2619	298.2761	307.9693
75	287.1530	283.2694	288.0405	287.3944	297.2519
100	279.9270	275.7090	280.5484	280.0776	290.0535

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	389.8306	389.9861	398.2684	393.4331	395.3304	391.5349
15	359.9072	359.4510	365.4685	362.2641	365.6942	359.6779
20	345.7341	344.6232	350.0934	347.5461	352.1165	344.1646
25	330.9502	329.5192	334.3725	332.3438	337.3553	328.4500
30	326.2108	324.3851	329.1126	327.3670	332.9531	322.9124
35	318.7552	316.5693	321.2279	319.7165	325.7522	314.8614
40	313.9373	311.4969	316.0706	314.7458	321.1174	309.5281
50	306.6452	303.9026	308.2753	307.2390	313.8622	301.6018
75	294.2408	290.8528	295.2451	294.5704	301.9152	288.0009
100	285.9771	282.1886	286.6732	286.1839	293.9750	279.0570

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	2112.0460	0.00%	666.4516	0.00%	957.1302
15	0.00%	876.5237	0.00%	460.4097	0.00%	551.6785
20	0.00%	658.9610	0.00%	396.1449	0.00%	460.1650
25	0.00%	565.1831	0.00%	363.5008	0.00%	416.1160
30	0.00%	518.7636	0.00%	346.9440	0.00%	393.8479
35	0.00%	482.8827	0.00%	331.5505	0.00%	374.0187
40	0.00%	460.4845	0.00%	322.1885	0.00%	361.7417
50	0.00%	425.6663	0.00%	308.6117	0.00%	342.9001
75	0.00%	385.2190	0.00%	289.9651	0.00%	319.1603
100	0.00%	364.4942	0.00%	279.4410	0.00%	305.9054

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	372.950	471.929	400.618	364.502	362.638	366.269	380.520
15	353.788	346.615	347.848	343.927	341.648	346.313	357.622
20	344.288	335.676	336.831	331.999	329.686	335.346	346.892
25	331.862	323.186	324.019	319.296	316.526	322.908	333.776
30	328.667	319.263	320.155	314.990	312.017	319.076	330.325
35	322.341	312.393	313.240	307.644	304.685	312.220	323.811
40	318.311	308.090	308.843	303.037	299.914	307.874	319.637
50	311.813	301.561	302.188	296.320	293.127	301.433	313.009
75	300.743	290.041	290.487	284.237	280.781	289.934	301.782
100	293.232	282.235	282.543	276.114	272.573	282.173	294.146

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	776.207	734.649	744.884	723.226	718.640	733.057	788.158
15	547.699	520.165	525.059	509.942	504.718	519.677	548.789
20	492.345	464.249	467.513	450.167	446.669	463.750	493.554
25	429.711	406.868	409.723	395.512	391.634	406.922	429.968
30	412.712	390.775	393.674	379.624	376.085	391.136	412.991
35	397.577	375.329	377.326	362.121	359.825	374.898	397.369
40	379.967	359.349	360.607	347.419	344.386	359.372	380.141
50	360.107	341.835	342.853	330.351	327.566	341.447	360.696
75	331.887	315.166	315.888	304.839	302.115	315.102	332.472
100	316.410	300.784	301.186	290.693	288.261	300.698	317.019

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	385.064	380.114	381.710	378.702	379.301	378.972	398.855
15	363.087	356.392	357.540	354.720	353.860	355.914	370.650
20	352.349	344.405	345.321	342.082	340.054	344.172	357.495
25	338.576	330.388	331.241	327.678	325.137	330.162	342.212
30	334.857	326.162	326.803	322.828	319.919	325.817	337.858
35	328.064	318.687	319.364	315.075	311.939	318.474	330.643
40	323.449	313.846	314.541	309.780	306.645	313.657	325.729
50	316.134	306.524	307.043	302.085	298.791	306.314	318.134
75	304.029	293.759	294.166	288.542	284.978	293.681	305.405
100	295.936	285.213	285.527	279.575	275.935	285.172	297.051

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	389.438	382.480	383.534	379.401	383.238	380.023	424.605
15	367.150	357.085	358.187	355.555	355.452	356.342	386.546
20	356.307	345.208	345.783	342.119	340.898	344.731	368.948
25	341.995	330.796	331.351	328.089	325.554	330.596	350.880
30	338.007	326.720	327.239	322.947	320.460	326.259	345.206
35	330.963	319.319	319.869	314.686	312.326	318.957	336.829
40	326.218	314.293	314.962	309.897	306.781	314.038	331.078
50	318.497	307.009	307.368	302.104	298.985	306.565	322.087
75	305.805	293.974	294.395	288.765	285.044	293.817	308.105
100	297.297	285.438	285.711	279.658	276.034	285.500	299.022

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	600.4177	604.2577	617.4371	610.1874	619.1168	602.4330
15	542.2747	545.6822	553.8600	548.8433	557.4284	544.9986
20	512.9069	515.9312	522.0700	518.0458	527.0797	516.2701
25	480.8191	483.2642	488.0202	484.8188	493.7027	484.3140
30	468.0676	470.1097	474.1601	471.4182	480.5980	471.8983
35	451.9201	453.5539	457.0907	454.7330	464.1100	456.0381
40	440.0771	441.3463	444.5154	442.4654	451.9788	444.4075
50	421.0947	421.7543	424.4531	422.8710	432.2366	425.6816
75	390.4624	390.0677	392.4791	391.4830	401.0841	395.7931
100	370.3307	369.2361	371.6964	370.9939	380.7530	376.2187

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	372.9343	773.1588	385.1516	389.5557	395.3623
15	353.8281	545.8850	362.9433	367.3367	365.7006
20	344.3264	490.8219	352.3669	356.2872	352.1192
25	331.7974	428.1967	338.5485	341.8637	337.3557
30	328.6935	411.3825	334.8646	338.1303	332.9535
35	322.3306	396.1878	327.9856	330.8331	325.7522
40	318.2837	378.9982	323.6106	326.2831	321.1174
50	311.8696	359.5865	316.3244	318.4247	313.8622
75	300.7612	331.4127	304.1310	305.7822	301.9152
100	293.2418	316.1301	295.8747	297.1892	293.9750

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	395.330	385.450	385.024	381.274	380.084	386.263	395.772
15	365.694	355.710	355.926	350.986	348.531	355.913	366.210
20	352.116	340.766	341.155	334.820	332.344	340.839	352.705
25	337.355	326.448	326.781	320.739	317.603	326.491	337.968
30	332.953	321.523	321.841	315.300	312.111	321.544	333.591
35	325.752	313.790	314.076	307.067	304.124	313.796	326.402
40	321.117	308.980	309.229	302.157	299.041	308.981	321.776
50	313.862	302.060	302.242	295.313	292.016	302.058	314.539
75	301.915	289.973	290.075	283.059	279.541	289.969	302.629
100	293.975	281.974	282.040	274.938	271.427	281.969	294.701

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	78.16	78.18	79.76	78.79	80.32	74.91	74.75	76.26	75.19	77.29
15	78.95	78.79	80.40	79.56	81.60	76.50	76.24	77.60	77.01	79.03
20	80.36	80.10	81.47	80.89	82.81	78.34	78.04	79.27	78.71	81.25
25	80.57	80.28	81.58	81.01	83.37	78.32	77.98	79.19	78.48	81.58
30	81.50	81.03	82.42	81.86	84.67	79.70	79.17	80.44	79.96	83.19
35	81.80	81.21	82.50	82.10	84.77	80.16	79.41	80.77	80.34	83.43
40	81.54	80.63	82.36	81.70	85.07	79.54	78.51	80.28	79.80	83.58
50	82.77	81.96	83.39	82.99	86.20	81.21	79.94	81.88	81.39	84.95
75	83.15	81.76	83.52	83.25	87.54	81.74	80.04	82.14	81.86	86.40
100	82.36	80.26	82.81	82.51	87.96	80.93	78.42	81.41	80.99	86.50

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	77.37	73.17	N/A	N/A	94.93	92.63
15	79.76	72.93	N/A	N/A	95.96	94.69
20	82.02	71.74	N/A	N/A	96.65	96.02
25	82.89	71.39	N/A	N/A	97.43	96.97
30	84.26	70.87	N/A	N/A	97.96	97.31
35	84.51	69.78	N/A	N/A	98.06	97.68
40	85.03	68.18	N/A	N/A	97.92	97.68
50	86.50	67.74	N/A	N/A	98.50	98.36
75	88.00	63.27	N/A	N/A	98.99	98.81
100	88.53	59.90	N/A	N/A	98.59	98.51

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	78.65	78.67	80.32	79.33	79.56	79.07
15	79.78	79.80	81.07	80.34	80.91	79.86
20	81.41	81.27	82.22	81.76	82.61	81.01
25	81.92	81.72	82.75	82.30	83.47	81.11
30	82.67	82.30	83.58	83.01	84.48	81.47
35	82.85	82.46	83.56	83.19	84.73	81.68
40	83.15	82.51	83.92	83.39	85.23	81.09
50	84.26	83.47	84.71	84.36	86.44	82.14
75	84.71	83.45	85.17	84.89	87.68	81.43
100	83.92	82.38	84.38	84.02	88.18	79.49

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	96.40	0.00%	89.21	0.00%	93.43
15	0.00%	97.29	0.00%	89.31	0.00%	94.16
20	0.00%	97.90	0.00%	88.42	0.00%	94.57
25	0.00%	98.46	0.00%	88.36	0.00%	94.14
30	0.00%	98.50	0.00%	88.22	0.00%	94.22
35	0.00%	98.44	0.00%	86.81	0.00%	93.90
40	0.00%	98.44	0.00%	86.50	0.00%	94.08
50	0.00%	99.13	0.00%	86.61	0.00%	94.67
75	0.00%	99.47	0.00%	84.97	0.00%	94.55
100	0.00%	99.49	0.00%	82.69	0.00%	94.30

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	75.60	74.81	75.09	74.44	74.04	74.77	75.58	77.01
15	78.57	77.27	77.50	77.01	76.26	77.25	78.50	79.23
20	81.11	79.27	79.50	78.61	77.74	79.23	81.11	81.74
25	81.94	79.62	79.70	78.65	77.50	79.50	81.92	82.50
30	83.50	80.99	81.13	79.96	78.53	80.89	83.41	84.08
35	83.86	81.35	81.54	80.12	78.36	81.23	83.80	84.46
40	84.42	81.05	81.60	79.41	77.13	81.05	84.24	84.97
50	85.92	82.65	82.89	80.67	78.53	82.42	85.78	86.12
75	87.27	83.09	83.29	80.50	77.21	82.87	87.23	87.78
100	87.82	82.20	82.44	78.97	74.91	82.12	87.84	88.50

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.47	85.82	86.04	86.20	85.03	85.86	87.19	87.17
15	88.83	87.03	87.35	86.75	85.80	87.03	88.48	88.55
20	89.39	87.84	87.82	86.97	85.98	87.70	88.81	89.09
25	90.16	88.22	88.46	87.19	85.82	88.10	90.06	90.10
30	90.57	88.18	88.44	87.50	85.62	88.30	90.55	90.71
35	90.71	88.08	88.61	87.05	85.17	88.22	90.55	90.83
40	90.40	88.22	88.59	86.93	84.71	87.98	90.30	90.63
50	91.80	89.03	89.05	87.92	85.11	88.95	91.62	91.82
75	92.26	88.63	88.95	86.16	83.68	88.63	92.08	92.36
100	92.30	87.98	87.82	84.89	81.23	87.74	92.16	92.61

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	76.87	76.57	76.63	76.26	76.32	76.04	76.93	79.50
15	79.68	78.50	78.93	78.36	78.04	78.38	79.86	81.64
20	82.04	80.65	80.61	80.32	79.90	80.30	82.02	83.29
25	83.01	81.31	81.60	80.61	79.68	80.89	83.09	84.28
30	84.44	82.48	82.71	81.60	80.50	82.24	84.51	85.37
35	84.95	82.51	82.69	81.80	80.71	82.53	84.99	85.66
40	85.41	82.73	82.87	81.45	79.80	82.83	85.52	85.94
50	86.69	84.00	84.06	82.44	80.83	83.82	86.77	87.54
75	88.26	84.14	84.44	82.10	79.62	84.36	88.10	88.83
100	88.59	83.52	83.64	80.83	76.99	83.60	88.69	89.29

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	77.45	76.36	76.63	75.62	77.37	75.70	77.23	82.44
15	80.57	78.06	78.38	78.32	78.53	78.08	80.46	83.94
20	82.75	80.30	80.53	80.04	79.60	80.14	82.59	84.99
25	83.66	80.83	81.09	80.44	79.86	80.50	83.80	85.90
30	84.71	82.16	82.20	81.49	80.83	81.80	84.71	86.55
35	85.33	81.98	82.61	81.43	80.75	82.26	85.11	86.93
40	85.72	82.46	82.69	81.09	79.62	82.28	85.66	86.91
50	87.43	83.70	83.96	82.63	80.57	83.45	87.41	88.61
75	88.65	84.06	84.40	82.46	79.15	83.94	88.61	89.23
100	88.85	83.41	83.78	81.07	77.29	83.70	88.89	89.80

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	95.03	95.09	95.58	95.43	95.58	94.99
15	97.11	97.15	97.50	97.41	97.58	97.15
20	97.88	97.96	98.04	98.00	98.10	97.92
25	98.06	98.20	98.40	98.22	98.42	98.14
30	98.69	98.73	98.75	98.75	98.85	98.73
35	98.46	98.53	98.65	98.55	98.91	98.55
40	98.73	98.77	98.87	98.81	98.99	98.85
50	99.11	99.11	99.13	99.13	99.27	99.15
75	99.52	99.52	99.56	99.52	99.70	99.60
100	99.50	99.50	99.58	99.56	99.74	99.62

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	79.56	78.23	77.84	77.70	77.29	78.48	79.60	79.62
15	80.91	79.31	79.21	78.57	77.60	79.31	80.91	81.13
20	82.61	80.69	80.61	79.64	78.18	80.75	82.61	82.81
25	83.47	81.13	81.15	79.52	77.92	81.17	83.47	83.62
30	84.48	81.76	81.80	80.44	78.34	81.80	84.48	84.91
35	84.73	81.94	81.94	80.28	78.14	81.96	84.73	85.01
40	85.23	81.76	81.80	79.50	76.95	81.82	85.23	85.60
50	86.44	83.01	83.03	80.40	77.82	83.03	86.44	86.81
75	87.68	83.17	83.17	80.04	76.42	83.17	87.68	88.18
100	88.18	82.28	82.34	78.55	73.96	82.28	88.18	88.61

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.00
Population Mean: 244.6919323
Number of Test Runs: 5050
Detection Limit: 30.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 244.205449
Distribution Check: Average of stdvs: 303.124382
Average of NDs per 100 observations: 5.500200

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	30.000000	0.567327	2828	1680	449	85	8	0	0	0	0	0
15	30.000000	0.824752	2172	1871	779	183	38	7	0	0	0	0
20	30.000000	1.098218	1638	1902	1037	355	92	21	3	2	0	0
25	30.000000	1.366931	1229	1826	1202	561	186	34	9	2	1	0
30	30.000000	1.666535	894	1646	1313	788	295	89	21	3	1	0
35	30.000000	1.937426	684	1409	1414	915	414	154	49	9	1	0
40	30.000000	2.227723	510	1238	1347	1017	563	271	75	23	5	1
50	30.000000	2.723564	313	878	1249	1156	761	425	176	66	15	7
75	30.000000	4.124554	56	336	689	961	983	868	564	322	178	47
100	30.000000	5.530099	14	94	277	568	797	912	789	631	452	257

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	1	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0
50	4	0	0	0	0	0	0	0	0	0	0	0	0
75	32	13	1	0	0	0	0	0	0	0	0	0	0
100	150	74	27	5	1	2	0	0	0	0	0	0	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	0	0	0	0	0	0
15	0	0	0	0	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 5. Ln(5,1.5) Detection Limit Fixed at 30 (Censoring Level = 14.33%)

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n	Kaplan-Meier	Winsor	Adjusted Known Gamma	Approximate Known Gamma	Adjusted Est. Gamma	Approximate Est. Gamma
10	848.6022	608.5350	N/A	N/A	3743.1145	2551.9741
15	786.6629	N/A	N/A	N/A	2135.4189	1753.9560
20	779.7445	448.4238	N/A	N/A	1586.7741	1434.0335
25	754.5717	421.7231	N/A	N/A	1334.1272	1238.6300
30	715.5403	395.9143	N/A	N/A	1151.9389	1089.9705
35	718.7856	384.5714	N/A	N/A	1075.8107	1032.3699
40	708.8337	373.4336	N/A	N/A	1000.7424	971.3593
50	684.5414	357.2758	N/A	N/A	899.1107	880.8691
75	651.2404	335.0624	N/A	N/A	775.2414	767.1097
100	634.5450	324.2829	N/A	N/A	717.8652	713.1124

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	835.8845	833.1144	888.7457	854.0021	937.4525
15	741.2642	729.7563	773.9882	751.1412	840.7315
20	715.7463	696.0035	739.6826	722.3241	819.2311
25	681.9943	657.0539	700.0804	686.5861	785.1016
30	639.5044	611.6897	653.4608	642.7318	740.3131
35	633.7454	600.2303	645.7786	636.2695	741.4197
40	619.4889	582.3790	629.7263	621.4756	728.5822
50	589.7948	547.6916	597.5236	591.0655	700.5312
75	547.9377	497.4543	552.6527	548.4580	662.1697
100	524.0659	466.8465	527.4559	524.3010	643.2039

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	739.5013	727.7850	782.5941	749.2048	838.6698
15	673.3363	654.4084	701.3417	679.3773	773.0215
20	658.0486	631.4199	679.0279	662.2854	762.4807
25	633.1514	602.2583	649.2456	636.1924	737.3511
30	597.8095	564.8788	610.3544	599.9495	699.7090
35	594.1612	555.6084	605.0570	595.8157	703.0038
40	582.9734	541.2412	592.3014	584.2694	693.1964
50	558.2364	512.0726	565.3438	559.0399	670.0005
75	523.3849	469.7616	527.7836	523.6713	638.4217
100	503.0736	443.3355	506.2630	503.1619	622.8875

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	839.5454	834.9341	889.9891	858.1333	885.2973	837.9828
15	750.1018	737.2480	782.8859	761.0356	804.6999	732.1717
20	726.7318	703.3498	751.3801	733.3840	791.5593	700.4221
25	694.2619	664.8358	712.9973	699.0902	762.4385	662.3313
30	650.5597	621.1034	665.3706	654.1986	720.8086	615.8665
35	644.5963	606.9305	657.1244	647.1818	722.7396	605.8000
40	630.9859	589.5131	641.8099	633.0666	711.7759	589.9611
50	600.5702	551.4507	608.7377	601.3618	686.0362	557.0436
75	557.9171	504.7748	562.7487	558.5629	651.1206	510.7408
100	533.0276	476.1088	536.4798	533.3480	633.7523	484.0887

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	61544.3710	0.00%	2984.9365	0.00%	358435.1992
15	0.00%	7839.1316	0.00%	1231.0110	0.00%	4248.0237
20	0.00%	3596.0558	0.00%	884.5459	0.00%	2049.8332
25	0.00%	2563.1820	0.00%	753.9722	0.00%	1513.5125
30	0.00%	1982.7869	0.00%	665.8454	0.00%	1241.0826
35	0.00%	1763.0775	0.00%	634.0249	0.00%	1137.8966
40	0.00%	1574.3236	0.00%	600.0859	0.00%	1032.0179
50	0.00%	1332.2322	0.00%	553.9262	0.00%	908.4562
75	0.00%	1082.0640	0.00%	499.0304	0.00%	767.0410
100	0.00%	971.8402	0.00%	474.1528	0.00%	706.9489

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	820.948	1161.571	807.131	718.892	701.127	737.077	849.523
15	770.036	678.042	689.447	642.212	622.411	673.197	784.011
20	767.040	659.637	668.205	612.673	597.096	656.140	777.114
25	744.582	632.010	639.016	579.302	567.181	628.859	751.934
30	707.684	594.796	600.766	541.548	530.509	592.387	713.444
35	711.825	586.701	592.204	525.735	517.914	584.326	716.736
40	702.600	573.703	578.551	508.547	504.741	571.774	707.149
50	679.177	545.697	549.373	476.766	477.322	543.821	683.163
75	647.175	506.605	509.373	434.088	440.127	505.567	650.212
100	631.256	483.512	485.521	409.612	417.758	482.751	633.689

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	4446.302	3342.557	3548.337	2916.254	2859.808	3268.076	4737.605
15	2331.386	1621.645	1695.648	1321.436	1315.488	1589.875	2352.636
20	2453.839	1644.370	1696.525	1273.156	1357.251	1609.103	2442.533
25	1971.515	1309.275	1340.645	961.531	1054.443	1288.510	1974.149
30	1547.494	1002.460	1027.313	736.283	813.237	997.765	1555.293
35	1421.099	905.297	924.097	666.447	728.811	897.636	1427.863
40	1377.672	855.002	870.539	612.971	693.677	846.726	1376.113
50	1216.103	729.753	740.819	531.366	601.747	723.881	1217.979
75	1007.567	613.018	618.917	455.713	519.510	609.548	1007.290
100	908.644	543.684	546.644	423.630	466.115	541.521	910.800

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	875.029	821.018	831.330	809.588	811.558	814.519	910.410
15	809.712	736.505	743.607	718.718	707.374	733.406	830.321
20	805.563	714.785	721.826	688.589	672.273	712.228	819.894
25	778.534	680.215	686.549	648.284	630.553	678.516	789.787
30	736.021	636.125	641.877	600.424	583.344	634.049	745.305
35	739.096	627.696	632.806	584.876	568.360	625.361	746.958
40	728.790	612.142	616.660	564.644	549.879	610.638	735.348
50	702.297	579.834	583.563	526.037	514.675	578.000	708.009
75	665.423	533.360	535.923	470.359	465.062	532.644	669.332
100	646.744	506.492	508.413	437.838	437.437	505.723	650.266

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	889.135	834.536	836.905	817.581	844.524	822.270	996.034
15	822.155	738.280	742.638	739.010	736.658	735.382	878.808
20	818.432	717.051	718.783	711.186	696.656	712.980	858.029
25	791.516	678.389	682.307	673.321	654.445	674.069	821.129
30	748.134	632.592	637.667	626.471	598.605	631.366	770.443
35	751.833	628.134	632.088	616.889	583.274	625.720	771.485
40	741.654	612.499	617.468	600.746	563.196	611.720	756.481
50	713.187	581.071	583.951	560.244	523.507	580.061	725.264
75	674.217	539.177	540.580	509.278	469.697	538.094	682.614
100	654.670	516.202	516.680	472.882	440.726	514.813	660.456

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	1464.0912	1483.9510	1565.3013	1515.1986	1602.2277	1484.8429
15	1308.6243	1321.2868	1375.7079	1342.1341	1430.8614	1331.6343
20	1269.3275	1266.9471	1320.0531	1291.3678	1392.2735	1301.9910
25	1202.0535	1190.4055	1240.0684	1218.6690	1317.2927	1235.9490
30	1110.4973	1102.1015	1140.6842	1123.6278	1223.0619	1149.9796
35	1097.5283	1073.5427	1122.6491	1107.3514	1215.6503	1143.8478
40	1068.3363	1038.6101	1090.0942	1076.6233	1184.8087	1116.8896
50	1001.8249	955.8956	1018.1089	1006.3211	1118.5071	1057.1160
75	903.2085	857.3281	912.2629	906.6551	1021.2841	970.0809
100	844.2137	794.5012	850.5141	846.4185	967.7568	922.1044

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	821.5994	4388.0762	875.4608	887.3895	885.3182
15	770.1867	2285.2540	810.0304	822.4104	804.7028
20	767.0956	2405.9773	805.3162	818.4230	791.5593
25	744.7964	1931.8758	778.5390	791.9456	762.4385
30	707.8196	1529.4682	736.0333	748.6452	720.8086
35	711.5587	1395.7819	739.5840	751.9078	722.7396
40	702.6279	1354.1008	728.6954	740.0156	711.7759
50	679.2939	1199.5961	702.3550	713.8401	686.0362
75	647.2379	997.7114	665.7267	674.6124	651.1206
100	631.0054	903.7684	646.7943	654.5478	633.7523

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	885.297	776.278	770.267	729.380	750.726	2608.256	886.399
15	804.700	680.422	679.119	625.894	638.271	683.108	806.066
20	791.559	648.296	648.492	584.046	599.920	649.486	793.101
25	762.438	614.701	615.363	547.853	562.069	615.239	764.099
30	720.809	577.695	578.178	513.349	522.662	578.045	722.495
35	722.740	566.077	566.518	498.230	509.115	566.335	724.531
40	711.776	551.056	551.529	481.723	493.553	551.208	713.563
50	686.036	522.565	522.951	454.532	464.575	522.645	687.918
75	651.121	486.067	486.299	419.184	427.001	486.103	653.060
100	633.752	465.106	465.221	399.310	405.405	465.150	635.738

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	64.69	64.73	68.16	66.28	70.44	58.14	57.62	61.43	58.83	65.25
15	67.25	66.69	69.64	68.04	73.45	61.23	60.02	64.28	61.62	69.45
20	66.46	65.54	68.42	67.01	74.57	61.52	59.54	63.37	61.84	70.36
25	67.92	66.14	69.54	68.42	75.68	62.67	59.78	64.59	62.99	72.59
30	66.02	63.54	67.45	66.36	75.41	60.87	56.79	62.57	61.09	72.06
35	66.71	63.49	68.16	67.11	77.35	61.56	57.52	63.17	61.84	73.88
40	66.53	62.53	67.74	66.87	77.78	61.68	56.22	62.83	61.78	74.97
50	65.78	59.62	66.69	65.90	79.76	60.04	53.13	61.68	60.20	76.57
75	63.35	53.05	64.22	63.43	81.23	57.76	45.68	58.85	57.76	78.69
100	60.79	46.10	61.62	60.83	82.83	55.23	38.75	56.30	55.29	80.06

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	65.13	48.06	N/A	N/A	95.70	94.10
15	69.68	41.33	N/A	N/A	97.52	96.50
20	71.23	36.24	N/A	N/A	98.04	97.07
25	73.19	33.19	N/A	N/A	98.06	97.31
30	73.01	28.12	N/A	N/A	98.04	97.27
35	74.99	24.75	N/A	N/A	97.70	96.91
40	75.98	22.71	N/A	N/A	97.70	97.21
50	77.72	17.98	N/A	N/A	97.29	96.71
75	79.70	9.82	N/A	N/A	96.16	95.72
100	81.21	5.52	N/A	N/A	95.84	95.68

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	64.24	64.21	67.68	65.33	66.77	64.24
15	67.21	66.52	69.49	68.01	70.71	65.60
20	66.68	65.66	69.17	67.42	71.86	64.51
25	68.43	66.72	70.03	68.88	73.52	64.53
30	66.87	64.27	68.26	67.15	73.27	61.94
35	67.45	64.57	68.97	67.63	75.09	61.84
40	67.52	63.43	68.79	67.70	76.00	60.71
50	66.75	61.09	68.12	67.00	77.66	57.80
75	65.13	55.15	66.08	65.25	79.49	51.47
100	62.84	49.07	63.85	62.90	80.93	46.61

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	97.92	0.00%	79.80	0.00%	92.14
15	0.00%	98.24	0.00%	78.57	0.00%	92.36
20	0.00%	98.73	0.00%	75.45	0.00%	92.97
25	0.00%	99.09	0.00%	74.12	0.00%	92.93
30	0.00%	99.05	0.00%	70.85	0.00%	92.42
35	0.00%	99.11	0.00%	70.55	0.00%	92.93
40	0.00%	99.29	0.00%	68.48	0.00%	93.03
50	0.00%	99.33	0.00%	64.63	0.00%	93.49
75	0.00%	99.56	0.00%	57.49	0.00%	92.77
100	0.00%	99.60	0.00%	51.29	0.00%	93.25

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	62.97	58.59	59.64	56.83	54.93	57.58	62.81	64.99
15	68.44	61.86	62.77	59.17	56.12	61.41	68.30	69.39
20	69.78	62.12	62.97	57.72	54.55	61.68	70.06	70.99
25	72.42	62.93	63.78	57.54	53.66	62.79	72.28	72.97
30	71.98	60.67	61.62	54.12	50.50	60.71	72.00	72.65
35	73.90	61.41	62.06	53.33	49.90	61.31	74.02	74.75
40	74.97	61.15	61.70	51.23	48.10	60.89	75.09	75.52
50	77.03	59.11	59.76	47.07	44.46	58.89	76.91	77.50
75	79.13	55.29	55.98	36.77	36.32	55.07	79.15	79.64
100	80.46	51.35	51.60	28.83	29.58	51.23	80.55	81.07

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.06	73.05	74.42	71.33	65.31	72.34	79.49	80.51
15	82.73	75.39	76.40	71.45	64.75	74.77	82.08	82.67
20	83.88	74.73	75.74	68.61	63.15	74.00	83.54	84.12
25	84.77	75.15	76.20	67.01	61.76	74.99	84.32	84.85
30	84.04	73.09	73.39	62.85	58.81	72.46	83.68	84.26
35	85.52	73.33	73.82	61.13	57.52	72.99	85.13	85.80
40	85.92	73.11	73.88	58.18	55.52	72.73	85.56	85.90
50	87.23	71.66	72.14	52.79	52.83	71.11	86.69	87.33
75	87.25	66.48	67.25	41.01	44.04	66.12	87.07	87.50
100	88.67	61.76	62.57	31.74	37.37	61.58	88.12	88.55

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	65.09	62.81	63.52	61.70	62.65	62.00	65.07	68.16
15	70.02	65.66	66.32	64.87	63.58	65.52	69.76	71.82
20	71.66	65.49	66.04	63.90	62.42	65.23	71.58	72.99
25	73.74	66.69	67.50	64.32	61.47	66.30	73.92	75.05
30	73.58	64.99	65.60	61.07	57.56	64.59	73.70	74.63
35	75.58	65.47	65.76	60.85	57.07	65.31	75.82	76.65
40	76.57	64.83	65.50	59.39	55.41	64.61	76.50	77.50
50	78.63	63.39	63.80	55.47	51.13	63.25	78.51	79.50
75	80.48	60.40	60.69	45.66	41.82	59.90	80.61	81.01
100	81.90	56.32	56.97	36.48	34.65	56.40	81.98	82.89

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	65.74	63.60	63.35	62.61	65.37	62.75	66.02	71.76
15	70.69	65.43	65.70	65.19	66.46	65.01	70.59	74.42
20	72.44	65.05	65.23	64.75	64.30	64.53	72.24	75.23
25	74.81	65.70	66.26	65.07	63.98	65.74	74.38	76.99
30	74.24	64.14	64.30	62.26	59.64	63.41	74.16	76.44
35	76.08	64.81	65.41	63.09	59.31	64.46	76.75	78.40
40	77.27	63.98	65.03	61.78	57.35	64.06	77.31	78.97
50	79.49	62.91	63.43	59.27	52.28	62.65	79.29	80.65
75	81.19	60.32	60.71	51.78	42.71	59.84	81.39	82.18
100	82.59	57.13	57.58	44.81	34.99	56.48	82.57	83.58

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	86.29	86.59	88.43	87.29	88.67	86.10
15	89.57	89.91	90.77	90.22	91.54	89.70
20	91.67	91.91	92.52	92.18	93.49	91.84
25	92.66	92.91	93.46	93.09	94.61	93.05
30	93.17	93.28	93.69	93.37	95.25	93.54
35	93.95	94.06	94.47	94.24	95.82	94.55
40	94.69	94.80	95.07	94.92	96.53	95.41
50	95.16	95.19	95.50	95.34	97.13	95.90
75	95.94	95.64	96.19	96.05	97.72	96.99
100	96.13	95.72	96.31	96.19	98.65	98.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	66.77	61.58	60.34	59.49	60.04	62.67	66.77	66.97
15	70.71	62.83	62.42	58.61	59.05	63.45	70.71	70.89
20	71.86	62.02	61.68	55.43	55.72	62.32	71.86	72.08
25	73.52	62.16	62.02	54.50	53.43	62.51	73.52	73.82
30	73.27	59.21	59.19	50.75	49.47	59.29	73.27	73.49
35	75.09	59.70	59.52	49.11	48.81	59.82	75.09	75.47
40	76.00	58.91	58.93	46.81	46.06	59.01	76.00	76.26
50	77.66	56.14	56.18	42.02	41.98	56.18	77.66	78.16
75	79.49	51.01	51.01	32.18	32.53	51.01	79.49	79.86
100	80.93	46.55	46.65	24.73	26.24	46.57	80.93	81.41

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Detection Limit: 30.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 454.972415
Distribution Check: Average of stdvs: 1048.064636
Average of NDs per 100 observations: 14.307200

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	30.000000	1.427327	1056	1809	1404	577	160	44	0	0	0	0
15	30.000000	2.150693	491	1273	1407	1088	532	190	54	12	3	0
20	30.000000	2.873465	249	759	1212	1146	936	452	211	63	19	3
25	30.000000	3.594059	94	452	892	1127	1014	780	409	182	64	24
30	30.000000	4.315050	43	261	554	960	1021	900	663	385	141	77
35	30.000000	5.021782	21	138	385	684	896	943	827	539	342	173
40	30.000000	5.740000	11	66	215	491	739	927	849	678	503	317
50	30.000000	7.164554	3	21	62	190	407	607	796	798	746	579
75	30.000000	10.789703	0	2	3	14	36	118	181	325	463	599
100	30.000000	14.352871	0	0	0	1	3	9	14	60	106	178

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	11	1	0	0	0	0	0	0	0	0	0	0	0
30	33	10	2	0	0	0	0	0	0	0	0	0	0
35	70	18	10	2	1	1	0	0	0	0	0	0	0
40	155	60	19	14	1	4	1	0	0	0	0	0	0
50	398	214	120	62	31	10	5	0	1	0	0	0	0
75	657	673	567	486	352	251	147	106	40	20	5	5	0
100	305	409	508	547	541	556	475	404	310	248	152	224	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	30	60	9	54	0	0	0	44
15	24	65	12	29	0	0	0	15
20	20	68	12	23	0	0	0	0
25	8	68	5	11	0	0	0	0
30	12	63	9	12	0	0	0	0
35	9	82	7	12	0	0	0	0
40	7	87	4	9	0	0	0	0
50	6	97	3	7	0	0	0	0
75	6	98	6	6	0	0	0	0
100	10	116	10	10	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	30	60	9	54	0	0
15	24	65	12	29	0	0
20	20	68	12	23	0	0
25	8	68	5	11	0	0
30	12	63	9	12	0	0
35	9	82	7	12	0	0
40	7	87	4	9	0	0
50	6	97	3	7	0	0
75	6	98	6	6	0	0
100	10	116	10	10	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	9	0	9	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 6a. Ln(5,1.5) 10% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	837.8517	651.7450	N/A	N/A	3032.3440	2142.3679
15	780.1076	545.4761	N/A	N/A	1781.9159	1496.0117
20	765.7297	501.0027	N/A	N/A	1355.1334	1240.4449
25	745.3503	475.1706	N/A	N/A	1163.9070	1090.7508
30	744.4545	458.1640	N/A	N/A	1065.9856	1015.4949
35	715.9368	436.5274	N/A	N/A	973.6564	939.0452
40	707.0694	428.0073	N/A	N/A	914.4392	890.9219
50	686.9372	404.1236	N/A	N/A	833.2408	818.3919
75	657.8369	380.0837	N/A	N/A	736.9200	730.1065
100	632.7425	365.6857	N/A	N/A	681.9955	678.0164

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	826.6373	823.9291	864.6581	840.7434	897.3212
15	742.8001	733.3061	767.4455	751.2672	811.7938
20	716.4814	701.5616	734.9231	722.6113	785.1491
25	689.8073	671.0162	703.9506	694.2490	758.2647
30	681.9726	658.2963	693.8880	685.5212	754.1763
35	651.6835	626.2773	661.4170	654.3981	723.7957
40	640.7622	612.8405	649.0610	642.9973	712.6977
50	616.1444	583.7561	622.5395	617.6987	690.3232
75	580.5786	540.6056	584.5354	581.3394	658.8150
100	553.3985	509.6999	556.1687	553.8302	632.5442

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	750.6475	741.5256	782.0017	759.1757	819.4680
15	689.3778	674.5629	710.6780	695.1727	758.2960
20	673.2621	653.8116	689.6033	677.7514	742.2807
25	652.9705	630.2281	665.6837	656.3090	721.9587
30	648.1089	620.6474	658.9278	650.8178	720.9588
35	621.7914	593.0522	630.6915	623.8722	694.5475
40	613.5619	582.5925	621.1999	615.2970	686.1237
50	592.2985	557.2019	598.2353	593.5085	667.0860
75	561.9061	519.8012	565.6284	562.4930	640.6569
100	537.9920	492.5604	540.6189	538.3183	617.5589

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	844.2798	839.0810	882.7279	859.5273	876.9614	845.5178
15	760.4625	750.0122	785.7110	769.9081	800.3193	751.5859
20	735.8421	719.9851	755.0378	742.5712	778.9886	720.6269
25	708.3607	690.5191	723.4317	713.4261	754.7012	689.5906
30	701.0593	675.9604	713.5684	705.1409	751.6489	678.4699
35	669.6210	645.3795	679.8800	672.7649	721.2378	643.7056
40	658.4355	630.4840	667.2001	661.0404	711.2974	631.5067
50	633.0064	600.3199	639.7520	634.8353	689.7323	603.4883
75	595.5586	554.3151	599.7196	596.4771	658.9247	562.6520
100	566.8927	522.6193	569.7988	567.4293	633.0700	532.6181

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	47430.5247	0.00%	3812.8775	0.00%	49581.9000
15	0.00%	5893.9108	0.00%	1376.5248	0.00%	3652.9068
20	0.00%	3018.6840	0.00%	1008.1532	0.00%	1923.5681
25	0.00%	2181.4914	0.00%	846.3962	0.00%	1474.3417
30	0.00%	1792.4759	0.00%	765.7117	0.00%	1258.7297
35	0.00%	1570.1811	0.00%	700.9089	0.00%	1124.4762
40	0.00%	1410.7650	0.00%	665.2553	0.00%	1027.5241
50	0.00%	1190.3121	0.00%	601.7632	0.00%	895.5978
75	0.00%	988.1961	0.00%	540.1002	0.00%	769.9442
100	0.00%	886.3107	0.00%	506.0789	0.00%	703.0824

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	812.883	794.432	771.649	741.059	729.227	755.813	838.723
15	765.462	750.783	916.200	673.456	662.977	698.799	778.025
20	755.313	685.050	691.551	650.869	643.066	682.771	763.475
25	737.168	663.162	668.346	624.499	618.756	661.143	742.860
30	737.566	654.846	659.677	609.153	608.659	653.014	742.544
35	710.132	626.488	630.915	580.066	578.483	625.175	714.244
40	702.063	616.747	620.320	567.092	568.775	615.306	705.634
50	682.832	592.103	595.210	537.729	543.328	591.190	685.545
75	654.991	556.134	558.259	494.238	506.716	555.271	657.060
100	630.474	529.819	531.422	466.216	481.225	529.147	632.017

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	5214.849	4211.727	4424.862	3849.005	3816.694	4152.177	5435.783
15	2606.259	1971.039	2033.669	1670.425	1700.304	1950.251	2614.873
20	2149.079	1647.029	1695.848	1368.744	1449.545	1647.709	2149.153
25	1888.451	1454.289	1502.424	1187.351	1281.905	1449.964	1896.821
30	1747.422	1306.011	1324.775	1009.885	1141.805	1296.729	1744.775
35	1431.298	1091.119	1112.286	858.522	956.035	1094.254	1436.845
40	1313.255	989.515	1003.828	774.936	871.389	989.009	1310.272
50	1215.025	904.595	913.182	689.575	801.713	897.395	1216.129
75	1062.382	744.079	749.242	556.132	677.541	741.833	1062.649
100	907.449	651.728	654.906	499.238	594.439	650.318	907.908

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	867.251	826.865	834.488	817.662	816.886	821.575	897.873
15	806.746	753.479	759.746	739.240	729.740	750.440	824.818
20	792.231	730.790	736.705	711.471	698.446	729.653	804.140
25	770.072	704.041	709.018	678.634	667.386	702.228	778.893
30	769.135	695.278	700.323	664.108	653.049	693.810	777.159
35	737.334	661.787	665.721	627.856	617.265	660.875	744.024
40	727.944	649.743	653.757	612.457	603.432	649.114	733.415
50	705.751	622.139	625.313	579.232	573.692	621.567	710.457
75	673.683	581.178	583.089	527.861	528.990	580.506	676.632
100	645.900	550.913	552.316	493.288	499.363	550.253	648.313

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	879.182	832.441	839.245	817.231	836.816	825.014	982.106
15	818.897	752.585	759.361	743.763	740.581	750.262	872.594
20	805.399	731.266	736.931	713.900	704.935	729.147	843.632
25	781.891	703.713	707.809	688.158	669.701	700.546	810.777
30	782.816	693.608	698.141	674.249	651.168	692.068	803.368
35	750.286	659.895	663.120	642.008	615.519	658.041	766.953
40	739.583	647.303	650.540	624.995	598.465	645.491	754.951
50	717.478	619.901	623.272	597.683	568.963	618.731	728.655
75	682.812	580.510	581.212	551.497	523.502	578.848	689.720
100	654.244	550.755	552.288	515.923	494.113	551.153	658.190

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	1453.8237	1466.5987	1531.0468	1495.6438	1549.7035	1469.7097
15	1305.9905	1317.1252	1357.9093	1333.5859	1394.9074	1327.4141
20	1252.6684	1258.0659	1292.3237	1272.9788	1335.1779	1275.6987
25	1193.8195	1200.7534	1225.1082	1209.5420	1274.6091	1220.8278
30	1175.6802	1171.5790	1201.4429	1188.6629	1257.1019	1205.3218
35	1109.6934	1110.0845	1130.5625	1120.0083	1187.9076	1139.4966
40	1081.0162	1074.2548	1098.7672	1089.6859	1157.8772	1112.6611
50	1027.3140	1014.5082	1040.7944	1033.6748	1104.9465	1063.4190
75	938.1807	911.1174	946.2507	941.7192	1018.0757	982.5793
100	870.6455	839.5986	876.1446	872.9167	950.6641	919.7359

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	813.4917	5151.3106	867.1717	877.4882	876.9700
15	765.4277	2571.8547	806.7691	818.9678	800.3193
20	755.1142	2131.5162	792.0854	804.5123	778.9886
25	737.5317	1887.3431	769.9145	782.6546	754.7012
30	737.8092	1727.1278	769.5997	781.4477	751.6489
35	710.4364	1412.0920	737.7570	749.8820	721.2378
40	702.1615	1300.9912	727.4531	740.3745	711.2974
50	683.0638	1206.3324	706.4876	716.5683	689.7323
75	655.0362	1053.2370	673.7692	682.7869	658.9247
100	630.3516	902.8850	646.0903	653.9521	633.0700

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	876.961	795.682	796.031	757.947	770.269	1269.619	877.453
15	800.319	708.451	710.305	662.393	672.667	709.147	800.957
20	778.989	681.744	684.102	628.455	640.384	681.793	779.705
25	754.701	655.014	656.982	599.107	611.178	654.902	755.506
30	751.649	640.993	642.892	577.358	596.180	640.749	752.508
35	721.238	613.528	614.962	552.166	565.985	613.336	722.136
40	711.297	601.838	603.160	538.438	554.712	601.612	712.188
50	689.732	575.900	576.953	509.917	529.036	575.699	690.676
75	658.925	539.100	539.757	471.791	493.129	538.953	659.899
100	633.070	514.456	514.904	448.319	469.314	514.352	634.074

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	63.74	63.64	66.14	64.53	67.60	58.32	57.90	61.19	59.07	63.31
15	65.45	65.01	67.19	65.98	70.20	61.60	60.79	63.39	62.06	66.99
20	68.36	67.43	69.74	68.83	73.39	64.63	63.15	65.98	64.95	70.14
25	67.39	66.16	68.81	67.88	74.36	64.02	62.00	64.99	64.40	70.91
30	68.77	66.99	69.94	69.21	75.49	65.47	63.07	66.50	65.74	72.91
35	69.35	67.23	70.50	69.68	76.10	66.14	63.03	67.17	66.28	73.62
40	68.61	65.96	69.56	68.89	76.04	65.17	62.18	66.42	65.41	73.78
50	68.75	64.59	69.56	68.89	77.72	65.05	60.14	66.04	65.21	75.64
75	69.39	62.40	70.00	69.49	80.02	65.52	58.02	66.38	65.68	77.84
100	67.52	58.44	68.16	67.68	80.95	63.88	53.82	64.42	63.94	79.13

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	63.86	50.83	N/A	N/A	93.01	90.06
15	67.52	45.79	N/A	N/A	94.95	93.25
20	71.33	44.48	N/A	N/A	95.74	94.44
25	72.40	40.77	N/A	N/A	95.29	94.24
30	74.44	39.13	N/A	N/A	95.54	94.28
35	75.15	35.49	N/A	N/A	95.39	94.63
40	75.27	34.00	N/A	N/A	94.95	94.32
50	77.01	28.02	N/A	N/A	94.85	94.28
75	79.47	20.28	N/A	N/A	94.46	94.12
100	80.59	14.53	N/A	N/A	93.17	92.89

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	64.22	64.15	66.54	65.24	65.84	64.55
15	66.20	65.87	68.06	66.82	68.75	65.35
20	69.54	68.75	70.81	70.03	72.10	67.98
25	68.91	67.61	70.11	69.25	73.23	66.24
30	70.18	68.48	71.63	70.58	74.89	67.13
35	70.92	68.86	71.90	71.18	75.60	67.49
40	70.14	67.91	71.17	70.36	75.43	66.06
50	70.38	67.08	71.74	70.83	77.13	64.85
75	71.49	65.45	71.92	71.62	79.50	63.47
100	70.18	61.58	70.67	70.26	80.50	60.14

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	96.67	0.00%	83.52	0.00%	92.55
15	0.00%	97.11	0.00%	81.33	0.00%	92.20
20	0.00%	97.72	0.00%	80.87	0.00%	92.65
25	0.00%	97.70	0.00%	78.97	0.00%	92.99
30	0.00%	98.44	0.00%	78.14	0.00%	92.79
35	0.00%	98.40	0.00%	76.24	0.00%	93.60
40	0.00%	98.55	0.00%	75.78	0.00%	93.54
50	0.00%	98.65	0.00%	72.57	0.00%	93.68
75	0.00%	99.07	0.00%	67.76	0.00%	94.42
100	0.00%	99.25	0.00%	62.08	0.00%	93.58

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	62.16	58.97	59.86	57.56	56.61	58.34	62.38	63.62
15	66.51	62.32	62.97	60.30	58.51	62.14	66.55	67.25
20	70.34	65.66	66.22	62.93	61.15	65.33	70.42	71.11
25	71.45	64.57	65.09	61.58	59.56	64.57	71.56	71.98
30	73.54	66.20	66.79	61.80	60.00	66.10	73.66	74.24
35	74.57	67.05	67.31	61.66	59.78	66.69	74.42	74.87
40	74.73	66.16	66.67	60.50	58.36	65.98	74.51	75.07
50	76.57	65.54	66.24	57.21	55.60	65.49	76.59	76.87
75	78.87	65.58	65.54	52.85	52.79	65.35	78.83	79.29
100	80.28	62.95	63.05	46.63	48.53	62.59	80.38	80.65

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.42	76.26	77.29	75.01	71.88	76.20	79.74	80.42
15	81.15	76.81	77.60	74.28	71.19	76.59	80.87	81.11
20	84.40	79.19	79.78	76.22	72.61	79.03	83.84	84.12
25	84.06	78.67	79.41	74.02	71.23	78.36	83.96	84.18
30	84.91	79.31	79.56	73.86	71.43	79.21	84.65	84.63
35	85.11	78.59	79.19	71.96	70.50	78.57	85.05	85.33
40	85.70	78.46	78.77	70.99	69.39	78.14	85.39	85.64
50	86.95	78.28	78.32	67.43	66.75	78.10	86.79	86.89
75	87.84	76.73	76.97	60.99	63.72	76.51	87.80	88.14
100	88.55	74.48	74.67	53.88	59.35	74.08	88.48	88.69

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	64.26	62.73	63.15	61.98	62.00	62.02	64.12	66.57
15	68.00	65.11	65.41	64.26	63.82	64.87	68.24	69.70
20	72.08	68.34	68.95	67.01	65.62	68.02	72.14	73.05
25	73.54	67.66	68.32	65.56	64.02	67.68	73.27	74.40
30	75.49	69.29	69.70	66.81	64.53	69.01	75.52	76.12
35	75.82	69.66	70.10	66.61	64.12	69.68	75.98	76.65
40	76.10	69.13	69.54	65.62	62.73	68.89	76.18	76.61
50	77.74	69.09	69.35	63.13	60.20	68.97	77.96	78.48
75	80.53	68.91	69.50	59.47	57.09	68.65	80.63	80.89
100	81.58	66.77	66.99	53.76	52.61	66.81	81.72	82.38

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	64.83	62.55	62.65	62.00	63.45	61.94	64.81	70.20
15	68.97	64.51	65.29	64.57	64.83	64.61	68.75	72.36
20	72.59	67.86	68.20	66.73	66.38	67.54	72.67	75.15
25	73.82	67.09	67.37	65.76	64.02	66.91	74.12	76.36
30	75.94	68.81	68.99	66.79	64.38	68.59	76.08	77.39
35	76.71	69.27	69.54	67.07	63.86	68.99	76.48	77.78
40	76.85	68.67	68.89	65.84	62.38	68.46	76.87	78.18
50	78.55	68.46	68.42	64.50	59.15	68.44	78.42	79.80
75	81.01	68.28	68.75	61.66	55.72	68.30	81.25	82.10
100	82.14	66.57	66.77	57.27	50.93	66.24	82.48	83.09

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	85.74	86.06	87.18	86.47	87.52	85.72
15	88.24	88.47	89.24	88.71	89.84	88.32
20	91.48	91.83	92.39	92.03	93.01	91.72
25	92.37	92.64	93.07	92.75	94.08	92.71
30	93.30	93.44	93.60	93.50	94.44	93.56
35	94.32	94.50	94.77	94.51	95.88	94.75
40	95.03	95.17	95.43	95.27	96.50	95.50
50	95.78	95.79	95.96	95.84	97.03	96.26
75	96.77	96.69	96.93	96.83	98.00	97.41
100	97.19	96.93	97.25	97.21	98.42	97.92

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 21.7078220
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	65.84	62.40	61.90	60.14	60.30	62.83	65.84	65.98
15	68.75	63.19	63.09	59.94	59.76	63.50	68.75	68.85
20	72.10	66.26	66.20	61.98	61.39	66.34	72.10	72.18
25	73.23	64.55	64.57	59.66	58.99	64.57	73.23	73.41
30	74.89	65.62	65.74	59.11	59.07	65.66	74.89	74.99
35	75.60	66.04	66.22	58.10	58.08	66.02	75.60	75.72
40	75.43	65.21	65.37	56.87	56.42	65.19	75.43	75.58
50	77.13	64.16	64.26	52.30	53.03	64.20	77.13	77.37
75	79.50	63.23	63.35	47.43	49.76	63.23	79.50	79.70
100	80.50	60.28	60.30	41.05	45.21	60.26	80.50	80.77

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Detection Limit: 21.7078220
Averaged Percentage Non-detects: 10.00%
Distribution Check: Average of means: 455.114081
Distribution Check: Average of stdvs: 1042.820927
Average of NDs per 100 observations: 10.000000

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	21.707822	1.004950	1744	1960	981	315	42	8	0	0	0	0
15	21.707822	1.523960	1020	1688	1381	684	205	59	12	1	0	0
20	21.707822	1.998812	587	1385	1483	928	448	164	40	14	0	1
25	21.707822	2.485347	369	1026	1356	1098	713	323	112	46	6	0
30	21.707822	2.976238	211	718	1173	1201	914	481	224	86	30	7
35	21.707822	3.539604	128	500	928	1064	989	732	420	174	76	27
40	21.707822	4.009307	67	324	699	1006	1073	847	556	287	120	45
50	21.707822	5.021782	28	140	421	677	871	942	805	511	352	169
75	21.707822	7.540000	2	18	55	173	349	508	731	759	727	621
100	21.707822	10.039604	0	3	8	26	69	160	320	437	576	664

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	2
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	1	0	0	0	0	0	0	0	0	0	0	0	0
30	2	3	0	0	0	0	0	0	0	0	0	0	0
35	10	2	0	0	0	0	0	0	0	0	0	0	0
40	18	6	2	0	0	0	0	0	0	0	0	0	0
50	88	28	14	3	1	0	0	0	0	0	0	0	0
75	440	326	161	103	45	18	8	4	1	1	0	0	0
100	664	598	500	377	275	171	101	50	25	13	8	5	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	8	23	2	15	0	0	0	8
15	6	19	3	8	0	0	0	1
20	4	20	3	5	0	0	0	0
25	3	9	2	3	0	0	0	0
30	3	19	2	3	0	0	0	0
35	1	12	1	1	0	0	0	0
40	0	20	0	0	0	0	0	0
50	0	17	0	0	0	0	0	0
75	0	28	0	0	0	0	0	0
100	0	27	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	8	23	2	15	0	0
15	6	19	3	8	0	0
20	4	20	3	5	0	0
25	3	9	2	3	0	0
30	3	19	2	3	0	0
35	1	12	1	1	0	0
40	0	20	0	0	0	0
50	0	17	0	0	0	0
75	0	28	0	0	0	0
100	0	27	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	5	0	5	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 6b. Ln(5,1.5) 15% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	841.9375	603.1115	N/A	N/A	3816.2664	2588.6918
15	790.2635	N/A	N/A	N/A	2176.4938	1781.8752
20	786.9674	448.4714	N/A	N/A	1627.7081	1468.9564
25	751.0420	410.8137	N/A	N/A	1348.4920	1250.2857
30	751.3136	391.5752	N/A	N/A	1225.2356	1157.3905
35	715.0998	378.1595	N/A	N/A	1082.6301	1038.3187
40	715.1037	367.5182	N/A	N/A	1014.8486	984.6818
50	683.2556	351.2749	N/A	N/A	909.7417	890.9459
75	649.2722	328.8632	N/A	N/A	779.4933	771.1739
100	636.2978	317.9851	N/A	N/A	724.5238	719.6376

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	829.2620	826.4452	883.7946	847.5324	934.5649
15	742.5918	730.2755	776.6589	752.6126	847.8393
20	720.7170	700.3021	745.4461	727.3577	829.1870
25	675.3628	649.2622	694.0349	679.8902	784.7111
30	663.8551	630.8125	679.5140	667.2461	781.6560
35	628.9071	595.2936	641.0718	631.3898	738.8458
40	622.2101	583.5500	632.7733	624.2028	736.1922
50	585.6675	543.3717	593.5808	586.8815	701.1131
75	541.3762	489.2894	546.2335	541.8502	661.9034
100	520.0320	460.4081	523.5498	520.2329	646.4446

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	730.7951	718.6108	775.1978	740.3437	833.6668
15	671.0692	650.6891	700.1731	677.0384	776.6779
20	660.7941	633.1613	682.4431	664.9925	770.2988
25	624.3797	591.8892	640.9642	627.2778	734.9622
30	616.0798	577.0918	630.1233	618.2219	735.2763
35	588.6773	549.9662	599.6829	590.2737	699.8061
40	584.2490	540.6773	593.8666	585.5232	699.4271
50	553.1073	506.6149	560.3747	553.8357	669.6256
75	515.7844	460.5414	520.3101	516.0132	637.1724
100	497.9813	435.8004	501.2872	498.0272	625.1178

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	828.5090	820.5931	884.1410	846.3489	877.8976	828.1317
15	749.0924	729.4988	783.1968	760.0023	808.2930	730.8504
20	729.4621	708.4777	754.0379	736.7518	798.6601	702.9308
25	685.5284	652.7513	704.9438	689.6849	758.6211	651.9269
30	673.1297	633.9080	689.7071	676.7593	756.8064	634.6725
35	639.5701	601.4046	652.0903	642.3831	718.7640	599.1674
40	632.9350	589.8198	643.8873	635.2383	717.9342	590.7151
50	594.9901	551.4495	603.6111	596.2390	684.4761	549.0029
75	549.5639	496.8400	554.6004	550.1206	648.9178	500.9187
100	527.8417	469.2294	531.4616	528.1240	635.2987	476.5231

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	69001.7673	0.00%	2937.4510	0.00%	189961.0407
15	0.00%	7106.2736	0.00%	1116.9184	0.00%	4143.3184
20	0.00%	3762.4186	0.00%	878.5204	0.00%	2158.5225
25	0.00%	2559.6045	0.00%	732.5012	0.00%	1512.2679
30	0.00%	2105.6407	0.00%	673.8754	0.00%	1305.5925
35	0.00%	1767.8257	0.00%	622.4403	0.00%	1118.4427
40	0.00%	1586.3024	0.00%	593.5566	0.00%	1030.7712
50	0.00%	1365.2618	0.00%	548.6525	0.00%	910.5185
75	0.00%	1090.5754	0.00%	492.7277	0.00%	764.3559
100	0.00%	983.0411	0.00%	469.7113	0.00%	708.1205

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	814.294	863.714	783.358	707.585	686.555	726.326	842.304
15	772.987	673.817	685.665	635.449	616.158	668.556	787.915
20	773.799	661.018	670.724	613.601	596.318	657.830	784.381
25	741.114	620.451	628.055	565.047	552.040	617.325	748.668
30	742.359	607.519	614.953	545.153	534.966	605.193	749.351
35	707.750	581.258	586.740	519.286	510.417	578.932	713.286
40	708.533	573.340	578.629	506.033	502.015	571.468	713.465
50	677.696	540.027	544.053	472.711	468.145	538.443	681.731
75	644.985	497.291	499.984	424.948	427.910	496.100	648.298
100	632.635	476.697	478.674	401.975	407.883	475.966	635.517

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	4049.998	2941.281	3154.044	2573.336	2514.112	2859.593	4379.464
15	2922.029	1920.299	2018.031	1524.672	1557.296	1863.631	3012.462
20	2354.845	1523.854	1578.424	1164.898	1237.961	1512.578	2373.132
25	1884.673	1185.882	1221.282	872.042	936.868	1171.285	1898.281
30	2293.395	1052.448	1094.525	779.800	819.478	1025.530	2316.705
35	1554.276	999.863	1017.815	712.598	816.631	982.622	1555.306
40	1432.598	890.381	905.450	618.003	726.064	882.765	1441.322
50	1146.501	713.519	723.683	523.079	578.667	709.447	1150.094
75	1004.536	586.189	590.628	446.580	486.896	583.535	1007.257
100	917.290	531.542	534.772	444.728	447.410	529.697	918.790

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	866.954	813.064	821.318	799.539	802.044	803.600	902.689
15	815.259	736.523	744.448	718.436	706.542	733.713	836.203
20	812.285	716.744	725.587	691.370	674.858	714.765	827.095
25	774.461	670.677	677.047	638.047	620.273	667.798	785.515
30	774.521	656.670	662.174	615.306	596.876	654.147	783.830
35	735.204	621.742	626.477	578.957	561.302	620.002	743.369
40	735.829	613.599	618.375	564.179	549.003	612.016	742.706
50	700.127	573.631	577.539	519.727	506.027	572.168	705.954
75	663.393	524.664	526.946	460.075	453.635	523.483	667.273
100	648.571	500.248	502.209	430.223	427.907	499.011	652.177

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	881.410	829.013	831.457	809.692	836.132	816.769	986.765
15	828.398	739.768	742.751	737.888	735.677	738.370	887.293
20	825.336	715.139	720.541	715.868	702.315	715.812	867.955
25	787.044	671.926	675.652	663.671	643.765	669.150	818.454
30	786.163	653.442	660.323	649.752	618.548	654.804	811.489
35	747.065	620.335	624.319	611.895	581.792	620.253	766.752
40	747.399	612.145	616.842	606.173	562.307	612.931	764.839
50	710.742	575.010	578.842	560.724	519.022	574.198	724.272
75	672.505	531.600	533.699	499.525	463.133	530.730	679.800
100	656.330	512.038	513.747	465.788	434.870	512.252	662.513

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	1446.4681	1456.9755	1559.1331	1496.6640	1593.4932	1471.6803
15	1316.5427	1313.6632	1385.5432	1350.0652	1447.7445	1343.2413
20	1277.7344	1282.8940	1327.6110	1301.5956	1409.1701	1314.4400
25	1192.8346	1172.3063	1232.3977	1207.8232	1316.9931	1231.1065
30	1167.2113	1138.6068	1201.1945	1180.4719	1301.8670	1217.7007
35	1092.3532	1067.9828	1117.1657	1103.2470	1211.0298	1137.5500
40	1076.9522	1047.8080	1098.6145	1086.0655	1200.3555	1129.6055
50	994.1303	966.3005	1011.3112	999.8418	1117.3931	1053.2417
75	893.1163	848.7012	902.7967	896.2138	1020.6717	966.8515
100	840.8037	788.2996	847.6383	842.9992	973.5813	925.3166

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	814.6502	4025.0737	867.7374	879.4528	877.9471
15	773.2203	2893.0978	815.5921	826.7232	808.2889
20	774.0315	2306.2346	811.8984	825.3664	798.6601
25	740.8176	1859.6686	774.3485	787.5231	758.6211
30	742.2651	2218.6334	774.6797	788.3615	756.8064
35	707.8841	1530.2241	735.2126	747.5407	718.7640
40	708.5908	1417.0935	735.9153	747.0644	717.9342
50	677.9741	1132.6495	700.1024	710.6212	684.4761
75	645.0689	996.7764	663.4430	671.9689	648.9178
100	632.7568	910.3926	648.6266	656.4024	635.2987

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	877.898	764.942	757.586	717.774	741.564	776.910	878.988
15	808.293	672.932	671.038	614.819	633.396	676.038	809.775
20	798.660	649.594	649.403	584.279	599.814	650.965	800.294
25	758.621	602.101	602.275	534.806	549.709	602.871	760.384
30	756.806	584.939	585.087	514.091	528.956	585.521	758.701
35	718.764	560.260	560.644	492.157	501.964	560.544	720.724
40	717.934	549.421	549.905	476.725	490.862	549.582	719.871
50	684.476	518.816	519.064	450.420	457.424	518.963	686.543
75	648.918	476.812	476.932	410.989	416.032	476.907	651.053
100	635.299	458.437	458.488	392.710	396.143	458.512	637.461

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	64.31	64.32	67.46	65.45	69.72	57.24	56.75	61.02	57.92	64.97
15	66.18	65.62	68.67	66.93	73.07	60.24	59.09	62.99	60.73	68.65
20	65.68	64.57	67.94	66.12	73.60	60.26	58.20	62.48	60.73	69.82
25	65.86	64.20	67.60	66.28	74.55	60.61	57.70	62.73	60.81	71.23
30	66.93	64.75	68.99	67.39	77.58	61.54	57.74	63.74	61.80	74.26
35	65.56	62.46	66.97	65.78	77.07	60.30	55.86	61.88	60.51	73.72
40	66.63	62.28	67.88	66.81	78.77	61.23	55.33	62.40	61.43	75.50
50	65.29	59.62	66.71	65.43	79.68	60.22	51.92	61.33	60.28	76.36
75	62.36	51.78	62.99	62.40	81.17	56.81	43.64	57.70	56.85	77.90
100	59.58	43.52	60.30	59.58	83.27	53.58	35.90	54.48	53.56	80.38

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	64.61	47.88	N/A	N/A	95.58	93.92
15	68.67	40.77	N/A	N/A	97.90	97.05
20	70.36	34.51	N/A	N/A	98.40	97.47
25	71.82	30.69	N/A	N/A	98.08	97.11
30	74.97	26.59	N/A	N/A	98.26	97.35
35	74.38	24.38	N/A	N/A	97.94	97.37
40	76.34	21.33	N/A	N/A	97.90	97.49
50	77.50	16.59	N/A	N/A	97.15	96.73
75	79.37	8.42	N/A	N/A	96.59	96.28
100	81.49	4.91	N/A	N/A	96.32	96.08

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	63.75	63.64	66.97	64.86	66.08	63.64
15	65.88	65.34	68.39	66.69	69.76	64.38
20	65.93	64.96	67.99	66.55	70.69	62.93
25	66.00	64.36	68.02	66.44	72.20	62.44
30	67.78	65.19	69.57	68.23	75.21	62.36
35	66.47	63.02	67.76	66.57	74.51	60.06
40	67.54	63.06	68.80	67.71	76.30	60.34
50	66.72	60.98	67.86	66.90	77.33	57.52
75	63.76	54.03	64.74	63.80	79.07	50.26
100	61.41	46.42	62.50	61.59	81.05	44.44

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	97.84	0.00%	78.65	0.00%	91.54
15	0.00%	98.51	0.00%	76.50	0.00%	91.50
20	0.00%	98.95	0.00%	73.07	0.00%	92.42
25	0.00%	98.87	0.00%	72.65	0.00%	91.92
30	0.00%	99.09	0.00%	71.54	0.00%	93.11
35	0.00%	99.15	0.00%	68.08	0.00%	92.38
40	0.00%	99.50	0.00%	67.15	0.00%	93.33
50	0.00%	99.35	0.00%	63.41	0.00%	92.67
75	0.00%	99.68	0.00%	55.84	0.00%	93.11
100	0.00%	99.82	0.00%	49.39	0.00%	93.11

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	62.69	57.75	58.87	55.97	53.66	56.83	62.63	64.32
15	67.52	60.51	61.74	57.84	55.21	60.16	67.43	68.42
20	69.27	60.67	61.31	56.30	53.41	60.10	69.05	70.02
25	70.85	60.83	61.70	55.03	51.41	60.51	70.97	71.49
30	74.20	61.76	62.71	54.34	50.50	61.41	74.14	74.67
35	73.37	60.10	60.91	51.98	48.14	59.84	73.52	74.20
40	75.49	60.40	61.09	50.34	46.71	60.04	75.58	76.10
50	76.61	58.42	59.35	45.35	42.24	58.50	76.46	77.31
75	78.44	53.62	54.26	34.73	33.74	53.01	78.46	79.11
100	80.85	48.71	49.58	26.79	27.09	48.75	80.71	81.25

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.16	72.33	74.15	70.22	64.02	71.45	79.43	80.67
15	81.64	73.37	74.59	69.11	62.59	72.67	81.07	82.04
20	82.57	73.43	74.59	66.63	61.11	72.65	82.36	82.81
25	84.48	73.01	73.94	63.96	58.67	72.38	83.90	84.30
30	85.25	73.72	74.79	62.46	57.76	73.64	85.09	85.47
35	85.31	72.26	72.75	58.73	55.05	71.50	84.75	85.33
40	86.32	72.28	73.13	56.75	54.10	72.00	85.88	86.55
50	86.51	70.24	70.97	50.79	49.45	70.02	86.16	86.55
75	87.25	64.16	64.79	38.50	40.65	63.86	87.07	87.70
100	88.48	58.71	59.37	29.05	33.60	58.18	88.32	88.93

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	64.26	61.82	62.40	61.07	61.70	61.33	64.32	67.11
15	68.95	64.36	65.25	63.62	62.79	64.34	68.89	70.93
20	70.85	64.30	65.05	62.46	60.51	64.08	70.89	72.18
25	72.50	64.63	64.99	61.94	59.50	64.34	72.36	73.60
30	75.58	65.56	66.16	61.92	58.46	65.82	75.66	76.44
35	75.01	64.18	64.42	59.64	55.62	63.74	75.07	76.08
40	77.17	64.73	65.54	58.48	53.68	64.36	77.11	78.10
50	78.22	63.41	63.66	53.98	49.90	62.79	78.32	79.21
75	79.49	58.87	59.49	43.41	39.88	58.75	80.02	80.67
100	82.22	54.69	55.03	34.08	32.55	54.28	82.02	82.75

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	65.35	62.97	62.81	61.94	64.67	62.00	65.35	70.97
15	69.60	64.24	64.75	64.28	65.29	63.92	69.64	73.64
20	71.62	64.26	64.44	63.45	63.54	63.68	71.58	74.71
25	73.25	64.00	64.81	63.03	61.98	64.10	73.11	75.64
30	76.34	64.93	65.62	63.80	61.27	64.77	76.18	78.28
35	75.78	63.35	64.00	61.76	58.24	63.50	75.96	78.08
40	77.82	63.92	64.51	61.39	56.89	64.06	77.84	79.25
50	78.89	62.51	63.31	58.08	51.80	62.28	78.59	80.55
75	80.48	59.09	60.10	50.51	41.68	58.93	80.71	81.62
100	82.61	55.62	56.00	42.55	33.23	55.72	82.48	83.72

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	85.67	85.90	87.72	86.69	88.04	85.60
15	89.25	89.53	90.49	89.89	91.29	89.27
20	90.93	91.14	92.03	91.40	93.43	91.15
25	92.45	92.73	93.33	92.88	94.63	92.93
30	93.64	93.81	94.20	93.89	95.49	94.06
35	94.05	94.17	94.61	94.29	95.96	94.73
40	95.00	95.05	95.38	95.18	96.89	95.56
50	94.63	94.60	95.16	94.88	97.09	95.80
75	95.99	95.72	96.19	96.05	98.32	97.47
100	96.45	95.71	96.67	96.53	98.59	97.96

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3542529
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	66.08	61.22	59.54	58.46	59.39	62.12	66.08	66.28
15	69.76	62.08	61.39	57.37	57.78	62.48	69.76	69.98
20	70.69	60.02	59.62	54.20	54.55	60.26	70.69	70.87
25	72.20	59.78	59.52	51.56	51.54	60.02	72.20	72.42
30	75.21	59.92	59.86	49.78	50.06	60.08	75.21	75.43
35	74.51	58.57	58.34	47.78	46.75	58.63	74.51	74.75
40	76.30	57.98	57.92	45.58	45.21	58.02	76.30	76.63
50	77.33	55.25	55.29	40.73	39.49	55.39	77.33	77.82
75	79.07	49.11	49.13	30.08	30.20	49.11	79.07	79.45
100	81.05	43.90	43.92	23.09	23.64	43.90	81.05	81.62

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Detection Limit: 31.3542529
Averaged Percentage Non-detects: 15.00%
Distribution Check: Average of means: 457.862268
Distribution Check: Average of stdvs: 1054.492586
Average of NDs per 100 observations: 14.997200

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	31.354253	1.481188	1004	1815	1325	642	231	33	0	0	0	0
15	31.354253	2.253663	462	1156	1413	1112	588	222	82	11	4	0
20	31.354253	3.001782	200	698	1145	1210	917	549	219	90	14	8
25	31.354253	3.738614	97	396	806	1066	1088	784	483	191	96	33
30	31.354253	4.544554	48	190	488	866	1026	912	730	416	221	95
35	31.354253	5.257228	15	106	335	572	893	934	836	632	393	181
40	31.354253	5.934851	7	60	186	403	709	885	840	778	543	344
50	31.354253	7.552079	3	14	57	145	341	531	719	752	744	644
75	31.354253	11.291485	1	3	0	6	38	64	160	264	389	533
100	31.354253	15.083960	0	0	0	0	3	4	12	44	81	128

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	7
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	8	2	0	0	0	0	0	0	0	0	0	0	0
30	40	11	5	2	0	0	0	0	0	0	0	0	0
35	106	30	11	4	2	0	0	0	0	0	0	0	0
40	172	73	34	12	4	0	0	0	0	0	0	0	0
50	472	296	163	96	53	14	4	2	0	0	0	0	0
75	633	660	591	517	431	295	201	132	70	34	13	15	0
100	211	318	414	500	545	568	513	483	371	273	220	362	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	32	78	9	53	0	0	0	33
15	18	64	11	27	0	0	0	15
20	11	70	5	15	0	0	0	0
25	15	100	10	20	0	0	0	0
30	19	106	13	23	0	0	0	0
35	7	90	6	7	0	0	0	0
40	10	85	9	11	0	0	0	0
50	8	89	6	10	0	0	0	0
75	9	116	7	11	0	0	0	0
100	12	136	10	12	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	32	78	9	53	0	0
15	18	64	11	27	0	0
20	11	70	5	15	0	0
25	15	100	10	20	0	0
30	19	106	13	23	0	0
35	7	90	6	7	0	0
40	10	85	9	11	0	0
50	8	89	6	10	0	0
75	9	116	7	11	0	0
100	12	136	10	12	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	9	0	9	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 6c. Ln(5,1.5) 20% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	871.7274	575.3311	N/A	N/A	4795.8111	3140.4256
15	794.4615	440.2847	N/A	N/A	2611.5672	2089.0899
20	789.0144	399.0814	N/A	N/A	1858.7838	1658.2952
25	757.0297	368.6246	N/A	N/A	1527.3805	1403.6765
30	728.7380	349.9975	N/A	N/A	1322.6189	1241.4862
35	719.0558	338.9549	N/A	N/A	1197.8588	1142.8258
40	718.2127	327.9417	N/A	N/A	1118.4708	1080.9977
50	692.0755	314.4122	N/A	N/A	988.1243	965.2629
75	661.3207	294.1973	N/A	N/A	837.8273	827.7967
100	634.1131	283.4211	N/A	N/A	758.8999	753.1789

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	858.0363	855.1904	933.0839	880.8384	1007.2362
15	736.6088	723.0149	781.3189	747.5086	883.4812
20	707.0570	682.9420	738.2038	713.7959	855.1430
25	662.3423	632.0628	685.6363	666.6373	811.4216
30	624.4519	588.8695	642.9453	627.3098	776.6264
35	605.5911	564.5187	621.0371	607.6346	762.1032
40	595.2577	548.7067	608.6983	596.7683	758.2938
50	560.5331	507.3558	570.6676	561.3462	725.9589
75	513.1092	447.9801	519.4120	513.2355	687.2437
100	480.1437	409.8975	484.5414	480.0457	655.1519

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	727.1170	710.8689	787.4616	736.7389	873.2924
15	642.9219	618.2914	680.6680	647.9694	790.8434
20	630.2257	596.3232	657.2246	633.6160	780.1414
25	596.7928	557.9780	617.2837	598.8696	747.8485
30	566.1969	523.1230	582.6300	567.4457	720.3855
35	551.9790	503.7747	565.8152	552.7788	710.4632
40	544.8442	491.9967	556.8137	545.3706	709.5216
50	516.5891	457.9253	525.8162	516.7164	683.7459
75	478.0813	409.2938	483.8873	477.8593	653.5550
100	451.0599	378.4432	455.1631	450.7471	627.1377

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	839.3213	825.2087	910.0803	861.1748	905.1041	830.0564
15	724.4109	703.2862	767.5919	734.8998	809.2111	696.4954
20	706.1511	669.0854	735.7917	711.4974	798.0758	664.1465
25	663.8762	625.2897	686.1498	668.9477	762.1621	613.5929
30	621.7077	579.6551	639.6688	624.2200	731.5423	570.9577
35	604.0406	556.0282	618.9672	605.1809	720.4843	549.1396
40	594.8212	543.4508	608.0701	596.2853	718.7872	535.1782
50	558.3583	506.0199	568.4401	558.6346	691.3323	497.5829
75	514.6207	452.9135	520.7780	514.8849	659.0579	445.5126
100	481.3945	419.9535	485.5309	481.4336	631.1819	410.0145

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	165659.8112	0.00%	2244.2111	0.00%	8407022.8596
15	0.00%	9056.1941	0.00%	972.9406	0.00%	8241.6849
20	0.00%	4197.2319	0.00%	764.3693	0.00%	2152.9877
25	0.00%	2914.5530	0.00%	665.2117	0.00%	1554.4388
30	0.00%	2311.9238	0.00%	604.8848	0.00%	1284.6927
35	0.00%	1992.1543	0.00%	569.4754	0.00%	1128.9251
40	0.00%	1790.0666	0.00%	550.2191	0.00%	1056.7150
50	0.00%	1498.9852	0.00%	511.1753	0.00%	917.7379
75	0.00%	1200.5261	0.00%	466.9370	0.00%	775.3919
100	0.00%	1066.1531	0.00%	445.0403	0.00%	708.7832

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	839.195	725.217	4346.822	686.959	656.471	708.492	872.318
15	773.697	655.156	660.897	588.363	556.105	626.968	791.774
20	773.291	618.791	631.464	560.096	532.946	612.920	786.144
25	744.519	582.497	591.975	518.536	492.042	577.667	754.063
30	718.031	548.223	556.294	481.889	456.602	544.401	726.327
35	709.637	530.300	537.574	459.860	436.466	527.085	716.897
40	709.549	521.550	527.806	446.411	424.746	518.532	716.286
50	684.535	489.781	494.528	416.120	393.912	487.337	690.616
75	655.085	448.080	451.368	369.333	353.526	446.364	660.417
100	628.490	422.076	424.473	347.273	329.703	420.809	633.397

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	5778.435	3341.026	3740.447	2459.857	2419.761	3101.499	6922.936
15	2639.136	1433.420	1523.048	1099.768	1090.269	1395.664	2741.105
20	2584.331	1341.203	1412.463	868.109	952.901	1287.012	2658.121
25	1897.849	1002.606	1040.656	684.621	725.921	977.078	1917.099
30	1581.274	789.837	816.238	573.626	577.977	777.157	1594.815
35	1508.230	715.749	733.975	518.977	518.289	702.851	1549.704
40	1446.617	674.911	692.220	488.831	492.818	666.815	1454.840
50	1239.931	580.709	590.232	455.545	425.887	574.830	1249.030
75	1026.146	487.103	491.926	421.294	364.251	483.824	1031.241
100	912.771	439.719	442.691	434.491	324.935	437.876	921.713

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	895.214	823.135	834.633	804.743	812.444	810.631	935.918
15	815.330	712.831	721.746	690.986	677.771	706.910	839.917
20	812.414	687.367	695.030	656.984	635.732	683.259	830.434
25	778.570	641.750	649.386	603.616	580.416	638.570	791.834
30	747.509	601.779	607.952	557.696	534.497	598.502	759.344
35	737.348	580.412	586.685	530.278	507.408	578.258	747.308
40	735.835	568.677	574.057	512.911	490.569	566.457	745.159
50	707.654	532.157	536.045	468.860	449.247	529.546	715.925
75	674.101	479.633	483.339	410.388	393.367	479.001	680.360
100	643.785	447.144	449.379	377.212	358.742	445.479	649.291

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	907.385	40820.099	850.715	832.256	872.688	832.526	1032.193
15	828.367	731.357	732.021	731.660	739.743	724.539	897.258
20	824.877	696.305	697.299	696.774	692.946	697.900	870.444
25	791.626	650.959	652.153	658.596	637.858	651.672	825.439
30	760.422	614.810	617.619	607.732	585.228	614.028	786.863
35	748.651	596.689	597.955	583.472	561.039	594.569	773.246
40	747.806	586.874	588.927	570.712	544.298	585.167	767.545
50	719.136	550.604	552.662	527.008	495.625	547.680	734.781
75	683.607	507.378	509.963	456.903	433.235	507.979	693.971
100	651.284	470.300	471.491	414.309	392.701	469.525	660.031

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	1495.5658	1498.6229	1639.1581	1558.1708	1698.5009	1524.3595
15	1299.5066	1293.6543	1387.8159	1333.4441	1493.1039	1345.9984
20	1270.7283	1239.0381	1330.7779	1291.5935	1445.6228	1316.3118
25	1188.0639	1159.6320	1232.5109	1206.8841	1355.6762	1238.6515
30	1099.8529	1061.9240	1135.9030	1111.8327	1280.5721	1171.7945
35	1064.7438	1015.5400	1094.4568	1072.5630	1246.2043	1143.1347
40	1044.6238	992.6979	1070.6509	1052.5892	1231.1828	1131.4342
50	965.8119	916.6477	985.2175	970.1695	1158.6289	1068.8179
75	872.4629	803.8647	883.7228	875.8656	1062.4527	986.6385
100	793.0371	733.8003	800.5156	794.8735	983.6891	918.3232

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	838.7924	5776.4409	895.0606	910.1642	905.2308
15	774.1325	2594.4820	815.3327	827.8076	809.2378
20	773.9147	2555.1324	812.4589	824.8447	798.0800
25	744.3744	1872.7330	777.6675	790.3132	762.1621
30	718.0224	1559.5618	747.1985	760.4580	731.5423
35	709.4786	1510.5174	737.0803	749.2597	720.4843
40	709.2792	1416.6352	736.1604	747.9393	718.7872
50	684.7448	1222.9858	707.8772	719.3788	691.3323
75	654.9906	1015.2131	673.9879	682.9471	659.0579
100	628.5557	904.9608	643.8715	650.8383	631.1819

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	905.104	750.998	731.430	692.751	735.845	1807.108	907.586
15	809.211	637.104	627.202	574.907	600.260	907.783	811.965
20	798.076	603.419	599.107	532.398	553.737	607.124	801.094
25	762.162	563.785	561.027	493.173	506.167	566.159	765.440
30	731.542	528.523	526.014	462.638	470.778	530.471	734.902
35	720.484	508.575	506.620	442.530	448.593	510.108	723.943
40	718.787	499.213	497.555	431.687	434.829	500.512	722.337
50	691.332	469.243	467.949	404.313	402.703	470.207	694.971
75	659.058	431.049	430.225	367.733	359.396	431.647	662.864
100	631.182	410.511	409.948	349.289	333.401	410.907	635.051

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	66.59	66.55	70.79	67.64	73.68	57.65	56.89	62.33	58.46	67.23
15	66.14	65.54	69.45	66.83	75.45	57.72	56.10	61.19	58.22	69.90
20	66.02	64.83	68.87	66.69	76.71	58.79	55.82	61.49	59.31	71.68
25	64.36	61.88	67.19	64.63	78.36	56.34	52.71	59.05	56.75	73.03
30	64.12	60.48	66.44	64.36	78.77	56.02	50.75	58.57	56.22	74.22
35	62.89	58.48	64.97	63.27	79.62	55.01	48.83	57.37	55.17	75.47
40	63.03	57.21	65.03	63.33	80.87	55.01	47.21	57.09	54.95	76.83
50	60.91	52.95	63.01	61.07	81.68	53.35	41.56	55.11	53.31	77.52
75	55.09	40.06	56.71	55.17	83.62	46.57	29.80	48.10	46.48	79.43
100	49.84	28.16	51.13	49.68	85.11	40.28	19.50	41.49	40.18	81.74

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	66.55	46.47	N/A	N/A	98.06	96.93
15	69.47	34.88	N/A	N/A	99.17	98.67
20	71.86	29.74	N/A	N/A	99.25	99.03
25	73.21	23.20	N/A	N/A	99.50	99.15
30	74.48	19.11	N/A	N/A	99.21	98.97
35	75.92	16.15	N/A	N/A	99.23	98.95
40	77.17	13.60	N/A	N/A	99.15	98.89
50	78.20	9.17	N/A	N/A	98.69	98.42
75	80.28	3.76	N/A	N/A	98.40	98.10
100	82.34	1.80	N/A	N/A	97.74	97.58

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	64.83	64.53	68.62	66.04	67.76	64.18
15	64.91	63.90	67.95	65.78	69.98	61.86
20	65.35	63.72	68.30	65.97	71.98	60.81
25	63.72	61.22	66.36	64.11	73.25	57.31
30	63.63	59.73	65.80	63.85	74.32	55.23
35	62.55	57.91	64.68	62.83	75.60	52.93
40	63.02	56.87	64.90	63.29	76.71	51.41
50	60.89	53.27	62.82	61.05	77.68	47.15
75	55.47	41.80	56.93	55.44	79.47	36.73
100	50.86	30.98	52.22	50.84	81.54	27.82

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	98.99	0.00%	75.29	0.00%	91.68
15	0.00%	99.21	0.00%	71.58	0.00%	92.24
20	0.00%	99.62	0.00%	69.50	0.00%	92.36
25	0.00%	99.54	0.00%	65.90	0.00%	93.39
30	0.00%	99.50	0.00%	63.66	0.00%	92.57
35	0.00%	99.68	0.00%	61.50	0.00%	92.87
40	0.00%	99.76	0.00%	60.48	0.00%	93.09
50	0.00%	99.72	0.00%	56.34	0.00%	92.91
75	0.00%	99.80	0.00%	47.35	0.00%	93.33
100	0.00%	99.88	0.00%	40.02	0.00%	93.35

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	64.18	57.85	59.78	54.90	51.90	56.16	64.34	66.40
15	67.74	57.82	59.43	53.96	48.34	56.95	67.64	69.17
20	70.53	57.72	59.35	52.42	47.21	57.17	70.44	71.41
25	71.90	55.45	56.77	48.34	42.77	55.01	71.88	72.89
30	73.15	54.59	55.69	44.75	39.43	54.00	73.03	74.04
35	74.61	53.37	54.65	41.86	36.25	52.53	74.71	75.64
40	75.96	52.65	53.57	38.89	34.19	52.20	76.10	76.89
50	76.89	48.97	50.06	32.91	28.57	48.67	77.01	78.04
75	78.89	40.46	41.15	21.41	18.22	39.80	78.95	80.04
100	81.31	32.89	33.52	12.55	10.89	32.38	81.19	82.24

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.79	68.75	71.68	66.10	57.58	67.80	80.30	82.10
15	83.31	68.24	70.69	62.14	52.10	67.01	82.44	83.86
20	83.80	69.01	70.53	58.63	49.76	67.54	83.13	84.20
25	85.37	66.28	68.00	53.23	44.91	65.13	84.83	85.29
30	85.21	63.84	65.96	48.88	42.25	63.17	84.77	85.72
35	85.82	62.57	63.72	44.89	38.35	61.50	85.25	86.18
40	86.22	61.19	62.53	40.92	35.95	60.28	85.88	86.73
50	87.01	57.47	58.85	34.71	30.37	56.53	86.57	87.25
75	87.86	46.71	47.64	22.08	19.96	46.12	87.54	88.55
100	89.03	38.57	39.13	13.23	12.32	38.51	88.42	89.45

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	66.00	64.10	64.87	62.30	63.68	62.67	66.08	69.47
15	69.21	63.07	64.18	61.52	61.09	62.57	69.45	71.58
20	71.96	63.29	64.34	61.31	58.73	63.27	72.20	73.66
25	73.54	60.93	61.80	57.35	53.92	60.73	73.62	75.25
30	74.89	60.75	61.35	55.30	50.58	60.02	74.71	76.38
35	76.12	58.85	60.04	52.51	47.50	58.53	76.26	77.52
40	77.33	58.38	59.45	50.78	44.67	58.06	77.21	78.55
50	78.55	56.26	56.63	44.04	38.07	55.50	78.53	79.70
75	80.22	47.54	48.24	29.23	24.38	47.11	80.42	81.84
100	82.48	39.64	40.12	17.84	15.01	38.89	82.59	83.64

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	67.35	65.80	65.78	63.78	68.36	63.98	67.35	74.04
15	70.02	64.40	64.51	63.90	66.83	63.49	70.28	74.91
20	72.67	64.08	64.28	64.06	65.21	64.26	72.67	75.94
25	74.06	61.58	62.04	61.13	61.09	61.07	74.53	77.76
30	75.39	60.99	61.52	60.17	58.59	60.87	75.52	78.22
35	76.97	59.90	60.57	58.02	55.65	59.74	76.93	79.03
40	78.16	59.35	59.92	56.57	53.63	59.33	77.94	80.18
50	79.41	57.92	58.04	52.59	47.11	57.70	79.29	81.21
75	81.09	50.44	51.52	39.90	33.02	50.65	81.09	82.89
100	82.99	44.10	45.19	28.38	22.02	43.86	82.95	84.51

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	86.79	87.09	89.41	88.07	89.88	86.53
15	90.28	90.66	92.18	91.20	93.35	90.32
20	91.51	91.72	92.76	92.03	94.48	91.78
25	93.00	93.19	94.12	93.47	95.86	93.58
30	93.30	93.42	94.01	93.63	96.18	94.02
35	94.26	94.22	94.97	94.48	96.87	95.15
40	94.06	94.04	94.63	94.25	96.89	95.29
50	94.14	93.94	94.82	94.32	97.49	95.98
75	95.24	94.58	95.60	95.44	98.73	97.52
100	95.51	94.41	95.80	95.59	98.89	98.10

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 41.9957384
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	67.76	61.88	58.57	58.69	60.93	63.64	67.80	68.16
15	69.98	59.50	57.98	54.11	54.95	60.38	69.98	70.48
20	71.98	57.84	56.85	50.28	51.31	58.65	71.98	72.44
25	73.25	54.59	53.96	45.47	45.29	55.09	73.25	73.62
30	74.32	52.63	52.16	41.88	41.27	53.01	74.32	74.87
35	75.60	50.71	50.28	38.69	37.31	51.05	75.60	76.30
40	76.71	49.90	49.58	36.08	35.11	50.18	76.71	77.45
50	77.68	45.17	44.95	29.66	28.22	45.35	77.68	78.40
75	79.47	36.00	35.92	19.29	16.46	36.10	79.47	80.46
100	81.54	28.63	28.59	10.97	8.85	28.65	81.54	82.46

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Detection Limit: 41.9957384
Averaged Percentage Non-detects: 20.00%
Distribution Check: Average of means: 455.123073
Distribution Check: Average of stdvs: 1042.706741
Average of NDs per 100 observations: 20.094400

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	41.995738	1.938614	579	1415	1515	963	434	144	0	0	0	0
15	41.995738	3.030693	173	641	1178	1241	941	567	205	81	18	5
20	41.995738	3.959406	55	295	703	1071	1099	912	493	275	101	30
25	41.995738	4.996040	19	123	329	704	939	1035	823	547	277	156
30	41.995738	5.990099	6	44	173	376	704	850	928	768	540	379
35	41.995738	7.026139	3	22	80	197	428	617	782	869	746	576
40	41.995738	8.010693	3	8	22	117	249	416	624	787	739	712
50	41.995738	9.965347	0	0	7	23	73	159	291	416	539	752
75	41.995738	15.032277	0	0	0	1	2	4	5	37	72	143
100	41.995738	20.009109	0	0	0	0	0	0	1	0	2	6

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	37
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	13	2	1	0	0	0	0	0	0	0	0	0	0
25	68	23	5	2	0	0	0	0	0	0	0	0	0
30	173	69	24	10	6	0	0	0	0	0	0	0	0
35	346	203	105	47	21	4	2	1	1	0	0	0	0
40	537	376	257	107	46	32	11	5	2	0	0	0	0
50	704	645	551	345	267	130	74	39	20	12	1	2	0
75	225	333	423	473	554	590	510	467	388	291	205	327	0
100	16	42	49	102	177	245	323	397	473	512	522	2183	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	91	162	27	138	0	0	0	144
15	80	191	48	109	0	0	0	104
20	57	182	34	69	0	0	0	16
25	47	192	32	60	0	0	0	7
30	52	218	38	57	0	0	0	0
35	49	241	36	54	0	0	0	2
40	50	255	42	57	0	0	0	0
50	51	267	47	54	0	0	0	0
75	53	363	51	54	0	0	0	0
100	58	343	54	62	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	91	162	27	138	0	0
15	80	191	48	109	0	0
20	57	182	34	69	0	0
25	47	192	32	60	0	0
30	52	218	38	57	0	0
35	49	241	36	54	0	0
40	50	255	42	57	0	0
50	51	267	47	54	0	0
75	53	363	51	54	0	0
100	58	343	54	62	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	1	0	1	0	0	0
35	0	0	0	0	2	0	0	0
40	0	0	1	0	2	0	0	0
50	0	0	0	0	2	0	0	0
75	0	0	0	0	1	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	1	0	1	0	0	0
35	0	0	0	0	2	0	0	0
40	0	0	1	0	2	0	0	0
50	0	0	0	0	2	0	0	0
75	0	0	0	0	1	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	1	0	1	0	0	0
35	0	0	0	0	2	0	0	0
40	0	0	1	0	2	0	0	0
50	0	0	0	0	2	0	0	0
75	0	0	0	0	1	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	1	0	1	0	0	0
35	0	0	0	0	2	0	0	0
40	0	0	1	0	2	0	0	0
50	0	0	0	0	2	0	0	0
75	0	0	0	0	1	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	27	0	27	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 6d. Ln(5,1.5) 25% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	868.1534	574.8968	N/A	N/A	5642.7249	3591.5206
15	805.4454	417.3351	N/A	N/A	3005.5577	2361.8136
20	768.9916	369.6047	N/A	N/A	2056.8304	1814.8517
25	759.1979	336.5451	N/A	N/A	1710.1763	1557.7551
30	730.4493	315.7616	N/A	N/A	1449.4577	1351.9705
35	711.5605	308.6476	N/A	N/A	1293.3036	1228.2160
40	719.8124	299.1082	N/A	N/A	1209.4788	1164.9174
50	691.5867	286.2924	N/A	N/A	1055.0726	1028.2832
75	664.5507	263.6009	N/A	N/A	884.3999	872.7269
100	636.9434	256.4472	N/A	N/A	792.2867	785.7321

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	857.0342	855.3286	950.7303	882.8063	1046.0764
15	736.7463	721.9992	793.4131	748.2483	927.5754
20	672.7741	648.4597	711.1493	678.9413	862.5044
25	639.4626	605.2819	669.5129	643.2112	841.3624
30	599.3639	559.0616	622.8189	601.6553	800.8365
35	572.3858	528.3106	591.5715	573.7818	774.5259
40	564.1410	511.0852	581.1654	565.0489	779.9719
50	526.7423	468.3090	539.4784	526.9927	742.3478
75	471.9665	397.3577	480.0926	471.6128	705.3860
100	438.0009	360.4341	443.6369	437.5229	669.9260

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	695.2432	677.0761	769.6974	703.2969	880.7955
15	617.4527	588.6165	664.5437	620.9643	810.0110
20	577.2751	541.0208	610.1836	578.9684	769.8959
25	553.6804	508.1003	579.8132	554.3074	758.7575
30	524.4444	474.6736	545.0251	524.5689	728.9188
35	505.3655	454.0113	522.1784	505.1649	710.0894
40	498.8905	438.1993	514.1253	498.4093	717.6144
50	471.0825	407.5039	482.4338	470.4378	688.9641
75	426.2847	349.9689	433.6901	425.4544	661.5140
100	400.2931	322.7727	405.5021	399.5226	633.6660

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	803.4696	783.5837	894.9598	827.5563	896.2258	798.0225
15	707.9812	678.7397	758.2538	719.0775	816.5009	666.8563
20	653.9278	619.3972	687.9692	659.7457	773.8305	598.0496
25	621.8174	579.3887	651.6649	625.3292	760.9220	556.0808
30	584.7306	536.5735	608.5434	585.4753	730.1593	514.4546
35	561.7881	517.6136	578.8755	563.1498	709.9165	485.1446
40	549.5881	495.9403	565.7111	550.2523	717.4715	471.4392
50	517.6519	466.5899	529.1879	517.6175	688.0313	432.8508
75	464.3066	404.9549	471.6206	464.1705	659.5789	372.2862
100	435.7448	375.0678	440.9529	435.3413	631.4298	337.6764

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	126257.3278	0.00%	1649.0496	0.00%	3906453.8135
15	0.00%	10096.2452	0.00%	837.8236	0.00%	5896.2703
20	0.00%	4692.3256	0.00%	682.2674	0.00%	2335.0923
25	0.00%	3311.4084	0.00%	609.3785	0.00%	1645.0746
30	0.00%	2481.2788	0.00%	554.4126	0.00%	1292.3811
35	0.00%	2156.1729	0.00%	531.8731	0.00%	1148.7774
40	0.00%	1950.9194	0.00%	515.1001	0.00%	1068.4852
50	0.00%	1611.4758	0.00%	484.7020	0.00%	920.4342
75	0.00%	1280.2374	0.00%	444.6016	0.00%	777.9109
100	0.00%	1131.9477	0.00%	427.8703	0.00%	709.9691

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	830.673	873.453	719.068	640.987	600.081	663.563	868.808
15	781.058	2225.992	654.879	545.216	505.653	586.887	802.748
20	750.088	555.665	571.155	495.401	456.361	546.475	765.936
25	742.997	523.641	536.909	454.360	414.833	517.019	755.985
30	716.567	494.058	504.200	424.200	385.337	488.735	727.600
35	699.111	476.030	484.122	409.729	367.110	471.251	709.122
40	707.999	462.255	470.219	391.552	347.393	458.242	717.665
50	681.301	436.630	442.557	367.953	323.127	433.472	689.855
75	655.472	388.254	392.298	321.568	272.543	386.320	663.311
100	628.753	368.453	371.132	297.053	251.446	366.799	636.009

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	7622.080	2959.893	4076.310	2029.870	1954.889	2473.543	10879.767
15	2726.351	1208.038	1307.503	864.813	839.530	1155.101	2899.505
20	2204.112	979.443	1033.168	657.051	684.278	938.892	2296.675
25	1816.495	735.694	770.579	528.935	513.163	718.573	1848.574
30	1593.651	626.148	651.375	479.333	450.093	613.500	1615.958
35	1401.169	574.849	591.626	470.864	426.870	565.465	1415.064
40	1460.335	531.418	545.252	426.240	372.116	523.988	1537.199
50	1199.241	492.331	497.621	454.862	352.566	487.836	1205.451
75	1054.922	403.561	406.177	476.381	280.354	401.310	1066.341
100	892.241	389.453	390.949	434.961	256.141	388.512	900.242

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	887.060	806.935	819.278	780.185	795.694	785.854	935.302
15	823.687	699.173	708.455	670.518	659.993	687.933	853.828
20	786.512	637.647	646.266	604.614	582.197	632.015	807.600
25	776.934	601.891	609.487	558.736	532.744	597.295	795.075
30	746.161	561.374	568.352	513.876	485.635	558.592	761.823
35	725.551	534.445	540.296	482.373	454.679	530.853	738.786
40	734.731	522.487	528.118	462.279	435.282	519.484	747.361
50	704.102	484.936	490.126	422.886	394.874	482.602	714.593
75	674.773	427.078	430.554	360.192	331.286	425.320	683.719
100	644.346	396.043	398.440	332.271	299.660	394.630	652.376

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	908.837	857.890	852.485	834.641	883.430	829.454	1042.237
15	836.740	740.329	738.308	736.964	746.883	727.681	913.079
20	799.100	671.349	668.644	674.910	668.573	666.522	850.277
25	789.611	637.928	643.208	635.726	615.214	637.594	828.502
30	759.026	599.642	604.612	584.221	566.738	598.882	791.120
35	737.571	572.173	573.458	551.410	531.095	571.235	763.394
40	746.296	562.024	565.728	532.947	510.384	560.809	770.786
50	714.679	522.210	525.763	488.245	463.362	520.838	734.569
75	684.139	466.677	469.674	409.333	387.876	465.023	698.202
100	652.174	429.937	433.333	370.679	349.141	429.416	663.648

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	1452.2708	1441.7131	1640.9713	1522.4325	1734.7088	1511.0554
15	1301.6972	1278.8564	1405.6688	1339.6641	1555.6465	1364.9863
20	1199.4841	1169.3637	1269.2580	1222.4665	1438.5788	1273.2431
25	1144.3207	1098.1767	1207.0175	1160.1954	1396.2971	1240.0594
30	1069.6677	1010.7579	1118.6355	1077.4238	1316.0469	1174.5050
35	1015.2983	969.1864	1049.1293	1024.5762	1255.7018	1124.4322
40	995.4601	932.7337	1027.8523	1002.5009	1262.3097	1132.6659
50	924.6151	872.1760	947.5374	928.6158	1179.1118	1064.1685
75	817.5405	750.0770	831.4313	820.0029	1090.2270	991.1887
100	750.9153	685.3546	760.6350	752.6842	1005.7778	921.5270

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	830.9786	8094.0277	886.9691	906.2280	896.5015
15	780.9708	2659.5740	824.1449	837.2303	816.5708
20	750.5911	2164.3909	785.8626	799.2162	773.8396
25	743.2353	1770.4480	777.1384	789.4242	760.9275
30	716.5648	1568.9513	746.8794	759.1979	730.1593
35	699.2263	1366.5115	725.3055	738.2965	709.9165
40	708.1678	1476.9388	734.8516	747.2777	717.4715
50	681.3142	1174.7469	703.9052	715.2481	688.0313
75	655.6596	1036.6456	674.6947	683.8565	659.5789
100	628.7926	880.8403	644.0529	652.5239	631.4298

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	896.226	716.387	678.966	657.156	722.651	2361.380	900.381
15	816.501	607.340	586.220	540.014	581.795	621.480	821.251
20	773.831	552.953	540.520	488.554	512.485	561.242	778.804
25	760.922	515.913	506.808	449.612	466.751	521.915	766.293
30	730.159	484.002	477.217	420.950	429.259	488.314	735.666
35	709.916	468.054	462.347	408.064	408.248	471.511	715.517
40	717.471	451.888	447.411	390.272	389.770	454.863	723.217
50	688.031	428.434	425.004	368.253	358.749	430.560	693.881
75	659.579	384.429	382.242	326.472	306.673	385.791	665.723
100	631.430	366.733	365.278	309.527	281.525	367.643	637.632

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	66.94	67.03	71.94	68.44	75.41	56.05	55.19	61.66	56.61	67.86
15	65.88	65.47	70.77	67.03	77.23	54.95	52.32	59.45	55.33	71.13
20	63.68	62.06	67.74	64.22	78.22	52.50	49.15	57.11	52.59	72.00
25	62.75	59.90	66.20	63.19	79.64	52.38	46.32	55.49	52.46	74.08
30	60.32	55.84	63.15	60.63	80.26	49.33	42.30	52.28	49.25	74.69
35	59.94	54.44	62.73	60.16	81.17	48.91	39.52	51.72	48.71	76.20
40	57.90	50.77	60.65	57.96	82.48	47.17	36.65	49.56	47.01	77.58
50	55.35	44.20	57.62	55.31	83.50	43.60	30.20	46.22	43.52	78.89
75	44.48	25.88	46.65	44.42	84.73	32.63	15.74	34.57	32.36	80.20
100	36.20	14.83	38.06	36.06	86.75	25.45	8.16	26.61	25.23	82.53

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	66.81	47.72	N/A	N/A	98.83	98.18
15	70.48	32.11	N/A	N/A	99.68	99.31
20	71.70	23.72	N/A	N/A	99.56	99.27
25	73.74	16.97	N/A	N/A	99.68	99.52
30	74.18	13.15	N/A	N/A	99.56	99.39
35	76.02	10.84	N/A	N/A	99.72	99.52
40	77.64	8.56	N/A	N/A	99.54	99.37
50	79.17	5.31	N/A	N/A	99.33	99.17
75	80.79	1.52	N/A	N/A	99.33	99.17
100	82.99	0.46	N/A	N/A	98.91	98.73

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	63.41	63.01	68.68	65.03	67.39	62.50
15	62.91	61.66	67.47	63.81	70.50	58.85
20	61.13	58.94	64.98	61.77	71.31	54.26
25	60.71	56.99	63.92	61.00	73.37	51.15
30	58.09	52.99	60.91	58.35	73.60	46.38
35	58.17	52.14	60.91	58.39	75.35	43.72
40	56.30	48.51	58.46	56.36	76.48	40.40
50	53.61	43.49	55.94	53.62	78.18	34.51
75	43.47	27.34	45.17	43.35	79.13	20.75
100	35.56	16.56	37.39	35.46	81.29	12.44

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.43	0.00%	70.97	0.00%	91.19
15	0.00%	99.68	0.00%	66.73	0.00%	91.39
20	0.00%	99.56	0.00%	63.60	0.00%	91.31
25	0.00%	99.62	0.00%	61.09	0.00%	91.90
30	0.00%	99.70	0.00%	56.85	0.00%	91.66
35	0.00%	99.88	0.00%	56.38	0.00%	92.34
40	0.00%	99.82	0.00%	53.84	0.00%	92.57
50	0.00%	99.90	0.00%	49.86	0.00%	92.73
75	0.00%	99.96	0.00%	39.11	0.00%	92.59
100	0.00%	99.96	0.00%	32.26	0.00%	93.43

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	64.28	56.13	58.83	52.78	48.63	54.02	64.22	66.89
15	68.02	53.66	56.17	48.38	41.88	52.03	68.10	70.30
20	69.37	51.19	52.81	43.80	36.56	50.06	69.35	70.99
25	71.98	48.65	50.43	39.07	31.64	47.67	72.12	73.70
30	72.44	45.60	47.32	34.71	28.48	44.83	72.55	74.08
35	74.32	43.88	45.50	31.80	24.57	43.01	74.20	75.72
40	75.56	41.92	43.46	27.66	21.25	41.11	75.52	77.31
50	77.49	37.25	38.50	21.54	16.85	36.69	77.50	78.95
75	78.48	25.05	26.12	9.96	6.96	24.63	78.48	80.53
100	80.95	17.52	18.07	4.79	2.94	17.05	80.91	82.83

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.24	63.02	67.30	59.82	48.51	61.47	79.98	82.48
15	82.73	60.79	64.34	52.72	40.67	58.82	81.86	83.58
20	83.52	58.79	61.23	46.44	35.45	57.27	82.61	84.06
25	84.53	54.83	57.29	40.27	31.15	53.30	83.98	85.35
30	84.85	51.64	53.37	34.86	26.63	50.53	84.38	85.76
35	85.62	49.73	51.43	32.39	23.45	48.45	85.07	86.30
40	86.02	46.91	48.51	27.00	20.01	45.58	85.68	87.03
50	87.01	41.64	42.95	21.41	16.03	40.89	86.65	87.86
75	87.82	27.96	28.73	9.68	6.63	27.11	87.39	88.59
100	89.27	19.86	20.83	4.72	3.02	19.64	88.85	90.32

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	66.06	64.02	64.77	61.29	63.58	61.70	66.06	70.36
15	69.90	62.00	62.99	59.62	59.07	60.41	69.88	72.89
20	71.09	59.39	60.34	56.26	53.26	58.44	71.13	73.54
25	73.78	57.86	58.89	53.16	48.93	57.48	73.68	75.78
30	74.26	54.44	55.19	48.09	42.31	53.92	74.26	76.16
35	75.94	53.87	54.46	45.25	38.28	53.37	75.80	77.74
40	77.37	51.17	52.36	40.60	34.22	50.42	77.37	79.49
50	79.15	46.59	47.66	32.73	25.83	46.02	79.09	80.55
75	80.06	33.15	33.82	15.70	11.66	32.44	80.30	82.04
100	82.38	23.39	23.98	7.63	4.94	22.85	82.34	84.40

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	67.43	67.68	66.71	64.57	70.44	64.91	67.43	75.19
15	70.67	65.23	64.99	64.15	67.82	63.48	70.38	76.18
20	72.06	62.26	62.36	62.02	63.16	61.49	72.04	76.14
25	74.53	60.91	61.19	59.91	59.83	60.49	74.42	77.94
30	75.03	57.49	57.80	56.13	54.20	57.52	74.97	78.34
35	76.59	57.30	57.58	54.26	51.57	56.77	76.81	79.58
40	77.94	55.54	55.56	51.88	47.58	55.35	78.22	80.67
50	79.78	51.98	52.20	45.94	40.62	51.96	79.45	82.00
75	80.77	40.38	41.45	28.26	23.52	40.40	80.67	83.19
100	82.73	32.16	32.97	17.22	13.22	32.08	82.83	84.97

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	87.31	87.36	89.96	88.40	90.46	86.97
15	89.92	89.97	91.82	90.61	93.01	89.92
20	91.03	91.00	92.79	91.51	94.91	91.47
25	92.34	92.31	93.62	92.77	95.76	93.31
30	92.66	92.51	93.40	92.87	96.53	93.72
35	93.17	93.14	94.10	93.45	97.05	94.77
40	93.89	93.76	94.80	94.22	97.60	95.68
50	94.20	93.76	95.05	94.37	97.92	96.28
75	94.09	92.80	94.68	94.18	99.03	97.92
100	94.06	92.41	94.48	94.16	99.11	98.34

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.9612057
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	67.39	60.96	56.22	57.39	60.57	64.20	67.43	67.96
15	70.50	56.64	52.65	49.32	53.15	58.59	70.50	71.15
20	71.31	51.86	49.76	43.60	45.33	53.66	71.31	72.12
25	73.37	48.46	46.79	39.01	39.50	49.64	73.37	74.18
30	73.60	44.97	43.70	34.04	34.04	45.70	73.60	74.57
35	75.35	42.83	41.76	30.48	28.89	43.64	75.35	76.32
40	76.48	39.68	38.91	27.15	25.05	40.28	76.48	77.86
50	78.18	34.79	34.34	20.40	18.24	35.11	78.18	79.37
75	79.13	22.02	21.80	9.68	7.39	22.28	79.13	80.83
100	81.29	15.27	15.13	4.55	2.73	15.33	81.29	83.05

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Detection Limit: 53.9612057
Averaged Percentage Non-detects: 25.00%
Distribution Check: Average of means: 455.647449
Distribution Check: Average of stdvs: 1050.930402
Average of NDs per 100 observations: 25.016800

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	53.961206	2.388317	309	1008	1446	1272	730	285	0	0	0	0
15	53.961206	3.751485	57	340	770	1134	1167	885	424	185	65	19
20	53.961206	4.996634	23	108	322	682	963	1035	833	574	287	156
25	53.961206	6.287129	1	31	127	319	559	878	895	819	619	425
30	53.961206	7.508713	0	7	49	141	303	531	706	845	806	671
35	53.961206	8.705743	0	0	9	64	153	301	467	663	750	777
40	53.961206	10.013861	0	1	3	26	57	113	279	414	613	709
50	53.961206	12.459604	0	0	0	8	9	30	65	139	251	380
75	53.961206	18.913465	0	0	0	0	0	0	0	2	6	10
100	53.961206	24.934059	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	106
15	4	0	0	0	0	0	0	0	0	0	0	0	0
20	49	14	4	0	0	0	0	0	0	0	0	0	0
25	227	102	24	18	3	2	1	0	0	0	0	0	0
30	440	291	156	64	25	11	3	0	1	0	0	0	0
35	680	497	326	184	109	37	19	11	0	2	1	0	0
40	721	685	500	407	252	137	74	38	15	4	2	0	0
50	480	608	618	626	560	437	346	203	143	74	41	32	0
75	27	53	83	161	257	341	410	470	546	526	455	1703	0
100	1	1	3	9	13	32	53	86	124	197	266	4265	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	142	232	28	223	0	0	0	285
15	178	332	97	225	0	0	0	273
20	165	359	110	198	0	0	0	67
25	179	460	127	211	0	0	0	48
30	156	459	125	183	0	0	0	15
35	163	476	136	178	0	0	0	14
40	171	515	146	185	0	0	0	2
50	168	532	143	182	0	0	0	1
75	194	676	179	206	0	0	0	0
100	168	715	156	169	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	142	232	28	223	0	0
15	178	332	97	225	0	0
20	165	359	110	198	0	0
25	179	460	127	211	0	0
30	156	459	125	183	0	0
35	163	476	136	178	0	0
40	171	515	146	185	0	0
50	168	532	143	182	0	0
75	194	676	179	206	0	0
100	168	715	156	169	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	1	0	0	1	0	0
20	0	0	0	0	1	0	0	0
25	0	0	1	0	6	1	0	0
30	0	0	1	0	7	0	0	0
35	0	2	2	0	7	2	0	0
40	0	0	2	0	10	0	0	0
50	0	0	0	0	10	0	0	0
75	0	0	0	0	10	0	0	0
100	0	0	4	0	12	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	1	0	0	1	0	0
20	0	0	0	0	1	0	0	0
25	0	0	1	0	6	1	0	0
30	0	0	1	0	7	0	0	0
35	0	1	2	0	6	2	0	0
40	0	0	2	0	8	0	0	0
50	0	0	0	0	10	0	0	0
75	0	0	0	0	11	0	0	0
100	0	0	4	0	12	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	1	0	0	1	0	0
20	0	0	0	0	1	0	0	0
25	0	0	1	0	6	1	0	0
30	0	0	1	0	6	0	0	0
35	0	1	2	0	6	2	0	0
40	0	0	1	0	9	0	0	0
50	0	0	0	0	10	0	0	0
75	0	0	0	0	8	0	0	0
100	0	0	5	0	11	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	1	0	0	1	0	0
20	0	0	0	0	1	0	0	0
25	0	0	1	0	6	1	0	0
30	0	0	1	0	6	0	0	0
35	0	1	2	0	6	2	0	0
40	0	0	2	0	8	0	0	0
50	0	0	0	0	10	0	0	0
75	0	0	0	0	8	0	0	0
100	0	0	5	0	12	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	42	0	42	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 6e. Ln(5,1.5) 40% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	918.3800	686.4724	N/A	N/A	8043.8375	4860.1432
15	830.9297	437.3777	N/A	N/A	4157.6293	3123.0720
20	782.9736	400.4350	N/A	N/A	2712.3059	2330.0775
25	768.9546	330.5497	N/A	N/A	2184.2134	1948.6855
30	761.0446	322.6502	N/A	N/A	1858.3625	1705.6628
35	737.8302	288.5129	N/A	N/A	1605.3903	1505.9587
40	730.3445	280.6282	N/A	N/A	1453.1768	1387.2890
50	705.3206	259.3014	N/A	N/A	1244.4526	1205.2756
75	673.2147	227.2439	N/A	N/A	997.0259	980.7985
100	653.9738	213.6670	N/A	N/A	880.0599	871.0316

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	923.4734	924.3950	1081.8616	1005.3671	1230.2198
15	738.1222	725.8679	855.7037	749.7951	1096.7158
20	627.4317	603.7868	707.3425	631.3804	989.2465
25	566.7298	531.8492	629.2661	567.3756	950.8920
30	526.7635	481.4983	577.0823	525.8839	923.0412
35	482.0842	429.5228	523.4083	480.2881	882.7059
40	452.6817	395.5334	488.0272	450.4520	866.7103
50	402.0511	342.1140	428.8985	399.4114	823.2372
75	329.1963	268.7179	344.8796	326.7423	765.3399
100	283.4184	233.3185	293.7029	281.4218	733.2350

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	653.4554	628.9027	776.1308	699.1099	954.9668
15	506.0890	471.8540	592.5813	500.2215	864.2816
20	447.2292	409.3861	505.2477	442.6868	808.5444
25	409.4320	369.0130	453.5225	405.2263	792.2088
30	387.0563	342.2882	423.1871	382.8823	781.2545
35	356.6554	313.3049	386.2012	352.5932	755.1870
40	340.6139	297.2223	364.9755	336.9872	746.8204
50	306.7417	266.3254	324.8088	303.4401	718.9194
75	258.8801	223.9307	269.6334	256.4043	682.2345
100	230.1315	209.2453	236.9686	228.3303	660.6074

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	766.8833	736.5644	911.9144	782.0202	929.1448	756.6662
15	627.6851	595.3745	701.3775	636.2185	821.6891	536.8490
20	555.5789	520.6662	600.8152	558.7079	769.4344	443.6968
25	511.9754	474.0420	549.0367	513.3304	753.5049	385.9416
30	484.8738	446.1421	514.2594	485.8761	744.7104	346.5168
35	446.4089	414.0702	470.5978	447.6702	720.6671	303.8933
40	430.5459	394.5683	450.1387	429.2718	712.6510	282.8901
50	394.3841	361.0895	409.0609	394.0020	686.9460	240.5831
75	336.9117	304.2765	346.0417	336.1380	654.2047	182.1041
100	301.9864	269.3010	308.9279	301.3107	634.5865	157.2585

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	183229.1070	0.06%	1090.5886	0.02%	15803708.3704
15	0.00%	12369.8547	0.02%	651.8277	0.00%	737796.4512
20	0.00%	5347.3394	0.00%	551.9033	0.00%	3181.6571
25	0.00%	3691.7039	0.00%	516.3932	0.00%	1919.1520
30	0.00%	2869.6591	0.00%	495.3440	0.00%	1501.9441
35	0.00%	2352.8255	0.00%	470.1742	0.00%	1213.3667
40	0.00%	2098.8674	0.00%	461.4295	0.00%	1105.0902
50	0.00%	1720.1546	0.00%	442.6104	0.00%	942.5303
75	0.00%	1346.1449	0.00%	421.3337	0.00%	786.0648
100	0.00%	1171.2573	0.00%	408.2933	0.00%	714.6212

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	858.791	2080.202	1439.769	562.621	513.272	694.808	922.449
15	784.633	1150.724	790.352	423.858	411.872	450.730	831.583
20	745.570	4517.704	714.537	372.238	353.864	395.483	780.963
25	736.258	658.060	2918.782	343.697	317.745	365.387	765.838
30	730.981	1795.985	703.500	324.579	287.956	342.255	757.707
35	709.303	326.377	433.438	308.849	270.484	320.617	734.987
40	703.616	916.802	318.968	296.930	245.893	305.198	727.434
50	680.235	285.559	291.456	279.794	224.959	282.613	703.248
75	650.353	244.079	248.649	237.738	167.616	241.888	671.627
100	632.045	227.664	230.221	228.651	148.188	225.706	652.921

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	4099.776	1251.245	1535.660	936.766	909.786	157580.829	6177.102
15	2829.306	685.036	725.937	641.534	1183.338	786.327	3551.630
20	2277.535	563.247	530.260	618.912	1020.196	551.535	2517.302
25	1847.256	480.362	476.604	771.463	934.576	481.691	1970.445
30	1906.042	418.172	415.202	633.841	691.926	424.941	2009.886
35	1752.258	551.355	532.316	1240.060	1035.159	640.133	1825.855
40	1436.048	441.235	420.739	825.880	633.231	434.771	1502.994
50	1255.156	529.378	511.111	957.690	737.573	541.230	1292.254
75	980.395	395.371	386.492	696.820	462.804	398.941	1009.219
100	915.284	474.291	466.504	831.781	484.644	479.983	940.925

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	923.060	832.900	847.299	774.786	820.114	782.669	1000.585
15	831.000	683.780	696.501	602.703	611.695	626.150	890.774
20	782.565	577.464	585.374	510.632	495.847	540.587	827.494
25	769.435	511.864	520.249	451.883	428.634	487.671	806.824
30	761.525	469.063	476.868	413.360	386.152	454.874	795.134
35	737.924	421.947	429.112	373.536	345.030	414.929	768.773
40	730.014	395.956	402.578	350.723	320.169	391.303	758.419
50	703.409	354.541	359.367	314.413	281.682	351.448	729.884
75	668.355	298.959	302.240	262.277	225.562	296.579	691.799
100	647.680	266.187	268.836	231.535	193.836	264.622	669.997

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	971.203	962.679	967.940	889.096	985.620	898.594	1155.689
15	853.708	815.666	841.087	707.372	721.883	725.275	981.009
20	795.826	694.385	705.443	603.252	589.695	632.668	882.930
25	781.733	618.352	627.162	530.515	503.095	577.659	851.245
30	775.044	559.300	566.475	487.715	454.699	539.641	832.328
35	749.935	501.917	510.387	440.976	403.454	489.994	799.971
40	741.443	471.610	478.072	410.226	369.787	463.097	786.377
50	713.909	417.409	423.192	364.159	319.687	412.982	752.827
75	677.035	347.098	351.226	296.672	247.493	344.299	708.026
100	655.247	303.364	305.667	256.141	207.552	301.261	682.853

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	1435.5637	1399.0160	1734.8934	1494.4160	1941.1174	1572.8081
15	1207.4534	1167.7062	1371.1106	1242.7903	1741.7997	1391.2353
20	1082.1059	1031.4156	1179.1957	1099.0501	1582.6955	1281.4956
25	1003.7782	941.3964	1083.7158	1014.9703	1520.7834	1239.4987
30	953.5731	891.4291	1015.9788	963.3029	1473.1626	1211.4659
35	876.1343	828.9123	928.5096	884.5281	1402.4664	1160.7613
40	846.8802	790.9338	888.4856	849.5146	1368.3717	1136.7849
50	773.8545	725.8761	804.3183	776.6120	1282.4648	1075.0732
75	663.0878	618.5918	682.2199	664.1463	1161.1751	990.0245
100	592.4523	548.4150	606.2933	592.9148	1090.5801	939.1607

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	859.2725	4482.3213	922.9610	970.9302	931.2251
15	785.6309	2897.3935	830.5955	850.5342	823.0041
20	746.2509	2262.8581	782.4733	796.1075	770.0717
25	736.2166	1804.5864	768.7452	782.2504	753.6715
30	731.0729	1854.5271	761.2982	774.5647	744.7951
35	709.5805	1688.6207	738.2024	749.0269	720.6671
40	703.6354	1398.9879	729.9827	741.3284	712.6510
50	680.2712	1225.4945	703.1620	714.5093	686.9460
75	650.2457	962.6254	668.1645	677.3847	654.2047
100	631.9527	899.5623	647.8292	655.9094	634.5865

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	929.145	699.601	592.487	642.962	785.011	12933.375	942.412
15	821.689	564.090	471.713	498.634	626.978	63611.441	838.086
20	769.434	484.765	424.516	427.480	507.061	6454.395	786.216
25	753.505	439.293	393.557	386.520	448.344	468.297	770.464
30	744.710	409.743	375.299	357.828	402.227	430.344	761.935
35	720.667	376.654	349.693	328.438	363.700	392.608	738.192
40	712.651	359.420	336.851	312.813	338.039	373.084	730.500
50	686.946	328.092	311.358	284.903	294.704	337.905	705.031
75	654.205	281.602	272.009	243.006	231.623	286.939	672.710
100	634.587	252.822	245.922	218.272	201.392	256.675	653.464

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	73.79	73.62	81.13	75.31	83.47	53.70	52.18	64.63	53.15	73.41
15	66.30	65.94	75.18	67.07	83.13	41.14	37.35	50.97	40.14	73.33
20	60.14	58.67	69.31	60.51	85.03	36.37	32.02	44.71	35.84	74.61
25	55.39	51.86	64.59	55.41	86.63	32.55	25.64	38.97	32.04	77.41
30	51.05	45.98	58.57	50.89	86.89	28.20	20.79	34.20	27.62	78.00
35	43.80	34.63	51.31	43.49	87.21	22.30	14.85	26.59	21.76	78.79
40	38.57	28.30	45.09	38.34	87.88	19.82	11.58	23.52	19.50	80.04
50	29.13	16.89	34.65	28.71	89.52	13.31	6.34	15.58	13.09	82.22
75	13.45	4.44	15.50	13.25	90.59	5.37	1.62	6.22	5.13	83.98
100	4.93	1.15	5.78	4.71	91.82	1.68	0.14	1.88	1.68	85.60

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	72.40	57.61	N/A	N/A	99.90	99.70
15	72.28	34.72	N/A	N/A	99.76	99.58
20	74.00	26.20	N/A	N/A	99.80	99.64
25	76.59	14.34	N/A	N/A	99.90	99.82
30	77.56	11.76	N/A	N/A	99.88	99.74
35	78.32	5.37	N/A	N/A	99.94	99.88
40	79.66	5.55	N/A	N/A	99.74	99.70
50	82.06	2.77	N/A	N/A	99.84	99.78
75	84.34	0.27	N/A	N/A	99.76	99.72
100	86.20	0.24	N/A	N/A	99.60	99.54

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	63.36	61.95	74.03	63.60	71.45	62.61
15	55.98	53.73	63.64	56.74	69.76	43.37
20	52.71	49.17	58.31	53.04	71.47	34.61
25	48.14	43.45	54.03	48.67	73.76	27.35
30	45.59	39.33	50.64	45.66	74.65	21.17
35	37.38	30.94	42.43	37.61	75.07	14.61
40	34.50	27.09	38.45	34.23	76.24	11.31
50	26.65	18.46	29.39	26.48	78.18	5.62
75	12.98	6.12	14.64	12.88	80.48	0.99
100	5.39	1.69	5.81	5.39	81.80	0.10

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.98	0.06%	65.44	0.02%	90.65
15	0.00%	99.64	0.02%	55.16	0.00%	89.52
20	0.00%	99.09	0.00%	52.63	0.00%	90.89
25	0.00%	99.52	0.00%	50.59	0.00%	91.17
30	0.00%	99.54	0.00%	49.37	0.00%	91.37
35	0.00%	99.47	0.00%	43.78	0.00%	91.17
40	0.00%	99.52	0.00%	41.90	0.00%	91.62
50	0.00%	99.52	0.00%	38.36	0.00%	92.02
75	0.00%	99.80	0.00%	30.87	0.00%	91.70
100	0.00%	99.86	0.00%	23.74	0.00%	92.73

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	67.25	54.20	60.42	46.64	40.12	46.73	67.27	72.99
15	67.27	39.31	45.33	30.17	22.63	33.29	67.35	72.93
20	69.78	32.32	36.20	23.53	15.54	29.00	69.90	74.12
25	72.44	26.42	29.59	18.07	10.20	24.83	72.32	76.61
30	73.49	22.30	24.57	13.76	7.13	20.91	73.41	77.29
35	73.98	16.78	18.48	9.48	4.73	15.86	74.20	78.04
40	75.45	14.29	16.25	7.42	2.93	13.62	75.50	79.56
50	77.45	9.07	10.30	3.55	1.47	8.65	77.25	81.88
75	79.96	3.24	3.77	0.96	0.23	3.20	79.98	84.20
100	81.49	1.33	1.50	0.16	0.00	1.25	81.54	86.16

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.63	46.58	53.94	43.49	28.91	42.61	81.21	85.27
15	80.93	33.35	38.42	25.84	15.71	31.00	80.77	84.32
20	83.58	28.31	31.73	18.84	9.53	26.11	82.73	86.28
25	84.99	22.88	25.55	14.35	6.51	21.01	84.50	87.29
30	85.15	18.93	21.06	10.93	4.34	17.54	84.51	87.72
35	85.37	14.69	16.25	7.88	2.74	13.77	84.79	87.80
40	86.36	12.20	13.46	5.55	1.78	11.54	85.76	88.71
50	87.45	8.13	8.99	3.14	0.93	7.50	86.81	90.08
75	88.08	3.16	3.37	0.78	0.21	2.96	87.62	90.38
100	89.15	1.23	1.24	0.11	0.00	1.07	88.61	92.02

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	69.98	70.34	71.41	62.81	68.10	63.58	69.92	77.37
15	69.49	62.08	63.29	51.86	54.26	53.76	69.52	76.28
20	71.56	55.17	56.31	45.85	44.02	49.16	71.31	77.27
25	73.94	47.18	48.61	38.51	33.62	43.61	73.82	79.05
30	74.83	41.34	42.51	31.81	25.83	39.09	75.03	79.35
35	75.76	31.31	32.93	22.40	16.52	30.38	75.56	80.22
40	77.03	27.15	28.37	18.12	12.35	26.43	76.93	81.54
50	78.97	17.85	18.94	10.05	5.40	17.31	79.05	83.82
75	81.13	6.55	7.00	2.18	0.72	6.26	81.29	85.58
100	82.93	1.79	2.02	0.23	0.05	1.83	82.71	87.50

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	72.65	76.50	75.03	71.35	79.56	73.21	72.65	82.69
15	70.87	72.51	72.14	61.00	66.10	63.47	70.75	80.81
20	72.02	67.70	68.12	56.49	56.37	59.36	72.20	80.93
25	74.61	61.10	61.90	50.28	46.42	54.84	74.51	82.79
30	75.37	54.38	55.33	44.65	38.17	50.81	75.78	82.42
35	76.42	45.89	47.42	36.36	29.32	44.22	76.34	82.42
40	77.80	41.50	41.91	31.22	23.84	39.87	77.47	83.78
50	79.66	31.72	33.53	22.80	14.84	31.39	79.80	85.78
75	82.06	17.00	17.87	8.81	4.57	16.75	81.98	86.67
100	83.49	7.93	8.37	2.74	0.92	7.55	83.58	88.46

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	89.90	89.58	93.77	91.01	93.86	89.70
15	88.56	88.03	92.28	89.42	94.28	89.70
20	90.77	90.42	93.45	91.69	96.18	92.73
25	90.69	90.00	93.36	91.18	97.35	94.02
30	91.36	90.70	93.27	91.93	97.47	94.71
35	90.42	90.01	92.92	91.10	98.20	95.74
40	90.54	89.56	92.59	90.89	98.34	95.98
50	90.31	88.76	92.26	90.63	98.71	97.11
75	85.18	82.25	87.69	85.45	99.27	98.02
100	80.07	73.53	82.23	80.19	99.68	98.59

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 101.4919358
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	71.45	65.60	50.02	62.18	68.42	73.21	71.70	73.17
15	69.76	52.93	39.07	44.28	54.42	61.70	69.88	72.40
20	71.47	43.80	34.20	33.50	41.47	50.59	71.52	73.86
25	73.76	36.15	29.05	25.27	32.30	41.29	73.76	76.26
30	74.65	30.28	25.39	20.06	24.34	34.40	74.65	77.27
35	75.07	22.26	18.73	13.52	16.71	24.99	75.07	78.02
40	76.24	18.59	16.24	10.85	13.05	20.67	76.24	79.39
50	78.18	11.80	10.59	5.37	7.11	12.59	78.18	81.78
75	80.48	3.82	3.56	1.33	2.63	4.12	80.48	84.16
100	81.80	1.41	1.35	0.36	1.21	1.49	81.80	86.10

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Detection Limit: 101.4919358
Averaged Percentage Non-detects: 40.00%
Distribution Check: Average of means: 458.046803
Distribution Check: Average of stdvs: 1057.894768
Average of NDs per 100 observations: 39.977200

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	101.491936	3.520000	41	246	733	1282	1522	1226	0	0	0	0
15	101.491936	5.951287	3	28	112	327	628	939	1053	923	627	281
20	101.491936	7.976832	0	5	14	60	154	391	651	856	879	841
25	101.491936	10.010297	0	0	1	10	35	109	204	408	595	787
30	101.491936	11.980000	0	0	0	1	3	21	63	133	279	403
35	101.491936	13.988317	0	0	0	0	1	8	13	31	83	159
40	101.491936	16.018218	0	0	0	0	0	0	3	4	17	51
50	101.491936	19.999604	0	0	0	0	0	0	0	0	0	0
75	101.491936	29.994653	0	0	0	0	0	0	0	0	0	0
100	101.491936	40.031089	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	1012
15	129	0	0	0	0	0	0	0	0	0	0	0	41
20	610	322	159	73	24	11	0	0	0	0	0	0	0
25	812	722	574	392	226	117	43	11	4	0	0	0	0
30	601	697	724	708	552	373	240	130	70	34	15	3	0
35	293	407	552	623	676	661	552	445	279	135	83	49	0
40	96	172	306	409	540	622	649	638	476	393	292	382	0
50	7	22	34	88	128	219	311	425	467	559	549	2241	0
75	0	0	0	0	0	0	2	4	8	20	38	4978	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	9	0	9	0	0	9	0	9	0	0
15	6	0	6	0	0	6	0	6	0	0
20	2	0	2	0	0	2	0	2	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	369	540	106	578	0	0	0	1226
15	975	1248	608	1183	0	0	0	1960
20	1030	1395	761	1198	0	0	0	1199
25	1151	1639	926	1286	0	0	0	1367
30	1198	1750	1010	1309	0	0	0	865
35	1251	1866	1065	1365	0	0	0	991
40	1340	2005	1175	1427	0	0	0	674
50	1437	2185	1301	1527	0	0	0	501
75	1576	2532	1458	1642	0	0	0	296
100	1728	2802	1645	1784	0	0	0	142

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	369	540	106	578	0	0
15	975	1248	608	1183	0	0
20	1030	1395	761	1198	0	0
25	1151	1639	926	1286	0	0
30	1198	1750	1010	1309	0	0
35	1251	1866	1065	1365	0	0
40	1340	2005	1175	1427	0	0
50	1437	2185	1301	1527	0	0
75	1576	2532	1458	1642	0	0
100	1728	2802	1645	1784	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	9	0	9	0	0	0	0
15	0	10	3	9	3	9	0	0
20	0	9	25	6	31	29	0	0
25	0	19	41	8	87	36	0	0
30	0	24	47	13	143	33	0	0
35	0	19	50	10	189	24	0	0
40	0	41	79	35	265	49	0	0
50	0	45	117	33	420	54	0	0
75	0	46	196	34	758	50	0	0
100	0	71	301	58	1123	77	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	9	0	9	0	0	0	0
15	0	10	4	8	3	8	0	0
20	0	9	23	5	32	29	0	0
25	0	19	41	8	89	37	0	0
30	0	26	46	13	142	33	0	0
35	0	20	50	10	190	23	0	0
40	0	41	78	34	267	48	0	0
50	0	45	121	33	423	53	0	0
75	0	45	194	38	760	50	0	0
100	0	72	293	59	1138	79	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	5	4	3	2	7	0	0
20	0	6	25	3	32	28	0	0
25	0	18	41	8	86	37	0	0
30	0	26	48	14	144	34	0	0
35	0	20	51	9	188	23	0	0
40	0	40	77	34	263	51	0	0
50	0	46	116	34	420	53	0	0
75	0	43	191	36	758	48	0	0
100	0	74	295	60	1128	80	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	5	4	3	3	7	0	0
20	0	7	24	3	30	28	0	0
25	0	19	40	8	85	37	0	0
30	0	24	47	13	146	33	0	0
35	0	18	50	8	186	23	0	0
40	0	40	79	34	269	49	0	0
50	0	44	121	33	420	54	0	0
75	0	44	190	37	762	47	0	0
100	0	70	300	57	1132	80	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	3	1	5050	5050	0	0
15	0	1	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	190	0	190	0	0	0	0
15	0	77	0	77	0	0	0	0
20	0	11	0	11	0	0	0	0
25	0	1	0	1	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 6f. Ln(5,1.5) 50% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	1027.6868	826.1556	N/A	N/A	9961.1316	5898.5439
15	882.0655	516.1400	N/A	N/A	4965.4414	3648.5054
20	842.5506	523.9451	N/A	N/A	3237.4331	2740.8416
25	799.3954	390.5650	N/A	N/A	2497.8713	2203.0069
30	785.5474	415.9813	N/A	N/A	2085.0137	1896.1899
35	761.9793	339.5366	N/A	N/A	1789.3165	1667.0598
40	747.1088	356.7544	N/A	N/A	1591.2384	1511.3951
50	735.9116	332.1537	N/A	N/A	1364.2049	1316.4939
75	698.1015	260.6709	N/A	N/A	1063.5086	1044.2168
100	680.5193	258.2202	N/A	N/A	929.3993	918.7893

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1047.3094	1049.9459	1260.4774	1143.5934	1444.5271
15	784.0808	772.9613	968.3125	2222.8176	1283.6502
20	636.1247	615.2081	775.6299	6352.2786	1185.4506
25	529.2127	499.7257	636.8309	1609.3765	1092.9300
30	460.2357	420.7979	547.4544	454.6634	1042.3841
35	409.5618	367.0681	478.0657	403.9328	985.0486
40	369.8869	330.6077	423.4962	364.5021	954.4818
50	311.7218	278.3932	348.1803	307.2182	922.6256
75	235.1539	226.3057	250.8791	232.4431	842.1679
100	210.9813	222.8397	218.5696	209.4711	803.3596

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	685.1837	655.2636	848.7005	729.7540	1076.3765
15	437.1811	401.6308	562.5214	5907.2440	932.4520
20	367.8432	342.8536	439.0573	58297.2401	888.2432
25	335.6956	318.7862	376.6704	36795.4159	839.4926
30	301.2825	289.7290	330.5800	299.4948	819.6359
35	274.6715	266.6039	297.5337	272.6202	790.5276
40	262.9901	263.9641	278.4711	261.7628	773.5067
50	238.4934	255.9590	245.9152	238.3766	759.2516
75	203.6411	244.7755	204.0430	204.3185	713.0398
100	199.8502	260.7521	198.0780	200.8874	690.9622

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	788.5066	754.7671	996.7587	791.0251	1026.4223	794.6188
15	587.4796	548.0713	667.1474	587.1288	850.3061	464.9717
20	512.5090	476.5713	565.3017	516.8349	806.6346	389.3704
25	461.1496	432.8965	498.7735	461.8815	762.5190	358.1159
30	420.3551	394.0777	448.0360	420.8040	748.3724	322.5753
35	393.0922	369.0680	420.8994	395.0496	725.3176	288.1449
40	370.7684	350.4587	391.2304	373.8338	710.3302	287.8262
50	335.0306	316.0294	351.0717	335.4674	699.0933	285.3401
75	276.3042	259.3645	285.3839	276.2235	661.3953	285.2361
100	244.3846	226.4370	250.6213	243.5890	643.9389	311.6606

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	171209.1034	0.14%	1011.7826	0.00%	1963184.3262
15	0.00%	12699.0949	0.08%	611.7289	0.00%	7186552.6140
20	0.00%	5500.2815	0.04%	538.6550	0.00%	7018.1307
25	0.00%	3564.9335	0.02%	504.8873	0.00%	2931.5844
30	0.00%	2673.0799	0.00%	484.2076	0.00%	28326.2497
35	0.00%	2221.3414	0.00%	470.6069	0.00%	1295.9502
40	0.00%	1931.2596	0.00%	460.5144	0.00%	1149.1416
50	0.00%	1575.7335	0.00%	447.8310	0.00%	986.5821
75	0.00%	1209.0190	0.00%	429.6749	0.00%	798.2077
100	0.00%	1056.8139	0.00%	422.0313	0.00%	727.3229

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	947.068	2155.406	1227.148	564.008	509.793	710.451	1035.484
15	810.445	4045.716	2837.421	389.418	452.374	9579.471	889.561
20	780.705	8503.472	3609.950	362.929	440.847	88220.773	844.860
25	744.866	3010.363	3188.065	326.824	395.146	311.731	798.820
30	734.400	2117.282	3878.816	318.972	353.223	295.555	783.667
35	714.412	3503.577	567.207	301.933	318.114	275.322	759.754
40	701.253	603.990	3419.074	286.385	286.333	261.988	744.568
50	692.277	248.539	936.911	283.796	261.506	246.309	733.586
75	657.481	212.111	212.108	244.255	208.920	211.213	696.346
100	641.217	193.047	196.030	222.140	167.281	191.432	679.258

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	4004.356	839.732	1062.111	693.375	753.788	158316.598	6628.140
15	3357.936	609.323	566.838	606.285	3306.038	1068337955.768	5372.024
20	2653.673	646.591	541.255	1025.449	2148.936	61632321455.637	3195.020
25	1819.848	692.994	709.167	1079.092	2582.889	683.003	2053.011
30	1866.899	786.150	729.456	1423.371	1677.922	832.368	2070.258
35	1648.977	988.728	907.580	1735.109	2024.697	1033.036	1838.114
40	1441.861	842.617	862.620	1389.470	1293.566	868.394	1649.395
50	1241.659	751.825	734.690	1262.247	1107.811	775.844	1314.748
75	1010.433	673.157	653.358	1037.669	820.217	686.865	1060.442
100	981.137	717.886	711.223	1030.516	701.709	712.871	1027.590

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	1022.890	928.262	945.663	840.137	911.809	848.560	1128.156
15	862.054	748.267	757.187	577.957	627.533	611.291	958.510
20	822.815	647.539	655.621	472.117	489.781	507.975	902.038
25	778.006	537.393	544.627	404.987	404.435	436.209	844.508
30	765.386	460.626	470.691	362.167	354.197	392.029	824.844
35	741.486	400.535	405.985	333.057	318.621	359.708	796.013
40	726.833	356.460	362.048	309.936	292.857	334.294	777.300
50	716.189	303.037	305.730	274.431	256.592	295.710	762.628
75	675.792	243.524	245.899	224.584	203.947	242.084	718.633
100	657.247	214.633	216.237	196.821	175.452	213.474	697.835

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	1096.037	3288.241	1158.111	991.024	1105.018	1023.207	1327.705
15	899.093	3013.119	932.104	668.054	727.951	727.919	1093.170
20	841.273	788.516	820.262	546.570	557.213	600.138	987.855
25	792.486	655.378	677.779	473.983	454.387	514.816	904.917
30	778.328	554.125	573.482	416.323	390.437	456.118	873.808
35	753.767	480.233	493.158	379.512	348.254	418.032	836.087
40	738.213	424.136	433.096	353.474	316.049	389.200	813.151
50	727.215	349.345	356.093	305.047	271.117	338.164	791.659
75	684.794	271.730	276.248	242.377	208.169	269.364	737.878
100	665.342	235.686	238.047	207.472	175.841	233.539	713.396

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	1492.1218	1443.6508	1924.9024	1530.6460	2216.5908	1739.2067
15	1140.3578	1084.3885	1320.1893	1166.4288	1936.3219	1455.5285
20	1021.6760	961.8937	1140.3740	1048.6185	1808.2874	1366.2461
25	926.9939	880.6065	1010.1503	939.3382	1665.0284	1268.7887
30	849.8140	806.7483	911.5607	858.6998	1597.0904	1233.3768
35	802.1055	758.9725	863.8047	809.8257	1508.0467	1179.2053
40	757.3040	726.9877	801.9064	769.8317	1454.5013	1143.3157
50	687.2323	658.2922	722.1905	693.1496	1398.7743	1110.0931
75	573.9167	548.7972	594.1748	575.2246	1250.7844	1015.8481
100	512.2411	484.8931	525.8380	512.0678	1173.1842	967.1126

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	947.8190	4599.9217	1022.4353	1095.3134	1031.4588
15	811.7317	3624.3930	861.1667	898.4621	855.8009
20	782.3785	2708.0582	822.4532	841.3700	810.4629
25	745.7880	1833.6111	777.8661	791.4385	764.4088
30	735.5830	1872.3152	765.2825	779.0550	749.2865
35	714.9535	1671.4647	742.3662	753.8878	725.9111
40	701.4728	1440.0762	726.8961	738.3907	710.8288
50	692.5333	1219.7832	715.8363	727.4514	699.0933
75	657.4730	993.4902	675.8543	684.8850	661.3953
100	641.1598	963.7755	657.3773	665.2191	643.9389

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	1026.422	755.881	585.081	707.765	923.757	37008.354	1048.718
15	850.306	595.662	425.302	532.606	748.311	625847.374	882.989
20	806.635	506.735	375.993	448.632	620.818	509512.805	839.681
25	762.519	453.036	353.702	397.358	532.452	146383.965	795.171
30	748.372	398.908	322.643	353.536	473.446	456.114	781.561
35	725.318	361.624	301.934	321.051	418.489	405.484	758.094
40	710.330	340.475	288.461	304.705	393.810	375.858	743.554
50	699.093	302.189	263.331	272.722	367.626	326.863	732.548
75	661.395	244.227	223.072	235.356	330.060	257.924	695.618
100	643.939	218.007	200.995	220.348	399.409	227.996	678.578

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	83.64	83.19	89.82	85.05	90.38	60.09	57.86	73.92	58.38	81.29
15	72.50	71.82	83.55	73.21	89.17	33.35	29.29	48.61	30.69	77.50
20	61.90	60.67	76.40	61.68	90.38	24.57	19.98	34.77	22.83	78.65
25	50.31	47.05	66.26	49.52	90.51	18.65	13.98	25.87	17.64	79.15
30	39.27	32.61	54.89	38.42	90.67	13.49	8.91	19.01	12.75	80.14
35	31.01	23.33	43.41	30.42	91.98	9.56	5.54	13.70	9.17	81.92
40	23.74	16.20	33.27	23.01	92.32	7.47	4.30	9.90	7.13	82.34
50	13.09	7.19	18.55	12.53	93.56	3.60	1.47	4.99	3.37	84.89
75	2.87	0.81	3.74	2.75	94.55	0.57	0.12	0.75	0.55	86.38
100	0.51	0.04	0.65	0.50	95.74	0.04	0.00	0.10	0.04	87.70

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	81.92	67.78	N/A	N/A	100.00	100.00
15	78.14	48.42	N/A	N/A	99.94	99.78
20	78.97	43.00	N/A	N/A	99.90	99.88
25	79.80	24.45	N/A	N/A	99.88	99.74
30	80.95	26.64	N/A	N/A	99.92	99.86
35	82.83	12.29	N/A	N/A	99.86	99.82
40	83.17	14.93	N/A	N/A	99.86	99.74
50	86.20	11.27	N/A	N/A	99.82	99.76
75	87.92	0.60	N/A	N/A	99.84	99.76
100	89.72	3.62	N/A	N/A	99.68	99.56

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	71.11	69.02	82.96	70.00	79.60	70.32
15	53.31	49.59	63.47	53.38	72.59	34.26
20	46.22	42.26	54.60	47.19	72.79	21.27
25	40.13	35.90	46.88	40.84	73.66	13.76
30	33.08	28.39	38.53	33.21	74.75	8.12
35	27.32	22.14	32.00	27.67	76.34	4.57
40	22.41	17.51	25.94	22.77	77.05	3.21
50	14.32	10.18	16.82	14.36	79.11	1.01
75	3.91	1.99	4.75	3.90	80.81	0.02
100	1.16	0.12	1.14	1.14	82.08	0.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.14%	70.83	0.00%	93.07
15	0.00%	99.50	0.08%	54.62	0.00%	90.00
20	0.00%	98.22	0.04%	51.25	0.00%	90.55
25	0.00%	97.96	0.02%	49.16	0.00%	90.63
30	0.00%	97.80	0.00%	46.77	0.00%	90.55
35	0.00%	97.88	0.00%	45.05	0.00%	90.99
40	0.00%	98.12	0.00%	42.50	0.00%	90.97
50	0.00%	98.40	0.00%	39.49	0.00%	92.08
75	0.00%	98.71	0.00%	32.63	0.00%	91.94
100	0.00%	98.81	0.00%	27.37	0.00%	92.26

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	75.35	61.84	69.74	49.71	41.23	48.65	75.72	82.75
15	69.84	35.66	45.03	21.95	15.36	24.08	70.18	79.50
20	70.87	23.76	31.43	13.54	8.12	16.89	71.23	80.12
25	72.00	16.28	20.49	9.54	4.76	12.79	72.24	80.28
30	73.92	10.62	13.53	6.00	2.64	9.11	73.90	81.19
35	75.54	6.97	8.40	3.54	1.47	6.04	75.47	82.87
40	76.14	5.53	6.59	2.77	1.04	5.02	76.38	83.17
50	78.24	2.74	3.36	1.19	0.33	2.45	78.36	86.10
75	80.40	0.49	0.67	0.11	0.04	0.48	80.34	87.94
100	81.72	0.00	0.05	0.00	0.00	0.02	81.68	89.70

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.10	40.31	49.95	37.47	24.38	36.02	85.84	90.16
15	82.16	21.13	25.41	15.53	8.64	17.65	83.84	88.59
20	84.10	13.83	16.90	9.08	3.89	11.48	84.89	88.89
25	85.19	9.97	12.01	6.08	2.34	8.87	85.41	89.39
30	85.31	7.38	8.37	3.90	1.23	6.51	85.07	89.45
35	86.42	4.69	5.42	2.24	0.67	4.23	86.40	90.73
40	87.13	3.94	4.28	1.95	0.36	3.64	87.01	91.35
50	87.96	1.90	2.29	0.87	0.08	1.71	87.41	92.18
75	88.51	0.34	0.46	0.10	0.04	0.34	87.96	93.45
100	89.19	0.00	0.00	0.00	0.00	0.00	88.89	94.26

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	78.42	79.88	81.39	71.76	78.20	72.69	78.20	86.50
15	72.48	71.23	71.73	50.75	58.75	54.13	72.53	83.01
20	72.95	63.85	65.06	39.21	42.69	43.27	72.97	83.25
25	74.02	51.29	51.76	29.98	29.17	34.81	73.78	83.54
30	75.19	38.36	39.30	20.78	18.48	26.82	75.37	83.92
35	76.79	26.94	28.45	15.18	10.74	20.05	76.87	85.50
40	77.52	18.53	19.11	10.54	6.98	15.33	77.64	85.49
50	79.80	8.58	9.02	4.19	2.06	7.39	79.82	87.84
75	81.58	1.19	1.39	0.45	0.04	1.25	81.74	89.29
100	83.01	0.23	0.25	0.03	0.00	0.21	82.85	90.75

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.66	85.17	84.18	80.89	89.41	84.20	81.76	90.55
15	75.01	79.78	80.09	60.90	70.35	66.96	75.21	87.78
20	74.10	77.47	78.03	50.16	54.05	55.40	74.30	87.64
25	74.67	67.49	69.07	41.34	37.79	46.77	74.79	87.45
30	75.82	55.09	56.87	32.53	26.85	38.09	76.16	87.27
35	77.45	43.42	45.58	25.56	18.61	32.13	77.49	88.44
40	78.30	33.89	34.98	21.26	14.06	27.31	78.22	88.75
50	80.30	20.74	21.66	12.69	6.56	18.20	80.55	89.84
75	82.10	6.66	7.13	3.59	1.08	6.58	82.28	91.03
100	83.19	2.40	2.55	0.66	0.10	2.43	83.68	92.16

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	94.76	94.26	96.71	95.26	96.30	94.26
15	89.69	88.36	94.97	90.69	96.20	92.75
20	89.94	88.81	93.98	90.83	97.01	93.90
25	89.33	88.63	93.41	90.36	97.56	95.11
30	87.44	85.99	91.62	88.20	98.06	95.52
35	87.84	86.53	91.39	88.00	98.79	96.32
40	86.80	85.95	90.76	88.10	98.83	97.15
50	85.77	83.76	89.36	86.33	99.21	97.68
75	73.58	69.35	77.85	73.46	99.64	98.65
100	60.42	53.00	65.17	60.26	99.86	99.25

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	79.60	76.06	52.55	74.87	79.96	84.42	81.15	82.71
15	72.59	61.08	33.64	53.94	64.99	74.65	73.84	77.88
20	72.79	48.32	26.38	35.77	49.07	62.22	73.49	78.20
25	73.66	35.16	20.46	23.67	35.13	46.32	73.94	78.81
30	74.75	24.55	15.33	14.96	25.49	32.77	74.87	80.22
35	76.34	16.85	10.87	9.11	18.04	21.74	76.38	82.18
40	77.05	12.46	8.44	6.48	13.35	15.45	77.09	82.46
50	79.11	6.20	4.10	3.07	8.79	8.16	79.11	85.41
75	80.81	1.27	0.77	0.83	3.96	2.00	80.81	87.49
100	82.08	0.61	0.36	0.83	2.53	0.91	82.08	89.41

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Detection Limit: 148.4131591
Averaged Percentage Non-detects: 50.00%
Distribution Check: Average of means: 456.695600
Distribution Check: Average of stdvs: 1050.737913
Average of NDs per 100 observations: 50.013100

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	148.413159	4.005941	10	92	344	943	1684	1977	0	0	0	0
15	148.413159	7.262574	1	4	11	74	241	462	849	1044	1027	834
20	148.413159	9.975446	0	0	1	6	20	64	182	366	628	819
25	148.413159	12.494257	0	0	0	0	0	11	21	66	179	303
30	148.413159	15.050297	0	0	0	0	0	0	1	5	34	68
35	148.413159	17.494257	0	0	0	0	0	0	0	0	4	7
40	148.413159	20.007921	0	0	0	0	0	0	0	0	0	2
50	148.413159	25.030495	0	0	0	0	0	0	0	0	0	0
75	148.413159	37.513069	0	0	0	0	0	0	0	0	0	0
100	148.413159	49.923960	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3024
15	503	0	0	0	0	0	0	0	0	0	0	0	288
20	882	826	637	383	162	74	0	0	0	0	0	0	30
25	489	698	798	748	654	518	283	155	84	35	8	0	0
30	139	266	394	524	690	733	670	564	455	246	149	112	0
35	34	78	111	200	333	492	605	704	636	582	479	785	0
40	4	9	27	68	114	173	269	402	525	617	617	2223	0
50	0	0	3	1	3	9	29	39	80	134	204	4548	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	19	0	19	0	0	19	0	19	0	0
15	24	0	24	0	0	24	0	24	0	0
20	3	0	3	0	0	3	0	3	0	0
25	5	0	5	0	0	5	0	5	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	505	709	157	790	0	0	0	1977
15	1694	1975	1133	2032	0	0	0	3408
20	2047	2388	1592	2314	0	0	0	2964
25	2219	2596	1846	2425	0	0	0	3283
30	2462	2866	2138	2626	0	0	0	2929
35	2550	3031	2275	2733	0	0	0	3186
40	2649	3142	2398	2797	0	0	0	2840
50	2920	3449	2719	3024	0	0	0	2796
75	3313	3895	3154	3407	0	0	0	3041
100	3587	4199	3468	3651	0	0	0	2699

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	505	709	157	790	0	0
15	1694	1975	1133	2032	0	0
20	2047	2388	1592	2314	0	0
25	2219	2596	1846	2425	0	0
30	2462	2866	2138	2626	0	0
35	2550	3031	2275	2733	0	0
40	2649	3142	2398	2797	0	0
50	2920	3449	2719	3024	0	0
75	3313	3895	3154	3407	0	0
100	3587	4199	3468	3651	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	19	0	19	0	0	0	0
15	0	28	9	24	4	13	0	0
20	0	41	96	21	88	117	0	0
25	0	99	184	51	257	204	0	0
30	0	145	274	83	497	252	0	0
35	0	171	325	106	706	280	0	0
40	0	261	434	168	914	345	0	0
50	0	375	584	279	1404	433	0	0
75	0	588	1042	514	2356	644	0	0
100	0	796	1405	694	3141	851	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	19	0	19	0	0	0	0
15	0	28	9	24	4	12	0	0
20	0	39	95	20	85	118	0	0
25	0	97	182	55	259	202	0	0
30	0	146	275	81	488	254	0	0
35	0	170	324	108	705	274	0	0
40	0	259	434	163	907	347	0	0
50	0	368	586	284	1409	434	0	0
75	0	590	1038	510	2358	646	0	0
100	0	796	1411	695	3141	847	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	7	8	2	5	14	0	0
20	0	38	94	16	89	116	0	0
25	0	94	180	52	257	203	0	0
30	0	146	272	85	494	248	0	0
35	0	172	332	104	710	271	0	0
40	0	262	438	167	912	347	0	0
50	0	377	587	281	1413	433	0	0
75	0	590	1050	510	2356	642	0	0
100	0	793	1414	694	3129	849	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	6	9	2	5	13	0	0
20	0	38	96	17	84	120	0	0
25	0	92	181	49	255	203	0	0
30	0	145	273	84	491	248	0	0
35	0	170	323	109	702	275	0	0
40	0	255	431	167	904	345	0	0
50	0	372	582	281	1407	435	0	0
75	0	593	1042	508	2356	643	0	0
100	0	805	1412	689	3132	851	0	0

		H-Statistics		Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	7	0	5050	5050	0	0
15	0	4	0	5050	5050	0	0
20	0	2	0	5050	5050	0	0
25	0	1	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	283	0	283	0	0	0	0
15	0	232	0	232	0	0	0	0
20	0	71	0	71	0	0	0	0
25	0	22	0	22	0	0	0	0
30	0	4	0	4	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 6g. Ln(5,1.5) 60% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	1181.3301	1078.0079	N/A	N/A	12099.4038	7082.4897
15	993.8707	632.9090	N/A	N/A	5946.2379	4304.7952
20	894.6302	683.2721	N/A	N/A	3613.0314	3024.3236
25	858.3672	511.0226	N/A	N/A	2784.7771	2432.1123
30	823.7007	566.9767	N/A	N/A	2255.9795	2035.4981
35	809.5408	448.5739	N/A	N/A	1941.5286	1797.4707
40	791.1170	507.3424	N/A	N/A	1706.7944	1613.6302
50	764.5454	432.6973	N/A	N/A	1423.6006	1369.4830
75	740.1257	358.2416	N/A	N/A	1109.0496	1087.0734
100	717.6527	378.3217	N/A	N/A	953.6595	941.7486

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1218.0097	1222.0625	1490.2448	1332.2644	1701.6661
15	902.4345	892.6855	1177.8121	1268.6552	1566.0493
20	674.7098	654.9411	899.6308	2377.3766	1400.5545
25	525.1463	496.7431	709.0066	507.0012	1306.2569
30	406.5071	379.3521	554.9758	391.2288	1215.6323
35	340.3057	315.5354	448.6273	328.7117	1164.4187
40	294.7421	278.4176	369.3790	286.4869	1112.7865
50	246.3929	246.3345	281.8099	242.7327	1034.6464
75	209.8431	252.3778	207.1654	212.0324	955.7292
100	224.1576	296.0642	211.4273	228.5780	899.4323

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	758.0706	721.8425	965.4943	801.8949	1233.3638
15	413.0503	380.7304	575.8074	2078.1841	1055.9210
20	347.1272	331.8921	388.4235	18162.0851	948.1624
25	338.0372	343.5866	332.5656	345.1855	907.1714
30	320.0080	344.3309	296.5970	334.3954	865.3501
35	307.5228	344.4699	280.2875	322.3916	846.7128
40	297.1094	346.0453	266.7089	312.6589	823.5606
50	287.1254	351.9815	256.5816	301.3141	788.4298
75	310.7021	413.6732	279.3709	323.5774	754.7750
100	342.8387	469.4669	314.8661	354.2314	725.4872

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	867.3528	823.1804	1126.5029	853.5063	1164.0650	874.7392
15	586.7932	536.5691	687.7973	573.8106	930.8906	465.0828
20	486.4403	435.9223	544.0431	468.2173	821.6983	445.5400
25	445.7709	404.1210	483.8242	430.1611	785.4825	486.0753
30	382.7986	352.3654	417.3259	375.8222	751.9301	503.5945
35	351.3440	328.6161	375.9011	347.4440	738.6516	520.8630
40	319.9259	303.5784	343.9832	319.0434	721.3110	530.2791
50	291.3350	279.5838	308.3057	293.7662	696.5515	548.7313
75	235.8238	228.6447	244.2319	235.9170	673.5158	656.5167
100	204.2825	191.1402	211.2422	202.9627	651.9991	736.8463

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	195257.5373	0.22%	1052.4113	0.02%	21033752.9011
15	0.00%	12899.5114	0.32%	648.0466	0.02%	5408805.7278
20	0.00%	4687.9424	0.24%	552.8248	0.00%	16737.5180
25	0.00%	2963.2217	0.06%	524.5917	0.00%	7173.4240
30	0.00%	2120.0500	0.06%	502.1208	0.00%	2548.7642
35	0.00%	1760.3324	0.04%	492.4913	0.00%	1860.8643
40	0.00%	1519.0977	0.00%	484.6164	0.00%	1272.7493
50	0.00%	1244.0074	0.00%	474.7664	0.00%	1014.8261
75	0.00%	956.1315	0.00%	463.8056	0.00%	822.4426
100	0.00%	831.4012	0.00%	457.1066	0.00%	738.8328

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	1072.963	2478.867	2092.764	613.731	560.477	775.369	1192.979
15	884.657	5789.502	4633.066	426.133	597.743	3310.923	1012.988
20	793.707	38380.968	39691.843	390.897	593.100	28608.372	911.978
25	765.853	188553.625	153713.713	385.039	605.715	345.689	869.265
30	737.794	21635.186	19948.889	360.605	514.154	322.153	829.485
35	727.330	549835.795	12766.709	342.461	490.655	291.244	811.587
40	712.269	7569.300	19677.774	323.908	444.516	272.459	791.493
50	689.878	1197.142	1552.290	300.470	370.555	250.076	763.792
75	669.530	297.993	230.419	277.295	297.990	230.835	738.686
100	649.380	196.822	192.193	252.498	269.349	198.181	716.395

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	4502.749	824.999	1013.896	706.756	851.409	129848.845	8345.367
15	3354.451	752.197	604.549	1540.827	3589.497	26844312.718	6163.914
20	2442.463	1616.506	1177.517	2535.534	5852.423	6253080987.589	3394.452
25	2234.899	2168.634	1775.683	3590.393	7640.960	2479.840	2817.392
30	1778.244	2149.472	1930.474	2893.499	5337.871	1802.083	2133.818
35	1651.069	1561.720	1349.667	2167.596	3695.723	1386.865	1979.743
40	1420.803	1561.980	1393.479	2092.653	3460.736	1181.030	1609.660
50	1231.011	1067.732	1030.127	1670.153	2102.879	1045.972	1363.595
75	1076.416	1245.311	1193.156	1982.779	2368.289	1269.185	1174.329
100	944.068	1051.468	1026.721	1677.059	1759.479	1082.159	1028.888

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	1161.526	1070.044	1091.845	945.784	1047.812	958.978	1303.217
15	947.587	905.887	915.857	598.130	708.017	649.595	1100.606
20	839.809	813.762	833.754	437.884	534.235	482.374	981.500
25	802.974	725.389	740.649	375.906	435.758	402.036	926.692
30	768.925	609.948	630.016	332.595	368.094	350.292	877.251
35	756.126	516.933	525.929	303.502	327.470	319.464	853.814
40	738.475	440.493	447.707	282.801	298.754	296.104	829.897
50	712.455	329.494	331.679	253.326	260.676	264.897	795.618
75	688.211	222.142	223.305	207.913	208.359	216.267	763.088
100	665.254	189.230	189.351	180.849	177.844	188.981	736.146

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	1276.120	4714.681	4767.192	1139.889	1278.223	1194.682	1563.846
15	1022.313	1019.418	3225.166	688.182	811.914	779.359	1292.634
20	876.671	899.574	973.526	494.259	590.075	555.315	1113.881
25	825.017	805.667	2609.244	425.542	475.281	460.945	1019.222
30	784.844	686.102	727.215	369.848	391.894	396.830	950.524
35	769.606	578.334	606.558	332.042	341.712	354.366	912.509
40	750.280	487.104	508.919	303.065	308.844	323.007	879.880
50	723.139	367.256	373.655	270.066	266.330	287.355	833.990
75	697.631	232.127	235.297	211.958	204.526	224.523	788.843
100	673.065	193.838	194.626	180.895	172.635	193.185	755.397

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	1641.0999	1572.7476	2175.1249	1660.7901	2547.4793	1964.5050
15	1127.3181	1070.3479	1360.3643	1154.8479	2237.7960	1607.9108
20	944.0698	879.2086	1085.8993	953.4887	1981.2559	1411.9776
25	876.4997	830.2296	968.8457	886.6365	1858.0913	1333.4389
30	780.3914	733.4966	860.1821	786.7399	1738.7094	1261.6970
35	718.5737	687.6118	779.8040	728.4690	1674.1419	1227.5424
40	663.4004	634.8308	721.1379	671.4891	1601.7496	1186.1054
50	615.4014	595.0788	654.1860	624.0819	1488.0856	1123.8371
75	507.2949	493.7080	528.8641	509.1277	1362.8321	1056.3958
100	451.8203	426.0087	465.9631	452.7246	1265.6021	999.9285

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	1073.5486	5329.8777	1162.6017	1268.5266	1174.8149
15	888.1480	3790.8838	947.7588	1016.7729	945.7021
20	798.3386	2613.9217	839.2483	874.2768	838.0703
25	770.4365	2420.9792	802.5606	823.1436	796.9807
30	741.3148	1881.0348	769.1570	783.9101	761.1774
35	730.2459	1763.9207	756.5121	769.7541	743.9590
40	714.2141	1479.2547	738.8093	751.3589	725.4335
50	691.0916	1240.4622	712.7022	723.2046	698.3352
75	669.8965	1071.8085	687.9558	697.5409	674.0159
100	649.3495	938.6863	665.4614	672.7300	651.9991

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	1164.065	865.237	629.379	824.473	1108.120	97547.873	1200.735
15	930.891	698.507	428.636	638.192	983.386	2005308.398	988.975
20	821.698	601.625	373.125	535.046	816.701	1680494.420	885.007
25	785.483	526.185	338.530	475.494	735.568	257147.302	847.792
30	751.930	459.268	307.354	416.521	664.516	610.847	813.621
35	738.652	411.300	284.652	376.273	634.892	537.827	799.902
40	721.311	381.058	271.178	355.096	619.806	494.229	781.984
50	696.551	326.856	250.373	320.908	595.347	400.764	756.899
75	673.516	294.133	245.024	348.679	908.515	331.284	734.631
100	651.999	301.682	267.142	430.951	1948.758	328.127	713.366

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	92.53	92.20	95.97	93.31	94.22	72.71	70.26	86.05	69.96	88.59
15	85.75	84.12	94.01	85.47	95.15	29.16	23.43	52.42	23.82	84.20
20	71.47	69.88	88.35	70.30	94.46	15.77	11.05	26.86	12.26	81.94
25	50.57	47.03	79.13	47.29	94.75	10.65	6.73	16.54	8.44	83.70
30	28.54	22.97	60.67	26.28	94.99	5.59	3.35	8.96	4.53	83.23
35	18.03	12.91	36.71	16.16	95.86	2.93	1.37	4.83	2.20	84.89
40	10.51	6.95	20.95	9.72	95.76	1.45	0.73	2.75	1.15	86.20
50	4.18	2.28	8.00	3.92	96.30	0.61	0.34	0.91	0.55	86.99
75	0.32	0.10	0.48	0.24	97.64	0.08	0.02	0.08	0.06	89.72
100	0.04	0.00	0.04	0.02	98.55	0.00	0.00	0.00	0.00	91.52

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	91.49	80.33	N/A	N/A	100.00	100.00
15	87.92	71.52	N/A	N/A	99.98	99.94
20	85.88	62.77	N/A	N/A	99.92	99.92
25	87.80	54.33	N/A	N/A	99.94	99.94
30	87.31	50.72	N/A	N/A	99.92	99.86
35	89.13	38.72	N/A	N/A	99.92	99.86
40	90.16	40.91	N/A	N/A	99.94	99.78
50	90.91	26.71	N/A	N/A	99.74	99.68
75	94.08	11.11	N/A	N/A	99.66	99.54
100	96.16	13.68	N/A	N/A	99.58	99.54

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	83.56	81.48	92.03	82.34	88.32	82.50
15	55.46	47.85	69.95	52.88	80.12	29.33
20	43.65	36.41	53.65	41.58	76.12	12.61
25	36.31	30.26	44.07	34.65	76.44	6.22
30	27.02	21.03	31.67	25.79	76.69	2.59
35	18.15	12.95	22.95	17.52	77.50	0.93
40	12.37	9.45	16.12	12.19	78.50	0.38
50	6.05	4.81	8.13	6.23	79.56	0.14
75	1.27	1.00	1.21	1.20	82.53	0.00
100	0.00	0.00	0.00	0.00	85.17	0.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.22%	81.48	0.02%	95.78
15	0.00%	99.90	0.32%	64.98	0.02%	93.13
20	0.00%	96.42	0.24%	57.48	0.00%	91.07
25	0.00%	94.42	0.06%	55.28	0.00%	91.03
30	0.00%	93.31	0.06%	53.34	0.00%	90.36
35	0.00%	93.05	0.04%	52.04	0.00%	91.07
40	0.00%	92.48	0.00%	52.30	0.00%	91.01
50	0.00%	91.94	0.00%	50.22	0.00%	90.87
75	0.00%	90.99	0.00%	47.23	0.00%	91.52
100	0.00%	91.45	0.00%	45.72	0.00%	92.06

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.53	74.22	83.03	60.53	48.87	56.95	84.93	92.08
15	76.44	40.65	54.70	17.72	15.38	18.29	77.54	89.98
20	74.02	24.57	38.01	7.94	5.91	9.37	74.89	88.32
25	74.75	16.21	26.16	5.13	3.42	6.70	75.74	89.54
30	75.56	8.70	15.09	2.34	1.21	3.51	76.28	89.09
35	76.51	4.50	8.28	1.04	0.67	1.72	77.39	90.38
40	77.70	2.74	4.53	0.58	0.34	1.18	78.08	90.91
50	78.85	1.08	1.56	0.34	0.00	0.58	79.29	91.45
75	82.14	0.17	0.16	0.03	0.00	0.11	82.02	94.20
100	84.87	0.00	0.00	0.00	0.00	0.00	84.77	96.08

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.23	37.80	52.78	35.35	24.87	34.04	90.65	95.70
15	84.55	15.60	19.58	10.67	6.54	10.49	87.74	93.58
20	84.12	8.54	10.08	4.80	2.52	5.47	88.24	92.81
25	85.98	5.68	7.05	3.15	1.55	3.60	88.93	93.45
30	86.06	2.78	3.37	1.33	0.44	1.81	88.97	93.49
35	87.94	1.37	1.61	0.76	0.19	0.86	90.08	94.79
40	88.46	0.85	0.99	0.37	0.18	0.56	89.86	94.55
50	88.26	0.46	0.54	0.20	0.00	0.44	88.93	94.99
75	90.44	0.13	0.13	0.00	0.00	0.11	90.50	96.93
100	91.15	0.00	0.00	0.00	0.00	0.00	91.15	97.88

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.52	90.40	91.35	83.27	88.65	84.24	86.97	93.96
15	79.88	84.45	84.93	55.15	72.09	60.66	79.88	92.73
20	76.57	78.60	78.88	34.33	51.24	41.27	76.44	91.49
25	77.07	70.73	70.27	24.33	33.57	28.84	76.93	92.12
30	77.33	55.00	55.14	15.26	19.29	18.79	77.05	91.68
35	77.96	40.40	40.88	8.99	9.99	11.69	78.18	92.67
40	79.31	28.45	28.50	5.73	4.60	7.65	79.29	92.69
50	80.36	12.79	12.91	1.93	1.32	2.79	80.36	93.13
75	83.58	1.11	1.00	0.04	0.00	0.11	83.41	95.33
100	85.66	0.00	0.00	0.00	0.00	0.00	85.82	96.77

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.77	88.71	88.51	91.17	96.44	93.09	90.50	96.16
15	83.64	84.17	84.67	65.76	80.83	73.67	83.64	95.92
20	79.15	82.85	83.96	43.72	58.95	52.26	78.95	94.97
25	78.42	77.85	78.44	33.31	40.49	38.75	78.57	95.01
30	78.14	66.69	67.32	23.41	25.32	27.64	77.70	94.57
35	79.47	52.68	55.22	16.81	15.09	20.48	78.85	95.35
40	80.06	40.06	41.56	11.48	8.92	14.70	80.02	94.79
50	80.95	23.09	23.63	7.10	4.19	9.44	81.19	95.07
75	83.64	3.03	3.57	1.03	0.68	1.67	84.44	96.53
100	86.20	0.46	0.55	0.17	0.16	0.49	86.36	97.52

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	98.00	97.88	98.94	98.29	98.57	97.66
15	94.15	92.31	98.42	93.61	97.82	97.03
20	90.10	86.98	96.39	89.36	97.94	96.44
25	89.27	86.54	94.50	88.98	98.36	96.85
30	84.68	81.93	91.61	85.22	98.44	97.29
35	85.23	83.21	91.31	86.06	99.11	98.24
40	80.66	79.26	87.13	82.40	99.09	98.28
50	76.24	73.69	81.61	77.63	99.25	98.55
75	59.96	57.86	64.14	61.15	99.78	99.45
100	42.01	33.33	46.88	43.28	99.96	99.80

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 217.0267581
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.32	86.80	59.90	91.39	91.21	93.74	91.13	91.78
15	80.12	78.78	33.50	78.45	81.31	91.21	84.79	87.88
20	76.12	63.77	23.43	51.53	63.47	83.01	80.63	85.19
25	76.44	44.82	17.15	30.01	47.49	66.91	78.85	87.09
30	76.69	27.31	10.53	16.66	32.85	43.19	78.42	86.69
35	77.50	17.32	6.30	9.56	24.32	26.38	78.75	88.26
40	78.50	10.99	4.00	6.23	18.95	16.18	79.19	89.31
50	79.56	4.93	1.64	3.09	12.40	7.68	79.76	89.98
75	82.53	1.39	0.57	1.25	6.99	2.16	82.59	93.39
100	85.17	1.11	0.57	1.17	4.32	1.52	85.17	95.58

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 1.50
Population Mean: 457.1447133
Number of Test Runs: 5050
Detection Limit: 217.0267581
Averaged Percentage Non-detects: 60.00%
Distribution Check: Average of means: 456.452189
Distribution Check: Average of stdvs: 1049.725749
Average of NDs per 100 observations: 59.980600

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	217.026758	4.364752	0	32	155	555	1505	2803	0	0	0	0
15	217.026758	8.266139	0	1	0	16	50	166	427	725	1138	1346
20	217.026758	11.760594	0	0	0	0	1	4	25	73	200	382
25	217.026758	14.901980	0	0	0	0	0	0	3	6	16	47
30	217.026758	18.001584	0	0	0	0	0	0	0	0	0	2
35	217.026758	21.020594	0	0	0	0	0	0	0	0	0	0
40	217.026758	24.084752	0	0	0	0	0	0	0	0	0	0
50	217.026758	30.031089	0	0	0	0	0	0	0	0	0	0
75	217.026758	45.065347	0	0	0	0	0	0	0	0	0	0
100	217.026758	59.967525	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	8721
15	1181	0	0	0	0	0	0	0	0	0	0	0	1416
20	637	846	924	924	618	416	0	0	0	0	0	0	277
25	102	242	398	583	739	810	784	603	409	206	102	0	49
30	9	27	61	126	262	405	546	683	740	727	583	879	4
35	2	2	5	11	31	87	159	270	380	562	674	2867	1
40	0	0	1	0	4	8	24	38	91	164	283	4437	1
50	0	0	0	0	0	0	1	0	3	4	4	5038	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	18	0	18	0	0	18	0	18	0	0
15	39	0	39	0	0	39	0	39	0	0
20	27	0	27	0	0	27	0	27	0	0
25	19	0	19	0	0	19	0	19	0	0
30	5	0	5	0	0	5	0	5	0	0
35	2	0	2	0	0	2	0	2	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	548	762	145	848	0	0	0	2803
15	2264	2450	1562	2688	0	0	0	4390
20	2949	3207	2364	3321	0	0	0	4365
25	3260	3497	2831	3535	0	0	0	4634
30	3503	3766	3143	3724	0	0	0	4563
35	3777	3984	3451	3931	0	0	0	4753
40	3959	4182	3698	4090	0	0	0	4720
50	4124	4343	3930	4232	0	0	0	4758
75	4578	4751	4470	4633	0	0	0	4933
100	4762	4891	4713	4782	0	0	0	4955

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	548	762	145	848	0	0
15	2264	2450	1562	2688	0	0
20	2949	3207	2364	3321	0	0
25	3260	3497	2831	3535	0	0
30	3503	3766	3143	3724	0	0
35	3777	3984	3451	3931	0	0
40	3959	4182	3698	4090	0	0
50	4124	4343	3930	4232	0	0
75	4578	4751	4470	4633	0	0
100	4762	4891	4713	4782	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	18	0	18	0	0	0	0
15	0	49	8	40	5	19	0	0
20	0	141	235	86	144	323	0	0
25	0	250	531	160	463	599	0	0
30	0	416	775	267	930	808	0	0
35	0	608	970	436	1337	974	0	0
40	0	811	1232	594	1770	1146	0	0
50	0	1172	1581	963	2404	1439	0	0
75	0	2083	2618	1861	3726	2219	0	0
100	0	2671	3260	2495	4427	2781	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	18	0	18	0	0	0	0
15	0	49	8	40	6	19	0	0
20	0	144	233	90	135	314	0	0
25	0	258	536	155	458	606	0	0
30	0	417	764	266	932	802	0	0
35	0	605	976	442	1334	969	0	0
40	0	809	1229	593	1762	1155	0	0
50	0	1178	1581	969	2398	1424	0	0
75	0	2078	2624	1860	3723	2230	0	0
100	0	2675	3249	2496	4425	2784	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	15	9	6	6	20	0	0
20	0	125	235	68	134	318	0	0
25	0	236	528	142	460	602	0	0
30	0	414	772	262	933	797	0	0
35	0	607	979	436	1337	969	0	0
40	0	808	1226	597	1769	1153	0	0
50	0	1189	1585	968	2392	1428	0	0
75	0	2069	2614	1862	3726	2234	0	0
100	0	2677	3257	2491	4429	2787	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	15	9	6	6	18	0	0
20	0	123	235	68	137	318	0	0
25	0	238	532	138	464	611	0	0
30	0	418	769	261	930	802	0	0
35	0	606	986	441	1338	973	0	0
40	0	811	1225	596	1767	1146	0	0
50	0	1183	1585	966	2400	1429	0	0
75	0	2079	2611	1860	3727	2230	0	0
100	0	2671	3256	2495	4430	2789	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	11	1	5050	5050	0	0
15	0	16	1	5050	5050	0	0
20	0	12	0	5050	5050	0	0
25	0	3	0	5050	5050	0	0
30	0	3	0	5050	5050	0	0
35	0	2	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	392	0	392	0	0	0	0
15	0	446	0	446	0	0	0	0
20	0	272	0	272	0	0	0	0
25	0	139	0	139	0	0	0	0
30	0	56	0	56	0	0	0	0
35	0	28	0	28	0	0	0	0
40	0	7	0	7	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 7. Ln(5,2) Detection Limit Fixed at 30 (Censoring Level = 21.18%)

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	2545.6876	1070.9939	N/A	N/A	15775.3758	9884.1505
15	2223.0367	716.2337	N/A	N/A	7451.4971	5835.0252
20	2132.8170	612.8289	N/A	N/A	5018.7942	4425.0549
25	2139.3802	562.1777	N/A	N/A	4202.9255	3826.9019
30	2078.4105	504.9279	N/A	N/A	3590.3717	3347.4728
35	2030.9671	482.8760	N/A	N/A	3187.4387	3025.9960
40	2002.3850	465.4095	N/A	N/A	2915.8313	2808.6639
50	1960.9751	432.4522	N/A	N/A	2583.0160	2517.2235
75	1891.9820	401.5157	N/A	N/A	2160.0959	2131.8241
100	1793.2946	382.6577	N/A	N/A	1924.1721	1908.3338

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	2465.9549	2445.6659	2732.2046	2546.1721	3029.2795
15	1991.4633	1919.1779	2146.2240	2028.4300	2534.5878
20	1821.9522	1708.6414	1929.1926	1843.6593	2370.7666
25	1751.5381	1593.7088	1837.9063	1766.0725	2352.8225
30	1644.4815	1454.4570	1714.1379	1654.3780	2267.3920
35	1556.0312	1338.4527	1614.9447	1562.8673	2206.0791
40	1503.5670	1265.8310	1553.4797	1508.5631	2160.0898
50	1404.3129	1121.8256	1443.6870	1406.9354	2101.8583
75	1238.9700	883.8740	1264.5001	1239.1927	2005.5652
100	1095.2961	740.4966	1113.6410	1094.6259	1891.1816

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1980.0010	1896.0060	2193.7784	2013.3723	2537.5845
15	1650.8766	1527.4164	1781.2296	1667.3444	2201.4896
20	1544.1234	1387.3587	1636.7456	1553.9735	2102.5827
25	1494.4846	1294.2331	1570.2024	1500.5541	2106.7194
30	1412.0103	1186.4703	1473.7963	1415.6895	2045.7169
35	1340.0297	1095.7964	1392.5506	1341.9981	2000.4829
40	1304.8536	1037.5442	1349.7877	1305.9890	1971.2125
50	1224.3121	926.7131	1260.0678	1224.2063	1930.9312
75	1089.4572	755.4498	1113.0377	1088.2194	1863.5299
100	968.1319	654.8541	985.0419	966.5870	1769.7714

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	2402.2422	2181.6106	2641.2227	2491.6622	2672.1225	2346.6467
15	1924.7751	1713.8339	2056.1750	1966.0129	2285.3274	1838.7711
20	1773.0263	1569.0993	1883.5609	1784.7403	2173.6085	1658.8878
25	1668.8240	1407.3929	1757.4787	1677.1679	2169.8868	1568.6291
30	1576.9157	1264.1301	1645.9446	1578.9556	2101.4099	1455.2035
35	1477.6882	1199.8783	1529.6562	1462.1968	2048.8817	1359.1502
40	1430.3780	1136.8814	1474.1184	1432.3619	2016.8891	1306.2697
50	1316.7692	1029.2714	1351.9446	1318.8132	1971.0414	1207.3125
75	1156.1845	867.4033	1179.0533	1155.3807	1896.6780	1055.8675
100	1035.5562	773.9293	1051.2059	1034.5620	1795.2801	920.0518

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	354037312.6685	0.00%	131448.2710	0.00%	53687355469142.3980
15	0.00%	127713.5191	0.00%	5181.9739	0.00%	3546842.5078
20	0.00%	29546.4588	0.00%	2499.5508	0.00%	42493.9146
25	0.00%	15377.4544	0.00%	1916.5046	0.00%	19824.3033
30	0.00%	10028.6251	0.00%	1574.2591	0.00%	11035.8506
35	0.00%	7573.4337	0.00%	1389.7867	0.00%	6931.3907
40	0.00%	6405.2767	0.00%	1294.0705	0.00%	5438.3301
50	0.00%	4834.0259	0.00%	1134.3440	0.00%	3964.1225
75	0.00%	3403.1961	0.00%	970.7569	0.00%	2757.3154
100	0.00%	2865.5822	0.00%	894.1412	0.00%	2331.4457

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	2444.417	1946.325	2061.585	1761.299	1664.166	1881.039	2557.579
15	2167.551	1570.376	1732.869	1359.256	1302.353	1538.093	2218.942
20	2093.209	1443.168	1490.205	1194.484	1159.380	1420.834	2126.495
25	2106.950	1358.334	1399.451	1086.215	1068.529	1339.576	2133.641
30	2051.914	1258.789	1292.443	956.408	951.822	1242.310	2073.487
35	2008.461	1174.795	1202.359	903.929	876.182	1160.456	2025.697
40	1982.798	1124.284	1151.083	837.551	824.807	1112.418	1996.609
50	1945.819	1031.231	1050.554	774.018	731.518	1020.270	1957.768
75	1880.254	876.868	888.875	721.021	608.206	870.985	1889.029
100	1785.115	782.485	790.527	691.750	520.307	778.086	1790.025

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	463781.096	118498.448	187117.803	43186.359	48540.173	83194.093	596120.982
15	34725.867	13381.632	15629.978	7720.905	9492.984	12565.620	35591.620
20	24792.277	6958.692	8013.543	3569.803	4676.557	6583.882	24991.055
25	24890.136	6525.160	7018.070	2290.136	4562.508	6209.648	25716.622
30	16362.906	3536.102	3833.956	1500.206	2332.555	3344.350	16208.718
35	14238.510	2916.355	3153.281	1668.776	2138.822	2862.574	14407.512
40	12025.897	2544.431	2683.084	1180.853	1886.136	2468.053	11984.423
50	18429.979	1612.657	1705.538	2089.120	1244.389	1564.372	19278.248
75	10825.934	1183.568	1214.095	4750.417	1026.056	1177.001	10931.665
100	8836.024	4018.752	3997.772	11900.696	2384.713	4113.383	8919.836

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	2704.323	2361.392	2414.284	2311.586	2298.760	2336.126	2784.762
15	2350.499	1926.660	1955.247	1853.027	1793.708	1907.538	2401.212
20	2256.453	1761.524	1787.312	1643.096	1583.192	1752.689	2290.485
25	2263.334	1684.387	1704.321	1521.417	1467.375	1668.983	2289.319
30	2197.640	1561.926	1586.456	1375.407	1321.376	1552.147	2220.277
35	2143.719	1460.984	1483.411	1241.517	1209.528	1455.294	2163.012
40	2108.694	1401.843	1422.125	1164.240	1144.148	1393.484	2125.055
50	2063.253	1287.329	1302.203	1010.283	1019.403	1280.369	2075.729
75	1984.547	1091.376	1103.087	779.591	830.780	1086.537	1993.368
100	1872.648	938.988	947.681	652.761	693.290	935.268	1879.088

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	2735.843	2459.723	2504.635	2357.075	2387.480	2412.483	3093.342
15	2379.573	1984.266	1997.192	1959.579	1897.720	2006.416	2561.804
20	2291.577	1846.669	1826.841	1780.247	1732.020	1847.150	2403.875
25	2302.147	1770.000	1780.568	1661.827	1631.318	1754.098	2386.960
30	2234.078	1660.604	1679.529	1533.300	1473.970	1644.774	2301.506
35	2183.248	1576.413	1581.196	1409.943	1365.552	1553.693	2253.350
40	2149.927	1517.305	1527.060	1332.695	1296.955	1515.023	2197.603
50	2101.001	1414.570	1423.299	1168.978	1176.892	1410.329	2144.866
75	2020.691	1245.248	1253.559	900.291	975.273	1240.037	2042.975
100	1901.775	1084.283	1090.786	754.289	823.409	1076.935	1922.275

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	4631.7131	4258.7442	5125.4805	4879.9912	5406.8946	4794.1059
15	3777.4908	3428.2078	4051.0313	3901.8417	4589.6962	4085.9184
20	3505.9413	3194.6759	3744.7946	3553.8504	4302.0500	3856.2904
25	3313.1528	2866.1307	3504.1901	3349.1023	4264.7262	3830.4467
30	3156.1077	2581.6792	3306.6821	3175.1162	4094.4667	3685.1435
35	2945.6328	2456.5727	3055.5692	2916.4560	3958.9244	3566.0143
40	2850.8996	2327.4655	2941.0484	2866.3297	3852.2148	3481.3842
50	2617.2855	2115.1183	2691.4172	2632.4538	3715.6287	3366.7724
75	2276.9950	1763.5577	2325.1721	2280.1205	3476.5592	3169.6769
100	2010.9340	1573.6740	2042.9669	2013.0593	3203.9988	2930.7794

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	2446.3248	434697.0881	2703.6425	2723.6778	2672.1292
15	2166.9999	34433.5387	2354.5274	2385.0200	2285.3277
20	2093.8547	23724.1816	2255.6842	2290.2219	2173.6085
25	2106.9701	24889.0064	2264.4813	2299.1485	2169.8868
30	2053.1277	15561.8659	2198.2142	2235.3999	2101.4099
35	2008.9012	13665.5285	2144.2952	2183.2222	2048.8817
40	1982.5569	11695.5969	2109.6037	2149.5473	2016.8891
50	1947.9034	18852.4462	2062.7233	2102.1099	1971.0414
75	1879.1441	10746.7088	1982.5589	2020.8196	1896.6780
100	1784.2771	8627.4025	1872.4831	1904.3052	1795.2801

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	2672.123	1907.956	1859.805	1599.661	1921.260	1973.851	2673.084
15	2285.327	1482.453	1453.245	1184.992	1440.204	1508.878	2287.040
20	2173.609	1328.236	1312.460	1032.577	1245.377	1342.639	2175.662
25	2169.887	1222.785	1210.461	931.017	1141.238	1233.950	2172.245
30	2101.410	1110.749	1100.870	827.429	1018.467	1119.203	2103.919
35	2048.882	1036.906	1029.390	775.474	947.724	1044.760	2051.539
40	2016.889	997.153	990.001	733.753	887.709	1003.132	2019.610
50	1971.041	914.002	909.687	670.584	795.054	917.721	1973.843
75	1896.678	793.003	789.410	571.437	667.340	795.791	1899.613
100	1795.280	722.191	718.931	513.523	578.715	724.403	1798.238

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	52.19	52.20	55.87	53.43	59.19	44.90	44.00	48.27	45.37	53.27
15	50.48	49.72	53.78	51.41	59.94	43.25	41.09	46.26	43.64	54.65
20	51.41	49.74	54.40	52.24	62.79	44.30	40.57	47.39	44.61	58.20
25	51.54	47.94	53.64	51.74	64.36	44.16	38.65	46.51	44.28	59.96
30	49.56	44.73	51.39	49.80	64.81	42.18	35.19	44.28	42.32	59.60
35	49.07	43.41	51.19	49.39	66.12	42.22	32.93	44.26	42.34	61.72
40	48.93	41.13	50.48	49.09	67.33	41.50	30.24	43.27	41.52	63.29
50	46.65	35.60	48.42	46.79	68.81	38.87	24.99	40.63	38.91	64.34
75	41.66	21.29	43.33	41.70	71.96	33.13	13.31	34.57	33.09	67.80
100	35.25	11.19	36.55	35.17	72.42	26.75	6.16	27.98	26.63	68.44

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	52.75	26.91	N/A	N/A	95.29	92.02
15	54.38	15.71	N/A	N/A	95.60	92.57
20	58.12	11.52	N/A	N/A	93.47	91.37
25	60.18	8.44	N/A	N/A	92.65	90.53
30	59.76	5.39	N/A	N/A	92.18	90.16
35	61.72	4.10	N/A	N/A	90.46	88.77
40	63.50	3.50	N/A	N/A	89.74	88.28
50	64.79	1.52	N/A	N/A	87.96	86.69
75	68.14	0.28	N/A	N/A	86.00	85.15
100	68.87	0.04	N/A	N/A	83.72	83.15

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	50.81	49.85	54.40	52.13	54.28	50.30
15	49.45	47.21	52.59	50.22	55.09	46.89
20	50.74	47.03	53.52	51.28	58.69	46.30
25	50.59	45.21	52.59	50.75	60.61	44.73
30	48.23	41.15	50.39	48.49	59.98	41.50
35	48.46	40.30	50.00	48.42	61.88	40.63
40	47.47	36.85	49.31	47.51	63.64	39.29
50	45.38	32.18	46.84	45.56	64.97	35.37
75	39.98	20.85	41.50	39.95	68.16	27.92
100	33.47	12.79	34.64	33.36	68.79	22.24

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	97.88	0.00%	71.23	0.00%	90.55
15	0.00%	97.84	0.00%	64.61	0.00%	91.43
20	0.00%	97.90	0.00%	60.93	0.00%	90.53
25	0.00%	98.28	0.00%	58.53	0.00%	91.29
30	0.00%	98.02	0.00%	52.87	0.00%	91.72
35	0.00%	97.82	0.00%	50.34	0.00%	91.43
40	0.00%	98.32	0.00%	46.77	0.00%	91.41
50	0.00%	98.26	0.00%	40.46	0.00%	91.15
75	0.00%	98.61	0.00%	30.36	0.00%	92.20
100	0.00%	98.51	0.00%	21.64	0.00%	92.18

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	51.13	44.29	45.94	41.28	38.34	43.09	51.23	52.75
15	53.21	41.88	43.37	36.22	32.69	40.85	53.37	53.98
20	57.45	41.82	43.45	33.98	30.56	40.80	57.23	57.90
25	59.56	40.74	42.28	30.07	27.98	39.75	59.45	60.04
30	58.99	37.90	38.95	24.81	23.81	36.87	59.17	59.56
35	61.09	36.44	37.73	22.06	21.76	35.98	61.03	61.68
40	62.77	34.53	36.08	18.59	19.54	33.80	62.99	63.11
50	64.26	30.83	31.74	13.17	15.73	30.28	64.36	64.48
75	67.47	21.39	22.37	5.33	8.62	21.11	67.52	68.02
100	68.42	14.12	15.10	2.00	4.35	13.84	68.42	68.61

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	73.07	59.22	62.49	53.23	45.29	57.72	72.50	74.02
15	74.83	56.34	58.75	45.88	39.60	55.07	74.00	74.91
20	75.84	54.61	56.99	39.10	35.41	53.30	75.33	75.74
25	76.97	52.53	54.90	33.70	31.71	50.96	76.32	76.85
30	77.52	48.50	50.40	26.77	26.71	47.11	76.81	77.47
35	78.46	45.56	47.88	22.80	23.92	44.50	78.12	78.51
40	79.35	42.51	44.48	18.41	21.12	41.56	78.93	79.09
50	79.27	37.62	39.11	12.04	16.96	36.57	78.93	79.43
75	81.78	25.07	26.34	4.69	9.06	24.72	81.47	81.90
100	81.33	15.94	16.38	1.81	4.76	15.45	80.95	81.45

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	53.37	49.92	50.46	48.93	49.52	49.21	53.49	55.60
15	54.99	48.38	49.13	47.15	46.22	48.14	54.95	56.34
20	58.91	49.56	50.08	47.20	44.87	49.48	59.15	59.74
25	61.29	48.72	49.44	45.10	41.96	48.35	61.27	62.24
30	61.13	46.20	47.05	40.59	37.92	45.96	61.09	61.70
35	63.13	45.98	46.77	38.22	35.34	45.80	62.81	63.92
40	64.77	44.57	45.56	35.59	33.13	44.40	64.93	65.35
50	66.14	41.66	42.26	28.51	27.60	41.01	66.28	66.65
75	69.72	33.27	33.95	14.16	16.76	32.90	69.56	70.08
100	70.00	24.53	25.19	5.90	9.93	23.98	69.92	70.67

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	53.88	51.98	51.62	51.27	53.86	50.99	53.74	59.60
15	55.70	49.82	49.80	50.48	50.85	49.94	55.76	59.45
20	59.70	50.97	51.31	51.73	50.29	51.22	59.56	62.24
25	61.98	50.74	51.14	50.47	47.99	51.02	61.90	64.14
30	61.92	48.67	48.87	46.84	44.45	48.44	62.08	63.62
35	64.12	48.55	49.13	45.47	42.77	48.48	64.06	65.47
40	65.88	48.04	48.81	42.76	40.28	47.84	65.64	67.03
50	66.95	45.66	46.26	36.92	35.52	45.54	67.07	68.06
75	70.48	39.85	40.27	23.41	25.12	39.93	70.53	71.56
100	70.99	32.85	33.05	14.26	18.10	32.34	71.11	71.94

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	72.77	72.71	76.15	74.41	77.41	72.99
15	76.25	76.02	78.74	77.33	81.01	77.15
20	78.32	77.71	80.20	79.09	83.47	79.68
25	80.39	79.35	82.10	80.99	85.78	82.16
30	81.30	79.39	82.54	81.57	87.21	83.41
35	81.62	79.63	82.86	81.80	88.42	84.50
40	82.78	80.36	84.04	83.06	89.50	86.08
50	83.49	79.94	84.43	83.78	90.83	87.29
75	84.78	78.49	85.39	84.86	93.25	90.65
100	83.55	75.03	84.28	83.62	94.38	91.78

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 30.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	54.28	46.45	44.34	41.39	45.68	47.66	54.28	54.34
15	55.09	41.33	39.88	33.37	38.55	42.53	55.09	55.23
20	58.69	40.22	39.17	29.72	35.21	40.79	58.69	58.73
25	60.61	37.80	37.07	25.76	31.37	38.26	60.61	60.79
30	59.98	33.58	33.19	20.57	26.36	33.94	59.98	60.10
35	61.88	32.06	31.70	18.61	24.71	32.28	61.88	62.08
40	63.64	29.41	29.15	15.64	22.10	29.60	63.64	63.82
50	64.97	25.50	25.31	11.01	17.19	25.64	64.97	65.11
75	68.16	16.36	16.34	4.59	8.95	16.40	68.16	68.38
100	68.79	10.73	10.73	1.80	4.61	10.75	68.79	68.95

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Detection Limit: 30.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 1108.505834
Distribution Check: Average of stdvs: 4293.623548
Average of NDs per 100 observations: 21.215800

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	30.000000	2.088911	470	1258	1506	1144	513	159	0	0	0	0
15	30.000000	3.178812	144	564	1064	1262	1025	622	252	87	26	4
20	30.000000	4.236634	29	255	610	951	1068	916	655	339	151	60
25	30.000000	5.271683	17	91	318	576	859	960	853	688	376	199
30	30.000000	6.391881	4	34	111	332	551	792	874	839	657	401
35	30.000000	7.433861	1	7	66	135	340	561	751	824	743	617
40	30.000000	8.479802	0	4	28	65	186	340	519	663	799	759
50	30.000000	10.661980	0	0	2	14	41	91	221	317	478	628
75	30.000000	15.864554	0	0	0	0	1	3	10	12	41	91
100	30.000000	21.213267	0	0	0	0	0	0	0	0	3	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	40
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	13	2	1	0	0	0	0	0	0	0	0	0	0
25	69	32	6	2	3	0	1	0	0	0	0	0	0
30	256	116	51	19	10	2	1	0	0	0	0	0	0
35	446	294	149	66	34	11	5	0	0	0	0	0	0
40	597	450	331	170	76	39	17	4	2	1	0	0	0
50	686	652	619	460	371	217	140	56	25	21	6	5	0
75	155	237	333	405	529	560	563	503	456	375	265	511	0
100	8	14	37	69	104	163	236	296	380	466	475	2799	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	199	360	61	266	0	0	0	159
15	221	509	144	273	0	0	0	117
20	225	617	160	263	0	0	0	16
25	221	697	178	258	0	0	0	12
30	265	873	206	296	0	0	0	3
35	285	936	242	318	0	0	0	0
40	300	1064	270	327	0	0	0	0
50	319	1222	285	335	0	0	0	0
75	430	1549	404	452	0	0	0	0
100	514	1750	495	527	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	199	360	61	266	0	0
15	221	509	144	273	0	0
20	225	617	160	263	0	0
25	221	697	178	258	0	0
30	265	873	206	296	0	0
35	285	936	242	318	0	0
40	300	1064	270	327	0	0
50	319	1222	285	335	0	0
75	430	1549	404	452	0	0
100	514	1750	495	527	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	1	0	1	1	0	0
25	0	1	3	1	10	1	0	0
30	0	0	0	0	10	0	0	0
35	0	0	3	0	14	0	0	0
40	0	0	3	0	13	0	0	0
50	0	0	9	0	22	0	0	0
75	0	1	13	1	26	1	0	0
100	0	0	29	0	33	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	1	0	1	1	0	0
25	0	1	3	1	10	1	0	0
30	0	0	0	0	10	0	0	0
35	0	0	2	0	13	0	0	0
40	0	0	3	0	13	0	0	0
50	0	0	9	0	22	0	0	0
75	0	1	14	1	26	1	0	0
100	0	0	30	0	32	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	1	0	2	1	0	0
25	0	1	3	1	9	1	0	0
30	0	0	0	0	11	0	0	0
35	0	0	3	0	13	0	0	0
40	0	0	4	0	13	0	0	0
50	0	0	9	0	21	0	0	0
75	0	1	14	1	26	1	0	0
100	0	0	30	0	35	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	1	0	1	1	0	0
25	0	1	3	1	9	1	0	0
30	0	0	1	0	11	0	0	0
35	0	0	1	0	14	0	0	0
40	0	0	3	0	13	0	0	0
50	0	0	7	0	22	0	0	0
75	0	1	13	1	26	1	0	0
100	0	0	30	0	33	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	17	0	17	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 8a. Ln(5,2) 10% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	2305.3411	1463.5671	N/A	N/A	9391.9002	6378.2655
15	2235.5784	1195.4558	N/A	N/A	5329.2047	4368.1807
20	2161.9869	1036.7634	N/A	N/A	3817.8695	3451.1556
25	2081.7303	914.3950	N/A	N/A	3143.8042	2921.7733
30	2069.1847	850.2735	N/A	N/A	2834.5799	2682.4928
35	2018.4970	793.6541	N/A	N/A	2572.8566	2469.2543
40	2047.9954	755.6253	N/A	N/A	2450.4203	2378.4232
50	1973.1439	722.3191	N/A	N/A	2184.8417	2141.1045
75	1827.3337	642.2899	N/A	N/A	1850.3873	1831.2744
100	1834.2530	609.0309	N/A	N/A	1748.4999	1737.0684

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	2247.6064	2231.7869	2369.2696	2292.4188	2481.9181
15	2084.5508	2036.3825	2167.8866	2113.2409	2329.5433
20	1969.1238	1895.9718	2031.5149	1989.6854	2217.5913
25	1871.4236	1782.7355	1919.7125	1886.9383	2112.5945
30	1829.6202	1717.5540	1870.8254	1841.9015	2093.7800
35	1763.1291	1634.2941	1798.0523	1772.9639	2036.6148
40	1765.2758	1614.3250	1796.9212	1773.6194	2062.6366
50	1686.5889	1522.0660	1710.2711	1692.4560	1975.3371
75	1513.3759	1309.7325	1528.1320	1516.2128	1825.2805
100	1486.0052	1240.4957	1497.2662	1487.8265	1825.5500

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1990.3808	1948.0994	2090.5190	2017.1056	2220.3674
15	1888.1316	1816.3841	1960.0294	1907.6017	2134.3448
20	1808.0813	1714.4442	1863.2416	1822.9361	2059.1316
25	1736.7700	1630.8448	1780.1556	1748.4663	1980.6754
30	1702.9970	1573.8720	1740.3594	1712.3052	1970.4303
35	1646.9441	1502.0692	1678.8495	1654.4574	1923.7878
40	1651.4905	1484.4405	1680.5619	1657.8616	1952.4380
50	1591.0772	1413.3669	1613.0535	1595.6483	1882.8643
75	1438.3279	1224.0802	1452.2005	1440.5019	1752.8082
100	1418.7522	1163.7842	1429.4301	1420.1392	1760.5744

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	2317.2927	2267.1885	2438.0503	2367.0694	2433.5465	2312.7533
15	2154.6872	2070.9551	2239.0081	2186.2184	2309.3653	2125.6914
20	2045.2370	1947.1244	2109.1895	2066.8992	2211.6971	1996.2914
25	1948.1332	1838.0242	1999.4094	1965.6663	2117.9676	1891.5870
30	1903.6437	1747.6554	1947.1819	1917.5718	2097.9963	1838.3232
35	1823.9504	1652.2945	1864.8180	1835.0881	2041.7104	1765.5311
40	1827.0801	1620.8480	1860.1665	1836.4718	2068.1368	1763.2036
50	1757.3472	1546.8429	1782.2272	1764.1403	1987.7734	1681.7878
75	1558.1287	1312.0115	1573.1687	1561.4432	1835.2282	1497.6723
100	1536.6171	1223.7586	1549.9114	1537.3236	1839.8028	1477.2631

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	16563841.5342	0.00%	315284.8726	0.00%	9768091862.0092
15	0.00%	98214.4511	0.00%	11543.5066	0.00%	971745.0417
20	0.00%	23181.6894	0.00%	4834.6296	0.00%	66810.8693
25	0.00%	11625.3003	0.00%	3274.2491	0.00%	11388.0464
30	0.00%	7964.1753	0.00%	2596.6138	0.00%	7765.9937
35	0.00%	6091.1982	0.00%	2154.4211	0.00%	5633.7558
40	0.00%	5180.4713	0.00%	1950.9220	0.00%	4901.1376
50	0.00%	3992.7732	0.00%	1662.7500	0.00%	3709.0947
75	0.00%	2896.8267	0.00%	1329.0121	0.00%	2684.5262
100	0.00%	2447.3204	0.00%	1192.4472	0.00%	2282.9476

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	2233.321	2026.013	2072.559	1939.868	1911.087	2009.803	2315.634
15	2188.330	1927.285	1957.347	1792.450	1787.347	1913.432	2235.228
20	2130.769	1837.639	1861.406	1670.456	1688.192	1825.624	2159.702
25	2057.918	1757.806	1780.094	1574.094	1612.916	1752.392	2076.919
30	2050.287	1705.477	1725.461	1485.824	1552.941	1698.734	2066.515
35	2002.808	1636.419	1653.821	1395.663	1482.593	1632.933	2016.273
40	2032.908	1625.859	1643.444	1362.450	1467.551	1621.458	2046.308
50	1962.955	1560.220	1574.122	1273.146	1410.069	1556.987	1970.700
75	1819.237	1377.299	1387.239	1063.434	1240.234	1374.307	1825.240
100	1827.059	1338.431	1346.777	982.918	1216.541	1334.751	1831.395

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	59431.823	46233.992	48778.744	41017.673	41035.685	45532.405	61309.863
15	39390.207	30305.413	31912.884	25560.084	26729.728	29836.581	38792.091
20	22872.172	15841.206	16799.746	11342.678	13601.395	15752.792	24355.245
25	15973.476	11648.868	11513.723	7735.618	9750.669	11370.637	15847.007
30	16370.418	10132.130	10498.310	5679.066	8888.849	10197.308	16833.460
35	24710.385	14000.578	17148.797	5690.556	12276.105	16864.334	23896.250
40	14859.686	9567.558	7657.484	3970.939	8731.191	7445.166	14536.777
50	16878.543	9469.746	9865.621	2829.662	8887.394	8927.866	16175.684
75	8506.280	2978.755	3030.919	1376.005	3113.577	2955.704	8456.822
100	16558.944	8461.919	8465.825	1936.815	9605.822	8497.154	15459.746

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	2448.734	2287.059	2317.904	2249.793	2233.099	2272.739	2514.435
15	2379.150	2158.094	2185.131	2097.043	2060.212	2147.943	2419.979
20	2296.767	2044.705	2067.738	1952.195	1919.843	2033.001	2325.372
25	2206.006	1945.281	1963.702	1833.398	1810.585	1940.461	2226.392
30	2190.451	1887.518	1905.907	1755.244	1738.015	1886.898	2209.795
35	2134.763	1814.951	1827.792	1655.928	1651.921	1807.899	2149.002
40	2167.690	1810.054	1820.353	1627.271	1642.105	1800.080	2179.706
50	2080.768	1718.030	1735.642	1517.615	1550.614	1718.625	2090.109
75	1914.583	1512.869	1520.024	1259.512	1343.526	1508.169	1920.484
100	1921.747	1472.545	1476.842	1169.719	1308.744	1468.364	1925.814

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	2470.043	2322.635	2343.610	2252.629	2271.244	2308.495	2743.041
15	2402.600	2177.265	2200.736	2142.326	2104.383	2168.893	2550.268
20	2329.927	2059.552	2084.506	1966.815	1941.877	2065.191	2445.975
25	2238.461	1962.926	1974.088	1884.181	1845.429	1959.407	2319.336
30	2230.445	1906.245	1915.594	1815.770	1763.215	1906.963	2293.856
35	2174.863	1825.448	1845.489	1723.272	1653.296	1822.687	2220.885
40	2207.044	1811.484	1829.283	1719.997	1634.386	1809.198	2253.688
50	2118.501	1726.015	1738.192	1621.201	1536.486	1724.656	2153.358
75	1948.711	1514.286	1522.646	1396.434	1320.442	1510.390	1966.907
100	1955.950	1481.097	1492.723	1295.774	1299.089	1483.730	1966.360

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	4240.7371	4218.3243	4484.2573	4376.7381	4554.1481	4309.1745
15	4008.2354	3961.1643	4181.6708	4100.7992	4330.6185	4110.9071
20	3810.4021	3757.4850	3943.1584	3875.7122	4110.4296	3913.8616
25	3608.8954	3549.9306	3715.3545	3662.9176	3888.1850	3715.5162
30	3537.0872	3381.5098	3626.7845	3581.5264	3835.2675	3662.6701
35	3377.1206	3198.8791	3463.5372	3413.4214	3707.2996	3541.9691
40	3390.7608	3145.9072	3458.4049	3421.9587	3746.7251	3579.5271
50	3230.0861	2999.2016	3279.9077	3253.5698	3536.3567	3390.4681
75	2801.5490	2492.8743	2830.7493	2814.3016	3167.9687	3040.2763
100	2756.0755	2310.5484	2782.8256	2760.7457	3135.4022	3016.6701

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	2232.1755	58136.6680	2448.5808	2465.5648	2433.5469
15	2191.2653	39041.4793	2379.4263	2410.9671	2309.3653
20	2128.8098	23023.6641	2295.1367	2330.9036	2211.6971
25	2058.2089	15776.5810	2206.2703	2246.4789	2117.9676
30	2048.5928	16431.1624	2188.7931	2228.8248	2097.9963
35	2000.7917	24135.3375	2135.4479	2171.2960	2041.7104
40	2033.9562	14155.4319	2167.7709	2208.4099	2068.1368
50	1962.7905	16070.7308	2079.4114	2118.1622	1987.7734
75	1820.3714	8393.7990	1914.3205	1951.3041	1835.2282
100	1829.1213	15769.0139	1922.0749	1955.7163	1839.8028

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	2433.546	2090.596	2104.197	1913.912	2017.442	4315.195	2433.445
15	2309.365	1893.898	1909.459	1659.792	1792.021	1892.728	2309.538
20	2211.697	1768.205	1782.316	1500.624	1654.821	1765.922	2211.987
25	2117.968	1682.068	1694.738	1398.015	1563.358	1679.612	2118.350
30	2097.996	1605.118	1615.688	1299.067	1491.077	1602.880	2098.419
35	2041.710	1524.053	1533.025	1207.416	1415.984	1522.023	2042.161
40	2068.137	1504.701	1513.633	1170.891	1399.974	1502.369	2068.628
50	1987.773	1443.061	1449.648	1098.584	1340.219	1441.363	1988.268
75	1835.228	1257.654	1261.505	938.649	1173.863	1256.580	1835.745
100	1839.803	1208.724	1211.877	862.285	1152.545	1207.882	1840.333

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	51.50	51.31	53.67	52.18	55.23	47.79	47.29	49.34	48.14	51.33
15	52.93	52.14	54.32	53.43	56.55	49.15	48.04	50.44	49.37	53.92
20	54.12	52.83	55.52	54.67	58.77	50.42	48.42	51.80	50.69	55.94
25	55.15	53.50	56.16	55.41	60.46	51.58	49.25	53.17	52.12	57.92
30	55.92	53.45	57.03	56.24	61.80	52.65	49.47	53.64	52.83	59.35
35	55.13	51.80	56.14	55.37	62.16	51.37	47.09	52.50	51.54	59.70
40	56.59	52.95	57.66	56.79	64.00	53.47	48.57	54.42	53.56	61.84
50	56.95	51.74	57.90	57.19	65.45	53.41	47.84	54.16	53.56	63.27
75	56.06	48.57	56.59	56.22	67.70	53.35	44.26	53.96	53.45	65.64
100	55.52	43.96	56.14	55.66	69.56	52.59	39.17	53.11	52.67	67.43

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	51.98	36.14	N/A	N/A	86.06	80.77
15	54.97	30.34	N/A	N/A	85.96	81.70
20	57.52	26.12	N/A	N/A	84.36	81.31
25	59.72	24.99	N/A	N/A	83.54	80.77
30	61.25	21.43	N/A	N/A	82.02	79.58
35	61.31	17.66	N/A	N/A	79.54	77.88
40	63.29	15.78	N/A	N/A	80.02	78.36
50	65.07	12.71	N/A	N/A	78.06	76.97
75	67.43	5.90	N/A	N/A	76.63	75.72
100	69.54	3.19	N/A	N/A	75.72	75.05

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	52.17	51.85	54.30	52.96	54.08	52.08
15	53.64	52.87	55.24	54.17	56.16	53.05
20	55.49	54.10	56.76	55.93	58.51	53.80
25	56.44	54.74	57.88	57.10	60.55	54.61
30	57.51	54.85	58.55	57.91	61.66	55.15
35	56.95	53.41	57.98	57.22	61.96	53.78
40	58.49	54.50	59.39	58.68	63.68	55.31
50	59.01	53.34	59.61	59.19	65.41	54.48
75	58.57	49.98	59.16	58.71	67.72	53.05
100	58.27	45.96	58.68	58.37	69.66	51.62

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	95.90	0.00%	83.09	0.00%	92.16
15	0.00%	96.18	0.00%	80.85	0.00%	92.57
20	0.00%	96.26	0.00%	79.41	0.00%	92.87
25	0.00%	96.63	0.00%	77.58	0.00%	93.45
30	0.00%	96.50	0.00%	74.65	0.00%	92.89
35	0.00%	96.00	0.00%	71.37	0.00%	92.26
40	0.00%	96.50	0.00%	70.87	0.00%	93.09
50	0.00%	96.50	0.00%	67.47	0.00%	92.81
75	0.00%	96.55	0.00%	59.17	0.00%	93.52
100	0.00%	96.81	0.00%	51.33	0.00%	93.11

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	50.91	48.05	48.69	46.96	45.90	47.68	50.89	51.88
15	54.26	49.86	50.59	48.00	47.01	49.58	54.22	54.91
20	56.51	51.07	51.68	47.56	46.67	50.61	56.63	57.05
25	59.19	52.24	52.97	47.86	47.15	52.06	59.15	59.62
30	60.59	52.91	53.45	47.37	47.39	52.67	60.50	60.85
35	60.99	51.70	52.46	44.24	44.85	51.60	60.91	61.15
40	62.97	53.52	53.78	44.77	46.24	53.43	63.19	63.25
50	64.81	53.31	53.56	41.98	45.33	53.05	64.97	65.01
75	67.19	51.64	52.04	34.99	42.63	51.47	67.31	67.29
100	69.43	49.82	50.34	27.45	39.01	49.76	69.19	69.60

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	73.31	68.77	69.80	66.18	63.66	68.48	72.63	73.19
15	74.18	68.99	69.60	65.17	62.91	68.63	73.62	73.86
20	76.22	70.40	71.05	64.89	63.01	70.00	75.86	76.04
25	77.96	71.17	71.47	64.16	64.02	70.77	77.54	77.64
30	78.18	70.63	71.13	60.67	61.82	70.32	77.68	77.92
35	77.86	70.24	70.50	58.73	61.27	69.96	77.54	77.50
40	78.51	70.16	70.81	56.93	61.29	70.04	78.42	78.55
50	79.05	69.92	70.20	53.05	60.77	69.43	78.71	78.97
75	81.27	67.11	68.14	41.49	57.47	67.62	81.23	81.27
100	82.38	65.41	65.92	31.78	54.89	65.43	82.14	82.10

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	53.03	50.97	51.39	50.59	50.48	50.65	53.03	54.63
15	56.14	53.03	53.52	52.26	51.60	52.95	56.04	57.07
20	58.55	54.83	55.23	53.45	51.86	54.65	58.53	59.35
25	61.21	55.86	56.30	53.76	52.57	56.20	61.17	61.68
30	62.50	56.81	57.11	53.54	52.65	56.77	62.34	62.97
35	63.05	55.80	56.61	51.76	50.32	55.88	63.15	63.43
40	65.03	57.15	57.74	52.67	51.37	57.21	64.75	65.37
50	66.71	57.29	57.90	50.79	50.61	56.87	66.36	66.91
75	69.03	55.78	56.32	45.60	47.52	55.86	69.17	69.21
100	71.41	55.07	55.13	38.63	44.02	54.91	71.17	71.41

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	53.62	51.49	51.37	50.89	51.68	50.89	53.43	57.39
15	56.59	52.97	53.31	52.69	52.44	53.01	56.81	59.01
20	59.35	54.38	54.81	53.49	52.63	54.04	59.70	61.56
25	62.20	55.56	56.00	54.38	52.44	55.31	61.94	63.50
30	63.50	56.32	56.71	54.57	52.36	56.22	63.39	64.83
35	64.12	55.45	55.70	52.89	50.16	55.54	63.94	65.09
40	65.94	57.01	57.47	54.42	51.11	56.77	65.86	67.05
50	66.97	56.93	57.05	53.17	49.25	56.53	67.56	68.14
75	69.80	55.98	56.18	49.66	45.78	55.47	69.92	70.08
100	72.20	55.01	55.25	45.29	42.32	54.51	72.02	72.65

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	71.34	71.70	73.25	72.31	73.54	71.52
15	75.86	76.21	77.46	76.73	78.40	76.34
20	80.12	80.32	80.97	80.56	82.20	80.57
25	82.24	82.47	83.27	82.73	84.67	82.89
30	82.89	82.86	83.89	83.37	85.35	83.78
35	83.01	82.95	83.93	83.51	85.70	84.12
40	85.37	85.06	85.83	85.62	87.72	86.30
50	86.41	85.96	86.91	86.67	89.05	87.60
75	89.19	87.95	89.49	89.33	92.40	90.99
100	89.93	88.57	90.25	90.01	93.58	92.32

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.4374936
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	54.08	49.63	49.45	46.70	47.98	49.94	54.08	54.08
15	56.16	50.12	50.32	45.90	47.41	50.24	56.16	56.16
20	58.51	50.71	50.87	44.14	46.57	50.67	58.51	58.50
25	60.55	51.68	51.90	44.42	46.51	51.70	60.55	60.57
30	61.66	51.27	51.35	41.86	45.90	51.27	61.66	61.68
35	61.96	49.58	49.84	38.61	42.83	49.60	61.96	61.98
40	63.68	51.21	51.35	38.40	44.26	51.23	63.68	63.70
50	65.41	50.06	50.28	34.73	42.95	50.04	65.41	65.45
75	67.72	47.47	47.58	27.29	39.41	47.43	67.72	67.74
100	69.66	44.22	44.32	20.32	35.80	44.18	69.66	69.66

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Detection Limit: 11.4374936
Averaged Percentage Non-detects: 10.00%
Distribution Check: Average of means: 1085.700658
Distribution Check: Average of stdvs: 4036.600786
Average of NDs per 100 observations: 10.031100

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	11.437494	1.007525	1777	1928	964	300	73	8	0	0	0	0
15	11.437494	1.531683	993	1697	1377	711	217	48	6	1	0	0
20	11.437494	2.011089	591	1361	1472	948	456	161	52	6	3	0
25	11.437494	2.476040	362	1027	1376	1120	689	312	116	34	11	3
30	11.437494	3.010891	221	704	1151	1181	887	528	244	82	39	12
35	11.437494	3.503366	112	510	934	1122	973	755	369	184	54	27
40	11.437494	4.022376	74	318	735	1001	1043	821	535	302	125	57
50	11.437494	4.946139	33	137	426	685	950	949	763	509	320	154
75	11.437494	7.512475	1	15	60	166	312	565	717	788	733	622
100	11.437494	9.995248	0	2	11	30	73	162	278	463	581	675

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1	0	0	0	0	0	0	0	0	0	0	0	0
35	8	0	2	0	0	0	0	0	0	0	0	0	0
40	27	8	2	2	0	0	0	0	0	0	0	0	0
50	75	38	9	2	0	0	0	0	0	0	0	0	0
75	479	254	172	80	50	19	11	5	1	0	0	0	0
100	685	605	496	389	254	149	102	50	24	13	6	2	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	18	64	4	27	0	0	0	8
15	9	53	5	10	0	0	0	1
20	11	70	6	15	0	0	0	0
25	6	65	5	6	0	0	0	0
30	6	107	5	6	0	0	0	0
35	5	107	3	5	0	0	0	0
40	6	136	5	7	0	0	0	0
50	2	136	2	2	0	0	0	0
75	8	196	8	8	0	0	0	0
100	15	283	14	17	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	18	64	4	27	0	0
15	9	53	5	10	0	0
20	11	70	6	15	0	0
25	6	65	5	6	0	0
30	6	107	5	6	0	0
35	5	107	3	5	0	0
40	6	136	5	7	0	0
50	2	136	2	2	0	0
75	8	196	8	8	0	0
100	15	283	14	17	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	3	0	3	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 8b. Ln(5,2) 15% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	2442.7174	1183.1738	N/A	N/A	12602.2053	8175.1339
15	2280.5711	914.8471	N/A	N/A	6454.3340	5168.5130
20	2135.2314	781.2623	N/A	N/A	4340.0607	3877.9550
25	2179.7241	710.8274	N/A	N/A	3726.7829	3429.1273
30	2068.3255	648.7914	N/A	N/A	3164.3000	2973.5638
35	2000.7947	617.2455	N/A	N/A	2816.2644	2689.5958
40	1933.3219	606.1790	N/A	N/A	2555.0237	2472.3800
50	1934.5893	557.3985	N/A	N/A	2332.7110	2280.2098
75	1859.4892	505.3404	N/A	N/A	2000.4965	1977.1694
100	1808.1510	485.3913	N/A	N/A	1827.1132	1813.7363

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	2367.1362	2346.1197	2559.5349	2431.7996	2759.0085
15	2088.5224	2024.9541	2205.3494	2123.1142	2468.0662
20	1895.4692	1801.6765	1975.5007	1917.4321	2263.2551
25	1883.8777	1754.6684	1949.7920	1900.3396	2286.8647
30	1746.7769	1595.5985	1799.4415	1758.4526	2161.3658
35	1663.0776	1494.9302	1706.2362	1671.8379	2080.1673
40	1594.2180	1419.8491	1629.7427	1600.9750	1999.5288
50	1546.6236	1330.5333	1575.5162	1551.2267	1992.3537
75	1404.3646	1124.1148	1423.2240	1406.2159	1905.4637
100	1313.1226	990.0728	1326.9686	1313.9503	1845.0865

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	2004.9417	1939.1494	2161.4914	2038.6993	2391.5269
15	1828.5442	1729.0899	1927.3915	1849.2604	2210.7963
20	1691.8452	1568.3044	1761.9146	1705.8562	2064.6916
25	1693.6158	1535.5215	1752.1787	1704.2877	2102.6619
30	1577.3509	1400.4739	1624.5879	1584.8258	1998.1947
35	1510.7816	1319.5449	1549.8012	1516.3389	1933.7955
40	1459.4890	1264.1215	1491.8240	1463.7979	1870.0833
50	1420.6533	1185.6108	1447.1950	1423.4688	1871.5919
75	1299.1045	1006.4060	1316.6727	1299.9900	1804.6732
100	1221.5427	892.0992	1234.5557	1221.7540	1757.3054

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	2369.9923	2280.6157	2543.5190	2438.6187	2572.6128	2357.5144
15	2119.1000	1982.4208	2230.2821	2157.0722	2351.7797	2055.5997
20	1937.5288	1785.2233	2017.9517	1959.1560	2180.9301	1849.2573
25	1917.9732	1700.5467	1995.5646	1935.4813	2215.4222	1825.2781
30	1768.7994	1537.9386	1825.1394	1780.8066	2094.9407	1676.3051
35	1688.5833	1412.8320	1739.3134	1697.7651	2021.7613	1588.9811
40	1630.6305	1370.9194	1667.2522	1637.9328	1950.0765	1517.7970
50	1577.2953	1266.0466	1607.2509	1580.9160	1947.2563	1466.1434
75	1398.1606	1085.8337	1418.7015	1400.1500	1866.3207	1319.6952
100	1304.2458	975.2069	1321.2489	1305.3513	1812.4130	1237.7909

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	308777407.2473	0.02%	111913.2613	0.00%	79710444388367632.0000
15	0.00%	111120.6854	0.00%	7562.6706	0.00%	47610362.2585
20	0.00%	25313.6922	0.00%	3522.6510	0.00%	39045.8360
25	0.00%	14397.3024	0.00%	2567.6344	0.00%	21629.5969
30	0.00%	8767.1868	0.00%	1980.6622	0.00%	8378.1972
35	0.00%	6766.9738	0.00%	1717.2846	0.00%	6251.9585
40	0.00%	5758.1646	0.00%	1600.6835	0.00%	4981.0177
50	0.00%	4390.5595	0.00%	1360.5271	0.00%	3793.2247
75	0.00%	3173.7740	0.00%	1131.1647	0.00%	2769.2515
100	0.00%	2657.5665	0.00%	1027.6625	0.00%	2316.2031

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	2359.383	2004.570	2069.255	1870.348	1814.729	1974.988	2453.578
15	2231.713	1817.414	1863.917	1634.741	1601.941	1799.722	2278.970
20	2100.365	1662.909	1699.543	1445.464	1444.752	1650.500	2131.817
25	2153.519	1645.157	1676.290	1376.717	1409.966	1632.760	2174.157
30	2047.207	1511.549	1536.399	1233.772	1282.118	1499.661	2062.972
35	1982.344	1433.964	1455.749	1138.914	1210.730	1424.310	1996.073
40	1918.273	1381.267	1399.162	1078.198	1157.661	1373.549	1928.603
50	1922.769	1316.692	1332.427	974.795	1092.483	1308.500	1931.229
75	1850.834	1158.127	1169.975	828.636	949.997	1153.469	1856.813
100	1801.783	1062.143	1071.775	754.404	877.129	1057.546	1806.197

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	91802.105	54330.805	62805.927	42331.077	44656.193	51120.967	96378.568
15	59103.124	34379.108	36871.080	20939.028	27027.758	34007.211	58557.610
20	25489.358	12953.686	13652.552	6119.021	9256.034	13291.149	25561.346
25	19094.955	9982.629	10205.336	5019.984	7765.086	9504.300	19554.746
30	18621.998	8663.764	9444.344	4883.039	7302.747	8645.784	18749.683
35	17461.244	5565.526	6358.169	1987.244	4844.078	5435.788	17361.793
40	8653.444	3609.145	3714.775	1632.502	2829.257	3541.633	8572.861
50	12555.709	4271.312	4511.093	1684.828	3893.359	4274.601	12651.947
75	8283.624	1957.939	2006.231	1198.436	1770.447	1947.144	8117.969
100	7264.446	1660.739	1696.260	1451.586	1827.074	1646.620	7243.767

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	2600.087	2334.662	2374.411	2295.848	2282.670	2313.495	2669.868
15	2422.445	2101.756	2127.633	2025.175	1974.605	2089.273	2468.109
20	2259.059	1905.058	1928.494	1800.444	1752.372	1893.721	2290.311
25	2311.422	1890.665	1913.325	1748.164	1701.077	1877.360	2334.517
30	2188.024	1737.763	1757.266	1571.865	1541.055	1732.810	2208.488
35	2113.282	1646.938	1663.096	1459.912	1437.801	1636.826	2128.786
40	2033.480	1570.298	1586.419	1372.662	1361.195	1561.207	2047.373
50	2036.009	1503.722	1516.859	1264.797	1280.299	1500.193	2047.181
75	1949.319	1327.437	1340.632	1024.621	1101.391	1323.679	1956.233
100	1888.846	1218.665	1228.415	880.962	998.907	1213.411	1894.030

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	2619.979	2401.534	2428.233	2311.480	2346.769	2356.750	2956.332
15	2457.177	2122.711	2142.522	2107.978	2057.699	2131.523	2619.761
20	2290.092	1925.292	1938.243	1873.845	1830.435	1919.628	2412.923
25	2353.120	1917.776	1952.346	1852.350	1805.703	1907.391	2431.429
30	2228.966	1758.290	1776.932	1704.848	1611.411	1751.904	2292.370
35	2147.579	1661.132	1680.769	1596.104	1486.481	1658.433	2207.652
40	2076.872	1596.850	1603.595	1527.866	1413.267	1593.023	2115.135
50	2080.144	1546.306	1554.872	1423.767	1348.982	1543.841	2104.671
75	1980.808	1391.778	1400.098	1189.818	1164.012	1388.106	2003.055
100	1927.369	1306.828	1311.365	1022.866	1051.465	1306.041	1939.276

LOGNORMAL DISTRIBUTION

```
          Censoring Type: 1
              Mean Value: 5.00
              Stdv Value: 2.00
         Population Mean: 1096.6331584
     Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
         Detection Limit: 18.6740195
  Percentage Non-detects: 15.000%
```

Average of UCLs

UCLs based upon Chebyshev Inequality

n	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	4455.7976	4384.0449	4802.9358	4647.1357	5008.0479	4590.0827
15	4055.0659	3905.8419	4283.0417	4168.6325	4547.9087	4199.9857
20	3709.6428	3546.1977	3875.7509	3780.0246	4149.8018	3852.8826
25	3694.3564	3399.9350	3862.2468	3753.8228	4199.3675	3908.5936
30	3403.7111	3073.7529	3520.7689	3444.5075	3936.1235	3663.4171
35	3242.3686	2808.6883	3349.2353	3277.3324	3759.7930	3505.5559
40	3107.7539	2714.7744	3181.4543	3135.8911	3570.9693	3338.8052
50	3018.8417	2516.4153	3079.9283	3036.3191	3539.8710	3314.2607
75	2632.0959	2142.2985	2674.2300	2643.5290	3304.8035	3101.0783
100	2432.3969	1902.7637	2467.8894	2440.1295	3145.3073	2960.4075

LOGNORMAL DISTRIBUTION

```
          Censoring Type: 1
              Mean Value: 5.00
              Stdv Value: 2.00
         Population Mean: 1096.6331584
     Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
         Detection Limit: 18.6740195
  Percentage Non-detects: 15.000%
```

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	2356.9475	90824.2301	2598.4665	2626.2362	2572.6208
15	2228.7262	56229.7211	2423.6962	2454.9604	2351.7797
20	2101.9957	25408.2628	2258.7684	2293.6033	2180.9301
25	2151.4907	18685.8462	2310.3926	2352.3327	2215.4222
30	2045.7730	18274.5510	2189.1261	2230.3079	2094.9407
35	1981.5372	17034.2511	2113.7683	2153.4269	2021.7613
40	1918.8286	8495.6372	2033.6692	2075.5646	1950.0765
50	1922.3369	12307.4375	2036.4004	2073.3811	1947.2563
75	1851.2591	7952.8790	1948.1692	1984.2301	1866.3207
100	1801.4358	7112.4797	1889.7151	1925.5557	1812.4130

LOGNORMAL DISTRIBUTION

```
          Censoring Type: 1
              Mean Value: 5.00
              Stdv Value: 2.00
         Population Mean: 1096.6331584
     Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
         Detection Limit: 18.6740195
  Percentage Non-detects: 15.000%
```

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	2572.613	2005.965	2003.567	1741.878	1943.366	2027.950	2572.681
15	2351.780	1739.719	1744.605	1445.644	1632.996	1746.063	2352.360
20	2180.930	1556.283	1563.691	1253.164	1424.366	1557.253	2181.822
25	2215.422	1507.106	1514.089	1169.114	1374.892	1507.333	2216.445
30	2094.941	1369.078	1374.433	1050.572	1244.049	1369.666	2096.004
35	2021.761	1284.264	1288.841	969.220	1160.056	1284.278	2022.916
40	1950.077	1246.002	1249.598	942.685	1110.414	1245.823	1951.238
50	1947.256	1165.062	1167.867	851.121	1041.301	1164.940	1948.493
75	1866.321	1026.648	1028.251	739.374	906.555	1026.523	1867.618
100	1812.413	941.020	941.613	674.855	833.907	941.188	1813.724

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	50.09	50.04	53.26	51.39	55.45	45.18	44.44	47.44	45.70	50.85
15	52.00	51.17	54.12	52.59	59.23	46.69	45.03	48.81	47.19	54.44
20	53.84	52.34	55.52	54.53	61.03	49.17	46.16	50.95	49.47	57.58
25	54.22	51.96	56.04	54.59	62.67	49.56	45.90	51.31	49.80	59.50
30	53.13	49.78	54.79	53.43	63.01	48.44	43.50	49.88	48.57	59.50
35	52.73	48.18	54.32	53.03	63.58	47.60	41.56	49.05	47.82	60.16
40	52.32	47.37	53.70	52.71	64.93	48.04	40.99	49.23	48.18	61.21
50	52.38	44.77	53.54	52.55	66.73	47.39	37.84	48.85	47.60	63.33
75	49.76	36.04	50.87	49.88	69.94	44.32	28.83	45.31	44.36	66.95
100	47.82	27.70	48.61	47.86	71.58	42.87	21.25	43.66	42.85	68.42

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	50.79	28.97	N/A	N/A	91.60	86.83
15	54.91	22.17	N/A	N/A	91.56	87.66
20	58.28	19.35	N/A	N/A	89.50	86.61
25	60.30	15.15	N/A	N/A	88.46	86.38
30	60.55	11.84	N/A	N/A	86.73	84.36
35	61.29	8.93	N/A	N/A	86.24	84.53
40	62.36	9.13	N/A	N/A	85.03	83.68
50	64.87	5.19	N/A	N/A	84.06	82.81
75	68.28	1.64	N/A	N/A	81.76	81.05
100	69.96	0.57	N/A	N/A	80.00	79.43

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

n	LOGDL2 Failed	LOGDL2 H-Stat	Delta Failed	Delta H-Stat	Helsel Failed	Helsel H-Stat
10	0.00%	96.77	0.02%	76.83	0.00%	91.07
15	0.00%	97.05	0.00%	74.28	0.00%	92.34
20	0.00%	97.15	0.00%	71.11	0.00%	92.36
25	0.00%	97.17	0.00%	69.39	0.00%	92.20
30	0.00%	97.45	0.00%	64.55	0.00%	91.92
35	0.00%	97.33	0.00%	61.66	0.00%	92.24
40	0.00%	97.19	0.00%	59.07	0.00%	92.57
50	0.00%	97.60	0.00%	54.51	0.00%	92.77
75	0.00%	97.80	0.00%	43.64	0.00%	92.57
100	0.00%	97.74	0.00%	34.83	0.00%	93.33

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	96.77	0.02%	76.83	0.00%	91.07
15	0.00%	97.05	0.00%	74.28	0.00%	92.34
20	0.00%	97.15	0.00%	71.11	0.00%	92.36
25	0.00%	97.17	0.00%	69.39	0.00%	92.20
30	0.00%	97.45	0.00%	64.55	0.00%	91.92
35	0.00%	97.33	0.00%	61.66	0.00%	92.24
40	0.00%	97.19	0.00%	59.07	0.00%	92.57
50	0.00%	97.60	0.00%	54.51	0.00%	92.77
75	0.00%	97.80	0.00%	43.64	0.00%	92.57
100	0.00%	97.74	0.00%	34.83	0.00%	93.33

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	49.37	44.92	45.90	42.96	40.89	44.14	49.43	50.71
15	53.80	46.50	47.57	42.72	40.32	45.97	53.90	54.75
20	57.58	48.89	49.64	43.19	41.43	48.36	57.50	57.88
25	59.62	48.32	49.45	40.67	39.78	48.02	59.74	60.08
30	59.90	47.25	47.98	37.70	37.08	46.75	60.10	60.32
35	60.75	45.60	46.40	34.40	35.18	45.43	60.83	61.09
40	61.90	45.37	46.26	32.97	34.48	45.09	61.92	62.18
50	64.36	43.62	44.40	27.25	31.25	43.19	64.59	64.65
75	67.92	38.59	39.21	16.26	24.26	38.30	67.90	68.12
100	69.49	33.94	34.56	9.41	20.06	33.49	69.54	70.10

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	72.83	65.38	67.34	61.07	56.10	64.59	72.32	73.29
15	74.53	64.55	66.51	57.20	53.00	63.78	73.84	74.26
20	76.14	65.43	66.75	55.29	52.71	64.48	75.47	76.20
25	77.31	65.09	66.10	50.34	50.53	64.16	76.77	77.05
30	77.54	63.29	64.77	45.96	47.59	62.44	76.91	77.13
35	78.34	62.24	63.76	41.09	45.26	61.45	77.96	78.06
40	78.79	61.74	62.51	39.09	44.62	60.99	78.57	78.73
50	79.74	58.26	59.50	30.99	40.91	58.06	79.52	79.68
75	81.88	50.97	52.18	16.61	32.67	50.57	81.66	82.08
100	82.24	43.74	44.71	9.45	28.18	43.56	82.00	82.38

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	51.72	48.93	49.23	48.32	48.57	48.73	51.62	53.70
15	56.06	51.14	51.77	49.89	49.16	50.86	56.18	57.35
20	59.60	53.09	53.78	51.31	49.72	52.93	59.50	60.10
25	61.68	53.60	54.22	50.77	48.38	53.47	61.41	62.36
30	62.24	51.98	52.89	48.16	46.05	52.14	62.28	62.61
35	62.81	51.21	52.06	45.78	43.91	51.07	63.09	63.60
40	64.00	51.43	51.92	44.50	42.76	51.21	63.98	64.55
50	66.77	50.44	51.05	40.32	39.50	50.32	66.67	66.89
75	69.84	45.78	46.42	29.17	31.80	45.29	69.66	70.08
100	71.84	42.42	43.17	19.55	25.84	42.20	71.43	71.74

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	52.50	49.78	49.84	49.25	51.15	49.33	52.59	57.23
15	57.21	51.24	51.30	51.44	51.42	51.08	56.85	59.88
20	59.96	53.54	53.56	52.93	51.72	53.33	60.28	62.36
25	62.59	53.47	53.70	53.11	51.25	53.21	62.71	64.42
30	62.89	52.28	52.73	51.66	48.17	52.12	63.39	64.73
35	63.94	51.13	51.88	49.98	45.79	50.97	63.76	65.21
40	65.70	51.43	51.23	48.85	44.80	50.85	65.25	66.59
50	67.41	50.57	51.09	46.81	42.79	50.65	67.64	68.50
75	70.97	47.39	47.68	37.88	34.36	46.95	70.75	71.47
100	72.71	45.35	45.92	30.82	28.81	45.62	72.51	72.99

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	71.57	71.65	73.63	72.74	74.30	71.82
15	76.55	76.89	78.76	77.71	80.26	77.23
20	79.82	79.73	81.29	80.44	83.07	80.53
25	81.64	81.20	82.70	82.04	84.99	82.32
30	82.35	81.80	83.30	82.76	85.84	83.50
35	83.93	83.29	85.00	84.44	87.60	85.47
40	84.43	83.58	85.18	84.77	88.16	86.10
50	86.00	84.48	86.65	86.27	90.18	88.04
75	87.53	85.06	88.17	87.72	92.85	90.71
100	88.11	84.66	88.70	88.29	94.36	92.32

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 18.6740195
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	52.73	46.49	45.84	42.73	44.55	46.95	52.73	52.69
15	56.08	46.61	46.24	39.86	42.77	47.07	56.08	56.14
20	59.03	47.47	47.35	39.33	42.12	47.54	59.03	59.05
25	60.85	45.78	45.84	35.13	39.72	45.88	60.85	60.89
30	61.25	43.84	43.78	32.04	37.19	43.94	61.25	61.41
35	61.68	41.74	41.70	28.48	33.94	41.76	61.68	61.70
40	62.87	41.31	41.45	27.01	32.89	41.23	62.87	62.91
50	65.19	38.40	38.48	21.33	28.85	38.40	65.19	65.29
75	68.53	31.11	31.41	12.85	21.39	31.07	68.53	68.61
100	70.02	26.26	26.34	7.33	17.13	26.20	70.02	70.20

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Detection Limit: 18.6740195
Averaged Percentage Non-detects: 15.00%
Distribution Check: Average of means: 1090.610302
Distribution Check: Average of stdvs: 4118.648771
Average of NDs per 100 observations: 15.070000

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	18.674019	1.509109	932	1788	1419	680	200	31	0	0	0	0
15	18.674019	2.326535	425	1068	1449	1131	613	272	72	16	3	0
20	18.674019	2.980594	206	683	1191	1222	896	515	229	82	21	4
25	18.674019	3.743168	88	375	822	1130	1021	793	484	211	86	28
30	18.674019	4.480198	43	205	537	855	1012	934	716	410	210	80
35	18.674019	5.257030	26	90	308	591	889	970	861	603	380	186
40	18.674019	5.990099	6	52	184	414	688	857	860	781	540	324
50	18.674019	7.490693	2	14	53	175	330	515	720	810	764	599
75	18.674019	11.316040	0	2	0	13	32	73	153	245	420	514
100	18.674019	14.986337	0	0	0	0	2	4	17	31	68	135

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	8
15	1	0	0	0	0	0	0	0	0	0	0	0	0
20	1	0	0	0	0	0	0	0	0	0	0	0	0
25	9	2	1	0	0	0	0	0	0	0	0	0	0
30	36	9	1	2	0	0	0	0	0	0	0	0	0
35	76	48	15	5	1	1	0	0	0	0	0	0	0
40	190	89	44	16	4	0	0	1	0	0	0	0	0
50	475	298	163	75	35	11	6	5	0	0	0	0	0
75	601	638	657	553	378	309	187	123	71	41	22	18	0
100	208	351	450	504	528	567	545	474	373	286	205	302	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	51	140	14	75	0	0	0	31
15	61	221	36	80	0	0	0	20
20	49	236	32	60	0	0	0	1
25	55	290	32	60	0	0	0	1
30	41	324	33	57	0	0	0	0
35	42	352	36	45	0	0	0	0
40	41	374	36	47	0	0	0	0
50	57	476	47	62	0	0	0	0
75	80	666	73	81	0	0	0	0
100	106	800	101	107	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	51	140	14	75	0	0
15	61	221	36	80	0	0
20	49	236	32	60	0	0
25	55	290	32	60	0	0
30	41	324	33	57	0	0
35	42	352	36	45	0	0
40	41	374	36	47	0	0
50	57	476	47	62	0	0
75	80	666	73	81	0	0
100	106	800	101	107	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	1	1	1	1	1	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	1	0	0	0
35	0	0	0	0	1	0	0	0
40	0	0	0	0	1	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	1	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	1	1	1	1	1	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	1	0	0	0
35	0	0	0	0	1	0	0	0
40	0	0	0	0	1	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	2	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	1	1	1	1	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	1	0	0	0
35	0	0	0	0	1	0	0	0
40	0	0	0	0	1	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	1	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	1	1	1	1	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	1	0	0	0
35	0	0	0	0	1	0	0	0
40	0	0	0	0	1	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	1	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	1	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	2	0	2	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 8c. Ln(5,2) 20% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	2377.6313	1029.6070	N/A	N/A	14417.7334	9075.9811
15	2246.9814	761.6561	N/A	N/A	7316.9055	5753.4382
20	2239.3419	637.9532	N/A	N/A	5188.5697	4576.5237
25	2047.6135	579.1236	N/A	N/A	3929.0031	3586.8542
30	2012.4920	533.9029	N/A	N/A	3427.2677	3201.0104
35	1998.3369	510.8033	N/A	N/A	3088.2981	2935.6311
40	1991.7807	488.9346	N/A	N/A	2862.0024	2758.8881
50	1948.5403	457.9076	N/A	N/A	2527.1866	2464.3859
75	1846.3465	418.0390	N/A	N/A	2105.9168	2078.8853
100	1820.7450	393.2204	N/A	N/A	1928.6240	1913.0083

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	2309.7306	2294.3633	2562.7745	2385.5644	2841.6224
15	2022.3385	1950.3617	2169.4727	2059.2726	2533.2532
20	1918.3351	1797.1898	2027.4394	1941.3967	2473.5116
25	1700.9113	1559.9889	1778.4454	1714.9825	2229.8706
30	1619.8141	1447.3320	1683.0333	1629.6604	2176.4406
35	1563.6455	1362.8895	1617.9154	1570.7571	2150.3342
40	1522.3530	1296.0447	1569.5048	1527.6756	2133.2454
50	1429.6883	1164.2370	1466.5390	1432.7178	2071.8825
75	1247.8269	923.0072	1271.3651	1248.3121	1946.0607
100	1144.0446	780.6171	1161.8848	1143.6490	1909.4933

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1849.4675	1773.4796	2052.1064	1879.4001	2376.1960
15	1698.6055	1578.9415	1822.5441	1716.5234	2215.7170
20	1634.5799	1469.0885	1729.0672	1645.6950	2199.5745
25	1472.4562	1295.6582	1540.1616	1479.1355	2009.9261
30	1410.1886	1202.8789	1466.3696	1414.4892	1976.0707
35	1366.0438	1142.6001	1414.5899	1368.7934	1961.9631
40	1335.6024	1082.4102	1378.1159	1337.3336	1955.4476
50	1263.2218	979.8745	1296.2140	1263.8559	1912.4884
75	1110.8938	789.7515	1132.4996	1110.0919	1815.6372
100	1021.0805	692.8395	1037.5221	1019.8536	1791.7080

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	2217.6897	2069.2841	2422.0140	2297.9871	2494.2786	2181.4114
15	2003.8875	1782.4457	2129.6539	2006.4892	2311.4509	1897.4691
20	1879.8147	1602.8874	1982.4703	1892.0934	2283.7428	1766.6606
25	1663.9717	1449.6914	1744.0031	1677.0023	2077.2037	1549.7701
30	1573.1154	1299.7958	1641.1004	1577.7047	2035.0764	1455.6655
35	1528.1298	1236.7654	1577.5040	1527.2158	2016.4866	1392.9796
40	1475.0977	1194.1810	1516.9147	1476.9474	2006.7108	1345.9715
50	1370.9612	1059.5575	1404.8058	1369.6298	1959.1200	1257.5257
75	1174.9082	886.0833	1198.0563	1175.1138	1851.2340	1078.6869
100	1084.2571	799.1984	1099.1869	1083.6426	1823.3268	987.0941

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	245034600.7381	0.00%	53155.9707	0.00%	1202811233054512900000.0000
15	0.00%	111729.3890	0.00%	4818.4876	0.00%	1002249.5464
20	0.00%	30231.5431	0.00%	2708.5815	0.00%	378159.0230
25	0.00%	14560.8935	0.00%	1965.6588	0.00%	16032.9993
30	0.00%	9914.1964	0.00%	1644.6167	0.00%	9379.2013
35	0.00%	7774.8860	0.00%	1479.5105	0.00%	8865.5050
40	0.00%	6408.5317	0.00%	1354.4582	0.00%	5370.4470
50	0.00%	4759.8636	0.00%	1178.8048	0.00%	3953.5807
75	0.00%	3402.2095	0.00%	997.7087	0.00%	2788.0945
100	0.00%	2829.9722	0.00%	911.1782	0.00%	2331.2789

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

	Std BOOT	Std BOOT	Std BOOT	Std BOOT	Std BOOT	Std BOOT	Std BOOT
n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	2289.680	1887.089	2261.045	1653.377	1587.357	1756.117	2382.314
15	2190.929	1633.625	1692.970	1418.811	1362.437	1604.995	2241.499
20	2199.085	1536.906	1584.567	1266.685	1250.061	1513.456	2233.193
25	2017.234	1366.896	1401.398	1104.518	1090.256	1348.391	2041.802
30	1988.207	1278.057	1308.729	980.121	979.088	1261.406	2005.798
35	1978.434	1231.447	1256.060	949.006	946.021	1218.762	1992.876
40	1973.985	1174.724	1199.556	880.288	879.186	1162.429	1987.003
50	1933.962	1089.167	1108.098	798.317	795.764	1079.670	1944.458
75	1835.633	920.394	932.245	694.907	648.522	913.257	1842.162
100	1813.203	828.287	836.179	693.673	569.897	823.563	1818.997

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	102383.557	28723.336	36689.835	16195.578	16662.719	24521.831	133008.730
15	51717.139	12205.358	15870.968	6206.208	7663.600	10896.473	53006.796
20	41362.161	12994.469	14122.512	4726.292	6448.382	12925.250	41447.555
25	19312.844	7597.784	8011.814	3184.464	5711.552	7489.458	19610.786
30	12272.764	3362.176	3824.292	1476.398	2401.665	3260.222	12446.411
35	11674.268	2882.049	3098.635	2102.557	2048.766	2825.589	11326.203
40	11087.080	2582.884	2720.829	1312.491	1902.034	2507.128	11282.370
50	9094.888	1746.651	1819.343	1623.454	1243.437	1833.484	9138.530
75	7001.631	1095.456	1114.208	1820.984	818.958	1084.127	6955.135
100	6546.515	1016.590	1024.288	4480.731	773.617	1012.285	6507.721

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	2518.026	2205.751	2248.075	2160.310	2164.008	2177.048	2592.656
15	2378.717	1964.551	2001.525	1887.814	1843.560	1949.133	2427.121
20	2375.099	1857.457	1888.117	1736.047	1675.470	1845.581	2407.179
25	2162.869	1646.565	1669.276	1497.321	1443.225	1634.627	2188.655
30	2120.617	1547.696	1569.736	1375.633	1326.439	1541.593	2142.040
35	2106.165	1484.070	1505.368	1279.003	1245.413	1476.577	2123.952
40	2097.076	1434.844	1448.984	1197.851	1181.436	1423.187	2112.420
50	2048.616	1324.717	1340.141	1057.751	1063.169	1317.018	2060.388
75	1930.919	1114.844	1125.862	812.050	856.821	1109.657	1940.584
100	1901.141	993.781	1004.827	685.613	744.155	989.753	1908.920

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	2569.082	2265.809	2289.074	2204.422	2229.375	2222.915	2911.922
15	2411.550	2019.469	2036.122	2021.452	1942.228	2029.223	2602.321
20	2409.938	1942.589	1931.827	1849.321	1800.572	1921.474	2522.990
25	2197.938	1712.140	1723.020	1666.140	1582.157	1711.538	2281.805
30	2159.397	1641.103	1655.492	1554.618	1465.751	1639.844	2228.654
35	2143.395	1579.298	1573.848	1448.252	1402.178	1569.714	2202.409
40	2139.265	1533.494	1538.688	1384.108	1317.241	1524.528	2189.325
50	2087.922	1436.757	1443.751	1224.326	1221.693	1427.984	2122.732
75	1966.813	1252.967	1261.670	934.850	993.554	1247.685	1989.693
100	1935.534	1134.725	1146.583	793.416	882.405	1130.915	1952.485

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	4234.7361	4015.6995	4655.5586	4454.6869	5036.4186	4458.0438
15	3930.2299	3568.0008	4190.3617	3960.6185	4603.3478	4129.3594
20	3724.0225	3242.3834	3941.4761	3771.0366	4515.7377	4067.4514
25	3271.6786	2949.3847	3443.6770	3322.1543	4033.4318	3649.0776
30	3114.4217	2637.2295	3259.2617	3139.0620	3914.2732	3545.9459
35	3021.1995	2507.0353	3123.4380	3031.4179	3849.8948	3493.1614
40	2916.2120	2441.1045	3001.7252	2932.8987	3801.2257	3454.8973
50	2705.4713	2154.4398	2774.8841	2710.5210	3661.1489	3339.0116
75	2283.1387	1782.4033	2331.8420	2289.9223	3355.3121	3073.9090
100	2100.1140	1618.2570	2131.7991	2103.1160	3247.3222	2984.4704

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	2288.2418	90612.7754	2516.6553	2570.1398	2494.2901
15	2191.2963	49309.5060	2380.5178	2415.1899	2311.4508
20	2197.9776	40786.8598	2373.6710	2408.2054	2283.7428
25	2019.0201	18951.5877	2162.9055	2198.2340	2077.2037
30	1988.5786	12025.8135	2120.1703	2157.0517	2035.0764
35	1977.5439	11327.1714	2105.4655	2143.3272	2016.4866
40	1973.5609	10785.1413	2096.9693	2134.7794	2006.7108
50	1934.2507	8817.6952	2046.8260	2088.4301	1959.1200
75	1836.3246	6660.3546	1932.0277	1966.3711	1851.2340
100	1812.2953	6427.0071	1900.2590	1939.4589	1823.3268

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	2494.279	1800.470	1755.041	1524.907	1837.495	2446.270	2495.015
15	2311.451	1534.589	1515.696	1234.734	1467.550	1555.540	2312.869
20	2283.743	1395.879	1383.761	1075.310	1308.632	1408.088	2285.550
25	2077.204	1239.707	1231.253	951.455	1138.766	1248.041	2079.208
30	2035.076	1144.383	1137.679	864.845	1028.082	1150.523	2037.252
35	2016.487	1094.457	1089.410	820.455	981.263	1100.166	2018.750
40	2006.711	1043.913	1039.912	770.599	923.948	1048.372	2009.098
50	1959.120	957.129	953.727	698.908	833.956	960.742	1961.532
75	1851.234	827.644	824.856	598.128	691.772	829.766	1853.770
100	1823.327	754.909	752.613	539.279	613.858	756.617	1825.937

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	50.77	50.67	54.30	51.80	57.84	43.60	42.71	47.15	44.24	51.76
15	51.66	50.79	54.48	52.34	60.77	44.77	42.50	47.60	45.11	55.39
20	51.09	49.27	53.52	51.56	62.14	44.50	40.69	46.69	44.59	57.62
25	52.22	48.97	54.32	52.65	63.60	45.33	40.10	47.47	45.50	59.50
30	51.11	46.77	53.13	51.39	64.91	44.22	37.25	46.42	44.36	60.59
35	50.10	44.30	51.60	50.28	65.72	43.11	35.03	44.89	43.19	61.64
40	50.30	42.75	51.98	50.55	68.20	43.11	33.21	44.69	43.11	63.98
50	47.66	36.97	49.37	47.96	68.06	40.34	27.17	41.84	40.28	63.35
75	42.65	23.37	43.94	42.61	70.50	34.81	15.45	36.06	34.77	66.81
100	37.37	12.89	38.44	37.35	73.11	29.50	7.37	30.42	29.41	69.31

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	51.09	25.86	N/A	N/A	94.06	90.36
15	55.29	17.10	N/A	N/A	95.23	92.08
20	57.68	11.84	N/A	N/A	93.47	90.65
25	59.72	9.28	N/A	N/A	91.88	89.45
30	61.09	6.46	N/A	N/A	90.77	88.95
35	61.78	4.93	N/A	N/A	89.62	88.10
40	64.30	3.84	N/A	N/A	89.68	88.28
50	63.92	1.88	N/A	N/A	87.52	86.57
75	67.29	0.20	N/A	N/A	86.02	85.15
100	70.02	0.16	N/A	N/A	84.16	83.60

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	49.40	48.45	52.78	50.52	52.50	48.77
15	50.63	48.73	53.63	51.42	56.38	48.12
20	50.27	46.75	52.78	50.73	58.50	46.26
25	51.62	46.27	53.65	51.76	60.10	46.20
30	50.39	43.59	52.31	50.66	61.41	44.20
35	49.18	41.10	50.75	49.38	62.10	42.06
40	49.62	39.37	51.09	49.70	64.46	41.37
50	46.65	34.08	48.44	46.81	64.12	37.11
75	40.91	21.94	42.60	40.91	67.29	30.34
100	35.83	13.66	36.91	35.84	69.96	24.89

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	97.29	0.00%	72.55	0.00%	90.22
15	0.00%	98.02	0.00%	68.06	0.00%	91.52
20	0.00%	97.86	0.00%	63.19	0.00%	91.29
25	0.00%	97.74	0.00%	60.04	0.00%	91.54
30	0.00%	98.08	0.00%	56.53	0.00%	91.86
35	0.00%	97.92	0.00%	52.24	0.00%	91.84
40	0.00%	98.38	0.00%	50.38	0.00%	91.92
50	0.00%	98.32	0.00%	43.27	0.00%	91.98
75	0.00%	98.73	0.00%	31.80	0.00%	92.16
100	0.00%	99.03	0.00%	22.57	0.00%	92.48

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	49.94	43.03	44.79	40.20	37.17	42.12	49.98	50.99
15	54.16	43.32	44.68	38.48	35.43	42.46	54.16	55.01
20	56.73	42.32	43.56	35.01	31.89	41.47	56.85	57.39
25	59.13	42.20	43.43	31.41	29.47	41.73	59.07	59.41
30	60.50	40.75	41.64	27.66	26.67	40.20	60.46	60.65
35	61.21	38.58	39.91	24.50	24.91	38.11	61.23	61.50
40	63.72	37.56	38.75	20.77	21.62	37.07	63.78	64.22
50	63.27	32.85	33.91	15.37	18.11	32.38	63.25	63.68
75	66.87	23.54	24.42	6.38	10.15	23.31	66.95	67.15
100	69.47	16.38	17.01	2.16	5.83	16.10	69.39	69.78

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	72.93	59.72	62.85	54.36	46.46	58.79	72.30	73.58
15	75.64	59.12	61.75	49.46	42.85	57.67	74.75	75.27
20	75.98	56.28	58.16	41.72	38.19	54.85	75.29	75.82
25	76.38	54.87	57.13	36.58	35.34	53.46	75.72	76.10
30	77.70	52.24	54.46	30.51	30.91	51.05	76.87	77.45
35	78.30	50.11	51.47	25.99	28.26	48.96	77.92	78.30
40	80.08	47.41	49.37	21.06	24.69	46.40	79.62	80.02
50	80.20	41.27	42.91	14.37	20.59	40.42	79.80	80.14
75	80.93	28.02	28.99	5.65	11.60	27.15	80.50	80.93
100	82.36	18.85	19.50	2.05	6.98	18.50	82.06	82.42

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	51.66	48.57	48.95	47.82	48.57	48.24	51.74	53.72
15	56.22	49.73	50.03	48.45	47.21	49.14	56.32	57.62
20	58.75	49.45	49.78	46.55	44.57	48.91	58.65	59.88
25	60.69	49.94	50.69	45.64	43.16	49.46	60.63	61.43
30	62.12	48.63	49.37	42.79	39.90	48.44	62.30	62.83
35	63.21	46.66	47.43	40.11	37.78	46.50	63.25	63.84
40	65.84	46.50	47.05	37.80	35.41	46.04	65.80	66.32
50	65.80	42.69	43.25	30.20	29.48	42.34	65.49	66.28
75	68.73	34.55	35.76	16.28	18.92	34.46	68.69	69.11
100	71.35	27.09	27.21	7.20	11.83	26.59	71.39	71.76

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	52.34	50.46	49.96	49.64	52.18	49.49	52.34	58.18
15	57.01	51.42	51.32	51.91	52.20	51.22	56.93	60.87
20	59.43	50.24	50.36	50.83	50.04	50.04	59.86	61.96
25	61.76	50.85	51.25	50.76	48.53	50.86	61.41	63.39
30	63.21	50.28	50.26	48.89	45.48	50.30	63.25	64.81
35	64.20	48.50	48.81	46.86	44.66	48.90	64.57	65.58
40	66.69	48.91	49.35	45.27	42.06	49.03	66.75	67.98
50	66.55	46.20	46.48	39.64	37.59	45.84	66.69	67.98
75	69.74	40.22	40.61	25.78	26.95	40.51	69.41	70.18
100	72.32	34.73	35.74	15.72	20.15	34.32	72.12	72.83

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	72.39	72.41	75.81	73.96	76.75	72.83
15	77.38	77.02	79.88	78.18	81.90	77.98
20	78.62	77.85	80.25	79.16	83.43	79.47
25	79.78	78.85	81.06	80.32	85.03	81.33
30	81.64	80.09	82.78	81.97	86.57	83.72
35	82.27	80.46	83.30	82.70	87.78	84.65
40	84.57	82.75	85.42	84.75	90.26	87.15
50	84.47	81.77	85.24	84.64	90.48	87.80
75	85.72	80.72	86.31	85.79	93.23	90.73
100	85.39	78.01	86.14	85.44	94.30	91.94

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 27.5708080
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	52.50	44.73	42.63	40.06	44.06	46.55	52.50	52.48
15	56.38	43.47	42.40	35.67	39.96	44.18	56.38	56.38
20	58.50	40.18	39.47	30.69	35.80	40.83	58.50	58.51
25	60.10	39.15	38.81	26.77	32.50	39.70	60.10	60.18
30	61.41	36.55	36.24	22.93	29.25	36.89	61.41	61.49
35	62.10	34.40	34.08	20.34	26.44	34.65	62.10	62.18
40	64.46	32.57	32.46	17.50	23.72	32.91	64.46	64.53
50	64.12	27.01	26.89	12.89	19.35	27.09	64.12	64.32
75	67.29	18.73	18.59	5.50	10.18	18.77	67.29	67.47
100	69.96	12.06	12.06	1.98	5.96	12.08	69.96	70.18

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Detection Limit: 27.5708080
Averaged Percentage Non-detects: 20.00%
Distribution Check: Average of means: 1091.623234
Distribution Check: Average of stdvs: 4080.912348
Average of NDs per 100 observations: 19.976000

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	27.570808	1.975248	564	1321	1552	1038	439	136	0	0	0	0
15	27.570808	3.022178	143	664	1193	1258	956	530	208	70	27	0
20	27.570808	4.021782	51	274	680	1049	1125	896	526	259	142	39
25	27.570808	4.974653	26	110	387	685	944	962	827	577	307	143
30	27.570808	5.999208	6	50	161	385	642	919	909	759	593	321
35	27.570808	7.000594	3	15	81	217	448	657	772	799	738	561
40	27.570808	8.075446	1	9	29	98	222	416	634	734	778	705
50	27.570808	10.015644	0	1	7	24	58	134	280	418	602	699
75	27.570808	15.034455	0	0	0	0	1	4	11	21	69	117
100	27.570808	20.180396	0	0	0	0	0	0	0	0	4	6

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	43
15	1	0	0	0	0	0	0	0	0	0	0	0	0
20	6	3	0	0	0	0	0	0	0	0	0	0	0
25	59	17	3	2	1	0	0	0	0	0	0	0	0
30	197	73	24	9	2	0	0	0	0	0	0	0	0
35	368	210	112	44	17	5	1	1	1	0	0	0	0
40	605	355	226	131	65	23	12	5	0	1	1	0	0
50	735	638	510	385	254	151	82	52	14	5	1	0	0
75	192	335	402	554	576	603	540	473	349	301	203	299	0
100	14	22	69	98	175	239	285	396	441	464	491	2346	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	182	352	56	250	0	0	0	136
15	183	437	105	225	0	0	0	98
20	190	539	133	238	0	0	0	9
25	188	615	146	203	0	0	0	6
30	174	721	143	202	0	0	0	0
35	200	812	171	218	0	0	0	2
40	241	940	215	255	0	0	0	1
50	246	1012	225	265	0	0	0	0
75	330	1331	311	342	0	0	0	0
100	403	1617	376	415	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	182	352	56	250	0	0
15	183	437	105	225	0	0
20	190	539	133	238	0	0
25	188	615	146	203	0	0
30	174	721	143	202	0	0
35	200	812	171	218	0	0
40	241	940	215	255	0	0
50	246	1012	225	265	0	0
75	330	1331	311	342	0	0
100	403	1617	376	415	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	1	1	0	1	0	0
20	0	0	0	0	1	0	0	0
25	0	0	3	0	8	1	0	0
30	0	0	0	0	3	0	0	0
35	0	1	1	0	7	1	0	0
40	0	0	2	0	12	0	0	0
50	0	0	4	0	9	0	0	0
75	0	0	10	0	8	0	0	0
100	0	0	25	0	21	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	1	1	0	1	0	0
20	0	0	0	0	2	0	0	0
25	0	0	3	0	8	1	0	0
30	0	0	0	0	3	0	0	0
35	0	1	1	0	7	1	0	0
40	0	0	2	0	12	0	0	0
50	0	0	4	0	9	0	0	0
75	0	0	8	0	7	0	0	0
100	0	0	25	0	23	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	1	1	0	1	0	0
20	0	0	0	0	2	0	0	0
25	0	0	2	0	8	1	0	0
30	0	0	0	0	2	0	0	0
35	0	1	1	0	7	1	0	0
40	0	0	2	0	12	0	0	0
50	0	0	4	0	9	0	0	0
75	0	0	8	0	7	0	0	0
100	0	0	24	0	21	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	1	1	0	1	0	0
20	0	0	0	0	2	0	0	0
25	0	0	3	0	8	1	0	0
30	0	0	0	0	2	0	0	0
35	0	1	1	0	7	1	0	0
40	0	0	2	0	12	0	0	0
50	0	0	4	0	9	0	0	0
75	0	0	7	0	8	0	0	0
100	0	0	25	0	22	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	13	0	13	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 8d. Ln(5,2) 25% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	2461.5642	1023.2178	N/A	N/A	16485.1422	10210.5800
15	2216.3138	667.9000	N/A	N/A	8142.0008	6298.0689
20	2150.5466	562.6175	N/A	N/A	5500.3742	4814.9526
25	2061.4823	487.0829	N/A	N/A	4378.2957	3965.0641
30	2076.0795	459.1496	N/A	N/A	3848.9322	3573.4499
35	1977.6150	439.5750	N/A	N/A	3307.2614	3131.3580
40	1930.1792	414.2158	N/A	N/A	2983.4724	2867.6289
50	1952.6315	387.8541	N/A	N/A	2695.1587	2622.4878
75	1817.1692	354.6090	N/A	N/A	2183.7634	2153.3982
100	1767.3609	335.8753	N/A	N/A	1968.5798	1951.3271

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	2396.4631	2383.2164	2694.6504	2479.7897	3028.1883
15	1963.5824	1892.4799	2147.6054	2001.3008	2616.3346
20	1794.9778	1674.6096	1922.4781	1816.0432	2464.3547
25	1630.7010	1469.7120	1729.2291	1643.2804	2336.7593
30	1571.9725	1370.5831	1654.8845	1580.1252	2332.4612
35	1458.6559	1241.5697	1524.4135	1463.8414	2197.4169
40	1376.0708	1137.7291	1432.3772	1379.3393	2133.9618
50	1310.4688	1013.9787	1356.3418	1311.6859	2139.9183
75	1075.0178	753.5669	1104.1298	1073.8564	1972.6963
100	936.3490	629.0244	957.8772	934.5633	1907.6143

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1857.4499	1775.0035	2094.6111	1884.5746	2483.0136
15	1561.8325	1434.1209	1713.7342	1574.7509	2223.4955
20	1464.8723	1296.9159	1573.6103	1471.4347	2146.7373
25	1337.4615	1135.3652	1422.9456	1339.9858	2057.0312
30	1297.8544	1064.8333	1369.8780	1298.4961	2070.3190
35	1219.7974	980.4697	1277.2449	1219.5370	1969.4319
40	1156.8315	905.9192	1204.4500	1156.0335	1921.9301
50	1103.7361	811.4787	1143.8332	1101.9582	1941.4801
75	908.7868	647.9849	933.5536	906.3382	1810.9271
100	793.6103	576.6335	811.6493	791.1579	1762.9256

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	2237.5053	2074.4440	2479.9208	2331.8452	2575.7808	2201.4447
15	1851.3966	1673.0436	1989.5020	1888.2810	2273.0002	1728.9923
20	1730.4373	1485.8997	1827.1484	1738.7462	2187.4280	1551.0697
25	1515.5574	1258.5003	1622.7100	1526.2854	2086.8875	1368.6144
30	1472.0776	1206.6099	1543.3931	1479.5398	2095.6249	1294.4848
35	1373.1526	1114.8883	1432.9120	1363.1775	1992.0201	1192.4981
40	1288.6718	1021.3567	1335.4419	1289.7344	1941.2968	1113.6230
50	1229.3669	920.7925	1263.8372	1227.1346	1960.3274	1044.9377
75	1003.4130	766.3139	1025.1335	1002.2659	1819.3181	814.2772
100	894.6366	684.7090	909.3163	892.9675	1767.2582	685.8180

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99428089.0880	0.00%	123164.4447	0.00%	308191869477975.6900
15	0.00%	117593.4811	0.00%	3835.2031	0.00%	83138572.7194
20	0.00%	35679.5610	0.00%	2207.3901	0.00%	231572.2277
25	0.00%	15684.7545	0.00%	1612.7451	0.00%	18571.0083
30	0.00%	10852.1464	0.00%	1439.2942	0.00%	11635.3650
35	0.00%	8053.3399	0.00%	1277.4089	0.00%	6697.1141
40	0.00%	6472.4911	0.00%	1164.0349	0.00%	5425.4376
50	0.00%	5020.5423	0.00%	1041.6687	0.00%	3981.7049
75	0.00%	3529.2857	0.00%	901.3753	0.00%	2753.1231
100	0.00%	2972.9331	0.00%	835.9040	0.00%	2352.3215

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	2359.648	2018.887	2104.175	1624.142	1511.526	1728.325	2468.090
15	2156.327	1726.673	1529.462	1248.968	1188.119	1423.826	2209.434
20	2107.749	1332.628	1385.743	1079.596	1032.981	1308.292	2143.008
25	2027.971	1175.640	1215.706	924.583	880.679	1151.723	2054.865
30	2048.211	1114.756	1149.887	879.965	820.271	1097.983	2069.005
35	1953.574	1040.817	1068.990	787.938	736.293	1025.314	1971.721
40	1909.283	971.791	995.128	747.947	671.595	957.181	1923.919
50	1934.311	897.289	916.017	705.946	598.971	885.690	1947.195
75	1805.343	743.532	751.435	702.774	463.653	737.873	1813.211
100	1757.231	666.245	670.767	688.706	392.421	663.429	1765.017

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	100211.198	47999.805	54544.347	37952.119	39538.378	44782.423	124141.656
15	37337.360	11436.645	12585.644	6754.119	7983.250	10784.833	40993.411
20	21441.902	7113.783	7669.752	2962.330	4691.739	6779.384	21534.146
25	16566.970	3562.789	3855.492	1796.052	2468.311	3400.741	16679.209
30	13433.421	2847.357	3025.458	1815.976	2215.959	2697.543	13216.982
35	9973.655	1810.022	1969.914	1396.205	1313.251	1771.152	10231.527
40	11358.053	1716.499	1784.945	4842.814	2486.197	1669.463	11301.051
50	43220.611	7503.546	7999.834	2428.334	9720.552	7655.089	42835.538
75	8612.858	1310.974	1292.273	7210.798	968.449	1320.159	8396.225
100	4998.722	1304.579	1276.550	4465.926	826.324	1350.396	5005.378

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	2605.804	2263.620	2311.193	2202.227	2243.970	2224.862	2692.192
15	2339.930	1865.590	1897.913	1779.327	1724.499	1843.805	2393.218
20	2268.972	1697.871	1726.354	1577.744	1508.471	1683.479	2306.107
25	2174.828	1523.902	1551.585	1365.541	1303.103	1514.265	2203.989
30	2185.921	1460.753	1482.881	1265.790	1208.793	1446.167	2211.371
35	2076.619	1341.648	1360.299	1133.555	1092.580	1330.342	2099.424
40	2027.552	1249.426	1270.653	1023.966	992.929	1241.577	2043.405
50	2052.483	1170.879	1184.884	901.316	901.393	1163.265	2067.185
75	1896.893	915.884	926.598	662.237	663.231	910.174	1907.890
100	1840.086	779.121	787.280	554.918	545.124	776.160	1849.410

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	2657.633	2377.357	2403.561	2282.911	2372.697	2324.387	3048.554
15	2364.948	1949.929	1972.317	1951.339	1862.875	1949.940	2564.361
20	2301.107	1826.183	1800.025	1746.850	1660.362	1829.008	2442.602
25	2208.145	1659.098	1692.043	1532.128	1477.744	1661.276	2302.876
30	2226.210	1590.135	1611.742	1450.876	1387.410	1586.044	2302.564
35	2116.879	1512.481	1518.512	1309.123	1248.648	1498.827	2176.476
40	2064.889	1411.550	1428.449	1183.676	1159.448	1405.390	2114.374
50	2088.905	1332.017	1346.373	1032.117	1051.415	1328.421	2128.371
75	1933.805	1059.171	1074.215	769.979	801.563	1054.422	1959.740
100	1876.304	911.984	921.248	631.129	640.018	903.523	1893.730

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	4319.0754	4065.9024	4832.9897	4572.4440	5317.6748	4620.0229
15	3672.3334	3400.1996	3967.7281	3786.1949	4680.3195	4071.2812
20	3489.0608	3069.3410	3691.6565	3530.7367	4427.1962	3882.4878
25	3061.7347	2595.0888	3304.8052	3106.8632	4189.5116	3678.6233
30	2983.1225	2509.3240	3141.4333	3014.8307	4166.6913	3667.8574
35	2784.3216	2314.0735	2913.9150	2770.9861	3895.7317	3447.1589
40	2611.8289	2119.1304	2715.3023	2624.4853	3765.6120	3338.0393
50	2512.8594	1910.6790	2586.1841	2516.6414	3762.5558	3349.5223
75	2006.3343	1594.7802	2053.6629	2008.9361	3376.7583	3018.5481
100	1783.9120	1424.2148	1814.1749	1783.3594	3209.7254	2878.8618

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	2357.9019	100912.5174	2606.6742	2654.8354	2575.8347
15	2154.6634	37155.3351	2339.7371	2367.1945	2273.0102
20	2106.1806	20724.2901	2268.9010	2303.6057	2187.4280
25	2028.9125	16398.1542	2173.9897	2212.0094	2086.8875
30	2046.9720	12526.2988	2188.2519	2226.9338	2095.6249
35	1953.5154	9567.3634	2076.6545	2114.1445	1992.0201
40	1908.9931	10895.8489	2026.5563	2064.5996	1941.2968
50	1934.2002	41470.3582	2051.8661	2087.8041	1960.3274
75	1804.6148	8081.2684	1896.8293	1931.5615	1819.3181
100	1757.2626	4881.1213	1839.9179	1875.9626	1767.2582

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	2575.781	1811.167	1716.481	1525.607	1891.279	3211.575	2577.907
15	2273.000	1402.278	1341.083	1111.241	1415.812	1451.357	2275.935
20	2187.428	1238.264	1200.836	947.084	1187.124	1264.371	2190.761
25	2086.888	1074.908	1046.008	810.526	1027.317	1095.141	2090.577
30	2095.625	1020.148	996.001	759.614	959.950	1036.750	2099.526
35	1992.020	946.424	927.996	704.819	860.507	958.853	1995.982
40	1941.297	885.331	871.377	653.787	793.366	895.671	1945.429
50	1960.327	808.349	796.735	592.395	716.968	816.414	1964.608
75	1819.318	689.284	682.013	501.388	566.593	694.032	1823.731
100	1767.258	614.148	607.305	446.355	482.965	618.669	1771.798

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	51.40	51.50	55.63	52.79	59.62	42.01	41.11	47.14	42.59	52.91
15	50.40	49.68	54.36	51.13	62.06	41.31	38.50	45.09	41.68	55.70
20	50.79	48.38	54.30	51.25	65.37	41.62	37.13	44.83	41.80	58.91
25	48.93	45.23	51.66	49.27	65.17	39.82	33.27	42.59	39.76	59.64
30	49.60	43.35	52.28	49.84	68.32	38.99	30.50	41.86	39.01	62.73
35	47.33	39.01	49.62	47.45	68.46	36.65	26.71	39.23	36.61	63.13
40	44.48	35.37	46.69	44.53	67.86	35.29	23.76	37.35	35.25	62.53
50	41.86	28.61	43.76	41.94	69.88	32.10	17.74	34.34	31.98	64.73
75	33.82	13.39	35.60	33.72	72.85	24.12	7.01	25.76	23.98	67.47
100	24.93	4.85	26.30	24.75	74.61	16.02	1.94	17.25	15.94	70.06

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	51.86	24.71	N/A	N/A	96.10	92.89
15	54.81	12.97	N/A	N/A	96.79	94.50
20	58.14	9.05	N/A	N/A	95.96	93.49
25	59.21	5.27	N/A	N/A	95.45	93.23
30	62.46	4.13	N/A	N/A	93.86	92.30
35	62.67	2.72	N/A	N/A	92.81	91.39
40	62.18	1.74	N/A	N/A	92.10	90.71
50	64.63	0.42	N/A	N/A	91.05	89.82
75	67.35	0.10	N/A	N/A	88.36	87.76
100	69.94	0.00	N/A	N/A	86.30	85.60

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	48.38	46.98	52.58	49.89	52.89	47.66
15	47.84	45.34	51.72	48.47	55.68	44.20
20	48.97	44.73	51.73	49.25	58.65	42.99
25	46.74	40.47	49.19	47.02	59.54	39.09
30	47.34	38.54	49.87	47.37	62.75	37.23
35	44.56	35.17	47.09	44.56	62.85	33.78
40	42.00	31.00	44.20	42.11	62.30	31.41
50	39.15	25.31	40.89	39.12	64.67	27.49
75	30.50	13.83	32.18	30.50	67.25	17.82
100	22.29	7.01	23.51	22.12	69.72	12.04

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	97.90	0.00%	67.50	0.00%	89.01
15	0.00%	98.28	0.00%	60.69	0.00%	90.04
20	0.00%	98.24	0.00%	56.67	0.00%	91.01
25	0.00%	98.57	0.00%	51.94	0.00%	91.29
30	0.00%	97.98	0.00%	48.83	0.00%	90.91
35	0.00%	98.53	0.00%	45.03	0.00%	91.25
40	0.00%	98.65	0.00%	40.67	0.00%	91.27
50	0.00%	98.65	0.00%	35.05	0.00%	92.10
75	0.00%	98.85	0.00%	23.33	0.00%	91.54
100	0.00%	99.05	0.00%	15.68	0.00%	91.41

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	50.20	40.38	43.19	37.29	32.97	38.89	50.08	51.70
15	53.62	38.80	40.73	32.40	28.05	37.67	53.56	54.53
20	57.13	37.72	39.79	29.35	25.31	36.81	57.25	57.96
25	58.32	34.87	36.53	23.13	20.11	33.87	58.14	58.97
30	61.62	32.34	33.99	19.77	17.50	31.37	61.62	62.10
35	61.92	29.31	30.75	15.59	15.25	28.72	61.94	62.48
40	61.33	27.29	28.60	12.14	12.12	26.83	61.47	61.84
50	64.04	22.13	23.37	7.41	8.16	21.74	63.92	64.34
75	66.71	12.75	13.46	1.98	2.95	12.34	66.79	67.05
100	69.29	6.50	6.95	0.57	1.01	6.28	69.45	69.70

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	72.32	53.46	57.99	46.32	36.99	51.90	71.70	73.60
15	74.18	49.07	52.87	37.46	30.11	47.08	73.15	74.30
20	76.24	47.55	50.08	31.44	26.45	45.74	75.41	76.34
25	76.85	42.03	45.01	23.61	21.14	40.16	76.26	76.93
30	78.89	39.78	42.29	18.78	18.32	38.20	78.04	78.87
35	78.97	35.00	37.08	14.57	15.25	33.52	77.86	78.93
40	78.97	31.31	33.76	10.60	11.80	30.64	78.32	78.95
50	79.60	24.43	26.16	6.01	8.04	23.70	79.11	79.90
75	80.53	13.76	14.18	1.68	2.70	13.05	80.14	80.89
100	81.58	6.84	7.31	0.53	0.95	6.64	81.13	81.66

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	52.10	48.44	49.13	47.50	48.34	47.92	52.10	54.48
15	55.41	47.49	48.14	45.80	44.60	47.04	55.68	57.15
20	59.39	47.35	48.34	44.59	42.14	47.26	59.49	60.61
25	60.32	44.79	46.12	40.56	37.90	44.73	60.42	61.25
30	63.29	44.73	45.79	37.68	34.44	44.38	63.37	64.20
35	64.02	41.83	42.92	32.72	30.39	41.31	63.90	64.55
40	63.43	38.66	39.58	29.20	26.59	38.55	63.31	64.16
50	65.96	34.93	35.70	21.88	21.00	34.61	65.72	66.28
75	68.71	23.76	24.42	8.24	9.71	23.52	68.87	69.45
100	70.93	14.33	14.82	2.50	3.93	14.21	71.33	71.72

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	52.91	51.62	51.01	50.46	53.86	50.57	52.75	59.09
15	56.22	50.39	50.34	50.13	50.32	49.97	56.20	60.14
20	60.08	50.70	50.57	50.35	48.78	50.27	60.10	62.93
25	61.09	48.44	49.05	46.82	45.21	48.34	61.39	63.37
30	64.12	48.70	49.04	45.34	42.77	48.68	64.24	66.26
35	64.95	46.73	47.06	41.08	37.89	47.04	64.83	66.81
40	64.26	44.35	45.15	37.65	35.88	44.45	64.36	65.78
50	66.53	41.55	42.14	30.54	29.85	41.35	66.65	68.04
75	69.94	32.54	33.49	17.00	17.93	32.28	69.58	71.09
100	71.86	24.02	24.44	7.77	9.58	23.52	71.98	72.81

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	72.11	71.92	76.01	73.57	77.41	72.95
15	75.36	74.45	78.05	76.16	81.27	76.67
20	79.09	78.00	80.89	79.66	85.01	80.75
25	79.45	78.04	81.75	80.12	87.03	82.34
30	81.22	79.29	82.96	81.64	88.63	84.69
35	81.40	78.71	82.91	81.68	89.78	85.19
40	81.91	78.81	83.48	82.33	89.74	86.38
50	81.69	77.33	83.25	82.10	91.66	87.96
75	81.89	74.27	82.78	81.96	93.39	90.51
100	79.33	67.89	80.51	79.56	94.53	91.84

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 38.5139495
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	52.89	43.62	39.64	37.83	43.56	46.00	52.89	52.97
15	55.68	39.48	36.32	29.77	37.47	41.03	55.68	55.84
20	58.65	37.05	35.17	26.42	33.43	38.30	58.65	58.87
25	59.54	32.51	31.13	20.61	27.70	33.62	59.54	59.66
30	62.75	29.41	28.38	17.41	24.48	30.02	62.75	62.83
35	62.85	25.96	25.35	14.02	20.30	26.51	62.85	63.07
40	62.30	23.33	22.91	11.29	16.36	23.60	62.30	62.44
50	64.67	18.65	18.51	7.05	12.04	18.89	64.67	64.85
75	67.25	10.32	10.26	2.00	4.65	10.40	67.25	67.47
100	69.72	5.17	5.15	0.63	2.61	5.19	69.72	70.04

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Detection Limit: 38.5139495
Averaged Percentage Non-detects: 25.00%
Distribution Check: Average of means: 1101.746776
Distribution Check: Average of stdvs: 4154.998786
Average of NDs per 100 observations: 24.973200

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	38.513950	2.437030	300	933	1438	1317	763	299	0	0	0	0
15	38.513950	3.769703	70	333	739	1144	1163	848	482	191	51	25
20	38.513950	4.997426	16	119	320	660	996	1018	859	531	321	144
25	38.513950	6.265149	4	24	120	335	563	847	935	861	598	398
30	38.513950	7.521980	1	7	43	134	323	512	731	853	775	642
35	38.513950	8.685941	0	3	19	50	164	296	503	652	729	786
40	38.513950	9.955050	0	1	5	22	56	153	249	459	603	702
50	38.513950	12.490693	0	0	4	0	6	20	68	125	249	381
75	38.513950	18.722376	0	0	0	0	0	0	0	2	2	14
100	38.513950	25.100594	0	0	0	0	0	0	0	0	1	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	115
15	4	0	0	0	0	0	0	0	0	0	0	0	1
20	45	14	6	1	0	0	0	0	0	0	0	0	0
25	206	104	43	8	4	0	0	0	0	0	0	0	0
30	479	275	163	59	36	11	5	1	0	0	0	0	0
35	677	474	305	215	103	40	19	8	6	0	1	0	0
40	742	668	504	384	226	133	81	34	20	5	2	1	0
50	492	613	665	618	509	468	322	228	128	70	42	42	0
75	27	60	100	156	268	363	463	488	509	551	467	1580	0
100	0	0	3	4	10	34	59	87	136	180	237	4299	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	325	531	103	438	0	0	0	299
15	439	791	294	515	0	0	0	271
20	431	932	329	488	0	0	0	66
25	491	1111	386	533	0	0	0	55
30	534	1259	438	589	0	0	0	17
35	512	1362	446	553	0	0	0	15
40	529	1450	444	574	0	0	0	3
50	631	1711	567	664	0	0	0	3
75	798	2034	746	827	0	0	0	0
100	981	2484	945	1009	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	325	531	103	438	0	0
15	439	791	294	515	0	0
20	431	932	329	488	0	0
25	491	1111	386	533	0	0
30	534	1259	438	589	0	0
35	512	1362	446	553	0	0
40	529	1450	444	574	0	0
50	631	1711	567	664	0	0
75	798	2034	746	827	0	0
100	981	2484	945	1009	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	1	2	0	6	1	0	0
20	0	2	6	0	9	3	0	0
25	0	0	5	0	13	2	0	0
30	0	3	8	1	33	3	0	0
35	0	1	13	1	54	2	0	0
40	0	4	12	2	57	4	0	0
50	0	8	22	5	86	8	0	0
75	0	0	64	0	131	0	0	0
100	0	4	132	4	213	5	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	2	0	5	1	0	0
20	0	1	6	0	10	4	0	0
25	0	1	5	0	13	3	0	0
30	0	2	8	1	34	3	0	0
35	0	2	12	1	54	2	0	0
40	0	4	12	2	60	4	0	0
50	0	8	24	5	89	8	0	0
75	0	0	63	0	126	0	0	0
100	0	4	131	4	213	5	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	2	0	5	1	0	0
20	0	2	6	0	10	3	0	0
25	0	0	5	0	13	2	0	0
30	0	2	8	1	33	3	0	0
35	0	1	14	1	55	3	0	0
40	0	4	12	2	59	4	0	0
50	0	8	23	5	89	8	0	0
75	0	0	62	0	128	0	0	0
100	0	5	136	3	217	5	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	1	0	6	1	0	0
20	0	1	5	0	11	3	0	0
25	0	0	5	0	13	2	0	0
30	0	3	8	1	32	3	0	0
35	0	2	13	1	54	3	0	0
40	0	4	11	2	58	4	0	0
50	0	8	24	5	89	8	0	0
75	0	1	62	0	130	0	0	0
100	0	4	131	4	208	4	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	43	0	43	0	0	0	0
15	0	5	0	5	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 8e. Ln(5,2) 40% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	2496.3631	1088.6429	N/A	N/A	22259.1287	13155.2997
15	2261.3045	635.2691	N/A	N/A	11427.1205	8445.9734
20	2193.7793	550.1364	N/A	N/A	7463.5167	6355.9870
25	2156.5484	441.8294	N/A	N/A	5941.3883	5265.1922
30	2115.7800	418.5963	N/A	N/A	4902.6754	4481.5465
35	2048.8455	364.9496	N/A	N/A	4220.3565	3947.2962
40	1985.7809	351.3874	N/A	N/A	3715.3494	3539.7811
50	1968.6998	313.9393	N/A	N/A	3216.3613	3110.7434
75	1879.3275	265.6035	N/A	N/A	2555.6296	2512.3246
100	1791.0002	246.7763	N/A	N/A	2217.3187	2193.7332

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	2473.2387	2477.3190	2953.1926	2588.7759	3481.2990
15	1916.9482	1861.6899	2304.8205	1961.3181	3200.0115
20	1608.0984	1485.4671	1889.0816	1623.5539	2980.0335
25	1389.1549	1206.5492	1614.0437	1391.6335	2870.1775
30	1247.7259	1015.9752	1421.3490	1245.1669	2730.4542
35	1098.6717	849.4482	1241.2651	1093.4638	2610.0654
40	978.2951	734.7058	1095.2231	971.9846	2503.0707
50	825.5817	646.8334	905.3317	819.5906	2451.7282
75	593.2091	611.9694	624.5088	589.6014	2283.8041
100	512.3708	667.8018	522.6961	511.0923	2143.1530

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1630.0547	1530.1385	2003.3946	1641.0879	2630.7897
15	1139.9151	1015.1952	1414.0139	1135.8548	2418.1190
20	1003.9287	879.7595	1168.3663	1002.1764	2332.0842
25	909.2228	802.8969	1008.4134	907.8142	2288.6604
30	821.6609	710.4394	905.4116	817.6264	2227.8058
35	730.8125	670.8539	796.5205	726.4479	2153.6636
40	670.6126	625.4985	719.8915	666.9306	2083.5216
50	617.8677	676.2745	641.5988	616.8162	2062.1674
75	527.8632	774.7966	527.5911	529.5440	1960.6557
100	513.5805	868.9671	506.4087	516.5551	1863.5275

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	1955.5601	1701.9724	2305.8921	2064.6206	2576.5668	1943.9547
15	1427.2085	1261.8060	1604.1864	1472.3329	2284.3264	1240.1101
20	1271.1610	1069.4081	1387.0967	1283.6892	2203.1418	1045.4250
25	1121.3470	950.7983	1202.5254	1119.6083	2158.7081	916.0728
30	1021.4271	860.5439	1083.8791	1031.0256	2114.3845	790.7713
35	924.5590	783.5108	983.8602	926.5583	2044.0964	687.4626
40	853.1988	721.9086	906.6180	857.2658	1978.3395	634.8437
50	777.9372	642.5238	811.0248	776.6793	1958.8615	589.4991
75	635.2932	531.0816	652.3084	635.6671	1866.0785	557.3670
100	549.0192	459.9458	563.0759	549.6377	1776.1940	604.4600

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	9694439.2065	0.02%	7648.5052	0.00%	130264207754.0577
15	0.00%	140969.1099	0.00%	1897.3799	0.00%	708782267468.7278
20	0.00%	33659.2419	0.00%	1374.8728	0.00%	3497290.4699
25	0.00%	18116.5325	0.00%	1171.6318	0.00%	7931760.2119
30	0.00%	11618.8387	0.00%	1055.8472	0.00%	17604.3205
35	0.00%	8834.0454	0.00%	974.1843	0.00%	11042.1083
40	0.00%	7101.9554	0.00%	914.7838	0.00%	6830.6349
50	0.00%	5302.0746	0.00%	846.6753	0.00%	4708.7355
75	0.00%	3724.3511	0.00%	771.3849	0.00%	2986.9579
100	0.00%	3068.6931	0.00%	731.7658	0.00%	2421.4889

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	2361.932	2955.794	3244.231	1247.050	1114.231	1350.054	2503.961
15	2165.024	10310.286	15004.394	893.835	997.365	963.184	2254.084
20	2121.625	1485.895	1852.780	844.481	917.632	869.359	2181.654
25	2097.916	955.780	902.834	766.503	738.031	741.477	2142.873
30	2065.776	1194.912	733.651	810.888	688.428	714.612	2103.429
35	2004.217	689.600	691.796	812.450	635.097	683.967	2037.996
40	1945.928	627.030	628.910	752.202	572.674	609.771	1977.417
50	1934.252	640.301	634.835	820.200	520.445	613.521	1961.305
75	1851.565	617.253	619.345	842.069	486.356	617.897	1873.136
100	1765.880	581.920	575.553	770.691	363.343	582.740	1787.326

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	56612.182	10571.751	15636.988	5345.962	5378.878	9842.290	74013.624
15	35956.973	2685.698	2923.134	2077.417	3101.684	2599.483	41715.505
20	39976.706	4109.639	1728.707	6249.215	41064.713	1655.500	47395.501
25	27112.086	1569.143	1557.820	3536.274	4140.366	1336.288	27380.057
30	25010.700	2142.397	2014.000	10711.660	8554.883	2235.666	26746.358
35	22284.621	1649.720	1629.749	25891.335	16297.356	1845.592	22805.597
40	10163.984	2369.562	2115.863	5212.771	2972.843	1845.115	10271.094
50	12719.213	8045.187	7801.589	14141.324	3397.242	8141.835	13234.746
75	7653.262	6098.026	6020.125	13313.243	6574.964	6195.972	7827.019
100	5872.607	5488.365	5328.163	8029.566	2052.269	5530.630	5923.523

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	2606.510	2170.679	2215.472	2075.553	2169.262	2095.256	2740.689
15	2358.839	1707.816	1733.867	1534.191	1505.820	1617.264	2451.423
20	2288.004	1420.935	1444.518	1227.002	1151.367	1372.018	2354.864
25	2250.346	1211.793	1254.696	1026.252	950.183	1181.652	2303.656
30	2209.559	1087.009	1112.678	877.531	830.097	1073.050	2253.689
35	2136.191	946.443	968.427	755.440	710.306	935.402	2175.679
40	2067.635	853.262	867.897	666.860	628.933	842.066	2103.852
50	2051.257	710.204	724.248	562.788	525.793	705.263	2080.882
75	1948.078	528.550	534.763	427.330	385.583	525.127	1973.175
100	1849.831	445.831	449.204	362.625	321.793	443.885	1872.494

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	2720.356	2657.142	2478.034	2269.248	2363.279	2284.908	3221.324
15	2407.893	1897.096	1969.625	1673.628	1608.508	1772.242	2709.487
20	2324.880	1634.588	1647.494	1357.630	1239.634	1544.009	2521.133
25	2286.717	1388.610	1432.475	1118.666	1023.754	1333.501	2421.434
30	2250.713	1228.590	1261.447	960.314	888.200	1204.269	2360.527
35	2172.679	1072.510	1106.242	830.657	748.968	1057.402	2265.156
40	2103.407	961.381	986.719	728.129	662.787	947.725	2187.700
50	2089.032	808.881	823.611	613.632	544.319	797.142	2151.313
75	1982.883	593.083	603.642	451.861	388.385	590.796	2029.314
100	1882.360	484.902	493.819	372.078	318.097	483.562	1918.365

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	3905.5526	3414.9677	4660.0213	4192.5113	5769.4531	4632.1803
15	2930.6802	2623.1113	3343.6027	3053.7428	5333.0785	4139.5923
20	2673.4899	2270.1742	2937.5517	2719.2355	5050.1033	3956.7536
25	2367.9540	2023.0928	2555.2168	2373.6266	4884.0080	3842.1476
30	2161.3695	1838.9906	2308.4614	2196.9601	4674.5425	3729.4391
35	1969.6405	1685.8455	2109.1640	1983.5443	4457.5516	3571.8934
40	1817.9830	1554.8690	1943.9669	1835.2691	4260.5673	3428.5559
50	1675.3250	1406.3636	1749.8290	1678.1993	4159.0790	3364.1384
75	1381.4876	1177.5805	1420.3559	1387.5307	3812.0822	3120.9489
100	1198.7354	1024.4241	1233.0570	1201.7347	3516.2059	2903.6120

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	2361.7680	56293.2421	2605.5306	2720.1248	2577.2742
15	2165.4630	33900.1331	2356.2365	2410.1497	2284.4986
20	2122.1123	39762.5952	2288.8450	2323.4698	2203.1591
25	2095.1175	25585.3341	2248.7688	2287.2941	2158.7193
30	2065.6041	23493.9959	2209.4078	2238.9696	2114.3845
35	2005.7973	20939.9650	2134.7101	2175.3536	2044.1062
40	1945.2470	10509.1245	2066.8235	2106.7711	1978.3395
50	1933.3458	12576.6663	2048.3532	2086.3375	1958.8615
75	1851.0650	7372.6322	1948.8342	1982.6230	1866.0785
100	1766.5991	5639.1608	1848.5100	1879.3675	1776.1940

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	2576.567	1598.329	1296.815	1308.824	1958.606	46818.424	2586.654
15	2284.326	1179.145	880.118	906.646	1618.869	163347.924	2297.340
20	2203.142	986.739	768.725	754.059	1361.048	70141.723	2216.822
25	2158.708	868.252	689.005	656.802	1229.017	988.313	2173.069
30	2114.385	764.757	637.178	583.922	1062.650	847.090	2129.345
35	2044.096	686.922	586.723	529.304	959.403	753.153	2059.141
40	1978.340	624.467	540.144	490.400	889.506	679.538	1994.078
50	1958.861	552.824	485.923	451.177	893.826	596.471	1974.970
75	1866.078	450.043	410.555	452.400	911.866	475.629	1882.678
100	1776.194	410.078	381.208	509.342	1188.637	428.236	1792.979

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	55.87	56.34	63.42	57.86	68.93	39.66	37.90	48.24	39.41	57.98
15	49.82	49.31	58.18	50.69	69.86	29.75	26.08	37.73	29.27	59.35
20	45.47	43.43	53.54	46.04	70.67	25.47	20.10	31.94	25.19	61.15
25	40.55	35.74	47.74	40.69	73.21	21.47	14.20	26.85	21.01	63.56
30	37.37	29.49	43.74	37.27	74.06	19.29	11.07	23.88	18.91	65.09
35	31.54	22.04	38.14	31.41	75.21	15.09	7.39	18.87	14.51	66.00
40	27.68	15.11	33.47	27.43	75.15	11.84	4.40	14.83	11.52	66.87
50	18.77	6.83	22.65	18.55	77.84	7.27	1.66	9.01	7.05	69.05
75	6.14	0.95	7.72	6.08	79.66	1.70	0.24	2.26	1.66	70.91
100	1.80	0.04	2.10	1.74	81.41	0.38	0.02	0.53	0.34	73.56

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	55.31	29.95	N/A	N/A	98.93	97.66
15	56.06	12.06	N/A	N/A	99.25	98.08
20	58.20	7.69	N/A	N/A	98.59	97.66
25	60.63	2.26	N/A	N/A	98.61	97.50
30	62.38	1.97	N/A	N/A	98.02	97.03
35	63.31	0.49	N/A	N/A	97.58	96.71
40	64.16	0.62	N/A	N/A	96.75	95.64
50	66.38	0.26	N/A	N/A	96.06	95.52
75	68.06	0.02	N/A	N/A	94.50	93.78
100	71.13	0.00	N/A	N/A	92.71	92.16

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	46.26	44.33	54.42	47.91	56.00	46.10
15	41.64	37.50	46.56	42.57	55.56	30.51
20	37.36	31.86	41.64	38.49	57.82	22.87
25	33.66	26.78	37.81	34.09	60.08	17.03
30	30.58	22.72	33.60	30.87	61.74	13.84
35	26.03	17.44	28.63	25.90	62.63	9.52
40	22.13	13.08	25.50	22.39	63.29	7.13
50	15.69	6.64	17.72	15.56	65.21	3.43
75	6.53	2.58	6.91	6.56	67.01	0.57
100	2.07	0.41	2.61	1.90	69.92	0.12

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.56	0.02%	57.34	0.00%	88.24
15	0.00%	98.73	0.00%	45.15	0.00%	87.88
20	0.00%	98.20	0.00%	40.32	0.00%	87.96
25	0.00%	98.12	0.00%	35.66	0.00%	88.61
30	0.00%	98.12	0.00%	33.33	0.00%	89.49
35	0.00%	98.18	0.00%	28.97	0.00%	90.50
40	0.00%	98.04	0.00%	25.86	0.00%	89.27
50	0.00%	98.22	0.00%	18.99	0.00%	90.28
75	0.00%	98.65	0.00%	11.52	0.00%	90.26
100	0.00%	98.83	0.00%	6.38	0.00%	90.53

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	52.87	36.48	42.08	30.60	24.67	32.28	52.71	55.76
15	53.19	24.10	28.33	17.13	11.87	21.67	53.23	56.12
20	56.10	18.72	21.50	11.44	7.35	17.43	56.20	57.96
25	58.57	13.32	15.76	6.84	4.55	12.59	58.53	60.34
30	60.57	11.26	12.85	4.70	2.66	10.45	60.71	61.92
35	61.43	7.78	9.15	2.63	1.60	7.42	61.43	62.81
40	62.46	5.14	6.42	1.45	0.72	4.75	62.46	63.92
50	64.50	2.35	2.94	0.50	0.21	2.25	64.46	66.08
75	66.55	0.66	0.90	0.11	0.04	0.56	66.44	67.94
100	69.60	0.05	0.07	0.00	0.00	0.05	69.60	71.03

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	73.29	35.41	44.00	29.21	18.61	32.34	73.29	76.57
15	74.24	22.36	26.52	14.70	8.38	20.32	73.19	76.16
20	74.89	16.25	19.32	8.08	4.17	14.76	73.82	75.84
25	77.82	11.26	13.19	4.46	2.72	10.32	76.57	78.59
30	77.64	8.23	9.77	3.02	1.65	7.52	76.75	78.30
35	78.59	5.60	6.43	1.74	0.74	5.23	77.33	79.11
40	78.30	4.01	4.72	0.99	0.36	3.73	77.68	79.05
50	80.59	1.51	1.72	0.30	0.12	1.42	79.84	81.01
75	81.52	0.40	0.48	0.05	0.04	0.36	80.71	82.53
100	82.32	0.05	0.05	0.00	0.00	0.05	81.88	83.27

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	55.23	51.86	52.61	48.44	51.52	49.03	55.21	59.39
15	55.72	45.98	46.42	40.64	40.83	42.09	55.70	59.35
20	58.12	40.22	41.22	34.55	31.84	38.39	57.96	60.87
25	60.65	34.40	35.40	27.90	23.74	33.35	60.79	63.13
30	62.50	30.69	31.44	22.41	19.52	30.31	62.71	64.69
35	63.56	25.21	26.23	16.43	13.70	24.82	63.29	65.33
40	64.51	19.97	21.16	11.16	9.32	19.23	64.42	66.14
50	66.91	12.26	13.30	5.46	4.70	12.27	66.77	68.55
75	68.55	3.56	3.78	0.76	0.52	3.58	68.53	70.16
100	71.35	0.78	0.82	0.03	0.07	0.69	71.43	72.75

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	57.60	59.45	58.71	54.20	58.89	55.37	57.68	66.04
15	57.01	54.32	54.98	46.26	46.97	48.41	57.25	63.94
20	59.39	49.41	50.31	40.19	36.18	44.68	59.09	64.50
25	61.62	42.77	43.93	34.31	28.59	40.42	61.50	65.90
30	63.76	38.17	39.20	27.66	22.77	37.29	63.62	66.81
35	64.26	32.68	33.81	21.45	16.75	31.84	64.50	67.41
40	65.49	27.12	29.18	15.99	12.84	27.16	65.66	68.28
50	67.56	19.25	20.40	9.55	6.41	18.90	67.62	70.83
75	69.15	7.90	8.45	2.28	1.34	7.86	69.45	71.62
100	72.22	2.73	3.10	0.59	0.07	3.29	71.94	74.34

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	73.50	72.47	80.93	74.96	83.25	76.50
15	73.74	71.98	78.20	75.50	85.60	77.84
20	73.13	71.04	77.36	74.77	87.29	79.94
25	75.00	71.18	77.95	75.57	89.09	82.32
30	74.32	70.27	78.02	75.17	91.07	84.85
35	73.63	69.10	77.11	73.98	92.63	86.18
40	71.72	66.22	74.58	72.15	92.26	86.14
50	70.52	62.29	72.96	70.91	94.42	88.61
75	61.93	50.64	65.06	62.21	95.88	91.41
100	51.71	35.77	54.84	51.66	96.81	92.67

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 89.4165505
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	56.00	45.94	33.70	39.19	48.61	51.96	56.00	56.32
15	55.56	35.30	22.75	24.11	37.92	42.24	55.56	56.38
20	57.82	26.84	18.59	16.03	29.68	32.32	57.82	58.30
25	60.08	19.70	14.28	10.42	22.34	23.94	60.08	60.69
30	61.74	15.35	11.72	7.11	18.61	18.71	61.74	62.50
35	62.63	10.97	8.51	4.16	14.16	13.64	62.63	63.31
40	63.29	7.62	5.98	2.30	10.97	9.25	63.29	64.10
50	65.21	3.94	3.21	1.07	8.44	4.75	65.21	66.40
75	67.01	1.15	0.79	0.42	5.29	1.43	67.01	68.08
100	69.92	0.48	0.24	0.44	3.96	0.63	69.92	71.21

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Detection Limit: 89.4165505
Averaged Percentage Non-detects: 40.00%
Distribution Check: Average of means: 1094.917168
Distribution Check: Average of stdvs: 4105.119335
Average of NDs per 100 observations: 39.944800

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	89.416550	3.491287	47	257	756	1305	1478	1207	0	0	0	0
15	89.416550	5.977030	5	28	124	334	609	929	1030	881	647	328
20	89.416550	8.028515	0	3	11	58	181	364	619	834	894	833
25	89.416550	10.015446	0	1	3	8	48	99	209	403	612	724
30	89.416550	11.933861	0	0	1	2	5	30	74	130	248	443
35	89.416550	13.958020	0	0	0	0	2	7	14	29	76	159
40	89.416550	16.025347	0	0	0	0	0	0	0	8	18	39
50	89.416550	20.009703	0	0	0	0	0	0	0	1	0	5
75	89.416550	30.004950	0	0	0	0	0	0	0	0	0	0
100	89.416550	39.961584	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	1019
15	135	0	0	0	0	0	0	0	0	0	0	0	40
20	607	363	174	82	22	5	0	0	0	0	0	0	3
25	833	732	590	394	220	107	42	19	5	1	0	0	0
30	577	701	780	671	541	366	225	144	66	31	9	6	0
35	273	434	596	651	670	650	527	405	280	139	75	63	0
40	112	219	292	396	528	577	633	641	495	409	283	400	0
50	11	9	33	77	134	207	295	440	475	544	601	2218	0
75	0	0	0	1	0	1	4	2	4	10	27	5001	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	4	0	4	0	0	4	0	4	0	0
15	4	0	4	0	0	4	0	4	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	820	1134	315	1132	0	0	0	1207
15	1726	2173	1270	1973	0	0	0	1991
20	1916	2498	1587	2101	0	0	0	1253
25	2162	2847	1876	2316	0	0	0	1378
30	2316	3052	2056	2436	0	0	0	847
35	2468	3267	2245	2583	0	0	0	962
40	2660	3475	2477	2763	0	0	0	683
50	2940	3785	2798	3025	0	0	0	501
75	3395	4274	3284	3449	0	0	0	292
100	3793	4558	3708	3842	0	0	0	145

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	820	1134	315	1132	0	0
15	1726	2173	1270	1973	0	0
20	1916	2498	1587	2101	0	0
25	2162	2847	1876	2316	0	0
30	2316	3052	2056	2436	0	0
35	2468	3267	2245	2583	0	0
40	2660	3475	2477	2763	0	0
50	2940	3785	2798	3025	0	0
75	3395	4274	3284	3449	0	0
100	3793	4558	3708	3842	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	4	0	4	0	0	0	0
15	0	9	23	5	27	29	0	0
20	0	49	114	31	182	100	0	0
25	0	87	190	48	394	143	0	0
30	0	146	279	97	652	178	0	0
35	0	152	349	107	854	196	0	0
40	0	209	484	155	1175	253	0	0
50	0	283	702	226	1656	330	0	0
75	0	503	1363	445	2732	547	0	0
100	0	833	2009	775	3580	874	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	4	0	4	0	0	0	0
15	0	10	23	4	24	31	0	0
20	0	52	113	28	180	103	0	0
25	0	87	187	46	388	145	0	0
30	0	143	278	96	635	180	0	0
35	0	156	346	108	855	193	0	0
40	0	207	491	155	1177	254	0	0
50	0	283	706	223	1654	323	0	0
75	0	498	1363	440	2735	554	0	0
100	0	831	2015	773	3579	880	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	6	23	0	27	28	0	0
20	0	53	115	28	182	104	0	0
25	0	85	190	44	392	141	0	0
30	0	143	276	91	649	180	0	0
35	0	156	350	109	867	199	0	0
40	0	202	490	154	1175	255	0	0
50	0	285	707	224	1648	324	0	0
75	0	500	1360	444	2733	555	0	0
100	0	831	2015	767	3578	875	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	6	24	1	26	28	0	0
20	0	53	113	31	183	104	0	0
25	0	88	192	47	394	142	0	0
30	0	146	281	93	645	180	0	0
35	0	154	345	105	858	197	0	0
40	0	205	484	157	1173	252	0	0
50	0	286	714	221	1649	324	0	0
75	0	505	1362	447	2729	560	0	0
100	0	830	2011	766	3575	881	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	1	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	133	0	133	0	0	0	0
15	0	47	0	47	0	0	0	0
20	0	9	0	9	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 8f. Ln(5,2) 50% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	2849.0547	1350.8671	N/A	N/A	29325.4487	16868.0885
15	2447.4097	749.0269	N/A	N/A	14125.6335	10227.4792
20	2218.8878	708.4641	N/A	N/A	8605.7082	7230.6582
25	2182.4895	523.0184	N/A	N/A	6739.5352	5909.4355
30	2123.4347	540.2790	N/A	N/A	5528.4417	5007.9976
35	2131.3737	436.7423	N/A	N/A	4873.9083	4525.0632
40	2060.9851	457.7422	N/A	N/A	4231.5631	4010.3844
50	1971.7928	406.3969	N/A	N/A	3520.1611	3392.7773
75	1894.0097	308.1187	N/A	N/A	2744.8047	2693.2104
100	1832.4313	298.9042	N/A	N/A	2372.8658	2344.8843

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	2884.2321	2907.0112	3599.0466	3036.1795	4336.7426
15	2068.3194	2035.1529	2668.7660	2125.0799	3879.3246
20	1514.0157	1424.4260	1963.8155	1524.4479	3432.4034
25	1206.4574	1051.6601	1572.6034	1197.4866	3286.2458
30	975.1763	792.1862	1259.5340	961.2714	3095.3371
35	809.9920	685.0571	1016.7606	800.0242	3082.4810
40	694.4244	615.1396	833.3207	686.3241	2924.4241
50	572.0500	611.2574	631.3996	569.0969	2720.6687
75	572.6649	897.1332	544.3507	580.6438	2542.6595
100	639.4380	1139.8364	595.9905	650.9572	2401.8755

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1638.8704	1512.4086	2188.3254	1623.1680	3084.2796
15	981.6214	867.7625	1313.4372	975.3887	2708.5972
20	799.6634	774.0658	908.4461	818.5315	2459.4481
25	776.3752	805.3779	790.6893	801.7894	2411.2889
30	686.5369	783.5659	672.4235	709.1249	2331.3428
35	725.2765	919.8251	672.5298	751.6749	2342.1235
40	680.0274	934.4869	620.5797	705.2586	2254.4944
50	675.2271	1000.0405	612.5682	697.8615	2143.2304
75	854.8244	1404.7446	785.5882	877.8867	2048.0196
100	973.1325	1655.1007	910.1648	994.7368	1968.8851

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	1702.1995	1546.3547	2228.2854	1752.3721	2909.7287	1950.6930
15	1330.4283	1087.1041	1495.4597	1385.8900	2436.8796	1106.7447
20	1046.8836	924.5720	1168.4535	1055.8617	2191.9950	1000.9651
25	952.9653	798.1832	1033.3389	964.5588	2151.9877	1057.3738
30	866.8568	740.7489	919.0640	874.9895	2091.7509	999.6574
35	785.1962	680.3841	829.1649	795.4243	2098.9458	1132.0420
40	683.7684	600.4898	731.9361	689.1468	2027.7661	1127.5885
50	626.9653	543.6576	654.5471	631.5597	1937.4530	1181.7800
75	509.5445	458.5391	529.3011	506.0478	1858.1650	1533.0418
100	436.8701	365.1088	449.6121	436.8461	1796.3274	1744.8280

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	48945369.2579	0.08%	6160.6913	0.00%	680047718441.2335
15	0.00%	157704.5357	0.00%	1624.3123	0.00%	40742822053.6683
20	0.00%	34504.3355	0.00%	1172.8398	0.00%	98883038.1858
25	0.00%	16321.5984	0.00%	1032.4215	0.00%	5463130.9327
30	0.00%	10839.0317	0.00%	956.0050	0.00%	46350.3454
35	0.00%	8017.3448	0.00%	900.4750	0.00%	25003.4466
40	0.00%	6406.6481	0.00%	856.3963	0.00%	9721.4828
50	0.00%	4879.0962	0.00%	816.8740	0.00%	5271.6530
75	0.00%	3295.2626	0.00%	752.2380	0.00%	3117.7271
100	0.00%	2715.7391	0.00%	723.2402	0.00%	2512.0240

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	2666.749	2266.956	4708.815	1125.654	1055.891	1198.238	2863.002
15	2307.051	5673.832	3946.125	951.982	1369.991	908.411	2454.476
20	2109.361	6189.538	5149.058	882.712	1203.599	750.715	2213.570
25	2091.990	17979.886	2308.449	805.638	1032.465	681.218	2171.280
30	2043.690	2621.249	9616.312	870.471	930.121	694.792	2112.467
35	2059.129	1814.524	1903.150	868.216	847.524	687.673	2116.929
40	1994.162	1734.698	940.818	1019.993	880.347	745.125	2048.235
50	1912.192	646.479	646.525	904.041	741.913	654.608	1963.318
75	1843.686	657.976	654.397	734.132	445.465	639.844	1887.646
100	1786.214	655.400	690.245	765.984	316.825	655.783	1827.677

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	81624.864	4843.910	5907.394	3446.404	4074.715	6901.851	128366.877
15	61359.863	2244.806	2213.236	7678.320	13225.055	2270.084	71831.400
20	20973.777	10007.759	3995.150	10834.686	27494.904	2251.106	25629.698
25	19126.003	2979.742	6852.170	5097.686	24579.641	2237.009	20824.171
30	14299.024	3275.374	3549.539	10960.461	11444.395	3034.280	15792.257
35	28536.474	7582.102	7012.314	14264.284	10999.753	7690.644	30185.107
40	12856.832	8255.055	7587.831	21210.953	10407.582	8837.378	13040.885
50	9120.268	5058.473	4829.480	12843.728	6614.614	5465.920	9235.386
75	9227.747	9909.854	10364.745	14022.502	2483.212	10211.696	9583.718
100	6484.455	10590.257	12129.305	7483.000	6221.673	10852.528	6468.655

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	2952.488	2417.886	2462.500	2274.377	2424.104	2268.033	3146.227
15	2522.982	1838.034	1863.789	1489.604	1553.470	1600.258	2676.028
20	2274.292	1383.215	1420.865	1050.288	988.326	1185.384	2391.130
25	2242.623	1140.616	1163.371	854.298	797.360	1008.513	2338.520
30	2183.307	935.087	960.117	716.486	661.404	863.542	2262.889
35	2196.095	779.239	790.504	613.669	567.135	736.447	2266.352
40	2122.488	666.911	677.149	544.407	508.168	648.220	2186.053
50	2022.610	557.575	562.006	474.893	430.021	552.951	2079.223
75	1940.827	414.638	418.596	360.996	324.370	413.162	1990.183
100	1870.238	349.624	350.820	308.860	281.333	348.066	1915.915

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	3189.634	2767.466	3313.398	2478.596	2667.862	2548.044	3850.620
15	2627.240	2044.496	2121.150	1570.181	1620.114	1787.559	3065.709
20	2327.433	1525.768	1624.311	1108.789	1038.847	1288.335	2640.274
25	2287.405	1250.462	1302.129	902.088	821.094	1088.403	2511.313
30	2223.285	1012.594	1040.525	757.226	674.417	928.814	2390.223
35	2237.041	843.640	864.867	650.392	575.223	799.498	2407.143
40	2157.798	715.415	732.473	573.380	513.480	690.718	2286.941
50	2063.612	596.589	605.125	489.183	425.788	589.066	2165.008
75	1973.147	429.544	435.797	360.577	317.632	428.731	2053.587
100	1904.236	355.096	359.522	300.619	273.418	352.307	1964.609

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	3412.6470	3125.4849	4562.9208	3568.1396	6911.0013	5267.1100
15	2792.6968	2280.7523	3174.9982	2954.0892	6134.3271	4457.6578
20	2223.7896	1981.7861	2518.7401	2261.3369	5475.0349	3963.1890
25	2059.7572	1735.3332	2254.9356	2100.1606	5297.0060	3859.7454
30	1882.3643	1615.1361	2003.7000	1909.4152	5034.7609	3711.1002
35	1719.5230	1498.5002	1824.3357	1752.2910	5026.1075	3707.3702
40	1491.7312	1323.6188	1606.7220	1512.0258	4773.8631	3550.0069
50	1391.5960	1204.8507	1457.1458	1407.1117	4424.9074	3331.1585
75	1148.4279	1038.8783	1198.6921	1145.3753	4097.4774	3123.0804
100	1007.0023	836.0435	1039.0104	1004.1506	3831.4206	2959.5034

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	2665.8026	87347.7542	2953.7067	3171.1522	2912.3481
15	2306.1511	58367.4246	2520.4113	2620.7209	2438.8935
20	2113.2608	20739.5208	2277.2547	2329.4256	2192.7269
25	2090.0841	19378.0456	2242.5939	2281.8906	2152.2680
30	2044.1769	14015.4148	2182.5900	2221.4556	2091.8172
35	2057.1347	27180.4994	2196.0562	2237.0871	2098.9458
40	1995.1116	12039.3208	2122.0202	2157.1980	2027.7661
50	1912.8178	8551.8991	2021.9959	2060.2486	1937.4530
75	1842.0084	8471.3336	1939.2800	1980.5173	1858.1650
100	1786.0077	6097.8523	1870.9268	1906.5902	1796.3274

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	2909.729	1720.254	1168.308	1397.325	2467.748	46982.323	2930.886
15	2436.880	1295.837	756.136	1008.093	2079.585	892801.533	2467.514
20	2191.995	1053.978	615.491	830.346	1779.093	45449.158	2224.096
25	2151.988	921.541	550.836	727.011	1750.007	1231.915	2184.318
30	2091.751	805.279	512.419	639.080	1664.452	1035.289	2124.282
35	2098.946	747.309	494.419	620.084	1840.225	936.917	2131.313
40	2027.766	672.123	471.454	605.557	1849.724	825.930	2060.569
50	1937.453	610.682	461.629	628.106	2058.592	715.801	1971.007
75	1858.165	610.523	508.081	984.097	5508.363	679.355	1892.850
100	1796.327	771.789	685.903	1927.824	15329.128	831.645	1831.475

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	64.15	64.06	71.95	65.62	76.14	41.53	39.15	54.32	40.59	64.93
15	53.86	53.70	64.74	55.05	76.65	22.51	19.07	34.32	21.33	63.09
20	44.73	43.62	57.19	44.97	78.16	15.19	10.59	23.04	14.57	65.64
25	34.79	29.96	47.78	34.42	78.81	10.63	6.22	15.64	10.02	66.14
30	26.55	18.85	38.89	26.08	80.36	7.39	3.31	10.51	7.13	69.52
35	18.79	10.46	27.92	18.32	81.15	4.71	1.94	6.51	4.46	69.31
40	12.99	5.54	19.82	12.46	81.98	2.55	0.79	4.06	2.36	70.16
50	6.10	1.52	9.25	5.72	83.74	1.17	0.22	1.45	1.13	73.05
75	0.48	0.02	0.67	0.48	85.52	0.04	0.00	0.10	0.04	73.90
100	0.04	0.00	0.04	0.04	86.77	0.00	0.00	0.00	0.00	76.32

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	62.69	40.53	N/A	N/A	99.70	99.27
15	59.60	16.07	N/A	N/A	99.54	98.77
20	61.27	13.98	N/A	N/A	99.23	98.24
25	62.59	3.61	N/A	N/A	98.93	98.06
30	65.33	6.14	N/A	N/A	98.93	98.32
35	65.60	0.71	N/A	N/A	98.71	98.22
40	66.12	3.14	N/A	N/A	98.00	97.49
50	69.03	1.93	N/A	N/A	97.56	96.91
75	70.24	0.00	N/A	N/A	96.26	95.98
100	72.93	0.48	N/A	N/A	94.46	94.10

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	47.08	44.35	60.55	46.97	62.48	49.80
15	37.86	32.77	43.21	38.93	57.90	22.04
20	31.86	25.93	36.29	32.39	59.41	11.52
25	26.48	19.66	31.12	27.53	60.42	6.61
30	22.55	15.67	25.62	22.89	63.13	3.80
35	17.77	10.85	19.74	18.34	63.43	2.06
40	11.95	7.25	14.06	12.11	63.74	0.99
50	5.84	2.66	8.11	5.81	66.36	0.28
75	1.37	0.00	1.65	1.16	67.72	0.00
100	0.47	0.00	0.40	0.52	70.14	0.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.08%	57.39	0.00%	89.03
15	0.00%	98.30	0.00%	41.41	0.00%	87.01
20	0.00%	96.63	0.00%	35.03	0.00%	88.26
25	0.00%	95.54	0.00%	30.18	0.00%	88.16
30	0.00%	96.28	0.00%	27.31	0.00%	89.15
35	0.00%	96.28	0.00%	24.20	0.00%	89.01
40	0.00%	96.46	0.00%	21.09	0.00%	89.03
50	0.00%	95.90	0.00%	16.53	0.00%	89.58
75	0.00%	95.68	0.00%	8.87	0.00%	89.82
100	0.00%	95.60	0.00%	4.65	0.00%	89.49

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	58.93	37.52	46.22	28.09	20.26	28.83	58.83	63.54
15	55.37	18.12	24.21	10.05	6.55	13.06	55.50	60.57
20	57.82	9.34	13.12	4.82	2.56	7.97	57.88	61.62
25	59.21	5.98	8.29	2.33	0.92	5.13	59.31	62.55
30	61.74	3.74	4.75	1.36	0.62	3.25	61.96	65.07
35	62.69	2.31	3.10	0.52	0.17	1.94	62.71	65.29
40	62.87	1.16	1.55	0.17	0.16	1.03	62.63	65.80
50	65.74	0.41	0.57	0.08	0.00	0.34	65.70	68.69
75	67.17	0.00	0.00	0.00	0.00	0.00	67.41	70.08
100	69.88	0.00	0.00	0.00	0.00	0.00	69.82	72.61

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	75.23	25.73	36.25	21.03	11.13	21.90	76.36	80.08
15	74.83	10.97	14.52	6.66	2.57	9.35	74.63	78.44
20	77.21	5.76	7.14	2.73	1.08	5.30	76.34	79.52
25	77.43	3.12	4.00	0.96	0.39	2.79	76.48	79.09
30	79.52	2.02	2.47	0.69	0.18	1.76	78.51	80.99
35	78.97	0.92	1.17	0.21	0.07	0.83	77.94	80.85
40	79.41	0.45	0.69	0.17	0.00	0.44	78.10	80.57
50	81.68	0.14	0.21	0.07	0.00	0.14	80.77	83.15
75	81.15	0.00	0.00	0.00	0.00	0.00	80.36	82.97
100	82.63	0.00	0.00	0.00	0.00	0.00	81.80	84.48

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	61.70	59.60	60.16	53.54	58.89	54.51	61.70	67.17
15	58.00	51.17	51.91	39.14	42.67	41.49	58.12	64.02
20	59.88	43.47	44.18	29.33	27.34	33.74	59.98	65.07
25	61.37	32.95	34.53	21.10	17.15	26.63	61.21	65.33
30	64.16	24.16	25.71	14.86	10.95	21.40	63.86	67.92
35	64.36	16.66	17.48	8.80	6.34	14.93	64.42	67.84
40	64.95	11.09	11.66	5.29	3.54	10.45	64.99	68.22
50	67.84	5.21	5.50	2.24	1.12	4.70	67.82	71.11
75	68.99	0.39	0.54	0.05	0.00	0.45	69.01	72.10
100	71.62	0.05	0.09	0.00	0.00	0.05	71.62	74.77

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	64.67	68.44	67.03	62.55	68.02	63.43	64.73	73.39
15	60.36	59.53	61.70	44.27	46.70	48.72	60.40	70.18
20	61.23	52.31	54.52	33.01	30.25	38.42	61.37	70.50
25	62.53	39.97	42.38	25.02	19.74	31.41	62.10	69.27
30	65.13	29.77	31.40	17.88	12.32	25.85	65.09	71.29
35	65.41	20.96	22.26	11.48	7.43	19.03	65.05	70.93
40	66.08	15.03	15.85	7.80	3.97	13.31	66.04	70.99
50	68.55	8.59	9.13	3.77	1.63	8.19	68.79	73.66
75	69.41	1.55	1.74	0.43	0.00	1.74	70.26	73.72
100	72.53	0.56	0.66	0.09	0.00	0.52	72.44	76.24

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	78.22	76.47	86.27	78.35	88.46	81.29
15	71.84	69.35	78.50	74.02	88.81	80.10
20	72.08	68.85	78.69	73.84	90.79	82.71
25	70.50	66.26	76.14	71.71	91.45	83.82
30	68.99	62.99	73.49	69.66	93.45	86.16
35	67.55	61.83	72.18	68.86	94.46	87.15
40	61.21	54.29	67.32	62.17	94.53	87.80
50	60.56	50.85	64.27	61.54	95.90	90.10
75	46.45	38.46	49.41	47.25	97.31	92.42
100	32.71	19.05	35.74	32.46	98.02	93.49

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 148.4131591
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	62.48	52.84	31.74	46.01	58.10	62.51	62.57	63.47
15	57.90	39.51	17.80	28.89	45.78	51.86	57.94	59.45
20	59.41	27.78	11.27	15.58	34.20	38.97	59.41	60.99
25	60.42	18.57	7.74	8.68	25.66	27.37	60.42	62.26
30	63.13	12.12	5.01	4.60	20.55	18.00	63.13	64.91
35	63.43	7.92	3.19	2.73	17.35	12.42	63.43	65.35
40	63.74	5.78	2.00	2.20	14.28	8.73	63.74	65.68
50	66.36	2.99	0.93	1.31	11.84	4.36	66.36	68.73
75	67.72	1.76	0.65	1.35	7.92	2.51	67.72	69.92
100	70.14	1.47	0.61	1.43	6.30	1.76	70.14	72.67

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Detection Limit: 148.4131591
Averaged Percentage Non-detects: 50.00%
Distribution Check: Average of means: 1097.173200
Distribution Check: Average of stdvs: 4143.789284
Average of NDs per 100 observations: 49.968400

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	148.413159	4.040990	7	63	343	945	1637	2055	0	0	0	0
15	148.413159	7.252871	0	2	19	65	237	509	817	1030	1054	815
20	148.413159	9.922574	0	0	0	8	19	87	188	363	614	845
25	148.413159	12.546337	0	0	0	0	2	7	16	70	162	302
30	148.413159	15.026139	0	0	0	0	0	1	2	11	25	71
35	148.413159	17.530099	0	0	0	0	0	0	0	1	3	9
40	148.413159	20.050297	0	0	0	0	0	0	0	1	0	1
50	148.413159	24.965743	0	0	0	0	0	0	0	0	0	0
75	148.413159	37.610891	0	0	0	0	0	0	0	0	0	0
100	148.413159	50.072079	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3114
15	502	0	0	0	0	0	0	0	0	0	0	0	296
20	928	789	604	344	206	55	0	0	0	0	0	0	23
25	497	662	779	798	656	502	288	196	70	32	11	0	3
30	141	260	410	560	684	697	643	596	420	281	142	106	0
35	22	60	127	212	357	465	574	669	651	629	482	789	0
40	5	10	26	46	117	151	290	394	542	580	649	2238	0
50	0	0	0	2	0	10	28	43	74	134	217	4542	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	13	0	13	0	0	13	0	13	0	0
15	4	0	4	0	0	4	0	4	0	0
20	2	0	2	0	0	2	0	2	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	1101	1442	482	1516	0	0	0	2055
15	2607	2975	2032	2918	0	0	0	3401
20	3148	3538	2708	3349	0	0	0	2926
25	3460	3829	3122	3615	0	0	0	3332
30	3702	4099	3473	3827	0	0	0	2885
35	3885	4285	3677	3987	0	0	0	3220
40	4029	4374	3869	4109	0	0	0	2887
50	4297	4637	4174	4361	0	0	0	2772
75	4684	4907	4625	4705	0	0	0	3061
100	4836	4987	4801	4859	0	0	0	2760

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	1101	1442	482	1516	0	0
15	2607	2975	2032	2918	0	0
20	3148	3538	2708	3349	0	0
25	3460	3829	3122	3615	0	0
30	3702	4099	3473	3827	0	0
35	3885	4285	3677	3987	0	0
40	4029	4374	3869	4109	0	0
50	4297	4637	4174	4361	0	0
75	4684	4907	4625	4705	0	0
100	4836	4987	4801	4859	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	13	0	13	0	0	0	0
15	0	28	48	7	29	79	0	0
20	0	177	394	90	438	410	0	0
25	0	370	681	236	1008	606	0	0
30	0	636	1008	431	1640	838	0	0
35	0	809	1270	624	2091	969	0	0
40	0	1014	1572	833	2564	1162	0	0
50	0	1406	2064	1212	3278	1520	0	0
75	0	2270	3180	2109	4440	2353	0	0
100	0	3071	3983	2938	4836	3146	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	13	0	13	0	0	0	0
15	0	25	47	7	30	79	0	0
20	0	175	401	93	438	405	0	0
25	0	375	678	245	997	607	0	0
30	0	636	1007	429	1642	847	0	0
35	0	811	1270	621	2084	961	0	0
40	0	1017	1564	834	2566	1162	0	0
50	0	1409	2056	1214	3267	1523	0	0
75	0	2263	3175	2110	4439	2351	0	0
100	0	3071	3983	2948	4832	3150	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	24	47	3	30	78	0	0
20	0	169	393	89	442	405	0	0
25	0	379	675	245	1010	596	0	0
30	0	641	1013	430	1643	844	0	0
35	0	813	1268	621	2087	964	0	0
40	0	1009	1575	830	2564	1165	0	0
50	0	1403	2061	1214	3270	1519	0	0
75	0	2264	3187	2102	4432	2362	0	0
100	0	3071	3981	2938	4831	3143	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	22	49	3	29	75	0	0
20	0	166	397	87	438	409	0	0
25	0	379	674	244	1007	605	0	0
30	0	636	1007	439	1642	845	0	0
35	0	800	1262	617	2089	961	0	0
40	0	1005	1561	829	2556	1165	0	0
50	0	1405	2056	1207	3267	1522	0	0
75	0	2269	3190	2112	4440	2351	0	0
100	0	3074	3985	2943	4834	3139	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	4	0	5050	5050	0	0
15	0	0	0	5050	5050	0	0
20	0	0	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	0	0	5050	5050	0	0
35	0	0	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	203	0	203	0	0	0	0
15	0	135	0	135	0	0	0	0
20	0	50	0	50	0	0	0	0
25	0	15	0	15	0	0	0	0
30	0	2	0	2	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 8g. Ln(5,2) 60% Type 1 Censoring

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	3238.2482	1818.9302	N/A	N/A	35275.8336	20144.3776
15	2641.4382	1008.2065	N/A	N/A	16624.5763	11862.3090
20	2448.9415	1027.8258	N/A	N/A	10311.7623	8564.1968
25	2226.3605	725.1003	N/A	N/A	7434.1858	6455.6815
30	2261.4880	870.4084	N/A	N/A	6324.6315	5681.5163
35	2168.9354	604.6264	N/A	N/A	5285.2956	4877.8440
40	2168.5705	678.8487	N/A	N/A	4710.8213	4444.2308
50	2071.7624	639.8382	N/A	N/A	3869.4156	3716.9339
75	1922.0317	469.1720	N/A	N/A	2882.7684	2823.8854
100	1886.3014	448.0276	N/A	N/A	2499.8786	2467.7264

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	3324.8220	3358.3735	4206.5660	3676.3654	5058.3579
15	2289.0550	2283.2546	3165.2944	6321.1919	4662.0080
20	1643.0842	1579.6439	2408.4135	1703.8085	4408.7384
25	1074.5610	957.0567	1666.1100	1038.7000	3884.7204
30	744.0900	642.0839	1228.0023	719.0704	3869.2656
35	593.9569	594.9500	830.0577	589.3204	3615.1645
40	574.5623	671.1333	632.7141	584.4272	3533.2046
50	652.9331	891.6537	561.9249	679.2719	3280.6901
75	943.1962	1403.9406	796.4483	980.3975	2891.0023
100	1304.9880	1938.5105	1168.8676	1342.2972	2760.7264

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	1803.7426	1669.1309	2477.5631	1937.4939	3525.3424
15	867.7482	818.5906	1214.4788	16533.2699	3004.9192
20	945.2452	1011.3033	814.1310	2101.7287	2823.9028
25	957.1393	1129.0960	726.9986	1053.4457	2556.2558
30	1110.4626	1400.9554	824.3901	1218.6845	2599.8660
35	1176.5643	1535.0388	898.2229	1277.4684	2481.3234
40	1269.7812	1704.0654	1001.6805	1364.3019	2470.3449
50	1434.1065	1954.4389	1199.8441	1516.4510	2346.3367
75	1719.2866	2379.0331	1546.9538	1781.8722	2147.6052
100	2053.1498	2854.7964	1913.9528	2105.3977	2092.9423

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	1900.7433	1686.3197	2654.8412	1913.0408	3273.6536	2134.7865
15	1131.9099	977.6783	1341.0484	1148.2117	2573.4910	1148.8725
20	952.4386	804.2687	1047.1036	942.6845	2358.6368	1575.7273
25	813.5593	690.9713	871.0587	785.5977	2134.7508	1763.9402
30	688.4396	636.0029	734.8341	692.1873	2174.4061	2166.9514
35	643.0275	584.3472	675.6982	651.4515	2083.6159	2317.3604
40	593.2395	551.1363	610.3164	610.9777	2085.3656	2508.2760
50	542.6298	489.6140	552.6358	540.0544	1990.9073	2784.4578
75	419.9302	337.9244	423.0735	425.2771	1843.7659	3195.5332
100	358.2400	308.5207	378.1511	354.4852	1809.6030	3617.3038

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	62416666.9443	0.18%	4331.9706	0.02%	10159065670.6897
15	0.00%	134596.1877	0.12%	1513.9790	0.00%	1861902883.5584
20	0.00%	28947.7267	0.08%	1148.2430	0.00%	191401815717.6804
25	0.00%	12684.2627	0.00%	985.4563	0.00%	44445089.0804
30	0.00%	8505.5814	0.02%	942.4895	0.00%	745886679.4227
35	0.00%	6185.4999	0.02%	895.5993	0.00%	450306.8041
40	0.00%	5139.1964	0.00%	876.6213	0.00%	17618.2745
50	0.00%	3818.4962	0.00%	840.4341	0.00%	6520.2873
75	0.00%	2579.5562	0.00%	792.0194	0.00%	3353.3753
100	0.00%	2125.8789	0.00%	772.3942	0.00%	2663.4315

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	3003.374	1878.089	1998.814	1219.888	1191.402	1689.969	3261.131
15	2433.928	18406.325	9208.146	1141.516	1930.459	27794.929	2666.952
20	2269.330	38197.523	29413.493	1131.667	1903.071	2941.017	2470.937
25	2072.806	66003.045	13536.625	1116.458	1676.599	885.230	2232.161
30	2123.537	39918.591	26952.770	1155.273	1632.953	902.550	2254.997
35	2042.800	20945.425	124620.748	1037.090	1342.784	860.681	2160.703
40	2050.343	29000.187	44174.171	1173.418	1232.127	892.888	2157.986
50	1966.684	17398.409	1966.202	1095.525	1525.546	832.170	2060.640
75	1828.933	581.067	584.606	783.805	704.524	580.620	1913.893
100	1798.122	551.559	544.413	1019.887	608.737	565.210	1879.628

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	43937.548	3018.234	4147.265	2081.099	3136.182	395290.117	96671.105
15	44451.106	2535.841	1887.313	28787.520	79555.248	1756856876.548	120057.274
20	35709.915	11173.179	8199.747	16947.714	43426.749	48800580.745	45701.546
25	19758.940	10124.886	7815.086	15147.418	33521.771	8671.135	23204.764
30	15766.331	12415.821	10688.576	20682.500	33176.083	11216.115	18009.123
35	15837.918	11126.933	10999.174	16149.507	20058.638	10184.628	17142.462
40	15320.403	13932.879	13721.727	24537.808	20938.476	13117.174	16282.051
50	17117.801	94283.296	78585.087	188794.136	330290.004	102913.259	20025.310
75	6067.508	4083.894	4202.396	6712.272	5420.394	4045.023	6273.888
100	8825.625	7350.403	6568.421	24489.479	2802.610	7928.650	9195.133

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	3319.247	2769.612	2812.717	2536.889	2819.239	2561.275	3587.164
15	2668.315	2100.626	2114.351	1420.943	1636.198	1606.256	2925.710
20	2457.845	1735.325	1813.118	946.652	1044.844	1129.679	2689.122
25	2227.197	1341.634	1403.058	709.248	745.580	840.709	2413.519
30	2275.870	1066.759	1113.926	594.942	604.221	688.984	2427.849
35	2179.239	861.517	893.716	527.917	527.797	597.851	2317.590
40	2183.539	705.976	717.923	478.902	471.881	538.074	2309.429
50	2082.288	519.020	523.642	420.190	407.218	466.098	2190.610
75	1920.397	366.969	369.555	328.974	313.228	365.018	2014.546
100	1882.437	305.091	306.774	281.611	265.760	307.748	1969.824

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	3646.285	3266.675	3519.244	2867.983	3103.530	2972.417	4429.533
15	2865.728	2232.555	18287.901	1471.263	1687.491	1732.840	3522.806
20	2573.809	1760.009	1881.053	962.631	1084.271	1184.667	3082.855
25	2285.762	1361.536	1445.045	726.143	756.772	865.758	2671.756
30	2321.757	1095.041	1142.072	617.963	609.009	712.268	2635.059
35	2217.258	886.504	923.883	540.094	527.805	616.226	2476.264
40	2222.970	724.584	733.485	488.571	468.817	552.598	2457.014
50	2122.766	525.778	531.232	420.058	402.455	472.845	2301.878
75	1956.198	367.484	368.427	320.679	301.482	361.847	2089.861
100	1922.075	300.812	302.905	270.619	251.384	300.003	2028.165

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	3835.9313	3421.4396	5481.4803	3937.7298	7861.0614	5877.6040
15	2327.1509	2059.8647	2832.1516	2438.6716	6928.9152	4733.2222
20	1944.0233	1720.2267	2205.4076	2032.2801	6492.4581	4328.1248
25	1677.0376	1503.4102	1837.6008	1714.4369	5783.8626	3874.1547
30	1485.3508	1414.9632	1607.6691	1531.3909	5833.4600	3921.3098
35	1402.0257	1290.2646	1495.2077	1442.0958	5489.2640	3719.5361
40	1308.3314	1230.1385	1351.2454	1357.1016	5408.5057	3697.4065
50	1217.5756	1083.2365	1247.0433	1206.0680	5025.4903	3471.7670
75	976.6968	778.3966	981.9059	995.3028	4409.8209	3117.1422
100	856.5907	759.0210	902.5833	849.1757	4190.9437	3003.8957

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	3001.1393	54137.4263	3318.9349	3609.3424	3280.3174
15	2436.3199	49383.2974	2667.2730	2858.4085	2579.2662
20	2270.1870	35817.8319	2456.6238	2567.6748	2363.3611
25	2074.5670	21913.6121	2227.7935	2286.2943	2137.5606
30	2124.1210	15524.5893	2274.7053	2323.3198	2175.2328
35	2043.9512	15601.8032	2180.0048	2221.7298	2084.6687
40	2049.7590	14904.9999	2183.2996	2220.5052	2086.2279
50	1965.7663	17086.2841	2083.0825	2120.0824	1990.9564
75	1828.5339	5792.3913	1921.0531	1957.4912	1843.7659
100	1798.7397	8441.2857	1882.7540	1916.6161	1809.6030

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	3273.654	2020.629	1291.713	1718.860	2940.830	72254.731	3314.276
15	2573.491	1545.166	694.774	1262.369	2764.108	1625759.072	2638.816
20	2358.637	1433.243	563.586	1216.793	2840.700	2509521.418	2431.312
25	2134.751	1228.577	527.593	1068.464	2800.629	3552452.014	2207.372
30	2174.406	1184.739	548.058	1044.749	3404.777	3584.290	2243.324
35	2083.616	1107.008	551.581	1052.705	3851.811	1782.236	2152.176
40	2085.366	1091.407	604.910	1130.363	4706.087	1647.887	2153.698
50	1990.907	1219.348	800.324	1523.236	7383.878	1629.455	2059.238
75	1843.766	2339.827	1958.727	4682.021	31570.071	2693.106	1913.351
100	1809.603	6262.339	5594.180	17210.581	158225.315	6959.726	1879.964

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	76.10	75.88	83.27	77.50	85.76	50.18	47.58	64.48	48.30	75.41
15	63.44	62.99	76.25	64.14	84.91	15.95	12.71	32.19	13.94	70.71
20	49.48	48.24	67.75	48.85	85.76	8.26	5.01	15.49	6.61	70.08
25	29.63	25.60	53.75	27.54	85.82	4.29	2.14	6.99	3.33	71.15
30	15.43	10.06	36.61	14.57	86.40	1.88	0.63	3.39	1.58	71.52
35	7.92	3.58	18.68	7.35	87.58	0.87	0.34	1.62	0.73	72.89
40	4.06	1.31	9.11	3.68	87.92	0.38	0.12	0.63	0.30	74.61
50	1.13	0.32	2.14	1.05	88.51	0.10	0.02	0.16	0.10	75.07
75	0.06	0.04	0.06	0.06	90.67	0.04	0.00	0.04	0.04	78.59
100	0.00	0.00	0.00	0.00	92.61	0.00	0.00	0.00	0.00	81.56

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	74.02	54.52	N/A	N/A	99.98	99.80
15	68.04	30.55	N/A	N/A	99.68	99.47
20	66.71	30.34	N/A	N/A	99.45	99.07
25	67.19	12.43	N/A	N/A	99.27	98.51
30	67.41	21.41	N/A	N/A	98.93	98.34
35	69.23	3.68	N/A	N/A	98.79	98.36
40	70.42	9.74	N/A	N/A	98.34	97.78
50	70.99	9.03	N/A	N/A	98.16	97.64
75	74.36	0.00	N/A	N/A	96.24	95.82
100	78.02	2.78	N/A	N/A	95.94	95.60

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	55.22	52.07	73.32	53.02	72.28	59.19
15	33.58	27.63	40.96	33.50	63.76	15.43
20	27.57	21.19	31.88	26.43	62.00	4.95
25	22.38	15.16	23.87	20.20	61.39	1.82
30	13.83	10.49	15.79	13.86	62.44	0.50
35	9.79	7.52	10.82	9.84	64.12	0.18
40	5.96	4.10	6.40	5.91	65.39	0.10
50	3.47	1.98	3.90	3.45	66.04	0.00
75	2.13	0.00	1.64	2.44	69.66	0.00
100	0.00	0.00	0.00	0.00	71.72	0.00

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.98	0.18%	63.36	0.02%	90.93
15	0.00%	99.13	0.12%	42.82	0.00%	87.98
20	0.00%	94.85	0.08%	35.24	0.00%	87.45
25	0.00%	91.70	0.00%	28.24	0.00%	86.85
30	0.00%	90.81	0.02%	25.07	0.00%	87.31
35	0.00%	90.20	0.02%	22.76	0.00%	87.94
40	0.00%	89.68	0.00%	20.57	0.00%	87.74
50	0.00%	89.03	0.00%	16.32	0.00%	87.05
75	0.00%	86.85	0.00%	9.13	0.00%	88.02
100	0.00%	85.84	0.00%	5.47	0.00%	89.09

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	68.22	44.72	57.35	32.98	23.56	32.55	68.51	74.77
15	61.35	16.46	25.11	6.16	3.84	8.04	61.37	69.66
20	60.10	7.76	15.74	1.87	0.90	3.32	60.16	68.79
25	60.00	4.13	8.14	0.79	0.20	1.68	60.22	68.51
30	61.33	1.94	3.81	0.30	0.11	0.66	61.43	67.80
35	63.17	1.14	1.56	0.11	0.05	0.33	63.19	69.47
40	64.16	0.47	0.86	0.03	0.06	0.16	64.38	70.50
50	65.39	0.29	0.38	0.00	0.00	0.05	65.37	70.79
75	69.23	0.00	0.00	0.00	0.00	0.00	69.21	74.40
100	71.35	0.00	0.00	0.00	0.00	0.00	71.35	77.62

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.75	23.56	34.74	19.15	10.10	18.75	81.84	86.32
15	76.36	5.71	7.88	2.83	1.26	3.58	77.88	82.71
20	76.75	2.76	3.45	0.75	0.23	1.29	77.31	82.08
25	78.02	1.64	1.91	0.39	0.03	0.70	78.00	81.90
30	78.87	0.48	0.62	0.16	0.04	0.32	78.79	82.44
35	79.94	0.35	0.37	0.04	0.00	0.15	79.66	83.07
40	80.24	0.11	0.10	0.05	0.06	0.08	80.06	83.72
50	80.22	0.00	0.00	0.00	0.00	0.00	79.80	83.78
75	82.28	0.00	0.00	0.00	0.00	0.00	81.49	85.35
100	83.90	0.00	0.00	0.00	0.00	0.00	83.27	87.43

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	71.52	70.91	71.80	63.11	69.74	64.02	71.41	78.95
15	64.22	62.27	62.71	39.61	48.69	43.93	64.22	73.86
20	62.69	58.39	58.97	24.51	29.81	30.93	62.75	73.23
25	62.20	45.43	47.02	14.49	14.53	20.36	62.24	72.42
30	63.41	33.43	34.79	9.30	6.93	13.28	63.41	71.43
35	65.39	20.69	22.85	5.01	3.36	8.31	65.43	72.53
40	66.42	13.01	13.48	2.37	1.23	4.70	66.53	73.60
50	67.13	4.58	4.31	1.01	0.23	2.03	67.25	73.25
75	70.53	0.44	0.67	0.17	0.00	0.36	70.67	76.42
100	73.15	0.00	0.00	0.00	0.00	0.00	73.35	79.84

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	75.54	80.32	78.75	74.14	80.46	76.69	75.64	84.40
15	68.18	68.49	70.55	43.44	52.41	50.34	68.02	80.24
20	65.27	62.22	64.42	26.87	32.56	33.97	65.21	79.50
25	63.92	49.63	52.48	16.47	16.06	21.90	63.92	77.41
30	64.59	36.51	38.67	10.47	7.50	14.81	64.32	76.34
35	66.75	24.00	26.50	5.77	3.70	9.87	66.36	76.57
40	67.43	15.89	16.21	4.01	1.92	6.25	67.49	77.13
50	68.06	5.90	6.07	1.07	0.68	2.73	68.22	76.51
75	71.58	0.98	1.05	0.17	0.00	0.60	71.54	78.81
100	74.12	0.26	0.00	0.00	0.00	0.00	74.12	81.64

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	87.58	86.70	92.98	88.12	93.62	89.39
15	70.58	66.38	81.67	71.85	92.83	85.74
20	66.16	60.71	74.40	67.72	93.52	85.80
25	64.10	58.01	69.17	64.14	93.92	86.12
30	57.95	54.39	65.37	60.00	94.73	87.62
35	57.47	51.50	63.99	59.37	96.02	88.77
40	57.89	51.79	59.20	60.76	96.02	89.23
50	48.55	39.60	53.25	47.59	97.13	90.46
75	27.66	15.79	29.51	29.27	97.84	93.11
100	15.38	0.00	23.53	9.09	98.79	95.03

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 246.3354455
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	72.28	65.73	37.43	61.44	71.17	75.94	72.61	74.53
15	63.76	52.20	15.11	42.31	57.52	68.16	64.04	67.41
20	62.00	38.93	8.85	25.51	46.16	58.10	62.14	65.96
25	61.39	24.69	4.50	13.34	34.40	40.57	61.45	65.92
30	62.44	15.97	2.65	7.91	27.88	26.83	62.46	66.28
35	64.12	11.08	2.20	5.93	24.10	17.84	64.12	68.38
40	65.39	8.36	1.60	4.98	21.52	13.15	65.41	69.54
50	66.04	5.43	1.60	3.84	16.95	8.18	66.04	70.32
75	69.66	2.97	1.47	2.59	11.84	4.40	69.66	73.78
100	71.72	2.24	1.31	2.14	8.30	3.01	71.72	77.58

LOGNORMAL DISTRIBUTION

Censoring Type: 1
Mean Value: 5.00
Stdv Value: 2.00
Population Mean: 1096.6331584
Number of Test Runs: 5050
Detection Limit: 246.3354455
Averaged Percentage Non-detects: 60.00%
Distribution Check: Average of means: 1112.656119
Distribution Check: Average of stdvs: 4290.834422
Average of NDs per 100 observations: 60.013600

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	246.335445	4.329901	4	19	178	611	1532	2706	0	0	0	0
15	246.335445	8.275446	0	0	4	10	55	145	372	800	1148	1368
20	246.335445	11.756436	0	0	0	0	1	6	28	71	191	359
25	246.335445	14.963762	0	0	0	0	0	0	0	4	18	44
30	246.335445	17.979406	0	0	0	0	0	0	0	0	0	1
35	246.335445	21.020198	0	0	0	0	0	0	0	0	0	0
40	246.335445	24.009901	0	0	0	0	0	0	0	0	0	0
50	246.335445	29.923366	0	0	0	0	0	0	0	0	0	0
75	246.335445	45.003168	0	0	0	0	0	0	0	0	0	0
100	246.335445	59.929307	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	8664
15	1148	0	0	0	0	0	0	0	0	0	0	0	1393
20	639	884	964	855	665	387	0	0	0	0	0	0	322
25	98	214	372	604	765	815	757	590	447	214	108	0	51
30	11	13	63	117	276	394	552	718	749	721	584	851	6
35	0	2	10	18	42	81	146	269	404	551	645	2882	2
40	0	0	0	1	6	5	27	50	98	162	288	4413	0
50	0	0	0	0	0	0	0	1	2	2	17	5028	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	16	0	16	0	0	16	0	16	0	0
15	23	0	23	0	0	23	0	23	0	0
20	26	0	26	0	0	26	0	26	0	0
25	12	0	12	0	0	12	0	12	0	0
30	7	0	7	0	0	7	0	7	0	0
35	1	0	1	0	0	1	0	1	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	1162	1470	451	1625	0	0	0	2706
15	3272	3512	2606	3647	0	0	0	4464
20	3998	4210	3585	4229	0	0	0	4394
25	4259	4476	3986	4456	0	0	0	4672
30	4522	4640	4328	4610	0	0	0	4569
35	4662	4784	4514	4735	0	0	0	4751
40	4765	4855	4675	4813	0	0	0	4701
50	4877	4949	4819	4905	0	0	0	4762
75	5003	5031	4989	5009	0	0	0	4931
100	5037	5046	5033	5039	0	0	0	4978

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	1162	1470	451	1625	0	0
15	3272	3512	2606	3647	0	0
20	3998	4210	3585	4229	0	0
25	4259	4476	3986	4456	0	0
30	4522	4640	4328	4610	0	0
35	4662	4784	4514	4735	0	0
40	4765	4855	4675	4813	0	0
50	4877	4949	4819	4905	0	0
75	5003	5031	4989	5009	0	0
100	5037	5046	5033	5039	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	16	0	16	0	0	0	0
15	0	61	67	33	47	102	0	0
20	0	412	800	233	619	924	0	0
25	0	842	1452	598	1487	1474	0	0
30	0	1337	1956	1011	2323	1882	0	0
35	0	1881	2481	1517	2995	2347	0	0
40	0	2282	2850	1954	3498	2624	0	0
50	0	2999	3468	2741	4177	3184	0	0
75	0	4138	4460	4008	4876	4217	0	0
100	0	4662	4852	4607	5012	4701	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	16	0	16	0	0	0	0
15	0	62	66	35	48	105	0	0
20	0	416	803	234	608	932	0	0
25	0	847	1439	593	1492	1475	0	0
30	0	1332	1959	1012	2316	1885	0	0
35	0	1881	2471	1516	2992	2345	0	0
40	0	2293	2854	1952	3497	2626	0	0
50	0	3005	3466	2736	4168	3175	0	0
75	0	4153	4455	3999	4875	4222	0	0
100	0	4664	4855	4604	5015	4697	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	43	66	17	47	104	0	0
20	0	388	803	212	625	924	0	0
25	0	839	1440	592	1486	1475	0	0
30	0	1326	1964	1000	2321	1881	0	0
35	0	1879	2475	1514	2995	2355	0	0
40	0	2282	2853	1949	3499	2626	0	0
50	0	2996	3470	2731	4175	3175	0	0
75	0	4144	4454	4004	4877	4216	0	0
100	0	4666	4852	4606	5012	4703	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	45	64	17	51	104	0	0
20	0	392	804	213	624	929	0	0
25	0	837	1437	593	1494	1480	0	0
30	0	1328	1966	1003	2316	1884	0	0
35	0	1875	2469	1510	2995	2344	0	0
40	0	2274	2858	1960	3490	2633	0	0
50	0	2999	3464	2728	4173	3180	0	0
75	0	4136	4455	4004	4880	4216	0	0
100	0	4662	4855	4610	5013	4696	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	9	1	5050	5050	0	0
15	0	6	0	5050	5050	0	0
20	0	4	0	5050	5050	0	0
25	0	0	0	5050	5050	0	0
30	0	1	0	5050	5050	0	0
35	0	1	0	5050	5050	0	0
40	0	0	0	5050	5050	0	0
50	0	0	0	5050	5050	0	0
75	0	0	0	5050	5050	0	0
100	0	0	0	5050	5050	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	270	0	270	0	0	0	0
15	0	299	0	299	0	0	0	0
20	0	208	0	208	0	0	0	0
25	0	125	0	125	0	0	0	0
30	0	33	0	33	0	0	0	0
35	0	12	0	12	0	0	0	0
40	0	5	0	5	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 9a. G(0.5,100) 10% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	83.6929	78.0219	230.2138	173.3283	270.0669	198.3767
15	77.3501	67.7370	150.0576	130.2219	173.8366	148.4265
20	74.6750	64.4394	121.3664	112.8836	137.4875	126.7260
25	71.3219	61.0183	105.3339	99.9297	118.1049	111.2363
30	70.0928	59.3903	97.8862	94.0890	108.4234	103.6453
35	68.7091	57.8852	92.1399	89.4530	101.3094	97.9378
40	67.9325	57.3125	87.7302	85.8869	95.7955	93.4858
50	65.7536	55.0143	81.5933	80.3944	87.9086	86.4322
75	63.1909	52.4769	73.9952	73.4276	78.3131	77.6276
100	61.2782	50.7830	69.6316	69.2923	73.0100	72.6044

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	83.7645	83.7417	87.1766	85.0286	89.9066
15	75.2116	74.8664	77.3024	75.9365	80.7620
20	71.7175	71.1660	73.1890	72.2038	76.9890
25	68.0472	67.3683	69.1300	68.3875	72.9978
30	66.5403	65.7449	67.4073	66.7983	71.4555
35	64.9175	64.0123	65.6381	65.1184	69.9041
40	64.0832	63.1257	64.6851	64.2451	68.9283
50	61.7328	60.6555	62.1818	61.8419	66.5402
75	58.9497	57.6875	59.2147	59.0011	63.7109
100	56.9275	55.5652	57.1104	56.9559	61.6865

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	77.7257	77.3577	80.5480	78.4976	83.6471
15	71.2320	70.6141	73.0479	71.7398	76.7313
20	68.6492	67.8794	69.9579	69.0102	73.9137
25	65.5822	64.7260	66.5595	65.8424	70.5421
30	64.3924	63.4422	65.1826	64.5925	69.3242
35	62.9756	61.9289	63.6368	63.1321	67.9832
40	62.3562	61.2750	62.9119	62.4837	67.2219
50	60.2680	59.0860	60.6860	60.3542	65.0963
75	57.8499	56.5112	58.0998	57.8903	62.6289
100	56.0225	54.5989	56.1963	56.0444	60.7962

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	84.5391	84.6307	87.9748	85.9098	87.0100	84.9378
15	76.2421	76.0270	78.4069	77.0601	79.0285	75.6354
20	72.7541	72.3428	74.3029	73.3115	75.7331	71.5561
25	69.0424	68.4977	70.1873	69.4376	72.0406	67.4795
30	67.5024	66.8307	68.4206	67.8048	70.6288	65.6133
35	65.8245	65.0395	66.5873	66.0618	69.1198	63.6362
40	64.9661	64.1250	65.6041	65.1586	68.2610	62.6341
50	62.5491	61.5811	63.0246	62.6805	65.9728	59.9087
75	59.6562	58.4899	59.9363	59.7201	63.2899	56.5602
100	57.5470	56.2698	57.7397	57.5836	61.3263	54.1894

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	3016.9977	0.00%	644.9009	0.00%	20207.1882
15	0.00%	639.9888	0.00%	250.2265	0.00%	699.6999
20	0.00%	382.1920	0.00%	175.6063	0.00%	387.5160
25	0.00%	277.2197	0.00%	143.2064	0.00%	274.8008
30	0.00%	233.2696	0.00%	126.6509	0.00%	229.4561
35	0.00%	206.9722	0.00%	115.9761	0.00%	203.8118
40	0.00%	190.1736	0.00%	109.8167	0.00%	186.2256
50	0.00%	163.3326	0.00%	98.8590	0.00%	162.3639
75	0.00%	135.5915	0.00%	87.0189	0.00%	135.5246
100	0.00%	122.1381	0.00%	80.6313	0.00%	122.5398

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	81.546	78.444	79.267	77.396	76.311	77.936	83.377
15	76.152	72.474	73.015	71.334	69.895	72.274	76.906
20	73.864	70.010	70.429	68.778	67.154	69.881	74.292
25	70.729	66.870	67.180	65.580	63.896	66.746	71.012
30	69.624	65.598	65.876	64.228	62.448	65.496	69.828
35	68.322	64.079	64.335	62.637	60.720	64.005	68.495
40	67.601	63.398	63.617	61.935	60.008	63.334	67.727
50	65.506	61.152	61.344	59.611	57.573	61.104	65.601
75	63.026	58.534	58.661	56.860	54.615	58.492	63.099
100	61.156	56.576	56.669	54.850	52.475	56.539	61.214

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	146.388	127.926	131.341	124.322	119.331	126.731	146.729
15	110.418	97.853	99.504	93.996	89.988	97.357	109.644
20	96.101	86.675	87.577	83.259	79.678	86.436	95.346
25	86.552	78.749	79.265	75.641	72.494	78.529	86.092
30	82.268	74.987	75.389	72.010	69.078	74.792	81.888
35	78.666	71.642	71.961	68.800	65.868	71.545	78.432
40	76.341	69.821	70.115	67.154	64.356	69.723	76.164
50	72.174	66.009	66.210	63.477	60.807	65.925	72.045
75	67.166	61.504	61.641	59.171	56.523	61.444	67.121
100	64.118	58.679	58.795	56.453	53.785	58.625	64.107

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	84.117	82.085	82.553	81.384	81.933	81.502	87.736
15	78.085	74.903	75.329	74.329	73.899	74.676	79.848
20	75.408	71.903	72.239	71.128	70.165	71.726	76.544
25	72.041	68.395	68.697	67.480	66.240	68.292	72.763
30	70.797	66.916	67.171	65.892	64.396	66.835	71.319
35	69.375	65.278	65.521	64.105	62.453	65.209	69.793
40	68.557	64.460	64.675	63.223	61.485	64.380	68.885
50	66.277	62.066	62.228	60.694	58.765	62.027	66.547
75	63.595	59.156	59.268	57.621	55.439	59.124	63.718
100	61.575	57.068	57.159	55.435	53.117	57.031	61.689

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	85.148	82.961	82.871	81.855	85.071	82.052	94.042
15	78.965	74.661	75.088	74.496	75.447	74.442	83.551
20	76.240	71.499	71.895	71.053	70.979	71.276	79.031
25	72.708	68.034	68.335	67.395	66.719	67.905	74.677
30	71.451	66.587	66.862	65.815	64.755	66.527	72.825
35	69.910	65.005	65.259	64.078	62.741	64.874	70.962
40	69.041	64.239	64.423	63.160	61.675	64.100	69.870
50	66.677	61.876	62.043	60.652	58.883	61.790	67.270
75	63.855	59.040	59.165	57.589	55.472	58.967	64.137
100	61.783	56.975	57.066	55.414	53.135	56.890	61.994

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	137.1856	138.6895	144.0730	140.8990	145.5491	137.7755
15	121.9069	123.2775	126.3390	124.2914	128.8382	122.6678
20	113.9985	115.1773	117.1854	115.6877	120.2605	114.9591
25	106.0263	106.9348	108.3804	107.2525	111.6829	107.1142
30	102.0561	102.7960	103.9358	103.0170	107.5097	103.2966
35	98.2864	98.8746	99.8370	99.0617	103.6922	99.6939
40	95.5927	96.0459	96.8838	96.2306	100.7724	97.0953
50	90.1868	90.4209	91.1366	90.6408	95.2132	91.9208
75	82.7181	82.5836	83.2612	82.9604	87.5683	84.8761
100	77.6230	77.2576	77.9874	77.7758	82.4179	80.0775

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	81.5488	143.2603	84.1666	85.1013	87.0100
15	76.1621	108.7902	78.1086	78.9273	79.0285
20	73.8447	95.1652	75.4282	76.2203	75.7331
25	70.7176	85.8329	72.0529	72.7188	72.0406
30	69.6259	81.7098	70.7856	71.4316	70.6288
35	68.3277	78.2086	69.3398	69.8635	69.1198
40	67.6021	75.9560	68.5618	69.0052	68.2610
50	65.5004	71.8667	66.2809	66.6544	65.9728
75	63.0274	66.9750	63.5965	63.8409	63.2899
100	61.1517	63.9521	61.5873	61.7770	61.3263

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	87.010	83.205	82.651	81.930	81.408	83.830	87.004
15	79.028	74.677	74.539	73.066	71.778	74.830	79.019
20	75.733	71.281	71.235	69.638	67.869	71.368	75.742
25	72.041	67.658	67.640	66.026	64.112	67.712	72.056
30	70.629	66.132	66.124	64.442	62.368	66.170	70.645
35	69.120	64.477	64.469	62.740	60.527	64.506	69.142
40	68.261	63.698	63.695	61.965	59.700	63.720	68.284
50	65.973	61.340	61.339	59.560	57.195	61.355	66.001
75	63.290	58.603	58.604	56.765	54.249	58.610	63.322
100	61.326	56.606	56.607	54.751	52.167	56.610	61.360

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	81.33	81.35	83.33	82.00	84.61	76.40	76.00	79.07	77.15	81.39
15	80.99	80.67	83.13	81.64	85.80	77.19	76.55	78.81	77.64	82.67
20	82.81	82.40	84.14	83.15	87.58	79.29	78.40	81.09	79.68	85.13
25	82.10	80.99	83.33	82.59	88.12	78.04	76.79	79.70	78.46	85.05
30	82.12	81.11	83.52	82.55	88.81	78.67	77.11	80.06	78.99	86.08
35	82.73	81.29	83.70	82.97	89.35	79.39	77.45	80.44	79.60	87.47
40	82.00	80.28	83.13	82.30	89.25	78.99	76.44	79.88	79.09	87.23
50	81.78	79.47	82.69	82.02	89.60	78.40	75.23	79.54	78.65	87.78
75	80.79	77.13	81.43	80.89	91.43	77.64	72.91	78.55	77.74	89.70
100	79.27	73.88	79.98	79.37	91.86	75.66	69.78	76.40	75.84	90.26

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	81.11	73.36	N/A	N/A	97.98	96.91
15	82.89	69.35	N/A	N/A	98.67	97.86
20	85.31	70.65	N/A	N/A	99.07	98.63
25	85.78	67.86	N/A	N/A	99.17	98.89
30	86.71	66.18	N/A	N/A	99.17	98.97
35	87.86	65.52	N/A	N/A	99.33	99.05
40	88.06	65.31	N/A	N/A	99.35	99.21
50	88.50	62.57	N/A	N/A	99.35	99.25
75	90.48	56.83	N/A	N/A	99.60	99.49
100	90.99	51.13	N/A	N/A	99.39	99.29

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	81.42	81.53	83.44	82.16	82.85	81.62
15	81.41	81.30	83.52	82.12	84.00	80.85
20	83.35	82.97	84.55	83.96	86.06	82.04
25	82.95	82.19	84.22	83.25	86.38	80.42
30	83.35	82.44	84.67	83.78	87.52	80.08
35	83.66	82.44	84.87	84.00	88.32	79.90
40	83.35	81.90	84.18	83.50	88.30	78.81
50	83.03	81.27	83.82	83.21	88.69	76.75
75	82.53	79.27	83.35	82.71	90.55	72.50
100	80.81	76.28	81.43	80.89	91.01	67.23

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.50	0.00%	97.09	0.00%	99.29
15	0.00%	99.68	0.00%	97.03	0.00%	99.52
20	0.00%	99.80	0.00%	97.68	0.00%	99.68
25	0.00%	99.80	0.00%	97.62	0.00%	99.74
30	0.00%	99.92	0.00%	97.58	0.00%	99.84
35	0.00%	99.94	0.00%	98.02	0.00%	99.94
40	0.00%	99.94	0.00%	98.42	0.00%	99.92
50	0.00%	99.98	0.00%	98.32	0.00%	99.98
75	0.00%	99.98	0.00%	98.85	0.00%	99.98
100	0.00%	100.00	0.00%	98.73	0.00%	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	79.76	77.11	77.66	75.82	74.87	76.40	79.76	80.93
15	81.82	78.28	78.71	76.69	75.29	77.90	81.64	82.42
20	84.50	80.79	81.31	79.29	76.34	80.63	84.53	84.93
25	85.11	79.98	80.40	78.04	75.13	79.58	85.03	85.50
30	86.22	80.36	81.07	78.06	74.69	80.32	86.14	86.40
35	87.54	80.83	81.27	78.32	74.08	80.61	87.39	87.64
40	87.62	80.53	80.93	77.82	73.03	80.50	87.47	87.70
50	88.10	80.48	80.83	76.12	70.32	80.36	87.96	88.22
75	90.02	79.37	79.86	74.02	65.29	79.25	90.28	90.20
100	90.79	77.39	77.88	70.53	59.70	77.25	90.63	90.87

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.53	86.93	87.96	86.10	83.17	86.28	90.12	90.44
15	91.60	87.49	88.22	86.36	82.81	87.19	91.09	91.37
20	92.53	88.59	88.79	86.73	83.15	88.06	92.20	92.14
25	92.75	88.24	88.63	86.24	82.36	88.12	92.50	92.77
30	93.35	88.65	89.01	86.14	81.72	88.55	93.15	93.11
35	93.49	88.55	88.36	84.97	80.18	88.16	93.15	93.33
40	93.31	87.60	87.70	84.40	79.23	87.45	92.93	93.03
50	93.50	86.93	87.09	83.33	76.67	86.95	93.25	93.62
75	94.34	85.94	86.22	80.14	70.99	85.90	94.12	94.12
100	94.28	83.41	83.82	75.94	64.50	83.54	94.14	94.24

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.27	80.22	80.34	79.27	79.84	79.41	81.31	83.07
15	83.09	80.40	80.91	79.72	79.64	80.04	83.27	84.50
20	85.60	82.46	82.95	81.70	80.53	82.30	85.72	86.63
25	86.22	81.47	82.22	80.46	78.63	81.52	86.12	86.93
30	87.56	82.44	82.91	80.57	78.00	82.18	87.33	88.02
35	88.20	82.36	82.79	80.55	77.49	82.42	88.30	88.95
40	88.38	82.44	82.71	80.16	76.38	82.34	88.42	88.89
50	89.01	81.92	82.30	78.61	73.41	81.90	88.89	89.50
75	90.99	81.07	81.39	76.55	68.36	80.85	90.83	90.97
100	91.23	79.27	79.45	72.71	62.44	79.07	91.33	91.60

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.39	80.22	80.42	79.56	81.98	79.45	81.64	85.92
15	83.35	79.86	80.26	79.84	81.07	79.62	83.84	86.77
20	85.88	81.68	82.18	81.35	81.39	81.50	86.14	87.98
25	86.99	80.95	81.31	80.22	79.31	80.71	86.61	88.69
30	87.92	81.50	82.42	80.61	79.11	81.45	88.06	89.37
35	88.73	81.86	82.18	80.57	78.30	81.64	88.79	89.68
40	88.83	81.54	81.88	79.78	76.73	81.47	89.03	89.78
50	89.43	81.33	81.49	78.40	73.82	80.67	89.47	90.18
75	91.09	80.51	81.13	76.51	68.51	80.48	91.01	91.62
100	91.37	78.63	79.17	72.97	62.42	78.18	91.60	91.92

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	95.54	95.71	96.34	96.05	96.44	95.50
15	97.03	97.14	97.52	97.34	97.80	97.05
20	98.30	98.36	98.53	98.42	98.69	98.32
25	98.36	98.44	98.55	98.44	98.87	98.46
30	98.87	98.99	99.07	99.05	99.35	98.99
35	99.19	99.31	99.31	99.31	99.49	99.31
40	99.29	99.31	99.37	99.37	99.56	99.39
50	99.29	99.39	99.47	99.43	99.82	99.54
75	99.66	99.64	99.68	99.68	99.88	99.74
100	99.66	99.60	99.68	99.66	99.88	99.80

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 0.7895387
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.85	80.64	79.82	79.45	79.25	81.25	82.85	82.89
15	84.00	80.06	79.82	78.36	77.25	80.22	84.00	83.92
20	86.06	82.02	81.82	79.92	77.47	82.18	86.06	86.16
25	86.38	80.85	80.73	78.30	75.29	80.97	86.38	86.44
30	87.52	81.17	81.03	78.51	74.28	81.29	87.52	87.56
35	88.32	81.15	81.13	78.40	73.35	81.25	88.32	88.32
40	88.30	81.11	80.99	77.62	72.34	81.13	88.30	88.36
50	88.69	80.87	80.79	75.84	69.70	80.89	88.69	88.79
75	90.55	79.58	79.56	73.66	64.06	79.62	90.55	90.59
100	91.01	77.58	77.58	69.70	58.04	77.62	91.01	91.15

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Detection Limit: 0.7895387
Averaged Percentage Non-detects: 10.00%
Distribution Check: Average of means: 49.903951
Distribution Check: Average of stdvs: 69.293831
Average of NDs per 100 observations: 10.013500

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	0.789539	0.991683	1770	1964	980	268	60	8	0	0	0	0
15	0.789539	1.525149	960	1795	1351	656	219	57	9	2	1	0
20	0.789539	2.005941	573	1363	1453	1028	448	142	30	10	2	1
25	0.789539	2.483168	365	1019	1320	1193	678	315	115	36	8	1
30	0.789539	2.979010	219	727	1181	1140	914	501	247	90	21	7
35	0.789539	3.560198	126	489	866	1136	1008	707	410	188	83	27
40	0.789539	3.981980	67	360	721	970	1072	850	518	291	128	46
50	0.789539	5.014851	16	146	405	687	921	920	784	532	336	185
75	0.789539	7.496634	1	9	69	159	370	522	717	757	795	594
100	0.789539	10.075248	1	1	7	34	92	149	284	430	565	673

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	2	1	0	0	0	0	0	0	0	0	0	0	0
35	10	0	0	0	0	0	0	0	0	0	0	0	0
40	24	1	1	1	0	0	0	0	0	0	0	0	0
50	76	26	12	3	1	0	0	0	0	0	0	0	0
75	428	290	175	85	48	13	13	3	2	0	0	0	0
100	662	591	526	382	255	180	104	58	33	15	7	1	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	7	16	2	17	0	0	0	8
15	3	7	2	5	0	0	0	3
20	0	1	0	0	0	0	0	0
25	0	2	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	7	16	2	17	0	0
15	3	7	2	5	0	0
20	0	1	0	0	0	0
25	0	2	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	4	0	4	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 9b. G(0.5,100) 15% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	83.0941	76.0631	267.1819	192.9038	344.2677	240.7385
15	77.3860	64.2972	168.3312	143.2217	210.7405	175.3771
20	74.3410	59.7444	132.2882	121.8501	160.8059	146.1849
25	72.2734	57.1255	116.4849	109.6634	137.7164	128.3690
30	70.6116	55.6041	105.6919	101.0803	123.1792	116.8798
35	68.9190	53.3385	99.0650	95.7884	112.9868	108.6328
40	67.5760	52.2257	93.0365	90.8125	105.2150	102.2628
50	66.1711	51.0062	86.2128	84.7991	96.2387	94.3684
75	63.4373	48.3995	77.2860	76.6234	83.7127	82.8690
100	61.6935	46.7896	72.3595	71.9681	77.4527	76.9581

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	83.1394	83.1532	88.1086	84.7845	92.5304
15	74.6228	74.2348	77.4480	75.4469	82.9704
20	70.4442	69.8024	72.3818	70.9556	78.5315
25	67.7230	66.8542	69.1530	68.0711	75.5698
30	65.7051	64.7106	66.8207	65.9521	73.4035
35	63.6401	62.4960	64.5545	63.8231	71.3984
40	62.1214	60.8972	62.8823	62.2607	69.7834
50	60.4201	59.0572	60.9868	60.5075	68.0178
75	57.2376	55.6225	57.5726	57.2709	64.7900
100	55.2418	53.4946	55.4747	55.2552	62.8090

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	74.8953	74.4051	78.9397	75.7366	83.9785
15	69.2138	68.4392	71.6331	69.7079	77.5170
20	66.2000	65.2425	67.8992	66.5248	74.3040
25	64.1943	63.0539	65.4677	64.4221	72.0771
30	62.6571	61.4287	63.6607	62.8190	70.3975
35	60.8863	59.5275	61.7148	61.0047	68.6896
40	59.6393	58.2226	60.3330	59.7283	67.3451
50	58.3019	56.7770	58.8233	58.3558	65.9396
75	55.6269	53.8902	55.9395	55.6439	63.2106
100	53.9014	52.0555	54.1205	53.9049	61.4937

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	82.5030	82.6277	87.2525	84.3106	86.0132	82.5860
15	74.7876	74.5746	77.5715	75.7195	78.7940	73.5296
20	70.7502	70.2732	72.7206	71.3470	75.1836	68.6910
25	68.1468	67.4162	69.6088	68.5492	72.8284	65.5719
30	66.1392	65.2722	67.2898	66.4235	70.9941	63.1812
35	64.0814	63.0542	65.0249	64.2949	69.1852	60.7365
40	62.5602	61.4559	63.3459	62.7313	67.7625	58.9994
50	60.8565	59.6013	61.4420	60.9628	66.2639	56.9236
75	57.6477	56.1283	57.9936	57.6916	63.4240	53.1326
100	55.6103	53.9489	55.8504	55.6307	61.6354	50.7459

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1673.9344	0.00%	303.3648	0.00%	10750.5267
15	0.00%	465.1406	0.00%	154.9121	0.00%	462.4214
20	0.00%	301.1383	0.00%	119.9281	0.00%	283.6522
25	0.00%	231.6353	0.00%	104.4592	0.00%	214.9463
30	0.00%	197.9721	0.00%	95.9452	0.00%	185.1786
35	0.00%	174.9287	0.00%	88.6863	0.00%	165.3576
40	0.00%	160.1346	0.00%	83.9092	0.00%	151.0712
50	0.00%	142.3789	0.00%	78.7143	0.00%	135.1043
75	0.00%	119.3924	0.00%	71.0531	0.00%	115.1789
100	0.00%	108.8834	0.00%	67.0474	0.00%	105.4528

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	80.576	77.078	84.672	74.037	72.358	74.602	82.849
15	75.945	70.344	71.177	68.741	66.432	69.881	76.947
20	73.321	67.397	67.963	65.764	63.126	67.145	73.955
25	71.490	65.316	65.796	63.575	60.862	65.154	71.946
30	69.986	63.736	64.098	61.961	59.131	63.606	70.337
35	68.383	61.880	62.191	59.985	57.040	61.745	68.686
40	67.109	60.537	60.822	58.641	55.647	60.449	67.387
50	65.778	59.082	59.309	57.122	54.046	58.998	66.013
75	63.166	56.175	56.308	54.049	50.803	56.097	63.337
100	61.468	54.325	54.434	52.145	48.734	54.277	61.624

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	146.164	115.667	120.654	110.900	103.364	113.405	150.751
15	108.610	90.182	92.026	85.743	79.267	89.237	108.392
20	94.452	80.237	81.245	76.059	70.306	79.595	94.091
25	87.864	75.172	75.879	71.154	65.903	74.825	87.581
30	82.471	71.222	71.706	67.519	62.678	70.931	82.207
35	78.853	68.055	68.412	64.423	59.760	67.792	78.667
40	75.901	65.688	66.006	62.289	57.879	65.478	75.796
50	72.401	62.936	63.186	59.838	55.692	62.808	72.367
75	67.349	58.549	58.720	55.660	51.798	58.477	67.420
100	64.433	56.010	56.126	53.258	49.380	55.953	64.509

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	83.221	80.690	81.277	79.278	80.495	79.468	87.527
15	77.822	73.332	73.901	72.477	72.033	72.952	79.967
20	74.904	69.574	70.014	68.626	67.430	69.338	76.245
25	72.847	67.066	67.473	65.841	64.144	66.873	73.816
30	71.155	65.155	65.510	63.827	61.817	65.022	71.900
35	69.417	63.138	63.453	61.555	59.279	62.991	70.055
40	68.048	61.643	61.896	60.017	57.544	61.513	68.550
50	66.580	59.983	60.177	58.215	55.459	59.900	66.979
75	63.726	56.793	56.943	54.797	51.686	56.725	63.976
100	61.899	54.804	54.925	52.703	49.394	54.763	62.120

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	84.420	83.216	82.348	81.109	86.107	81.463	94.482
15	78.717	73.721	73.913	73.466	75.902	73.028	83.929
20	75.686	69.297	69.552	69.102	70.222	68.998	78.978
25	73.558	66.560	66.874	65.991	66.020	66.367	75.872
30	71.746	64.647	65.036	63.966	63.300	64.530	73.432
35	69.962	62.618	62.946	61.722	60.482	62.466	71.325
40	68.502	61.222	61.476	60.126	58.528	61.112	69.622
50	66.938	59.619	59.821	58.249	56.122	59.498	67.792
75	63.992	56.557	56.726	54.836	52.071	56.504	64.496
100	62.111	54.661	54.774	52.765	49.673	54.602	62.452

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	136.3842	138.2468	145.7954	141.3448	148.6242	136.5188
15	121.7896	123.5173	127.4246	124.6535	131.7147	122.2842
20	113.1247	114.5362	117.0626	115.0583	122.2345	114.0171
25	107.2004	108.3480	110.1195	108.6013	115.7664	108.5221
30	102.2114	103.1207	104.4880	103.2641	110.4310	103.8560
35	97.9518	98.6686	99.8040	98.7833	106.0931	99.9322
40	94.3433	94.8876	95.8744	95.0167	102.2911	96.5660
50	89.7308	89.9983	90.8559	90.2022	97.4942	92.3782
75	81.7259	81.5188	82.3701	81.9708	89.3137	85.1553
100	76.6345	76.1336	77.0697	76.7860	84.1868	80.5786

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	80.5724	141.5693	83.2107	84.3996	86.0132
15	75.9302	106.2637	77.8530	78.7506	78.7940
20	73.3304	92.9604	74.8763	75.6644	75.1836
25	71.4824	86.7637	72.8715	73.5685	72.8284
30	69.9886	81.5720	71.1432	71.7003	70.9941
35	68.3807	78.1153	69.4196	69.9817	69.1852
40	67.0926	75.3126	68.0320	68.5102	67.7625
50	65.7930	71.9549	66.5729	66.9911	66.2639
75	63.1592	67.0491	63.7294	64.0084	63.4240
100	61.4641	64.2287	61.8962	62.0886	61.6354

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	86.013	80.556	79.082	78.993	78.865	107.493	86.097
15	78.794	72.690	72.150	70.799	69.202	73.106	78.858
20	75.184	68.739	68.447	66.811	64.539	68.966	75.243
25	72.828	66.064	65.898	63.985	61.382	66.198	72.907
30	70.994	64.224	64.106	62.179	59.337	64.321	71.077
35	69.185	62.167	62.080	60.021	56.969	62.239	69.281
40	67.763	60.738	60.670	58.594	55.446	60.794	67.861
50	66.264	59.159	59.116	56.981	53.656	59.197	66.367
75	63.424	56.148	56.129	53.871	50.332	56.166	63.535
100	61.635	54.294	54.282	51.987	48.305	54.305	61.752

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	81.49	81.60	84.51	82.59	86.22	73.66	73.13	78.30	74.50	82.06
15	81.13	80.93	83.66	81.68	87.94	74.97	74.10	78.06	75.66	83.94
20	81.80	81.15	83.86	82.34	89.11	75.17	73.82	78.18	75.58	86.14
25	82.30	80.97	84.08	82.67	90.61	76.79	74.63	78.79	77.05	87.35
30	82.18	80.48	83.94	82.53	91.47	76.24	73.74	78.06	76.50	88.75
35	80.77	78.57	82.22	80.95	90.73	75.01	72.00	76.57	75.19	88.26
40	79.92	77.60	81.54	80.24	91.47	74.51	70.95	76.34	74.57	88.65
50	78.42	75.19	79.58	78.55	92.28	72.77	68.50	74.18	72.87	89.76
75	75.84	70.26	76.85	75.88	92.79	69.72	63.50	70.99	69.78	90.63
100	72.91	64.85	73.82	72.91	93.80	66.40	57.64	67.60	66.42	91.45

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	81.47	69.69	N/A	N/A	98.89	98.00
15	83.37	65.84	N/A	N/A	99.41	98.99
20	85.70	62.23	N/A	N/A	99.60	99.43
25	87.27	60.48	N/A	N/A	99.90	99.84
30	88.65	58.44	N/A	N/A	99.88	99.80
35	88.14	54.44	N/A	N/A	99.86	99.72
40	88.75	52.63	N/A	N/A	99.84	99.78
50	89.78	49.76	N/A	N/A	99.86	99.84
75	90.67	41.19	N/A	N/A	99.84	99.80
100	91.52	34.30	N/A	N/A	99.78	99.76

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	80.70	80.77	83.78	81.91	82.91	80.40
15	80.76	80.63	83.08	81.29	84.08	79.15
20	81.55	81.10	83.65	82.07	86.12	78.26
25	82.15	81.15	84.08	82.59	87.60	78.42
30	82.36	80.86	84.14	82.81	88.85	76.46
35	80.65	79.03	82.51	81.03	88.44	73.78
40	80.20	78.27	81.86	80.63	88.87	72.24
50	79.01	76.08	80.34	79.25	89.80	68.48
75	76.71	71.68	77.74	76.83	90.53	60.20
100	73.90	66.75	74.83	73.94	91.35	51.72

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.35	0.00%	93.33	0.00%	98.91
15	0.00%	99.47	0.00%	92.46	0.00%	99.13
20	0.00%	99.52	0.00%	93.11	0.00%	99.33
25	0.00%	99.78	0.00%	93.41	0.00%	99.64
30	0.00%	99.82	0.00%	93.86	0.00%	99.70
35	0.00%	99.84	0.00%	93.80	0.00%	99.82
40	0.00%	99.82	0.00%	94.26	0.00%	99.88
50	0.00%	99.96	0.00%	94.24	0.00%	99.92
75	0.00%	99.98	0.00%	93.50	0.00%	99.96
100	0.00%	99.94	0.00%	93.56	0.00%	99.94

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	79.50	74.44	76.16	72.55	70.63	73.01	79.56	81.23
15	82.08	76.24	77.23	74.32	71.17	75.62	81.98	83.11
20	84.61	76.77	77.88	74.24	69.84	76.30	84.63	85.45
25	86.51	78.16	78.95	75.17	70.04	77.66	86.59	86.95
30	87.88	77.98	78.77	74.40	68.34	77.66	87.92	88.28
35	87.64	76.53	77.29	72.57	65.90	76.10	87.62	87.92
40	88.16	76.14	76.91	71.84	62.93	75.96	88.30	88.57
50	89.25	74.50	75.27	69.41	60.06	74.46	89.25	89.54
75	90.14	71.74	72.57	63.82	50.59	71.66	90.22	90.65
100	91.01	68.44	68.87	58.00	41.94	68.12	91.01	91.43

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.53	83.11	84.87	81.78	75.72	81.94	89.76	90.51
15	92.06	84.02	85.27	82.00	75.05	83.58	91.41	91.94
20	92.51	84.73	85.35	81.19	73.43	84.16	91.90	92.40
25	93.54	85.76	86.10	81.62	73.96	85.19	92.83	93.27
30	94.02	85.72	86.32	81.25	72.08	85.45	93.49	94.10
35	93.60	84.06	84.65	78.26	69.05	83.84	93.21	93.64
40	93.92	83.33	83.74	77.74	67.50	82.81	93.58	93.80
50	94.32	81.88	82.12	74.89	63.88	81.23	94.10	94.44
75	94.34	78.59	78.83	68.79	54.46	77.98	93.82	94.42
100	94.73	74.79	75.13	63.05	45.05	74.38	94.34	94.93

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.97	79.49	80.04	77.98	79.49	78.04	81.01	83.84
15	83.49	79.62	80.28	78.71	78.42	78.91	83.35	85.29
20	85.78	80.08	80.53	78.55	76.67	79.70	85.84	86.97
25	87.52	80.61	81.23	78.61	75.96	80.24	87.52	88.36
30	88.89	80.75	80.97	77.94	73.84	80.22	88.79	89.66
35	88.40	78.63	79.41	75.76	70.95	78.50	88.46	89.19
40	89.09	78.44	78.73	74.67	68.55	77.90	89.19	89.82
50	90.16	76.79	77.13	72.02	64.10	76.61	90.22	90.71
75	90.91	73.84	74.79	66.65	54.16	73.78	90.73	91.39
100	91.68	70.30	71.07	61.09	44.83	70.20	91.66	92.24

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.74	80.34	80.26	79.13	82.26	79.01	81.66	86.44
15	83.82	80.10	80.06	79.49	81.98	79.37	83.78	87.37
20	86.14	79.39	79.25	78.99	81.13	78.73	86.28	88.77
25	87.86	79.90	80.42	79.35	79.84	79.54	88.06	89.80
30	89.35	79.29	80.40	78.50	77.50	79.19	89.62	90.91
35	88.85	77.52	78.40	76.67	74.32	77.37	88.93	89.98
40	89.50	77.35	78.22	75.31	71.70	77.19	89.50	90.75
50	90.16	75.33	75.88	72.20	66.59	75.47	90.59	91.29
75	91.33	72.85	73.33	66.91	55.70	72.65	91.52	91.76
100	91.92	69.80	69.96	61.05	46.02	69.37	92.04	92.61

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	95.84	96.01	96.99	96.40	97.15	95.70
15	97.22	97.37	97.88	97.47	98.24	97.15
20	98.00	98.11	98.41	98.17	98.73	98.04
25	98.63	98.73	98.91	98.75	99.35	98.75
30	98.93	99.01	99.17	99.05	99.54	99.07
35	99.07	99.13	99.25	99.13	99.60	99.23
40	99.41	99.45	99.47	99.45	99.74	99.52
50	99.35	99.43	99.47	99.43	99.86	99.56
75	99.52	99.50	99.54	99.52	99.94	99.84
100	99.45	99.43	99.50	99.47	99.88	99.78

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 1.7882890
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.91	78.87	76.63	77.24	77.49	80.34	82.91	83.03
15	84.08	78.69	77.72	76.43	75.03	79.39	84.08	84.08
20	86.12	78.63	77.88	75.76	72.30	78.89	86.12	86.18
25	87.60	78.89	78.65	75.76	70.95	79.23	87.60	87.68
30	88.85	78.79	78.51	74.50	68.53	78.93	88.85	88.97
35	88.44	76.99	76.73	72.51	65.39	77.17	88.44	88.59
40	88.87	76.38	76.16	71.66	62.18	76.59	88.87	88.97
50	89.80	74.59	74.42	68.75	58.24	74.67	89.80	89.96
75	90.53	71.72	71.66	63.01	48.55	71.80	90.53	90.89
100	91.35	68.10	68.04	57.21	40.12	68.20	91.35	91.52

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Detection Limit: 1.7882890
Averaged Percentage Non-detects: 15.00%
Distribution Check: Average of means: 50.117233
Distribution Check: Average of stdvs: 69.661287
Average of NDs per 100 observations: 15.029300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	1.788289	1.491287	995	1803	1337	657	207	51	0	0	0	0
15	1.788289	2.244356	469	1154	1470	1045	582	230	80	15	3	2
20	1.788289	3.025149	199	694	1123	1233	888	537	267	79	25	4
25	1.788289	3.736040	92	366	823	1099	1088	779	468	231	65	28
30	1.788289	4.459604	46	232	510	883	1037	954	611	408	221	92
35	1.788289	5.282376	18	109	297	616	851	948	822	636	397	211
40	1.788289	6.019406	6	53	178	413	665	856	883	764	530	339
50	1.788289	7.525743	1	20	49	155	332	529	674	844	767	617
75	1.788289	11.232079	0	1	1	8	37	92	151	266	404	521
100	1.788289	15.042970	0	0	0	1	2	3	16	33	77	134

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	7
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	1	0	0	0	0	0	0	0	0	0	0	0	0
25	7	4	0	0	0	0	0	0	0	0	0	0	0
30	40	10	4	2	0	0	0	0	0	0	0	0	0
35	97	32	10	4	2	0	0	0	0	0	0	0	0
40	206	100	36	16	3	1	1	0	0	0	0	0	0
50	439	310	174	80	26	20	8	3	1	1	0	0	0
75	609	643	666	506	401	304	194	125	66	37	9	9	0
100	224	308	437	533	511	570	531	447	371	301	203	348	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	24	42	7	53	0	0	0	51
15	13	26	3	21	0	0	0	20
20	4	14	3	9	0	0	0	1
25	1	5	0	2	0	0	0	0
30	0	2	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	24	42	7	53	0	0
15	13	26	3	21	0	0
20	4	14	3	9	0	0
25	1	5	0	2	0	0
30	0	2	0	0	0	0
35	0	0	0	0	0	0
40	0	1	0	1	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	14	0	14	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 9c. G(0.5,100) 20% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	84.0469	77.4077	310.4745	216.9170	430.3641	290.2242
15	78.8605	62.9223	191.8221	160.1212	254.9739	207.5324
20	74.9546	56.9332	145.3896	132.6454	183.7728	165.2190
25	72.7050	53.8829	125.9554	117.7715	155.7541	143.8922
30	70.5389	51.5707	112.9656	107.4800	136.2683	128.4439
35	69.8132	50.5569	105.3561	101.5529	124.7374	119.3821
40	68.1555	48.8348	98.7635	96.1589	115.2851	111.6557
50	66.5915	47.1223	91.3279	89.6546	103.9276	101.6594
75	63.6926	44.8061	79.9652	79.2197	88.7593	87.7575
100	62.0346	43.2562	74.4995	74.0627	81.3528	80.7727

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	84.2531	84.2329	90.8300	86.1771	96.9318
15	75.3380	74.9262	79.0788	76.2424	87.0263
20	69.8907	69.1509	72.3582	70.4081	81.0208
25	66.7121	65.7523	68.5514	67.0362	77.8036
30	64.0322	62.8924	65.4427	64.2495	74.8219
35	62.8593	61.5731	64.0123	63.0127	73.6235
40	60.8581	59.4747	61.8251	60.9656	71.6323
50	58.7546	57.1645	59.4788	58.8118	69.5590
75	55.2708	53.4440	55.6965	55.2794	65.8938
100	53.2073	51.1986	53.5044	53.2007	63.8508

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	73.5088	72.8344	78.7888	74.2457	85.7663
15	68.0501	67.1344	71.2124	68.4687	79.7059
20	64.2512	63.0854	66.3899	64.5061	75.4350
25	61.9227	60.5970	63.5403	62.0734	73.0903
30	59.9240	58.4653	61.1785	60.0213	70.7912
35	59.1708	57.5954	60.2047	59.2336	70.0118
40	57.4895	55.8442	58.3619	57.5256	68.3374
50	55.8474	54.0290	56.5072	55.8567	66.7183
75	53.0709	51.0755	53.4647	53.0563	63.7426
100	51.3686	49.2205	51.6460	51.3479	62.0504

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	82.2422	82.2857	88.1570	84.2889	86.5424	81.7456
15	74.4660	74.1729	78.0246	75.4514	79.9177	72.4471
20	69.4515	68.8570	71.8616	70.0178	75.5078	66.4667
25	66.3932	65.5573	68.2227	66.7568	72.9808	62.7354
30	63.8545	62.8404	65.2634	64.0950	70.6576	59.7859
35	62.7574	61.6214	63.9188	62.9396	69.8501	58.2805
40	60.7878	59.5120	61.7527	60.9119	68.1127	55.9926
50	58.7324	57.2301	59.4636	58.8023	66.4671	53.4415
75	55.3122	53.5658	55.7427	55.3284	63.4704	49.4080
100	53.2707	51.3306	53.5713	53.2693	61.7810	46.9393

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1309.6831	0.00%	196.5117	0.00%	3030.0379
15	0.00%	413.8196	0.00%	117.4911	0.00%	362.6373
20	0.00%	261.1292	0.00%	96.0776	0.00%	232.1430
25	0.00%	209.0078	0.00%	85.7410	0.00%	184.1888
30	0.00%	175.8875	0.00%	78.8703	0.00%	156.6763
35	0.00%	160.5571	0.00%	76.0175	0.00%	144.3201
40	0.00%	147.3676	0.00%	72.1958	0.00%	133.3843
50	0.00%	130.8257	0.00%	68.1060	0.00%	119.5948
75	0.00%	111.0471	0.00%	62.7858	0.00%	102.8222
100	0.00%	101.5925	0.00%	60.0121	0.00%	95.1986

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	81.009	90.713	113.978	72.050	69.937	72.608	83.938
15	77.033	125.890	313.091	67.063	63.885	68.272	78.482
20	73.635	65.294	66.063	63.166	59.558	64.805	74.582
25	71.655	62.937	63.577	60.763	56.876	62.628	72.373
30	69.651	60.940	61.414	58.735	54.758	60.696	70.259
35	69.036	60.133	60.534	57.870	53.757	59.931	69.575
40	67.440	58.427	58.770	56.145	51.961	58.249	67.951
50	65.997	56.645	56.911	54.286	49.960	56.509	66.439
75	63.210	53.672	53.837	51.280	46.911	53.561	63.596
100	61.604	51.810	51.940	49.333	44.865	51.744	61.970

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	146.268	108.032	113.989	102.791	93.973	105.093	154.198
15	110.070	84.315	86.807	79.420	70.902	82.968	110.530
20	96.202	75.506	76.829	70.447	62.878	74.568	96.205
25	87.996	70.020	70.971	65.315	58.228	69.375	87.958
30	82.397	66.545	67.175	62.188	55.553	66.059	82.430
35	79.548	64.743	65.230	60.673	54.213	64.398	79.671
40	76.155	62.246	62.641	58.441	52.147	61.987	76.350
50	72.769	59.577	59.860	55.952	49.945	59.372	72.952
75	67.275	55.445	55.616	52.248	46.898	55.316	67.569
100	64.596	53.077	53.215	50.004	44.840	52.993	64.853

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	83.783	81.250	82.089	78.692	80.810	78.935	89.025
15	78.946	73.373	74.064	71.871	71.781	72.343	81.750
20	75.208	68.071	68.678	66.778	65.549	67.685	77.015
25	72.979	65.064	65.587	63.653	61.754	64.815	74.336
30	70.814	62.566	62.997	60.958	58.591	62.362	71.905
35	70.081	61.512	61.897	59.769	57.021	61.317	71.006
40	68.402	59.565	59.914	57.724	54.718	59.404	69.161
50	66.783	57.520	57.829	55.462	52.019	57.373	67.427
75	63.765	54.232	54.417	51.976	48.011	54.131	64.268
100	62.046	52.244	52.389	49.854	45.581	52.171	62.475

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	85.330	85.113	84.390	81.539	89.409	82.205	96.943
15	79.917	75.267	75.130	74.085	78.645	73.637	86.188
20	76.050	68.556	68.621	68.448	70.769	68.100	80.063
25	73.706	65.179	65.362	65.008	66.187	64.955	76.607
30	71.419	62.333	62.661	61.899	62.086	62.170	73.706
35	70.649	61.294	61.602	60.503	60.077	61.099	72.493
40	68.886	59.271	59.563	58.369	57.282	59.077	70.412
50	67.159	57.221	57.490	55.943	54.113	57.073	68.341
75	64.015	53.980	54.185	52.211	49.186	53.869	64.781
100	62.242	52.076	52.192	50.026	46.410	52.001	62.855

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	138.2553	140.2613	150.0787	144.1215	154.2271	137.6139
15	124.0886	125.9259	131.1572	127.4055	137.5232	124.2504
20	113.9077	115.4309	118.6149	116.0343	126.1152	114.9384
25	107.1714	108.4257	110.6910	108.6764	118.9386	108.8360
30	101.4397	102.4331	104.1366	102.5561	112.6982	103.6565
35	98.2689	99.0585	100.4677	99.1559	109.3519	100.9714
40	94.0954	94.6835	95.9101	94.7959	105.0708	97.2034
50	89.0651	89.3386	90.4147	89.5514	99.9646	92.9119
75	80.3452	80.0903	81.1136	80.5878	90.9337	85.2807
100	75.2093	74.6029	75.7312	75.3559	85.7738	80.8961

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	80.9986	141.5230	83.7580	85.2720	86.5424
15	77.0030	107.0098	78.9228	79.8669	79.9177
20	73.6372	94.1039	75.2345	76.1086	75.5078
25	71.6601	86.4835	72.9882	73.6897	72.9808
30	69.6510	81.2033	70.8316	71.4471	70.6576
35	69.0431	78.6656	70.1238	70.6284	69.8501
40	67.4612	75.4366	68.4064	68.8802	68.1127
50	65.9883	72.1778	66.7886	67.1719	66.4671
75	63.2032	66.9102	63.7669	64.0332	63.4704
100	61.6104	64.3296	62.0415	62.2558	61.7810

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	86.542	79.887	77.239	78.022	78.481	446.256	86.794
15	79.918	72.191	71.013	69.964	68.282	75.695	80.133
20	75.508	66.913	66.281	64.674	62.210	67.343	75.712
25	72.981	63.997	63.572	61.727	58.684	64.283	73.198
30	70.658	61.527	61.242	59.223	55.848	61.719	70.893
35	69.850	60.523	60.308	58.184	54.525	60.669	70.086
40	68.113	58.668	58.497	56.315	52.457	58.784	68.359
50	66.467	56.690	56.578	54.239	50.086	56.768	66.725
75	63.470	53.609	53.554	51.126	46.637	53.647	63.749
100	61.781	51.736	51.703	49.169	44.479	51.760	62.064

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	81.38	81.37	85.15	82.26	87.68	71.66	71.05	76.81	71.94	82.16
15	81.29	81.03	84.79	82.10	89.54	71.86	70.95	76.32	72.53	85.29
20	80.51	79.88	83.54	81.09	90.44	72.08	70.16	75.47	72.48	86.63
25	79.13	78.34	81.86	79.45	90.89	70.77	68.14	73.92	70.93	87.09
30	79.15	76.87	81.41	79.41	92.44	70.46	67.39	72.89	70.59	89.09
35	78.10	75.62	80.65	78.53	93.11	69.60	65.58	71.82	69.62	89.70
40	76.67	73.62	78.46	76.83	92.83	68.26	63.64	70.53	68.18	89.37
50	74.75	71.01	77.01	74.91	93.17	67.01	60.97	68.81	67.03	90.22
75	69.11	62.00	70.75	69.13	94.10	60.81	52.06	62.36	60.69	91.19
100	63.82	54.46	65.35	63.78	94.93	55.66	44.61	56.93	55.58	92.53

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	80.75	69.06	N/A	N/A	99.39	98.83
15	84.46	62.20	N/A	N/A	99.88	99.74
20	85.94	56.54	N/A	N/A	99.84	99.76
25	86.40	53.59	N/A	N/A	99.90	99.86
30	88.63	49.86	N/A	N/A	99.90	99.86
35	89.41	47.66	N/A	N/A	100.00	99.98
40	88.91	43.55	N/A	N/A	100.00	99.96
50	89.88	38.34	N/A	N/A	100.00	100.00
75	90.95	29.27	N/A	N/A	99.92	99.90
100	92.46	21.21	N/A	N/A	99.98	99.94

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	78.90	78.85	83.03	80.60	82.08	78.36
15	79.67	79.36	82.90	80.45	84.87	77.13
20	79.23	78.66	82.24	79.71	86.06	74.51
25	78.17	77.07	80.54	78.48	86.50	71.52
30	77.73	75.74	80.33	78.13	88.59	69.33
35	77.58	75.00	79.86	77.93	89.17	66.75
40	75.97	73.19	77.64	76.17	88.75	63.78
50	74.30	70.73	76.18	74.42	89.52	58.53
75	68.81	62.37	70.69	68.85	90.50	46.00
100	63.96	55.21	65.50	63.92	91.92	34.55

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.05	0.00%	88.69	0.00%	98.02
15	0.00%	99.45	0.00%	88.36	0.00%	99.01
20	0.00%	99.47	0.00%	87.92	0.00%	99.11
25	0.00%	99.62	0.00%	87.29	0.00%	99.56
30	0.00%	99.58	0.00%	88.08	0.00%	99.47
35	0.00%	99.72	0.00%	87.72	0.00%	99.66
40	0.00%	99.72	0.00%	86.67	0.00%	99.68
50	0.00%	99.92	0.00%	86.08	0.00%	99.86
75	0.00%	99.90	0.00%	84.59	0.00%	99.92
100	0.00%	99.96	0.00%	82.75	0.00%	99.96

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	78.46	72.71	74.93	70.09	67.41	70.46	78.53	80.85
15	82.63	73.39	74.97	70.32	66.08	71.82	82.67	84.22
20	84.57	73.03	74.28	69.82	63.40	72.55	84.61	85.66
25	85.23	72.32	73.64	68.50	61.17	71.72	85.15	86.30
30	87.52	72.36	73.49	68.34	59.23	71.84	87.43	88.38
35	88.24	71.84	72.55	66.24	57.23	71.19	88.26	89.05
40	88.04	70.48	71.37	64.87	53.39	70.32	87.88	88.67
50	89.09	69.07	69.96	61.56	49.31	68.63	89.07	89.74
75	90.16	62.73	63.47	53.39	36.99	62.42	90.10	90.99
100	91.60	57.58	58.20	45.25	26.40	57.31	91.47	92.36

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.92	78.13	80.69	76.73	68.93	76.53	89.01	90.59
15	92.26	79.74	81.35	75.98	66.20	77.88	91.27	92.12
20	92.93	79.64	81.23	74.73	63.62	78.26	92.22	92.91
25	92.57	78.20	79.72	72.67	60.85	77.11	91.72	92.59
30	94.08	78.77	79.17	72.44	59.49	77.72	93.45	94.34
35	94.42	78.59	79.49	71.11	58.04	77.64	93.84	94.59
40	93.78	76.79	77.52	69.27	54.24	76.04	93.15	93.98
50	94.10	74.91	75.80	65.80	50.00	74.65	93.58	94.22
75	94.24	68.34	69.37	57.15	38.22	68.34	93.86	94.51
100	94.85	62.71	63.39	48.55	27.39	62.61	94.55	95.19

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.02	78.87	79.56	76.22	78.32	76.53	79.90	83.58
15	83.96	78.79	79.37	76.95	77.11	77.13	83.76	86.48
20	85.76	77.25	78.28	75.82	73.86	76.83	85.66	87.39
25	86.30	76.40	76.95	74.06	70.46	75.84	86.38	87.74
30	88.38	75.25	75.92	72.06	67.41	74.67	88.59	89.68
35	89.17	74.50	75.62	70.53	64.00	74.16	89.29	90.30
40	88.69	72.97	73.66	68.55	59.82	72.36	88.93	89.94
50	89.90	71.19	72.14	65.31	54.00	70.81	89.90	90.69
75	90.81	64.65	65.35	55.90	40.12	64.53	90.85	91.78
100	92.04	59.35	60.06	47.76	28.91	59.29	92.14	93.13

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	80.97	80.73	80.34	78.55	83.64	79.31	81.11	86.99
15	84.50	80.18	80.38	79.45	83.76	79.11	84.28	88.79
20	86.36	78.55	78.53	78.02	81.32	77.72	86.04	89.43
25	86.77	76.75	77.03	76.71	78.95	76.50	86.71	89.29
30	88.79	75.05	75.92	74.73	76.26	74.97	88.79	91.27
35	89.43	74.10	75.11	73.11	73.07	73.49	89.47	91.68
40	89.23	72.30	73.31	70.99	68.42	71.98	89.21	91.05
50	90.06	70.18	71.31	66.59	61.25	70.10	90.36	91.80
75	91.11	63.74	64.50	56.75	43.74	63.27	91.03	92.08
100	92.40	58.55	59.29	48.28	31.27	58.02	92.38	93.58

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	96.07	96.06	96.92	96.49	97.13	95.60
15	97.69	97.80	98.21	97.94	98.65	97.68
20	97.99	98.07	98.41	98.15	99.01	98.04
25	98.61	98.75	98.93	98.77	99.41	98.73
30	98.97	99.01	99.27	99.03	99.56	99.19
35	99.21	99.31	99.39	99.29	99.74	99.41
40	99.03	99.11	99.19	99.11	99.78	99.29
50	99.31	99.31	99.45	99.33	99.92	99.68
75	99.35	99.31	99.47	99.37	99.92	99.84
100	99.47	99.45	99.52	99.49	99.98	99.90

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 3.2092377
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.08	77.92	74.36	76.19	77.21	80.24	82.08	82.30
15	84.87	77.13	75.23	74.56	72.83	78.51	84.87	85.13
20	86.06	75.74	74.59	72.20	68.18	76.30	86.06	86.44
25	86.50	74.67	73.62	70.36	64.57	75.47	86.50	86.87
30	88.59	73.45	72.89	69.03	61.37	73.98	88.59	88.77
35	89.17	72.36	71.92	67.25	58.08	72.71	89.17	89.56
40	88.75	70.99	70.48	65.19	53.98	71.25	88.75	88.99
50	89.52	69.09	68.67	61.37	48.73	69.35	89.52	89.92
75	90.50	62.08	61.86	52.28	35.31	62.26	90.50	90.95
100	91.92	57.07	56.99	44.50	24.53	57.15	91.92	92.50

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Detection Limit: 3.2092377
Averaged Percentage Non-detects: 20.00%
Distribution Check: Average of means: 50.019658
Distribution Check: Average of stdvs: 69.444010
Average of NDs per 100 observations: 19.968700

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	3.209238	1.971683	566	1319	1585	1006	420	154	0	0	0	0
15	3.209238	2.997426	170	658	1203	1238	943	543	210	70	13	2
20	3.209238	3.962772	65	283	714	1071	1080	877	549	246	125	34
25	3.209238	5.013663	17	126	369	670	928	1003	813	549	317	163
30	3.209238	5.973663	4	39	174	385	682	871	980	753	529	346
35	3.209238	6.938812	1	19	98	227	409	665	821	824	751	517
40	3.209238	8.018614	0	10	30	101	216	465	618	779	758	724
50	3.209238	10.024158	0	1	3	15	64	160	284	399	580	718
75	3.209238	14.989703	0	0	0	0	1	4	10	31	70	144
100	3.209238	19.992475	0	0	0	0	0	0	0	1	2	9

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	39
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	5	1	0	0	0	0	0	0	0	0	0	0	0
25	63	22	8	2	0	0	0	0	0	0	0	0	0
30	176	68	28	11	2	2	0	0	0	0	0	0	0
35	352	196	102	43	12	9	2	1	1	0	0	0	0
40	528	363	224	119	70	28	11	3	2	0	1	0	0
50	706	667	506	382	257	152	94	29	27	3	1	2	0
75	230	302	403	557	531	590	586	470	341	275	174	331	0
100	15	38	59	101	169	258	309	429	428	507	479	2246	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	69	95	12	122	0	0	0	154
15	29	50	10	43	0	0	0	85
20	15	35	10	19	0	0	0	6
25	6	18	5	9	0	0	0	10
30	3	13	2	3	0	0	0	2
35	1	14	1	2	0	0	0	2
40	2	7	1	2	0	0	0	1
50	0	1	0	0	0	0	0	0
75	0	1	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	69	95	12	122	0	0
15	29	50	10	43	0	0
20	15	35	10	19	0	0
25	6	18	5	9	0	0
30	3	13	2	3	0	0
35	1	14	1	2	0	0
40	2	7	1	2	0	0
50	0	1	0	0	0	0
75	0	1	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	1	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	1	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	1	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	1	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	36	0	36	0	0	0	0
15	0	3	0	3	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 9d. G(0.5,100) 25% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	84.4588	82.0948	337.6216	230.4274	504.2085	331.2063
15	78.8576	61.7557	210.4018	172.6866	291.1030	232.6592
20	75.6155	56.1960	157.3365	142.3458	208.5344	185.5016
25	72.6978	51.1911	134.2276	124.7201	171.0246	156.8120
30	71.1373	49.0162	119.6608	113.3667	149.7059	140.2807
35	69.6693	46.9949	109.8738	105.5722	134.7694	128.3971
40	68.6924	45.8972	103.9041	100.9273	124.1661	119.8857
50	67.0753	44.1957	94.9116	93.0420	110.9668	108.3115
75	64.2077	41.7312	82.3917	81.5690	93.4649	92.3079
100	62.0728	39.9214	75.5085	75.0405	84.3986	83.7383

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	84.9143	84.8880	93.1437	87.0723	100.7670
15	74.5661	74.1670	79.4020	75.5090	89.8803
20	69.2257	68.5101	72.4080	69.7205	83.9634
25	65.1391	64.1529	67.4559	65.4210	79.5499
30	62.7820	61.5879	64.5825	62.9538	77.0456
35	60.6763	59.2999	62.1434	60.7817	74.9297
40	59.2604	57.7653	60.4916	59.3242	73.4603
50	56.9237	55.2228	57.8483	56.9395	71.1612
75	53.2052	51.2107	53.7504	53.1819	67.2485
100	50.5813	48.4286	50.9610	50.5482	64.5554

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	71.5083	70.6942	78.0321	72.0217	86.8163
15	65.0387	64.0170	69.0353	65.2952	80.3371
20	61.8166	60.5879	64.5328	61.9389	76.6558
25	58.9606	57.5189	60.9780	59.0027	73.5038
30	57.4036	55.8049	58.9865	57.4083	71.7940
35	55.8441	54.0949	57.1475	55.8230	70.2229
40	54.8585	53.0250	55.9599	54.8229	69.1758
50	53.1201	51.1254	53.9557	53.0690	67.4608
75	50.3132	48.0969	50.8141	50.2574	64.4302
100	48.1738	45.8387	48.5260	48.1209	62.2049

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	81.0715	81.0630	88.2643	83.3448	86.3178	80.1627
15	72.7494	72.5198	76.8819	73.8047	79.4023	69.4402
20	67.9569	67.4389	70.8107	68.5767	75.6874	63.7655
25	64.1122	63.3011	66.2545	64.4397	72.5503	59.2757
30	61.8715	60.8337	63.5906	62.0753	70.8663	56.6219
35	59.8758	58.7039	61.3005	60.0111	69.3131	54.1714
40	58.5847	57.1905	59.7866	58.6516	68.2928	52.5275
50	56.3808	54.7715	57.2805	56.4136	66.6000	49.7833
75	52.8086	50.8688	53.3502	52.7945	63.6658	45.5021
100	50.2626	48.1611	50.6402	50.2315	61.4985	42.5395

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1046.1209	0.00%	139.7007	0.00%	1278.5396
15	0.00%	363.8860	0.00%	95.5053	0.00%	303.9424
20	0.00%	244.0339	0.00%	82.0701	0.00%	202.2728
25	0.00%	190.7655	0.00%	74.3302	0.00%	160.0415
30	0.00%	165.3220	0.00%	70.2532	0.00%	140.6056
35	0.00%	148.7510	0.00%	67.0664	0.00%	128.0118
40	0.00%	138.2304	0.00%	65.1961	0.00%	120.2641
50	0.00%	123.6766	0.00%	62.1948	0.00%	108.7289
75	0.00%	105.6733	0.00%	58.2136	0.00%	94.9499
100	0.00%	96.2407	0.00%	55.6709	0.00%	87.4834

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	80.697	173.915	110.167	69.499	67.156	69.955	84.576
15	76.484	71.610	68.125	63.399	59.694	64.569	78.634
20	73.827	170.552	78.821	60.355	55.814	61.981	75.295
25	71.230	109.550	355.218	57.315	52.338	59.264	72.379
30	69.856	58.313	74.624	55.796	50.590	57.930	70.864
35	68.512	56.716	57.258	54.088	48.691	56.414	69.431
40	67.645	55.742	56.221	53.121	47.589	55.486	68.501
50	66.128	53.996	54.343	51.315	45.721	53.781	66.920
75	63.402	51.061	51.282	48.401	42.686	50.936	64.108
100	61.330	48.799	48.964	46.150	40.414	48.705	62.006

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	142.226	94.889	102.321	90.837	81.574	92.070	161.538
15	110.353	76.544	79.415	71.858	63.378	75.006	112.350
20	95.837	69.074	70.864	64.232	55.693	67.929	96.361
25	87.313	64.027	65.209	59.326	50.989	63.147	87.710
30	82.587	61.724	62.548	57.127	48.775	61.014	83.039
35	79.139	59.358	60.072	54.973	46.816	58.813	79.614
40	76.661	58.157	58.728	53.888	45.802	57.721	77.110
50	72.934	55.819	56.198	51.893	44.032	55.508	73.447
75	67.551	52.242	52.458	48.768	41.429	52.083	68.092
100	64.266	49.628	49.791	46.377	39.529	49.499	64.829

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	83.690	81.752	82.566	77.573	80.735	78.041	90.114
15	78.455	72.319	73.080	69.641	70.130	70.265	82.202
20	75.405	66.749	67.407	65.081	64.015	65.923	77.882
25	72.577	62.672	63.286	61.084	59.173	62.258	74.470
30	71.028	60.441	60.973	58.752	56.249	60.192	72.610
35	69.555	58.460	58.931	56.581	53.615	58.223	70.943
40	68.591	57.175	57.618	55.177	51.845	56.974	69.824
50	66.916	55.002	55.340	52.846	48.944	54.807	67.973
75	63.970	51.566	51.830	49.171	44.531	51.430	64.830
100	61.767	49.144	49.323	46.634	41.586	49.040	62.539

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	85.692	438.204	436.807	82.581	92.618	84.167	98.930
15	79.455	76.912	76.365	73.677	79.831	73.519	87.157
20	76.183	69.190	69.129	68.175	72.182	67.701	81.267
25	73.302	64.143	64.229	63.949	66.239	63.646	76.999
30	71.672	61.212	61.425	61.111	62.585	61.038	74.626
35	70.074	59.015	59.283	58.629	59.130	58.924	72.588
40	69.041	57.489	57.747	56.912	56.790	57.297	71.208
50	67.325	55.112	55.381	54.038	52.935	54.971	69.065
75	64.232	51.540	51.754	49.807	47.107	51.406	65.439
100	61.935	49.101	49.306	47.108	43.418	49.014	62.974

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	138.4390	140.3425	152.6994	145.2019	158.2031	137.2806
15	124.0698	125.9293	132.3081	127.6912	140.9920	123.8034
20	114.2632	115.8862	119.8292	116.6130	129.8873	115.2885
25	106.2273	107.5808	110.3552	107.8425	121.2079	108.3748
30	101.1034	102.1714	104.3281	102.2867	115.7582	104.1139
35	96.7077	97.5356	99.3228	97.6404	111.1872	100.4349
40	93.4353	94.0419	95.6185	94.1589	107.7366	97.7116
50	88.0180	88.2902	89.6257	88.5220	102.2298	93.2699
75	78.9885	78.6782	79.9157	79.2303	92.9134	85.7576
100	72.9552	72.2829	73.5831	73.0906	86.7714	80.6757

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	80.6900	138.7110	83.6808	85.6346	86.3252
15	76.5035	106.9637	78.4468	79.4579	79.4023
20	73.8227	93.3426	75.3764	76.1201	75.6874
25	71.2318	85.4678	72.5667	73.2480	72.5503
30	69.8655	81.1804	71.0458	71.6209	70.8663
35	68.5042	77.9988	69.5430	70.0809	69.3131
40	67.6356	75.6520	68.5955	69.0565	68.2928
50	66.1220	72.2064	66.9099	67.3133	66.6000
75	63.4100	67.0948	63.9667	64.2384	63.6658
100	61.3319	63.9212	61.7678	61.9350	61.4985

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	86.318	78.322	74.263	76.998	78.727	532.473	86.928
15	79.402	70.148	67.939	67.759	66.781	73.432	79.857
20	75.687	65.432	64.200	63.132	60.596	66.227	76.160
25	72.550	61.585	60.789	59.265	56.095	62.094	73.018
30	70.866	59.503	58.935	57.134	53.461	59.857	71.359
35	69.313	57.553	57.132	55.129	51.102	57.820	69.816
40	68.293	56.337	56.008	53.850	49.518	56.545	68.795
50	66.600	54.272	54.047	51.748	47.015	54.415	67.126
75	63.666	51.050	50.941	48.438	43.154	51.120	64.212
100	61.498	48.743	48.675	46.106	40.548	48.787	62.059

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	83.10	83.01	87.76	84.50	90.08	70.66	69.78	77.37	70.91	84.00
15	81.60	81.41	86.22	82.48	91.35	68.44	66.99	74.63	68.67	86.55
20	79.11	78.28	83.19	79.66	92.36	67.01	65.11	71.52	66.99	87.39
25	77.47	76.06	81.05	77.86	92.63	66.28	63.49	70.36	66.30	88.18
30	76.06	73.62	79.54	76.16	93.96	63.84	60.77	67.33	63.86	89.29
35	73.54	70.22	76.95	73.66	93.74	61.64	58.00	65.11	61.64	89.25
40	71.94	68.57	74.81	72.12	93.88	60.42	55.49	62.89	60.30	89.90
50	69.72	64.81	72.10	69.72	95.25	57.35	51.37	60.34	57.25	91.80
75	61.19	53.41	63.56	61.05	96.18	49.41	40.55	51.64	49.11	93.21
100	50.95	40.38	52.71	50.83	95.80	39.45	30.08	40.93	39.19	92.59

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	82.48	69.61	N/A	N/A	99.74	99.60
15	85.58	61.22	N/A	N/A	99.94	99.88
20	86.26	53.66	N/A	N/A	99.94	99.90
25	87.17	47.80	N/A	N/A	100.00	100.00
30	88.46	44.23	N/A	N/A	100.00	99.98
35	88.61	39.71	N/A	N/A	100.00	99.98
40	89.66	36.22	N/A	N/A	99.96	99.96
50	91.25	29.60	N/A	N/A	100.00	100.00
75	92.91	19.90	N/A	N/A	99.98	99.98
100	92.53	12.51	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	79.38	79.40	84.55	81.21	83.15	78.20
15	78.65	78.38	83.23	79.70	85.25	73.90
20	76.64	76.06	80.49	77.27	85.96	69.74
25	74.87	73.82	78.42	75.28	86.50	66.67
30	73.49	71.42	76.69	73.74	87.64	62.02
35	70.78	68.51	74.35	70.95	87.64	57.52
40	69.79	66.26	72.34	69.79	88.83	53.96
50	67.93	62.76	70.36	68.06	90.32	46.93
75	59.41	52.07	61.74	59.38	91.86	31.41
100	49.35	39.19	51.23	49.27	91.29	19.54

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.41	0.00%	84.83	0.00%	98.04
15	0.00%	99.19	0.00%	83.27	0.00%	98.53
20	0.00%	99.47	0.00%	82.30	0.00%	98.83
25	0.00%	99.47	0.00%	80.87	0.00%	98.95
30	0.00%	99.50	0.00%	80.85	0.00%	99.31
35	0.00%	99.52	0.00%	79.31	0.00%	99.37
40	0.00%	99.58	0.00%	79.39	0.00%	99.35
50	0.00%	99.72	0.00%	78.28	0.00%	99.64
75	0.00%	99.86	0.00%	76.26	0.00%	99.88
100	0.00%	99.90	0.00%	72.00	0.00%	99.92

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	79.54	72.42	75.07	67.64	64.36	67.84	79.45	82.81
15	83.43	70.51	73.23	66.38	60.73	67.58	83.25	85.49
20	84.36	68.67	70.81	64.92	56.90	67.02	84.44	86.28
25	85.37	67.92	69.43	63.01	53.09	66.59	85.37	86.97
30	86.59	66.05	67.54	60.57	50.62	65.02	86.48	88.08
35	86.71	64.02	65.31	58.38	46.40	63.47	86.67	88.16
40	88.04	62.46	63.76	56.69	43.21	61.96	88.08	89.49
50	89.52	60.71	61.88	52.63	37.21	60.12	89.64	91.09
75	91.47	52.87	53.86	42.48	24.46	52.12	91.56	92.69
100	90.95	42.26	43.11	31.33	14.85	41.80	90.93	92.53

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.46	72.08	77.33	71.39	61.11	69.60	89.62	91.70
15	92.02	72.10	75.60	68.67	57.07	70.50	91.11	92.65
20	92.91	71.60	74.07	66.47	53.40	70.13	91.74	93.33
25	92.75	71.05	72.93	64.08	49.45	69.29	91.86	93.23
30	93.58	69.90	71.17	62.86	47.85	68.77	92.59	93.78
35	93.31	68.14	69.47	60.26	44.16	67.35	92.55	93.76
40	93.60	67.45	68.55	58.79	41.18	66.36	92.87	94.04
50	94.99	65.96	66.53	55.27	35.68	64.77	94.28	95.45
75	95.25	57.54	58.04	44.89	24.34	56.51	94.91	95.88
100	94.57	46.85	47.43	33.21	14.71	45.88	94.24	95.33

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.43	80.89	81.47	76.91	79.84	77.27	81.25	85.96
15	84.51	79.31	80.32	75.29	76.77	76.32	84.57	87.62
20	85.49	75.20	75.84	72.29	71.06	73.94	85.45	88.04
25	86.40	72.97	73.76	70.46	67.03	72.08	86.59	88.71
30	87.86	70.13	71.21	66.88	61.34	70.15	87.58	89.78
35	87.58	67.76	68.69	63.37	56.04	67.37	87.94	89.74
40	88.97	65.84	67.29	60.51	51.84	65.23	89.07	90.55
50	90.50	63.41	64.75	56.36	43.19	62.83	90.73	92.18
75	92.14	54.55	55.58	44.95	27.37	53.66	92.20	93.68
100	91.39	44.18	44.85	33.07	16.57	43.47	91.70	93.03

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.79	83.35	82.59	80.48	86.04	81.11	82.61	89.86
15	84.87	82.83	82.75	80.00	85.03	80.08	84.91	90.10
20	85.74	78.97	78.75	77.62	82.06	77.52	86.26	90.61
25	86.77	76.32	76.02	75.74	79.07	75.62	87.13	90.71
30	87.90	72.73	73.39	73.00	76.21	72.41	88.26	91.52
35	88.08	69.68	69.96	69.15	70.97	69.29	88.44	90.87
40	89.47	67.84	67.92	66.12	66.84	66.97	89.23	91.72
50	90.99	63.66	64.75	60.77	57.37	63.41	91.03	93.11
75	92.42	54.10	55.01	46.28	34.63	53.39	92.40	94.16
100	91.62	43.43	44.06	34.24	19.66	43.41	91.72	93.76

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	96.38	96.33	97.80	97.08	98.02	96.06
15	97.53	97.65	98.40	98.02	98.91	97.37
20	98.42	98.52	98.76	98.67	99.27	98.50
25	98.68	98.75	98.99	98.80	99.64	98.83
30	98.81	98.88	99.13	98.91	99.76	99.05
35	99.07	99.10	99.27	99.11	99.82	99.37
40	98.87	98.97	99.13	98.97	99.86	99.33
50	99.21	99.22	99.37	99.23	99.94	99.58
75	99.37	99.33	99.45	99.39	99.98	99.92
100	98.99	98.83	99.15	99.01	100.00	99.94

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 5.0765522
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	83.15	78.08	71.80	76.91	78.71	81.80	83.15	83.82
15	85.25	76.18	72.30	72.83	72.42	78.73	85.25	85.86
20	85.96	72.91	70.59	69.68	65.72	74.55	85.96	86.67
25	86.50	70.93	69.56	66.87	60.57	72.16	86.50	87.23
30	87.64	68.81	67.50	63.54	54.75	69.60	87.64	88.57
35	87.64	65.70	64.59	60.12	49.82	66.50	87.64	88.59
40	88.83	63.96	63.09	57.70	45.19	64.67	88.83	89.70
50	90.32	61.25	60.36	52.95	37.70	61.68	90.32	91.27
75	91.86	52.51	51.92	41.82	23.49	52.79	91.86	92.89
100	91.29	42.06	41.82	30.53	13.92	42.38	91.29	92.50

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Detection Limit: 5.0765522
Averaged Percentage Non-detects: 25.00%
Distribution Check: Average of means: 49.987686
Distribution Check: Average of stdvs: 69.451042
Average of NDs per 100 observations: 24.981300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	5.076552	2.423762	297	1009	1385	1267	800	292	0	0	0	0
15	5.076552	3.755446	55	345	783	1160	1114	845	453	212	61	17
20	5.076552	5.010099	23	108	323	629	993	1019	878	593	277	138
25	5.076552	6.248713	1	38	113	350	634	779	901	828	640	397
30	5.076552	7.495050	2	9	46	132	315	511	699	882	836	609
35	5.076552	8.736634	0	2	8	43	148	304	491	630	753	758
40	5.076552	9.966733	0	1	5	15	72	134	280	414	639	710
50	5.076552	12.495842	0	0	0	1	7	29	50	131	251	376
75	5.076552	18.659010	0	0	0	0	0	1	0	2	6	16
100	5.076552	24.961188	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	99
15	5	0	0	0	0	0	0	0	0	0	0	0	1
20	48	17	3	1	0	0	0	0	0	0	0	0	0
25	220	89	45	13	2	0	0	0	0	0	0	0	0
30	481	290	144	60	23	8	2	0	0	1	0	0	0
35	701	524	348	166	91	58	19	5	1	0	0	0	0
40	706	655	515	378	246	143	78	34	16	6	2	1	0
50	502	610	647	622	526	478	331	215	112	79	41	42	0
75	23	61	108	177	263	344	459	471	524	564	501	1530	0
100	0	4	5	7	13	37	57	91	106	176	257	4297	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	3	0	3	0	0	3	0	3	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	103	147	13	191	0	0	0	292
15	108	160	52	149	0	0	0	295
20	62	105	33	88	0	0	0	69
25	41	72	22	49	0	0	0	60
30	17	43	9	23	0	0	0	11
35	9	46	6	13	0	0	0	6
40	8	23	6	8	0	0	0	3
50	8	18	6	10	0	0	0	3
75	0	3	0	1	0	0	0	0
100	0	3	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	103	147	13	191	0	0
15	108	160	52	149	0	0
20	62	105	33	88	0	0
25	41	72	22	49	0	0
30	17	43	9	23	0	0
35	9	46	6	13	0	0
40	8	23	6	8	0	0
50	8	18	6	10	0	0
75	0	3	0	1	0	0
100	0	3	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	3	0	3	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	1	1	1	1	1	0	0
25	0	0	0	0	0	0	0	0
30	0	1	1	0	1	1	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	2	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	3	0	3	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	1	1	1	1	1	0	0
25	0	0	0	0	0	0	0	0
30	0	1	1	0	1	1	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	2	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	1	1	1	1	1	0	0
25	0	0	0	0	0	0	0	0
30	0	1	1	0	1	1	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	2	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	1	1	1	1	1	0	0
25	0	0	0	0	0	0	0	0
30	0	1	1	0	1	1	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	2	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	91	0	91	0	0	0	0
15	0	7	0	7	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 9e. G(0.5,100) 40% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	91.0533	107.5048	416.1387	272.3008	722.9511	452.8220
15	82.7217	69.5608	263.5554	208.1681	394.8714	302.8797
20	78.5320	68.0025	184.4465	163.6974	265.9792	231.1807
25	75.7768	53.9075	155.3681	142.3097	214.3613	192.9504
30	74.0210	53.0038	138.0617	129.2932	183.4623	169.4276
35	73.1380	46.9345	125.2125	119.3615	162.8615	153.5230
40	71.0112	46.4584	114.1696	110.3106	146.2773	140.1080
50	69.8472	42.5512	103.2725	100.8844	128.2589	124.5035
75	66.9165	36.6962	87.5355	86.5180	104.2617	102.6776
100	65.1051	34.6269	79.4265	78.8609	92.7478	91.8576

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	93.0116	92.6072	106.6119	103.8862	117.2200
15	76.7436	75.7995	86.6310	77.1643	103.9584
20	67.5811	66.8003	74.2484	67.6506	94.5288
25	61.9359	61.0570	66.8668	61.8986	88.9271
30	58.1077	56.9352	62.0452	57.9161	85.4951
35	56.0201	54.7236	59.1783	55.8647	83.0906
40	52.9502	51.5544	55.6132	52.7555	79.9719
50	50.1341	48.4206	52.1540	49.9160	77.4108
75	45.1966	43.0549	46.4053	44.9933	72.3107
100	42.2433	39.9026	43.0960	42.0646	69.3189

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	70.7543	69.1994	81.2496	78.1922	94.0180
15	57.5418	55.4795	65.4158	55.9698	84.8891
20	52.6757	51.1217	58.0525	51.7881	80.0167
25	49.5037	47.9570	53.5092	48.8918	76.8824
30	47.0449	45.2528	50.3357	46.4401	74.8611
35	46.2097	44.3363	48.9170	45.7407	73.7332
40	43.9827	42.0483	46.3051	43.5315	71.4541
50	42.3760	40.1840	44.1544	41.9862	70.0277
75	39.2579	36.7164	40.3510	38.9688	66.6527
100	37.2783	34.6100	38.0573	37.0476	64.5746

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	82.4888	81.6965	94.4976	83.7612	90.5757	80.5965
15	70.2980	69.5039	76.7979	71.1683	80.3114	61.6755
20	63.7887	63.1945	68.0633	64.2071	75.9053	54.1427
25	58.8583	58.2054	62.1419	59.1147	73.1152	48.9917
30	55.5786	54.7940	58.2623	55.6807	71.2955	44.7292
35	53.6136	52.6867	55.9420	53.7228	70.4531	42.7867
40	50.4535	49.4925	52.4515	50.3904	68.3067	39.5844
50	48.0728	46.8870	49.6577	48.0076	67.1451	36.5336
75	43.2230	41.5382	44.2653	43.0804	64.2386	31.1192
100	40.3421	38.4090	41.1028	40.2058	62.4314	27.8682

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	794.0745	0.04%	92.0794	0.00%	589.2567
15	0.00%	296.1003	0.06%	71.1545	0.00%	224.2956
20	0.00%	203.1487	0.00%	65.2278	0.00%	151.6876
25	0.00%	164.0575	0.00%	61.8679	0.00%	127.0486
30	0.00%	141.8220	0.00%	59.6657	0.00%	113.2912
35	0.00%	130.7378	0.00%	58.9687	0.00%	105.7391
40	0.00%	119.9737	0.00%	57.1894	0.00%	98.8494
50	0.00%	108.4114	0.00%	56.1195	0.00%	91.8324
75	0.00%	93.3461	0.00%	54.0087	0.00%	81.8746
100	0.00%	86.2557	0.00%	52.8888	0.00%	77.0136

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	84.279	146.085	267.938	67.402	64.768	87.408	91.973
15	77.214	426.242	1977.165	53.838	51.036	54.362	83.506
20	74.019	909.131	554.115	50.056	45.894	50.702	78.802
25	71.801	206.926	107.354	46.992	41.263	48.235	75.783
30	70.301	96.660	71.256	44.149	37.662	45.828	73.950
35	69.641	47.089	80.097	43.487	36.174	45.516	73.016
40	67.661	44.578	45.954	41.322	33.429	43.454	70.896
50	66.679	54.773	44.010	39.762	31.210	42.254	69.725
75	63.974	40.204	40.885	36.761	27.043	39.786	66.828
100	62.261	38.530	39.006	35.059	24.596	38.211	65.050

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	136.992	73.982	84.370	72.007	63.385	26439.279	180.035
15	109.909	57.606	60.608	54.157	52.718	58.716	121.261
20	95.747	51.991	53.728	49.061	47.436	50.601	100.643
25	88.095	47.825	49.619	44.691	42.261	46.358	91.517
30	83.620	45.004	46.504	41.880	38.740	43.796	86.729
35	80.502	44.370	45.775	40.935	35.377	43.312	83.399
40	76.500	41.785	43.215	38.389	32.127	40.805	79.216
50	73.578	40.831	41.934	37.237	30.134	40.035	76.327
75	68.268	38.582	39.332	34.514	25.381	38.042	70.918
100	65.273	37.261	37.825	33.064	22.916	36.865	67.897

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	88.289	89.809	91.146	79.572	86.638	80.662	99.314
15	79.527	78.953	79.917	66.185	70.857	67.418	88.561
20	75.626	69.197	69.878	59.886	61.758	60.770	82.326
25	73.130	61.301	61.924	55.498	55.528	56.368	78.525
30	71.500	56.193	56.733	52.048	51.032	53.166	76.249
35	70.732	53.194	53.786	50.305	48.494	51.632	74.996
40	68.594	49.607	50.229	47.524	45.167	48.863	72.571
50	67.473	46.965	47.501	44.913	41.683	46.532	71.070
75	64.564	42.500	42.910	40.264	35.509	42.240	67.730
100	62.702	39.898	40.247	37.506	31.851	39.692	65.722

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	92.629	103.969	101.110	90.824	108.340	94.353	111.564
15	81.228	94.509	3115.293	76.286	87.110	78.702	96.242
20	76.556	82.825	83.081	68.293	75.358	68.908	87.473
25	73.832	72.870	73.047	63.696	66.973	63.704	82.354
30	72.140	65.882	65.973	59.453	61.504	59.906	79.311
35	71.297	60.651	60.471	57.224	58.287	57.500	77.574
40	69.087	55.996	56.030	53.886	54.297	54.397	74.755
50	67.861	51.633	51.642	50.239	49.630	50.942	72.780
75	64.801	45.252	45.445	44.050	41.954	45.170	68.757
100	62.892	41.854	42.070	40.441	37.225	41.765	66.427

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	145.7691	146.5252	168.4448	152.3684	176.0868	143.4760
15	126.5628	127.7313	139.8553	131.2665	155.8726	126.3201
20	114.3076	115.3499	123.0272	117.0559	141.2973	116.5968
25	105.6496	106.6671	112.0755	107.5583	131.9936	110.2962
30	99.5526	100.2996	104.7957	100.9935	125.8717	106.0792
35	95.1961	95.9545	99.4351	96.3522	121.1977	103.2654
40	89.4268	90.0479	93.0606	90.2285	115.4323	98.8663
50	83.9051	84.3316	86.6348	84.4781	109.9658	95.3211
75	73.0864	72.8937	74.7666	73.3071	99.3422	87.9458
100	66.4522	65.9259	67.6179	66.5580	92.8407	83.3388

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	84.3233	140.5518	88.2323	92.4660	90.7345
15	77.2719	108.0955	79.5133	81.2516	80.4073
20	74.0657	93.2584	75.6447	76.5496	75.9218
25	71.8094	85.9662	73.1061	73.8718	73.1158
30	70.3031	81.7595	71.4908	72.1339	71.2904
35	69.6431	79.0527	70.7110	71.2592	70.4531
40	67.6743	75.2204	68.6047	69.0404	68.3067
50	66.6740	72.5798	67.5021	67.9081	67.1451
75	63.9786	67.6350	64.5488	64.8031	64.2386
100	62.2621	64.8252	62.6924	62.8881	62.4314

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	90.576	80.035	70.728	81.030	86.960	11251.854	92.834
15	80.311	69.431	62.120	67.063	70.172	65470.050	82.969
20	75.905	303.959	299.200	60.132	60.128	12900.368	78.339
25	73.115	57.887	54.599	55.357	53.601	90.667	75.451
30	71.296	54.020	51.591	51.635	48.824	55.553	73.676
35	70.453	52.184	50.381	49.874	46.221	53.373	72.793
40	68.307	49.496	48.057	47.212	42.927	50.385	70.656
50	67.145	47.008	46.022	44.610	39.545	47.627	69.541
75	64.239	42.653	42.157	40.108	33.569	42.945	66.671
100	62.431	40.099	39.789	37.470	30.020	40.281	64.906

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	89.58	89.19	94.21	90.69	94.93	70.94	69.07	83.00	69.03	88.53
15	84.86	83.96	91.72	85.19	95.90	57.29	54.22	69.08	54.53	88.75
20	77.85	77.15	87.38	78.02	96.53	51.05	48.34	60.06	49.82	90.44
25	71.58	70.44	81.39	71.29	97.03	45.54	42.77	53.84	44.55	91.01
30	66.75	64.28	75.80	66.28	97.09	41.32	37.66	48.29	40.20	91.80
35	62.75	59.49	71.11	62.44	97.56	39.09	34.89	44.81	38.02	92.97
40	55.66	51.72	62.83	55.25	97.52	33.56	28.99	38.53	32.71	92.91
50	48.87	43.27	54.46	48.32	98.42	28.42	23.90	32.40	27.74	94.61
75	31.17	24.61	35.09	30.75	98.77	16.79	11.84	18.79	16.40	95.45
100	18.91	13.19	21.05	18.48	98.89	9.62	5.76	10.51	9.25	95.94

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	88.46	80.31	N/A	N/A	100.00	100.00
15	88.87	70.16	N/A	N/A	99.98	99.98
20	90.63	63.34	N/A	N/A	100.00	99.98
25	91.29	51.14	N/A	N/A	100.00	100.00
30	91.98	45.32	N/A	N/A	99.98	99.98
35	93.49	36.39	N/A	N/A	99.98	99.98
40	93.35	31.78	N/A	N/A	100.00	99.98
50	95.31	22.04	N/A	N/A	99.98	99.98
75	96.55	7.87	N/A	N/A	100.00	100.00
100	97.05	2.99	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	82.63	81.79	89.80	82.82	87.29	81.27
15	75.61	74.76	83.41	76.62	85.54	62.93
20	70.26	69.85	77.40	71.06	86.69	53.56
25	65.05	63.89	71.46	65.42	87.66	45.70
30	60.24	58.42	66.42	60.27	88.51	37.72
35	55.18	52.71	61.69	55.19	89.90	32.79
40	48.08	45.32	53.53	48.06	89.47	25.78
50	41.73	37.66	46.90	41.40	91.13	18.48
75	25.37	20.25	28.28	25.10	92.61	6.42
100	15.11	10.78	16.85	14.93	92.97	1.84

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.62	0.04%	80.65	0.00%	96.65
15	0.00%	98.85	0.06%	72.80	0.00%	97.23
20	0.00%	98.50	0.00%	71.25	0.00%	98.00
25	0.00%	98.48	0.00%	70.44	0.00%	98.18
30	0.00%	98.26	0.00%	69.80	0.00%	98.20
35	0.00%	98.89	0.00%	70.83	0.00%	98.55
40	0.00%	98.71	0.00%	67.01	0.00%	98.46
50	0.00%	98.83	0.00%	67.25	0.00%	98.93
75	0.00%	99.13	0.00%	65.25	0.00%	99.27
100	0.00%	99.49	0.00%	63.58	0.00%	99.54

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.14	75.89	80.91	66.33	63.49	64.87	84.32	89.19
15	83.33	65.05	72.04	51.16	46.57	51.21	83.45	89.88
20	84.79	57.56	63.95	47.35	38.73	48.79	85.01	91.35
25	86.55	50.52	55.16	42.87	32.59	45.54	86.48	91.72
30	87.43	44.96	49.02	37.89	27.19	41.49	87.33	92.22
35	89.21	42.37	45.03	36.20	23.76	40.23	89.29	93.54
40	88.59	37.00	39.77	31.06	18.83	35.35	88.77	93.41
50	90.65	32.77	34.73	26.55	13.99	31.76	90.48	95.27
75	92.14	21.45	22.51	15.13	5.47	20.76	92.32	96.46
100	92.65	12.79	13.61	8.08	1.63	12.54	92.83	97.01

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.51	61.10	67.48	61.01	48.10	56.32	90.75	93.50
15	91.47	48.84	54.38	45.17	33.90	45.03	91.01	94.32
20	93.66	46.54	50.60	42.13	29.34	43.48	92.81	95.76
25	94.00	43.09	46.75	37.79	24.97	40.39	92.89	96.04
30	93.78	39.71	42.87	33.84	20.09	37.38	92.93	96.04
35	94.53	38.69	41.21	32.77	18.02	36.79	93.90	96.51
40	94.02	34.39	36.69	28.25	13.83	32.88	93.37	96.42
50	95.45	31.54	33.33	24.48	11.11	30.75	94.87	97.62
75	95.64	21.99	22.60	14.51	4.09	21.10	95.31	97.98
100	96.02	13.51	14.06	8.06	1.45	13.19	95.47	98.32

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.38	88.12	88.95	81.27	86.50	82.34	86.30	91.98
15	85.03	85.26	86.07	71.05	77.98	72.32	84.97	92.42
20	86.28	78.60	79.73	64.35	68.38	65.80	86.38	93.39
25	87.50	69.24	70.84	58.25	58.43	60.13	87.62	93.50
30	88.59	60.36	61.78	51.70	49.15	54.92	88.36	93.82
35	90.00	53.41	55.23	46.35	41.27	50.03	90.28	94.77
40	89.35	45.32	47.54	39.60	32.05	43.40	89.56	94.59
50	91.37	37.61	39.75	31.74	22.28	36.44	91.41	96.18
75	92.93	22.46	23.75	16.29	7.27	21.93	92.91	96.99
100	93.31	13.15	13.65	8.52	2.17	12.62	93.27	97.52

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.42	88.14	87.56	87.21	93.66	89.60	88.26	94.71
15	86.42	89.97	89.77	80.48	87.37	83.39	86.83	94.97
20	87.09	88.19	87.36	76.44	82.14	77.68	86.93	95.62
25	88.14	83.55	82.63	73.33	75.24	74.25	87.92	95.45
30	88.67	76.62	77.15	68.49	69.32	69.91	88.81	95.60
35	90.61	71.77	70.99	66.82	66.39	67.26	90.44	96.14
40	89.80	63.89	63.76	59.48	58.99	61.36	89.88	95.80
50	91.78	52.66	52.74	49.83	51.58	51.84	91.64	97.01
75	93.25	27.54	28.43	23.72	24.97	27.91	93.01	97.54
100	93.29	14.02	15.31	10.68	6.91	14.16	93.45	97.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	97.57	97.42	98.67	97.97	98.57	97.05
15	98.22	98.23	99.20	98.64	99.35	98.26
20	98.77	98.74	99.40	98.99	99.72	98.81
25	98.74	98.79	99.22	98.91	99.74	99.19
30	98.52	98.71	99.20	98.76	99.78	99.39
35	98.55	98.79	99.31	98.83	99.90	99.47
40	98.17	98.33	98.97	98.32	99.86	99.52
50	98.50	98.64	99.09	98.69	99.98	99.90
75	96.95	96.98	97.90	97.00	99.98	99.98
100	93.91	93.70	95.38	94.03	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 13.7497949
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.29	84.27	68.57	87.44	87.33	90.50	87.64	88.95
15	85.54	78.06	63.07	74.95	78.30	85.49	85.76	89.07
20	86.69	69.40	59.39	64.63	65.64	76.93	86.73	90.38
25	87.66	62.23	55.29	57.13	53.68	67.52	87.66	90.69
30	88.51	56.37	51.15	50.51	43.19	60.04	88.51	91.43
35	89.90	52.10	47.31	45.72	35.80	54.95	89.90	93.13
40	89.47	45.31	41.94	39.01	27.80	47.76	89.47	92.87
50	91.13	38.32	36.04	31.60	18.69	39.78	91.13	94.83
75	92.61	22.89	21.58	16.12	6.14	23.60	92.61	96.26
100	92.97	13.11	12.83	8.30	1.76	13.49	92.97	96.89

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Detection Limit: 13.7497949
Averaged Percentage Non-detects: 40.00%
Distribution Check: Average of means: 50.091631
Distribution Check: Average of stdvs: 69.570675
Average of NDs per 100 observations: 39.956400

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	13.749795	3.527327	32	238	732	1291	1547	1210	0	0	0	0
15	13.749795	5.972079	2	23	112	314	643	913	1066	940	609	295
20	13.749795	7.980792	0	4	19	69	182	351	629	844	943	791
25	13.749795	10.010891	0	0	1	6	39	91	205	434	583	753
30	13.749795	12.065941	0	0	0	1	2	27	50	127	257	418
35	13.749795	13.940396	0	0	0	0	2	3	8	48	90	169
40	13.749795	16.113069	0	0	0	0	0	0	1	9	19	44
50	13.749795	20.033663	0	0	0	0	0	0	0	1	0	1
75	13.749795	29.924950	0	0	0	0	0	0	0	0	0	0
100	13.749795	39.932475	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	1008
15	133	0	0	0	0	0	0	0	0	0	0	0	46
20	595	322	208	68	21	4	0	0	0	0	0	0	2
25	845	760	563	382	228	97	44	11	7	1	0	0	0
30	516	724	775	704	534	395	245	149	77	25	18	6	0
35	264	423	571	647	679	667	579	340	266	143	80	71	0
40	89	194	228	383	521	663	610	646	543	436	286	378	0
50	8	23	42	77	129	199	293	396	495	600	602	2184	0
75	0	0	0	1	0	0	0	3	8	15	27	4996	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	22	0	22	0	0	22	0	22	0	0
15	11	0	11	0	0	11	0	11	0	0
20	2	0	2	0	0	2	0	2	0	0
25	0	0	0	0	0	0	0	0	0	0
30	1	0	1	0	0	1	0	1	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	144	202	29	323	0	0	0	1210
15	560	691	295	781	0	0	0	1977
20	561	679	355	689	0	0	0	1218
25	463	583	306	562	0	0	0	1333
30	457	615	315	535	0	0	0	915
35	353	489	268	424	0	0	0	900
40	295	449	208	343	0	0	0	664
50	257	417	204	301	0	0	0	541
75	130	274	107	150	0	0	0	309
100	60	190	47	74	0	0	0	130

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	144	202	29	323	0	0
15	560	691	295	781	0	0
20	561	679	355	689	0	0
25	463	583	306	562	0	0
30	457	615	315	535	0	0
35	353	489	268	424	0	0
40	295	449	208	343	0	0
50	257	417	204	301	0	0
75	130	274	107	150	0	0
100	60	190	47	74	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	22	0	22	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	3	7	3	5	10	0	0
25	0	4	19	2	30	21	0	0
30	0	6	11	4	19	15	0	0
35	0	2	9	0	33	11	0	0
40	0	2	4	1	25	4	0	0
50	0	3	6	3	55	6	0	0
75	0	2	4	2	42	2	0	0
100	0	1	3	1	29	1	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	22	0	22	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	3	8	3	6	9	0	0
25	0	5	20	2	28	21	0	0
30	0	6	12	4	18	12	0	0
35	0	2	9	0	33	11	0	0
40	0	2	5	0	25	4	0	0
50	0	3	6	3	55	6	0	0
75	0	2	4	2	41	2	0	0
100	0	1	3	1	30	1	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	4	0	4	0	0	0	0
20	0	3	7	3	5	9	0	0
25	0	5	20	2	29	21	0	0
30	0	5	11	3	18	14	0	0
35	0	2	10	0	34	11	0	0
40	0	2	4	0	27	4	0	0
50	0	3	6	3	55	6	0	0
75	0	2	4	2	41	2	0	0
100	0	1	2	1	30	1	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	4	0	4	0	0	0	0
20	0	3	8	3	5	10	0	0
25	0	5	19	2	29	21	0	0
30	0	4	11	3	18	15	0	0
35	0	2	8	0	34	10	0	0
40	0	2	6	1	27	4	0	0
50	0	3	7	3	54	6	0	0
75	0	2	4	2	43	2	0	0
100	0	1	3	1	29	1	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	2	0	0	0	0	0
15	0	3	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	288	0	288	0	0	0	0
15	0	132	0	132	0	0	0	0
20	0	20	0	20	0	0	0	0
25	0	4	0	4	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 9f. G(0.5,100) 50% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	100.7405	129.8563	430.4831	282.3883	843.2354	522.9376
15	88.5731	82.2631	285.2459	222.4476	446.7967	337.3418
20	83.8825	87.6998	204.8542	179.8162	298.2828	256.2558
25	80.5876	64.0429	168.1495	152.8434	236.1127	210.6018
30	78.4499	70.0696	146.0289	136.0710	198.7822	182.3560
35	77.0725	55.3377	131.6889	125.0164	174.8451	163.9095
40	75.5539	59.5457	119.8274	115.4797	156.4083	149.2523
50	73.5347	55.1846	105.8742	103.2642	134.3985	130.1106
75	70.6344	43.5790	88.8736	87.7790	107.4616	105.6798
100	68.9314	42.7067	80.5668	79.9576	94.6781	93.6879

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	104.0224	103.0161	120.8841	193.8826	131.3227
15	82.5899	80.7688	97.3436	214.6248	116.9260
20	70.0367	68.5476	81.1614	69.1147	106.8232
25	61.5778	60.5080	69.9121	60.8115	98.9351
30	56.2590	55.2234	62.8206	55.6015	93.9101
35	52.4199	51.2888	57.8387	51.7983	90.5538
40	49.4922	48.3250	54.0219	48.9513	87.2853
50	44.9643	43.5115	48.4073	44.4203	83.1785
75	38.5888	36.7046	40.6967	38.1361	77.1564
100	34.9993	32.8579	36.4971	34.6194	73.6946

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	76.5143	74.0449	89.3948	160.9626	102.4364
15	54.4053	51.0019	66.0556	622.2308	89.3430
20	46.9080	44.2812	54.9209	44.2557	84.0637
25	42.5606	40.7677	48.5229	41.0018	80.2829
30	39.9043	38.2909	44.6301	38.7800	77.8819
35	37.7270	36.1239	41.7200	36.7697	76.2184
40	36.1634	34.5359	39.6044	35.3618	74.4201
50	33.4338	31.6236	36.1511	32.7056	72.0718
75	29.6304	27.4992	31.3654	29.0855	68.5851
100	27.4226	25.0649	28.7035	26.9804	66.5069

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	89.4539	87.6861	104.2897	89.3749	98.1616	86.7812
15	70.8806	68.2957	79.1924	70.3980	82.6626	58.1553
20	63.2243	61.6205	68.6234	62.9581	77.6424	48.2825
25	56.7407	55.8909	61.1409	56.7604	74.4589	42.4506
30	53.1048	52.4142	56.3312	53.1078	72.5499	38.4544
35	49.8825	49.3886	52.7056	49.9971	71.1816	34.9075
40	47.4227	46.8933	49.8623	47.5741	69.7273	32.2808
50	43.3413	42.5607	45.2733	43.2461	67.7703	28.3173
75	37.2775	36.4622	38.5665	37.1452	64.9655	22.1205
100	33.7495	32.7274	34.6537	33.5928	63.3169	18.6066

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	772.9079	0.08%	89.4274	0.00%	341.3209
15	0.00%	267.6154	0.06%	69.0573	0.00%	189.4232
20	0.00%	181.2077	0.04%	64.3284	0.00%	141.2880
25	0.00%	145.9875	0.00%	61.9217	0.00%	117.4103
30	0.00%	126.7824	0.00%	60.5787	0.00%	105.3782
35	0.00%	115.8241	0.00%	59.7126	0.00%	98.7874
40	0.00%	107.7628	0.00%	58.9612	0.00%	93.1172
50	0.00%	96.4130	0.00%	57.7578	0.00%	86.2800
75	0.00%	83.5810	0.00%	56.3696	0.00%	77.9989
100	0.00%	77.4688	0.00%	55.6513	0.00%	73.9005

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	91.108	118.381	194.356	72.911	70.496	285.934	102.140
15	79.211	418.427	406.755	49.462	49.818	1015.280	90.694
20	75.590	770.801	461.219	43.495	43.337	43.196	85.379
25	73.098	1050.607	392.479	39.792	37.859	39.888	81.421
30	71.539	370.256	510.000	37.699	34.535	38.242	78.919
35	70.392	221.604	594.624	35.401	31.168	36.232	77.298
40	69.073	300.887	233.890	33.808	28.669	34.941	75.719
50	67.310	2290.012	908.554	31.158	25.218	32.588	73.583
75	64.709	30.090	31.272	27.260	19.904	29.351	70.613
100	63.156	28.062	28.990	25.051	16.766	27.514	68.909

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	134.410	74.530	84.710	69.466	61.979	406336.294	191.815
15	108.162	52.951	54.393	49.256	57.922	58477665.355	133.349
20	98.014	49.005	48.035	46.353	59.986	47.511	109.641
25	89.961	43.722	43.453	40.837	52.295	41.393	97.772
30	85.426	40.832	40.803	38.500	47.866	39.002	92.181
35	81.739	37.611	38.112	36.051	43.557	36.377	87.958
40	78.276	35.281	36.000	33.646	38.795	34.075	84.285
50	74.364	32.293	33.084	30.732	34.114	31.476	80.104
75	69.011	28.052	28.917	26.383	27.820	27.552	74.578
100	66.209	25.880	26.623	23.707	23.788	25.379	71.729

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	95.900	101.198	103.138	86.299	95.986	87.914	110.731
15	82.146	92.512	93.896	66.214	76.270	68.720	97.254
20	77.522	83.855	84.536	57.885	64.855	59.852	90.124
25	74.553	72.913	73.341	52.980	56.949	53.881	85.040
30	72.788	63.948	64.196	49.431	51.534	50.243	81.861
35	71.462	56.545	56.943	46.620	47.505	47.420	79.787
40	70.032	51.451	51.929	44.463	44.602	45.335	77.878
50	68.111	44.059	44.505	40.761	39.843	41.745	75.292
75	65.272	36.872	37.392	35.248	32.857	36.482	71.745
100	63.594	33.657	34.097	31.983	28.683	33.388	69.735

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	102.314	118.549	114.262	101.974	124.220	109.104	125.264
15	85.237	109.539	265.757	78.687	95.170	85.096	107.830
20	78.973	102.677	105.887	68.524	79.211	71.639	97.737
25	75.391	93.617	95.168	62.928	68.716	64.220	90.580
30	73.463	81.447	83.124	58.419	61.410	59.137	86.237
35	72.044	72.433	73.307	54.797	56.367	55.522	83.362
40	70.523	65.092	66.107	52.170	52.777	52.903	80.927
50	68.486	54.125	54.641	47.691	46.763	48.593	77.630
75	65.566	42.704	42.961	40.857	37.946	42.057	73.220
100	63.772	38.265	38.548	36.768	33.013	38.066	70.817

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	157.1973	157.1095	183.9965	164.1945	191.2102	153.4347
15	128.7101	127.6609	146.5518	132.8602	167.0519	130.6915
20	116.5926	116.1972	128.1627	119.2667	152.7215	121.1392
25	106.1547	106.4402	114.9547	108.2678	141.3984	114.0971
30	99.0831	99.5968	105.6820	100.6110	133.7209	109.4434
35	93.4872	94.0941	99.0795	94.7849	128.2247	106.0752
40	88.8388	89.3152	93.5433	89.9576	122.6616	102.6055
50	81.0050	81.3176	84.5631	81.6922	115.3814	97.9329
75	69.0476	69.1847	71.2666	69.3225	104.0510	90.7981
100	61.6746	61.6221	63.2146	61.7872	97.2379	86.4988

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	91.2681	143.5372	95.8124	101.9134	98.9250
15	79.4370	110.5951	82.0727	85.0376	83.3140
20	75.8207	98.0701	77.4735	78.8826	78.0754
25	73.2578	89.2490	74.5103	75.2839	74.6749
30	71.6583	84.6061	72.8008	73.3816	72.6957
35	70.4593	80.7387	71.4826	72.0081	71.2109
40	69.1223	77.3339	70.0262	70.5227	69.7446
50	67.3231	73.5133	68.1230	68.4942	67.7740
75	64.7065	68.4057	65.2710	65.5211	64.9655
100	63.1497	65.7227	63.6071	63.7828	63.3169

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	98.162	86.654	74.278	90.415	98.850	19898.127	102.216
15	82.663	72.602	60.751	71.770	79.662	211448.572	88.420
20	77.642	197.247	188.150	61.976	66.185	124884.021	83.249
25	74.459	59.046	52.343	55.730	56.579	1922.921	79.810
30	72.550	54.502	49.473	51.214	50.652	57.152	77.664
35	71.182	49.994	45.981	47.799	46.025	52.735	76.313
40	69.727	47.363	44.196	45.294	42.714	49.550	74.850
50	67.770	43.079	40.901	41.170	37.587	44.636	72.894
75	64.965	37.276	36.087	35.125	30.000	37.975	70.149
100	63.317	33.873	33.138	31.686	25.681	34.337	68.545

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	96.17	95.90	98.07	96.59	97.45	80.57	78.83	91.89	78.02	93.56
15	91.86	91.25	97.35	92.22	98.10	51.93	47.54	69.81	46.89	92.34
20	83.03	82.26	94.63	82.63	98.16	41.01	37.37	54.42	37.50	92.32
25	71.67	70.22	88.62	70.46	98.93	33.76	30.83	44.12	31.31	93.33
30	61.80	59.64	78.87	60.50	98.63	28.67	25.72	36.36	27.27	94.20
35	52.91	50.20	67.86	51.68	99.05	24.20	20.93	30.63	22.59	94.77
40	46.51	43.37	58.46	45.03	99.03	20.34	17.64	25.31	19.47	95.41
50	34.06	30.18	42.87	32.87	99.43	12.95	10.65	16.30	12.26	95.60
75	15.54	11.94	19.62	14.79	99.76	5.13	3.90	6.36	4.91	96.57
100	6.65	4.51	8.16	6.30	99.70	1.88	1.07	2.38	1.84	97.72

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	95.23	87.68	N/A	N/A	100.00	100.00
15	94.67	85.17	N/A	N/A	100.00	100.00
20	94.81	79.05	N/A	N/A	99.98	99.96
25	95.86	71.04	N/A	N/A	100.00	100.00
30	96.50	66.04	N/A	N/A	99.96	99.96
35	96.95	56.86	N/A	N/A	100.00	100.00
40	97.70	54.85	N/A	N/A	100.00	100.00
50	98.02	44.67	N/A	N/A	100.00	100.00
75	99.07	21.70	N/A	N/A	100.00	100.00
100	99.43	13.76	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	91.23	90.28	96.05	91.00	93.45	89.74
15	76.67	74.13	86.83	77.25	89.03	59.07
20	69.22	67.83	78.69	69.75	88.46	43.78
25	60.33	59.48	69.16	60.88	89.33	34.40
30	53.06	51.74	61.56	53.53	90.50	26.30
35	45.81	44.54	53.32	46.06	91.37	20.08
40	39.62	37.56	46.24	39.68	91.21	15.43
50	26.97	24.16	32.48	26.51	92.26	7.82
75	11.45	9.58	13.55	11.14	93.50	1.78
100	4.61	3.10	5.40	4.50	95.13	0.42

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.08%	88.23	0.00%	98.14
15	0.00%	98.77	0.06%	77.61	0.00%	97.64
20	0.00%	96.75	0.04%	74.66	0.00%	97.25
25	0.00%	96.99	0.00%	75.86	0.00%	97.96
30	0.00%	96.59	0.00%	75.54	0.00%	98.14
35	0.00%	96.73	0.00%	76.73	0.00%	98.28
40	0.00%	96.61	0.00%	76.53	0.00%	98.30
50	0.00%	96.77	0.00%	77.50	0.00%	98.65
75	0.00%	96.40	0.00%	78.67	0.00%	98.67
100	0.00%	97.27	0.00%	79.86	0.00%	99.21

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.67	86.57	90.36	76.48	72.30	73.47	90.73	95.80
15	86.53	69.17	78.48	45.80	45.07	44.51	87.13	95.90
20	86.55	59.14	69.61	36.54	32.29	36.45	87.15	96.04
25	88.04	48.91	58.21	30.96	24.52	31.72	88.42	96.75
30	89.52	39.76	46.39	26.74	19.21	28.98	89.86	97.13
35	90.79	31.52	36.57	23.25	15.36	25.43	90.97	97.45
40	90.48	26.93	31.00	19.93	12.22	22.74	90.57	97.80
50	91.80	17.58	20.32	13.50	6.91	15.83	91.84	98.16
75	93.13	8.41	9.43	6.17	1.90	8.18	93.29	99.09
100	94.97	3.79	4.28	2.19	0.56	3.63	95.03	99.43

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	93.64	58.17	69.85	59.09	48.85	54.71	94.65	97.60
15	92.51	38.95	45.56	35.72	28.06	32.67	93.88	97.52
20	93.07	31.99	36.60	28.22	20.44	27.90	94.14	97.50
25	94.51	27.07	31.11	23.92	15.48	24.33	95.29	98.42
30	95.25	24.42	28.44	21.31	12.14	22.34	95.56	98.24
35	95.45	22.05	24.68	18.37	9.61	19.74	95.66	98.95
40	95.90	20.06	22.21	16.11	7.67	18.57	95.84	98.95
50	95.64	14.70	16.05	10.99	4.58	13.50	95.56	99.15
75	95.96	7.79	8.55	5.44	1.27	7.18	95.66	99.56
100	97.21	3.53	3.98	2.03	0.43	3.44	97.05	99.78

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	92.71	95.43	95.98	89.90	93.70	90.91	92.38	97.17
15	88.83	92.48	92.70	72.42	85.17	75.52	88.81	97.39
20	88.24	88.68	88.36	61.33	74.65	64.19	88.04	97.31
25	89.19	79.67	80.51	52.86	61.61	54.57	89.17	97.96
30	90.61	67.73	68.37	43.76	49.83	45.88	90.48	98.04
35	91.45	54.02	55.16	36.68	37.91	39.38	91.58	98.14
40	91.39	43.95	45.34	31.21	29.70	33.12	91.33	98.57
50	92.44	26.10	27.71	19.75	16.08	22.36	92.50	98.77
75	93.62	9.84	10.46	7.12	3.87	9.12	93.72	99.27
100	95.45	3.81	4.40	2.35	0.82	3.65	95.41	99.60

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.63	89.39	89.21	94.42	98.22	95.60	94.42	98.18
15	91.01	90.80	91.00	83.49	91.35	87.50	90.85	98.55
20	89.49	92.33	92.39	74.29	83.41	77.43	89.62	98.42
25	90.06	91.29	91.47	69.74	75.05	71.48	89.68	98.89
30	90.77	84.94	85.80	64.20	65.18	64.95	90.85	98.71
35	91.82	78.48	79.43	59.51	57.15	61.35	91.58	98.97
40	91.56	71.15	71.93	55.42	51.79	57.71	91.47	99.01
50	92.48	54.81	55.60	46.01	41.67	47.78	92.77	99.35
75	93.86	23.22	22.73	20.04	21.72	22.23	93.78	99.60
100	95.49	7.31	7.20	5.66	6.88	6.99	95.47	99.78

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.21	99.14	99.64	99.42	99.45	99.03
15	98.62	98.47	99.74	98.89	99.56	99.11
20	98.69	98.44	99.51	98.75	99.66	99.11
25	99.12	99.08	99.64	99.42	99.92	99.68
30	98.81	98.81	99.45	98.92	99.84	99.66
35	98.79	98.96	99.26	99.09	99.90	99.82
40	98.40	98.52	99.19	98.68	99.94	99.86
50	97.73	97.82	98.98	98.02	100.00	100.00
75	94.14	94.66	96.38	94.53	100.00	100.00
100	87.60	87.85	90.94	87.68	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 22.7468212
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	93.45	91.87	71.94	101.20	95.05	96.83	95.21	95.64
15	89.03	86.45	61.21	89.15	88.81	95.33	91.25	94.65
20	88.46	76.56	55.82	72.27	76.99	89.74	89.74	94.71
25	89.33	64.43	49.80	57.25	61.31	77.45	90.02	95.58
30	90.50	53.26	42.89	46.90	47.23	62.95	90.63	96.08
35	91.37	44.51	37.23	38.71	35.41	50.16	91.49	96.61
40	91.21	38.62	32.57	32.86	27.25	42.46	91.29	97.41
50	92.26	26.44	23.15	21.35	13.92	29.23	92.28	97.80
75	93.50	10.99	10.14	8.14	3.15	11.80	93.50	98.79
100	95.13	4.53	4.12	2.63	0.69	4.71	95.13	99.33

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Detection Limit: 22.7468212
Averaged Percentage Non-detects: 50.00%
Distribution Check: Average of means: 50.015291
Distribution Check: Average of stdvs: 69.674996
Average of NDs per 100 observations: 50.031400

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	22.746821	4.009901	8	74	363	959	1657	1989	0	0	0	0
15	22.746821	7.264356	0	1	14	71	223	499	790	1090	1050	834
20	22.746821	9.989307	0	0	2	9	14	68	199	377	585	837
25	22.746821	12.530297	0	0	0	1	0	4	18	65	159	308
30	22.746821	14.974653	0	0	0	0	0	3	5	11	28	72
35	22.746821	17.521188	0	0	0	0	0	0	0	3	3	8
40	22.746821	20.017228	0	0	0	0	0	0	0	0	0	1
50	22.746821	25.084356	0	0	0	0	0	0	0	0	0	0
75	22.746821	37.623168	0	0	0	0	0	0	0	0	0	0
100	22.746821	50.085743	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3135
15	478	0	0	0	0	0	0	0	0	0	0	0	314
20	868	796	634	407	172	82	0	0	0	0	0	0	27
25	460	684	803	822	664	500	303	153	66	31	9	0	2
30	126	250	411	600	688	743	616	599	400	256	128	114	1
35	27	48	120	200	340	502	578	696	680	597	452	796	0
40	4	14	22	65	99	183	307	422	520	567	595	2251	0
50	0	0	0	2	3	8	24	49	71	131	198	4564	0
75	0	0	0	0	0	0	0	0	0	1	0	5049	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	32	0	32	0	0	32	0	32	0	0
15	39	0	39	0	0	39	0	39	0	0
20	24	0	24	0	0	24	0	24	0	0
25	5	0	5	0	0	5	0	5	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	104	145	35	237	0	0	0	1989
15	995	1134	485	1371	0	0	0	3452
20	1223	1401	793	1529	0	0	0	2959
25	1168	1348	847	1402	0	0	0	3351
30	1175	1349	859	1351	0	0	0	2856
35	1151	1379	879	1331	0	0	0	3221
40	1105	1341	863	1270	0	0	0	2846
50	1049	1283	854	1161	0	0	0	2874
75	901	1252	763	994	0	0	0	3032
100	801	1174	678	871	0	0	0	2790

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	104	145	35	237	0	0
15	995	1134	485	1371	0	0
20	1223	1401	793	1529	0	0
25	1168	1348	847	1402	0	0
30	1175	1349	859	1351	0	0
35	1151	1379	879	1331	0	0
40	1105	1341	863	1270	0	0
50	1049	1283	854	1161	0	0
75	901	1252	763	994	0	0
100	801	1174	678	871	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	32	0	32	0	0	0	0
15	0	39	0	39	0	0	0	0
20	0	26	26	25	5	48	0	0
25	0	24	66	11	37	79	0	0
30	0	17	71	8	83	85	0	0
35	0	34	68	13	109	76	0	0
40	0	34	66	17	131	73	0	0
50	0	38	75	28	205	65	0	0
75	0	43	65	29	317	49	0	0
100	0	33	69	25	421	42	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	32	0	32	0	0	0	0
15	0	39	0	39	0	0	0	0
20	0	26	26	25	5	50	0	0
25	0	23	67	10	38	80	0	0
30	0	17	70	8	84	82	0	0
35	0	35	70	14	108	76	0	0
40	0	35	66	16	133	70	0	0
50	0	38	73	27	206	63	0	0
75	0	42	65	30	322	48	0	0
100	0	33	68	26	427	45	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	7	0	7	0	0	0	0
20	0	6	26	6	5	49	0	0
25	0	18	63	6	38	78	0	0
30	0	18	71	7	85	83	0	0
35	0	33	72	14	110	76	0	0
40	0	35	68	17	128	71	0	0
50	0	38	73	26	206	63	0	0
75	0	41	66	29	321	52	0	0
100	0	34	70	26	420	42	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	6	0	7	0	0	0	0
20	0	7	24	6	5	48	0	0
25	0	19	66	8	39	82	0	0
30	0	17	69	9	85	85	0	0
35	0	37	69	13	109	77	0	0
40	0	38	68	16	130	70	0	0
50	0	36	77	27	202	65	0	0
75	0	42	66	30	322	47	0	0
100	0	30	71	25	425	46	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	4	0	0	0	0	0
15	0	3	0	0	0	0	0
20	0	2	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	452	0	452	0	0	0	0
15	0	340	0	340	0	0	0	0
20	0	149	0	149	0	0	0	0
25	0	37	0	37	0	0	0	0
30	0	14	0	14	0	0	0	0
35	0	2	0	2	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	1	0	1	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 9g. G(0.5,100) 60% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	114.4198	161.4389	404.7335	272.9293	938.1114	583.4162
15	98.5953	98.0747	292.8198	228.4510	488.2546	366.3424
20	91.6433	111.1760	212.7637	185.8531	316.6945	270.1773
25	88.1828	82.3148	175.1542	158.4252	247.8331	219.6621
30	85.2575	95.3248	150.1604	139.3962	205.4935	187.5474
35	84.0938	71.6037	135.5687	128.3373	180.0447	168.1370
40	82.3938	79.5289	121.5470	116.9621	159.8581	152.1323
50	80.5774	75.2240	108.9070	106.0552	136.9927	132.3519
75	77.4767	56.1367	89.9988	88.8380	107.8428	105.9484
100	75.8875	59.9080	81.3559	80.7153	94.4629	93.4177

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	119.1176	117.3702	138.9741	178.3191	147.1040
15	95.1537	90.7734	114.6334	920.9066	131.2839
20	78.7615	74.6058	95.4997	704.6908	120.7166
25	66.9945	63.4789	80.2496	286.3868	112.4099
30	57.7700	55.5511	68.5444	56.1259	104.3156
35	51.5587	50.1702	60.7090	49.6901	100.6923
40	47.6099	46.2618	55.1443	45.9365	96.0797
50	40.8046	39.6047	46.6702	39.6039	91.6828
75	32.6717	31.2190	36.0990	31.8463	83.9635
100	27.9940	26.2739	30.4351	27.3186	79.9673

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	86.8494	83.5152	101.9116	139.3562	113.0846
15	58.1660	51.2391	73.6217	3276.9460	95.3914
20	45.7457	39.7999	56.2959	7819.6104	87.7853
25	39.8597	35.3915	47.1858	7527.9837	83.9111
30	34.6200	32.0587	40.3110	38.8130	80.5052
35	31.8432	30.3259	36.1284	30.4301	79.2340
40	29.9864	28.6380	33.8892	28.6742	77.2322
50	25.9923	24.9911	28.9151	25.2305	75.2329
75	21.4092	20.3494	23.2955	20.8562	71.4683
100	18.8074	17.6959	20.1674	18.3643	69.4792

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	101.2397	98.5565	118.3441	100.2865	109.3557	97.7037
15	76.1173	69.4951	87.3914	71.2390	88.0688	59.3378
20	66.1705	59.8585	72.7742	61.3030	79.8304	45.8271
25	58.9421	54.0562	64.1149	54.9514	76.2113	39.4901
30	52.7722	50.0861	57.1042	50.8563	73.6997	35.3117
35	48.7263	47.4439	52.1560	48.1464	72.7191	32.7938
40	45.3716	44.4079	48.4019	44.8418	71.2558	29.9511
50	40.6449	40.1279	42.9894	40.4282	69.6404	26.0001
75	33.9515	33.5553	35.3728	33.8674	66.8151	20.4908
100	29.8977	29.5719	30.8665	29.9502	65.3700	17.9527

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	808.2319	0.46%	96.3228	0.02%	258.7100
15	0.00%	250.0758	0.42%	75.0757	0.00%	163.3906
20	0.00%	154.5799	0.32%	68.9725	0.00%	132.0857
25	0.00%	123.3296	0.16%	66.8069	0.00%	110.7882
30	0.00%	106.2246	0.08%	65.5253	0.00%	99.9919
35	0.00%	97.8224	0.06%	65.1850	0.00%	94.6673
40	0.00%	91.5095	0.02%	64.6052	0.00%	89.4817
50	0.00%	82.1273	0.00%	63.8542	0.00%	83.9713
75	0.00%	71.7535	0.00%	62.9211	0.00%	76.5630
100	0.00%	67.0162	0.00%	62.5348	0.00%	73.0485

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	101.325	733.849	876.666	83.564	82.220	221.430	116.475
15	84.027	762.053	3109.992	50.367	54.327	5446.476	102.099
20	77.445	946.234	1419.383	41.024	46.399	11912.171	95.201
25	74.694	1126.462	2348.948	36.357	40.916	10903.457	90.867
30	72.637	2602.983	2305.012	33.125	36.757	41.896	87.194
35	71.909	2087.072	524.119	31.035	33.914	30.618	85.571
40	70.626	1973.867	1835.970	29.047	30.045	28.906	83.365
50	69.182	448.569	470.945	25.380	25.773	25.512	81.124
75	66.563	74.582	91.478	20.554	19.487	21.146	77.660
100	65.209	147.988	29.002	17.933	15.687	18.763	75.981

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	136.521	79.344	88.711	74.188	66.763	206831.560	218.875
15	107.149	59.425	61.081	49.344	65.993	471791731.814	145.480
20	97.011	57.155	51.894	53.043	87.468	4561831696.970	121.471
25	91.091	55.275	49.610	48.566	83.836	4358697571.672	107.833
30	86.176	50.204	44.774	45.356	78.545	5771.811	99.944
35	83.434	47.185	42.851	42.556	72.513	42.390	95.885
40	80.188	41.144	38.503	37.602	60.764	36.900	91.667
50	76.688	35.518	33.824	34.045	55.209	32.909	87.600
75	70.998	26.741	26.229	27.749	43.270	26.543	81.465
100	68.395	22.695	22.652	23.811	36.915	22.882	78.701

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	107.174	117.154	119.691	97.290	109.571	99.578	126.304
15	87.831	110.311	111.862	70.357	86.040	74.319	110.189
20	80.023	107.703	109.314	58.032	73.542	62.377	101.708
25	76.456	100.461	101.793	52.054	63.881	54.150	95.904
30	73.957	90.686	91.289	47.948	56.880	48.862	91.262
35	73.078	81.624	82.096	45.264	52.089	45.829	89.036
40	71.606	70.738	70.949	42.979	47.942	43.393	86.282
50	70.022	55.741	55.911	38.822	42.096	39.268	83.458
75	67.128	36.254	36.524	32.725	33.806	33.295	79.096
100	65.666	30.370	30.826	29.128	29.236	29.804	77.065

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

n	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	173.8704	173.0951	203.5653	182.4667	207.9939	167.6770
15	134.5015	130.0317	158.6447	135.5961	178.1222	139.1820
20	118.6765	114.0706	133.6894	118.0575	161.2376	126.4609
25	107.2804	104.0373	118.7748	106.7094	150.2182	119.4807
30	98.5945	96.9631	107.5025	98.9693	139.8409	113.9554
35	92.5907	92.1498	99.8211	93.5459	134.8518	111.1953
40	87.1597	86.7914	93.2380	87.8863	128.4560	107.6172
50	79.2190	79.1898	83.8680	79.7529	121.7424	103.6413
75	66.4226	66.4565	69.1909	66.7116	109.2336	96.4605
100	58.7974	58.9485	60.5991	59.0730	102.3028	92.5257

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	173.8704	173.0951	203.5653	182.4667	207.9939	167.6770
15	134.5015	130.0317	158.6447	135.5961	178.1222	139.1820
20	118.6765	114.0706	133.6894	118.0575	161.2376	126.4609
25	107.2804	104.0373	118.7748	106.7094	150.2182	119.4807
30	98.5945	96.9631	107.5025	98.9693	139.8409	113.9554
35	92.5907	92.1498	99.8211	93.5459	134.8518	111.1953
40	87.1597	86.7914	93.2380	87.8863	128.4560	107.6172
50	79.2190	79.1898	83.8680	79.7529	121.7424	103.6413
75	66.4226	66.4565	69.1909	66.7116	109.2336	96.4605
100	58.7974	58.9485	60.5991	59.0730	102.3028	92.5257

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	101.3869	149.7148	106.8129	115.1714	111.1759
15	84.6169	115.3774	87.5676	92.5854	91.7604
20	78.2955	103.9321	79.8178	82.4525	83.4166
25	75.5352	96.3387	76.2725	77.5323	79.3724
30	73.4506	90.0849	73.9014	74.6010	76.3923
35	72.5571	85.9536	73.0039	73.5742	74.2303
40	71.1825	82.0836	71.5747	71.9815	72.8133
50	69.5480	77.4903	69.9967	70.4033	70.3443
75	66.6817	70.8657	67.1358	67.3869	67.0247
100	65.2344	68.1353	65.6588	65.8593	65.3700

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	109.356	96.410	81.544	104.161	115.352	50969.191	115.811
15	88.069	78.697	63.481	81.902	94.772	429411.966	98.387
20	79.830	72.602	58.974	68.977	79.134	543839.620	90.932
25	76.211	67.973	57.024	60.742	66.206	341086.757	87.279
30	73.700	1115.041	1100.826	54.348	57.824	173128.998	84.217
35	72.719	733.460	720.131	50.382	52.029	352.881	83.063
40	71.256	48.829	42.800	46.681	47.047	53.586	81.381
50	69.640	42.339	37.740	40.873	40.249	46.288	79.581
75	66.815	34.346	31.769	32.865	30.792	36.279	76.735
100	65.370	30.128	28.320	28.517	26.358	31.288	75.270

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	99.66	99.64	99.90	99.72	99.72	96.47	95.96	99.32	95.35	96.75
15	99.07	98.79	99.88	99.05	99.05	53.29	46.46	81.89	43.92	94.83
20	96.74	95.96	99.64	96.32	98.44	35.28	29.41	52.69	27.78	94.12
25	85.52	83.88	98.55	82.00	98.63	26.35	21.58	38.03	20.77	94.59
30	61.52	58.75	94.80	56.40	99.11	19.94	16.73	27.88	16.40	95.23
35	48.55	46.12	79.37	44.97	99.27	15.04	12.83	20.85	12.99	96.16
40	40.21	37.92	61.49	37.62	99.52	10.88	9.35	15.55	9.66	96.69
50	24.63	21.86	37.05	22.79	99.80	6.14	5.31	8.32	5.50	97.43
75	7.80	6.18	10.93	7.09	99.90	1.25	0.95	1.92	1.11	98.50
100	2.63	1.82	3.60	2.30	99.98	0.46	0.30	0.59	0.44	99.15

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	99.66	95.43	N/A	N/A	100.00	100.00
15	99.29	97.44	N/A	N/A	100.00	100.00
20	99.37	92.61	N/A	N/A	100.00	100.00
25	99.43	93.70	N/A	N/A	100.00	100.00
30	99.50	90.71	N/A	N/A	100.00	100.00
35	99.78	91.30	N/A	N/A	100.00	100.00
40	99.78	83.38	N/A	N/A	100.00	100.00
50	99.98	83.21	N/A	N/A	100.00	100.00
75	99.98	65.18	N/A	N/A	100.00	100.00
100	100.00	70.10	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	99.17	99.08	99.64	99.17	99.07	98.81
15	81.65	77.27	96.34	77.87	94.93	61.49
20	69.92	65.30	82.53	67.76	92.04	38.02
25	58.58	54.26	70.87	56.81	92.26	26.42
30	48.73	46.27	59.23	47.76	92.36	18.95
35	40.21	38.59	48.41	40.09	92.85	14.10
40	31.11	29.11	39.32	31.05	93.50	9.68
50	18.60	17.39	24.21	18.41	94.77	4.69
75	5.53	4.51	7.20	5.54	96.00	0.75
100	1.65	1.35	2.02	1.45	97.21	0.10

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.46%	98.65	0.02%	99.70
15	0.00%	99.54	0.42%	94.01	0.00%	98.89
20	0.00%	95.43	0.32%	91.28	0.00%	98.26
25	0.00%	92.53	0.16%	91.81	0.00%	97.92
30	0.00%	90.38	0.08%	92.21	0.00%	98.12
35	0.00%	90.81	0.06%	93.84	0.00%	98.36
40	0.00%	89.94	0.02%	94.95	0.00%	98.40
50	0.00%	89.27	0.00%	96.22	0.00%	98.44
75	0.00%	88.10	0.00%	98.32	0.00%	98.97
100	0.00%	87.07	0.00%	99.37	0.00%	99.41

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	97.78	98.05	97.58	95.86	86.59	94.12	96.32	99.68
15	92.71	79.94	88.59	46.87	50.44	44.87	93.33	99.50
20	90.00	68.74	81.40	30.89	32.24	28.81	92.22	99.72
25	90.91	60.26	75.31	23.45	22.89	22.90	93.17	99.68
30	91.23	49.57	63.57	18.82	17.83	19.62	93.98	99.74
35	92.38	39.73	51.11	15.35	13.88	16.07	94.85	99.86
40	92.89	30.19	39.77	12.44	10.33	13.33	95.49	99.88
50	94.46	16.55	21.20	7.77	5.81	8.65	96.08	100.00
75	95.82	4.01	4.87	2.36	1.48	3.12	96.51	99.98
100	97.11	1.38	1.78	0.84	0.36	1.16	97.35	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	97.76	74.24	87.99	73.37	59.92	61.15	94.48	99.76
15	94.14	37.24	46.37	33.43	29.64	27.70	95.49	99.50
20	93.47	26.56	31.58	21.44	17.47	19.62	96.20	99.58
25	94.93	20.84	24.41	16.93	12.79	16.01	97.37	99.76
30	95.82	16.14	19.44	13.79	10.04	13.59	98.46	99.74
35	96.51	13.24	15.61	11.79	8.07	11.91	98.85	99.84
40	97.15	10.73	12.74	9.55	5.76	9.49	99.07	99.94
50	97.47	7.05	8.44	6.08	3.13	6.43	99.31	99.98
75	97.94	2.75	3.04	1.83	0.92	2.44	98.75	100.00
100	98.77	1.17	1.23	0.69	0.15	0.88	98.83	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	98.83	99.62	99.66	99.01	99.56	98.99	98.91	99.84
15	94.85	97.40	97.70	81.56	94.93	85.47	93.90	99.76
20	92.36	95.48	95.37	62.03	86.95	68.29	91.56	99.82
25	92.48	92.52	92.17	49.33	76.51	52.96	91.88	99.88
30	92.34	85.29	84.37	39.45	62.45	40.97	92.36	99.84
35	93.15	74.82	74.86	31.58	50.38	32.65	93.09	99.92
40	93.76	60.60	60.51	25.28	38.69	26.28	93.47	99.94
50	95.05	35.17	35.43	14.20	20.39	15.12	94.91	100.00
75	96.24	7.38	7.73	3.47	3.68	4.29	96.18	100.00
100	97.39	1.70	2.01	0.93	0.67	1.29	97.39	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.41	87.41	87.19	99.58	99.92	99.74	99.60	99.90
15	96.93	85.37	85.61	92.44	97.29	95.01	95.74	99.82
20	94.40	89.19	89.45	74.64	90.98	81.93	93.03	99.94
25	93.66	92.20	92.57	65.60	82.81	69.52	92.67	99.96
30	92.87	92.11	92.32	57.27	70.49	59.32	92.28	99.94
35	93.50	88.79	89.16	51.67	60.60	51.91	93.37	99.98
40	94.00	82.32	84.24	49.29	51.35	50.00	93.54	100.00
50	95.15	64.52	66.55	38.48	35.91	40.25	94.99	100.00
75	96.36	27.29	28.26	18.52	21.05	20.70	96.24	100.00
100	97.45	8.49	8.27	5.81	9.58	6.64	97.45	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.96	99.96	99.96	99.96	99.96	99.96
15	99.85	99.74	99.98	99.83	99.88	99.88
20	99.10	98.66	100.00	98.94	99.60	99.88
25	98.95	98.80	99.97	98.94	99.74	99.96
30	98.67	98.36	99.71	98.68	99.66	99.98
35	98.78	98.59	99.76	98.91	99.78	99.98
40	98.59	98.62	99.49	98.89	99.86	100.00
50	97.50	97.53	98.81	97.54	99.90	100.00
75	92.34	92.27	95.40	92.71	99.98	100.00
100	81.00	81.97	85.98	81.98	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.07	98.09	79.88	114.22	99.72	99.76	95.29	99.68
15	94.93	94.41	61.60	113.47	97.68	99.70	95.56	99.33
20	92.04	92.15	54.97	99.06	89.50	99.37	94.81	99.25
25	92.26	81.18	48.51	75.28	76.73	97.33	94.63	99.37
30	92.36	62.27	40.79	51.99	61.35	87.03	94.85	99.47
35	92.85	48.61	33.37	39.89	48.14	64.04	94.42	99.80
40	93.50	38.29	27.90	30.90	37.01	46.55	94.55	99.80
50	94.77	21.42	16.32	17.68	19.17	25.96	95.50	99.92
75	96.00	6.00	5.01	4.67	3.45	6.79	96.14	99.96
100	97.21	1.88	1.72	1.27	0.53	2.06	97.21	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Detection Limit: 35.4163150
Averaged Percentage Non-detects: 60.00%
Distribution Check: Average of means: 49.911709
Distribution Check: Average of stdvs: 69.460905
Average of NDs per 100 observations: 60.072600

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	35.416315	4.360198	4	21	145	588	1516	2776	0	0	0	0
15	35.416315	8.239802	0	0	1	11	55	183	415	781	1136	1284
20	35.416315	11.761386	0	0	0	0	3	13	26	81	172	382
25	35.416315	14.927327	0	0	0	0	0	0	2	4	10	37
30	35.416315	18.017030	0	0	0	0	0	0	0	0	0	2
35	35.416315	21.024950	0	0	0	0	0	0	0	0	0	0
40	35.416315	23.933465	0	0	0	0	0	0	0	0	0	1
50	35.416315	30.045941	0	0	0	0	0	0	0	0	0	0
75	35.416315	44.953267	0	0	0	0	0	0	0	0	0	0
100	35.416315	59.817822	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	8729
15	1184	0	0	0	0	0	0	0	0	0	0	0	1366
20	626	854	944	904	628	417	0	0	0	0	0	0	250
25	115	229	398	571	741	835	771	649	376	214	98	0	45
30	12	30	69	136	257	407	491	657	746	738	578	927	8
35	1	2	8	12	52	94	176	249	388	498	639	2931	0
40	0	0	0	4	2	12	21	59	93	187	267	4404	0
50	0	0	0	0	0	0	0	1	0	2	9	5038	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	70	0	70	0	0	70	0	70	0	0
15	79	0	79	0	0	79	0	79	0	0
20	55	0	55	0	0	55	0	55	0	0
25	30	0	30	0	0	30	0	30	0	0
30	14	0	14	0	0	14	0	14	0	0
35	4	0	4	0	0	4	0	4	0	0
40	2	0	2	0	0	2	0	2	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	91	62	70	110	0	0	0	2776
15	1105	1227	481	1611	0	0	0	4385
20	1729	1915	1105	2218	0	0	0	4373
25	1914	2127	1398	2320	0	0	0	4653
30	2048	2251	1626	2399	0	0	0	4544
35	2175	2355	1751	2478	0	0	0	4705
40	2080	2295	1688	2348	0	0	0	4671
50	2286	2502	1935	2491	0	0	0	4782
75	2375	2657	2091	2540	0	0	0	4938
100	2381	2760	2132	2559	0	0	0	4953

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	91	62	70	110	0	0
15	1105	1227	481	1611	0	0
20	1729	1915	1105	2218	0	0
25	1914	2127	1398	2320	0	0
30	2048	2251	1626	2399	0	0
35	2175	2355	1751	2478	0	0
40	2080	2295	1688	2348	0	0
50	2286	2502	1935	2491	0	0
75	2375	2657	2091	2540	0	0
100	2381	2760	2132	2559	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	70	0	70	0	0	0	0
15	0	79	0	79	0	0	0	0
20	0	72	35	62	7	86	0	0
25	0	57	138	36	38	199	0	0
30	0	51	178	30	110	258	0	0
35	0	84	256	46	201	307	0	0
40	0	88	245	43	250	286	0	0
50	0	161	310	95	475	335	0	0
75	0	259	350	181	799	336	0	0
100	0	342	438	263	1151	388	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	70	0	70	0	0	0	0
15	0	79	0	79	0	0	0	0
20	0	72	36	62	7	91	0	0
25	0	55	141	36	37	198	0	0
30	0	50	177	29	112	259	0	0
35	0	88	251	47	206	305	0	0
40	0	84	245	44	255	288	0	0
50	0	159	313	96	477	340	0	0
75	0	256	348	180	806	338	0	0
100	0	342	441	264	1153	386	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	26	38	17	7	90	0	0
25	0	38	142	15	35	201	0	0
30	0	41	180	20	112	261	0	0
35	0	85	249	43	207	312	0	0
40	0	86	247	44	255	286	0	0
50	0	162	312	99	470	334	0	0
75	0	255	346	184	809	337	0	0
100	0	340	441	266	1151	385	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	26	34	17	6	91	0	0
25	0	36	140	16	36	198	0	0
30	0	42	178	22	110	261	0	0
35	0	82	250	43	205	309	0	0
40	0	84	238	43	255	284	0	0
50	0	163	313	96	478	335	0	0
75	0	260	347	188	813	336	0	0
100	0	340	438	263	1156	382	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	23	1	0	0	0	0
15	0	21	0	0	0	0	0
20	0	16	0	0	0	0	0
25	0	8	0	0	0	0	0
30	0	4	0	0	0	0	0
35	0	3	0	0	0	0	0
40	0	1	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	661	0	661	0	0	0	0
15	0	721	0	721	0	0	0	0
20	0	477	0	477	0	0	0	0
25	0	272	0	272	0	0	0	0
30	0	120	0	120	0	0	0	0
35	0	61	0	61	0	0	0	0
40	0	17	0	17	0	0	0	0
50	0	4	0	4	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 9h. G(0.5,100) 60% Type 1 Censoring (2nd Run)

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	114.0861	164.6503	404.1321	272.1806	942.9525	585.1830
15	98.3871	98.7005	293.8662	229.1670	489.2742	366.7830
20	91.8871	109.8500	216.9352	189.2464	318.8544	271.8941
25	88.3816	79.6300	173.9044	157.4109	248.4637	220.3043
30	85.8630	94.1378	150.0674	139.4018	207.4297	189.3355
35	84.0590	70.8583	134.5906	127.4602	179.8016	167.9243
40	82.9709	80.4826	123.4661	118.7591	161.4294	153.6105
50	80.8883	76.9992	109.5240	106.6580	137.7374	133.0723
75	77.6685	58.5955	90.2000	89.0365	108.2207	106.3179
100	75.6703	61.6987	80.8531	80.2206	94.0763	93.0355

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	118.6716	117.0640	138.6346	153.3158	146.9612
15	94.9391	90.6152	114.7573	2232.7311	131.9627
20	78.6907	74.5722	95.6005	219.3639	121.2574
25	67.1641	63.8855	80.3610	63.6291	111.4873
30	58.3451	56.0412	69.0846	596.7275	105.1660
35	52.1406	50.2421	61.1489	49.7780	100.3201
40	47.8312	46.3952	55.4781	46.0689	97.0337
50	41.1098	39.9521	46.9792	39.9371	91.9271
75	32.5617	31.0998	36.0516	31.7281	84.2532
100	27.8369	26.1925	30.2679	27.1625	79.7354

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	86.2335	82.9670	101.3702	114.2777	112.7105
15	57.4083	50.4803	73.0503	8294.5173	95.3344
20	44.9452	38.8628	56.0041	1869.2755	88.0659
25	40.0272	35.8674	47.4218	35.7837	83.9118
30	35.4659	32.6627	41.1178	2076.5523	81.2388
35	32.4648	30.4619	36.8950	30.5295	79.0901
40	30.1377	28.6815	34.0096	28.8346	77.8888
50	26.1665	25.0972	29.0645	25.4108	75.5170
75	21.4423	20.3458	23.3103	20.9073	71.6909
100	18.7333	17.6383	20.0568	18.3058	69.2387

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	100.6878	98.1544	117.8162	99.8067	108.9254	97.0766
15	75.2192	68.5116	86.8352	70.3786	87.7089	59.0326
20	65.9706	59.5510	72.6639	60.8599	80.0357	45.1312
25	59.4364	54.8848	64.3715	55.7536	76.6067	40.1320
30	53.1583	50.3531	57.2888	50.9434	74.3356	35.9531
35	48.9595	46.9946	52.4165	47.4494	72.6326	32.4648
40	46.0030	44.8477	48.9199	45.4130	71.7968	30.0580
50	41.0653	40.5510	43.3504	41.0077	69.9221	25.5241
75	33.7548	33.2835	35.2246	33.6232	67.0103	20.4054
100	29.8257	29.4398	30.8829	29.7738	65.1314	17.8322

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	808.2329	0.42%	95.7119	0.00%	256.8266
15	0.00%	245.6455	0.34%	74.7101	0.00%	167.7983
20	0.00%	154.2359	0.38%	69.0189	0.00%	132.1699
25	0.00%	124.9320	0.06%	67.1386	0.00%	111.6375
30	0.00%	107.8641	0.06%	65.9498	0.00%	100.8517
35	0.00%	97.8745	0.00%	65.1117	0.00%	94.2860
40	0.00%	92.4523	0.00%	64.9386	0.00%	90.4842
50	0.00%	82.8762	0.00%	64.1110	0.00%	84.4048
75	0.00%	72.0194	0.00%	63.0488	0.00%	76.7860
100	0.00%	66.6556	0.00%	62.4171	0.00%	72.8019

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	100.901	278.577	321.016	82.911	81.268	160.198	116.110
15	83.598	474.017	6109.665	49.566	54.043	13819.923	102.094
20	77.634	1626.085	12335.702	40.102	46.375	2835.551	95.543
25	75.077	1773.757	114692.404	36.802	41.732	35.553	91.100
30	73.287	2213.644	486.036	33.440	37.237	2977.117	87.784
35	71.835	1506.346	1117.006	30.858	32.607	30.308	85.446
40	71.151	6155.877	930.549	28.873	29.935	28.765	83.991
50	69.465	755.161	821.454	25.417	25.167	25.624	81.436
75	66.756	160.524	62.590	20.493	18.839	21.091	77.872
100	64.966	40.628	43.080	17.817	15.525	18.708	75.773

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	135.661	77.417	86.855	73.175	65.773	81492.713	211.989
15	106.778	58.434	59.801	48.582	65.506	2052117351.459	146.563
20	97.284	57.801	52.615	51.746	83.969	131775772.641	120.910
25	91.367	53.900	48.866	47.522	82.060	48.387	108.344
30	87.000	50.733	45.566	45.243	78.526	536322458.150	100.780
35	83.369	46.518	42.765	40.806	68.492	40.112	95.737
40	80.854	41.978	39.024	37.801	61.370	36.659	92.380
50	76.750	35.576	33.790	33.649	53.363	33.035	87.631
75	71.228	26.183	26.017	27.136	42.150	25.979	81.694
100	68.120	22.791	22.709	23.687	36.542	22.822	78.422

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	106.794	116.201	119.043	96.913	109.036	99.021	125.918
15	87.529	111.123	112.703	70.014	86.519	74.482	110.409
20	80.198	108.100	109.660	57.846	73.885	62.931	102.156
25	76.837	99.914	101.287	52.516	64.366	54.500	96.141
30	74.632	89.799	90.500	48.343	57.152	49.220	91.859
35	72.991	81.047	81.542	45.313	51.944	45.777	88.895
40	72.145	71.995	72.407	43.233	48.341	43.652	86.964
50	70.286	56.570	56.775	39.027	42.264	39.522	83.730
75	67.346	36.809	37.257	32.838	34.053	33.369	79.366
100	65.418	30.451	30.838	29.083	29.302	29.673	76.862

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	114.917	136.230	692.237	116.900	145.007	128.198	142.712
15	92.885	521.556	1079.628	84.977	108.946	95.478	124.351
20	82.950	119.985	277.240	68.883	89.432	77.749	112.854
25	78.193	117.507	227.770	62.028	76.529	65.951	104.276
30	75.500	111.433	115.534	56.986	66.867	58.580	98.204
35	73.605	102.100	106.432	53.077	59.685	53.926	94.101
40	72.690	92.171	95.702	50.513	55.217	51.197	91.404
50	70.700	72.065	74.638	45.301	47.407	45.954	87.132
75	67.609	45.453	46.431	37.952	37.477	38.864	81.456
100	65.624	35.693	36.187	33.325	31.904	34.324	78.439

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	173.3089	172.8548	202.8774	182.1582	207.6507	167.1717
15	133.1985	128.9069	157.9313	134.2974	178.5536	138.8420
20	118.2264	113.7273	133.3281	117.4935	162.0790	126.9904
25	108.5922	105.4092	119.4684	108.0461	149.4500	119.8716
30	99.6547	97.9341	108.3777	99.8141	141.1941	114.8780
35	92.6182	91.6765	99.9945	92.8337	134.4625	111.0565
40	88.3752	87.8976	94.4885	89.1976	129.7828	108.5191
50	79.8592	79.9567	84.5076	80.5726	122.0807	104.0015
75	66.5175	66.6114	69.2946	66.8078	109.6533	96.7566
100	58.6698	58.6776	60.5761	58.8799	101.9237	92.1995

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	100.9953	149.6112	106.4915	115.0550	110.6004
15	84.2487	115.2851	87.2421	92.3835	91.2521
20	78.4600	103.6948	79.9931	82.5603	83.1962
25	75.9087	96.3031	76.7219	77.9257	79.2222
30	74.0522	90.8676	74.5306	75.2415	76.6239
35	72.5034	86.0585	72.9115	73.4299	74.3017
40	71.6889	82.5794	72.0999	72.5799	73.4431
50	69.8179	77.3941	70.2745	70.6088	70.4669
75	66.8624	71.0719	67.3492	67.6433	67.3135
100	64.9997	67.8538	65.4152	65.6333	65.1314

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	108.925	1280.495	1264.102	103.703	114.739	27677.030	115.396
15	87.709	292.054	276.586	81.818	94.834	692205.330	98.252
20	80.036	616.035	601.173	68.862	79.547	556715.527	91.224
25	76.607	1953.127	1932.990	61.136	66.755	266732.876	87.462
30	74.336	60.347	51.357	54.848	58.241	206578.601	84.807
35	72.633	54.590	47.233	50.316	52.057	15807.667	83.005
40	71.797	50.010	43.873	46.948	47.506	140512.048	81.930
50	69.922	43.312	38.692	40.949	40.076	46.438	79.921
75	67.010	34.532	31.869	32.924	31.096	36.396	76.907
100	65.131	29.963	28.207	28.554	26.409	31.215	75.048

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	99.68	99.66	99.88	99.70	99.70	96.24	95.76	98.70	94.95	96.20
15	99.15	98.87	99.86	99.09	99.09	52.01	44.81	82.69	42.34	95.05
20	96.75	96.06	99.56	96.32	98.61	34.68	28.34	52.68	26.85	94.32
25	85.32	84.20	98.71	82.42	98.59	27.76	23.07	39.51	22.28	94.99
30	64.56	61.72	95.39	59.84	99.11	19.85	16.38	28.47	15.96	95.45
35	49.69	46.75	79.37	46.28	99.31	14.82	12.48	20.94	12.51	95.94
40	40.97	38.36	62.26	38.14	99.54	11.25	9.66	16.24	9.84	96.55
50	25.54	23.13	38.12	23.80	99.86	6.46	5.13	9.23	5.74	97.58
75	7.62	6.02	10.89	6.97	99.92	1.64	1.15	2.40	1.45	98.55
100	2.20	1.68	3.33	2.04	99.96	0.28	0.18	0.40	0.26	99.01

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	99.56	96.35	N/A	N/A	100.00	100.00
15	99.29	96.88	N/A	N/A	100.00	100.00
20	99.29	92.26	N/A	N/A	100.00	100.00
25	99.39	92.51	N/A	N/A	100.00	100.00
30	99.56	89.46	N/A	N/A	100.00	100.00
35	99.68	88.51	N/A	N/A	100.00	100.00
40	99.76	83.69	N/A	N/A	100.00	100.00
50	99.94	84.56	N/A	N/A	100.00	100.00
75	99.96	78.18	N/A	N/A	99.98	99.98
100	99.98	68.42	N/A	N/A	99.98	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	98.51	98.34	99.60	98.50	98.40	98.42
15	81.51	76.07	96.36	76.99	94.79	60.48
20	69.64	64.46	83.21	66.47	92.50	37.39
25	61.00	57.63	72.39	59.41	92.59	27.98
30	48.87	45.93	61.16	47.56	92.40	19.19
35	39.48	37.03	49.19	38.50	93.21	14.00
40	32.39	30.61	41.58	32.02	93.47	9.86
50	20.62	19.16	25.84	20.31	94.77	4.30
75	5.85	5.16	7.07	5.79	96.40	0.59
100	1.40	1.05	1.84	1.36	97.17	0.06

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.42%	97.91	0.00%	99.68
15	0.00%	99.60	0.34%	93.90	0.00%	98.97
20	0.00%	95.62	0.38%	91.87	0.00%	98.38
25	0.00%	92.65	0.06%	91.88	0.00%	98.18
30	0.00%	91.21	0.06%	92.43	0.00%	98.08
35	0.00%	90.85	0.00%	93.80	0.00%	98.26
40	0.00%	90.57	0.00%	94.30	0.00%	98.12
50	0.00%	89.66	0.00%	96.48	0.00%	98.67
75	0.00%	88.65	0.00%	98.44	0.00%	99.01
100	0.00%	87.25	0.00%	99.11	0.00%	99.03

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	97.35	97.74	97.72	94.56	86.06	93.25	95.52	99.64
15	92.42	80.86	89.01	45.13	49.35	43.19	93.54	99.52
20	90.44	69.06	81.83	29.49	32.28	27.84	92.26	99.54
25	91.27	61.71	75.42	24.79	24.40	24.46	93.39	99.76
30	91.37	50.52	64.14	18.75	17.36	19.00	93.86	99.80
35	92.53	38.94	51.60	15.00	13.07	15.85	94.79	99.80
40	92.93	31.77	40.80	12.81	10.31	13.58	95.23	99.90
50	94.50	17.20	21.72	7.82	5.41	8.86	96.04	99.96
75	96.22	4.58	5.32	2.48	1.23	3.07	96.83	99.96
100	97.07	1.23	1.55	0.71	0.31	0.97	97.17	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	97.39	72.10	86.67	72.16	59.03	59.70	93.74	99.80
15	93.84	35.97	44.85	31.66	27.88	25.98	95.84	99.62
20	93.52	25.41	31.12	20.73	17.34	18.33	95.88	99.54
25	95.03	21.49	25.64	17.78	13.21	16.34	97.60	99.80
30	95.72	16.53	19.71	13.56	9.25	13.17	98.50	99.68
35	96.48	13.32	15.86	11.42	6.86	11.17	99.03	99.84
40	96.91	10.99	13.02	9.28	5.43	9.56	99.07	99.84
50	97.60	7.02	8.29	5.56	2.91	6.33	99.25	99.98
75	98.02	2.75	3.22	2.07	0.69	2.43	98.61	99.96
100	98.51	0.96	1.05	0.65	0.13	0.78	98.67	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	97.98	99.49	99.56	98.38	99.23	98.42	98.32	99.78
15	94.81	97.74	97.97	82.57	95.43	85.96	93.84	99.72
20	92.48	95.64	95.49	62.19	87.55	68.31	92.00	99.74
25	92.75	92.63	92.54	51.48	77.12	54.99	92.16	99.88
30	92.53	86.25	85.96	41.14	63.70	43.10	92.14	99.86
35	93.39	74.03	74.54	31.91	49.74	33.05	93.13	99.90
40	93.56	62.07	62.58	26.06	38.82	27.80	93.45	99.92
50	94.99	36.04	36.43	14.75	19.44	16.02	94.99	99.98
75	96.51	7.84	8.45	3.63	3.60	4.13	96.63	99.98
100	97.31	1.74	2.03	0.83	0.64	1.14	97.33	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.11	87.43	87.39	99.58	99.92	99.64	99.47	99.90
15	97.29	84.56	84.84	93.43	97.54	95.41	96.18	99.90
20	94.71	88.69	88.80	74.72	91.42	81.43	93.66	99.86
25	94.00	93.17	93.40	66.58	82.38	71.02	93.49	99.96
30	93.31	92.42	92.91	58.76	72.06	61.02	92.61	99.94
35	93.70	88.87	89.49	52.19	60.00	53.81	93.43	99.96
40	93.92	82.14	83.86	48.72	50.90	49.78	93.66	99.94
50	95.17	64.90	67.59	38.79	36.03	40.25	94.99	100.00
75	96.73	28.74	29.66	19.69	20.43	21.49	96.61	99.98
100	97.35	7.81	7.76	5.23	9.52	6.80	97.37	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.98	99.98	99.98	99.98	99.98	99.96
15	99.97	99.84	100.00	99.88	99.92	99.96
20	99.29	98.86	99.92	99.03	99.62	99.88
25	99.17	98.81	99.97	99.05	99.62	99.98
30	98.92	98.55	99.74	98.82	99.64	99.90
35	98.74	98.69	99.62	98.87	99.84	99.98
40	98.38	98.29	99.40	98.71	99.80	100.00
50	97.57	97.48	99.10	97.76	99.96	100.00
75	92.45	92.44	96.08	92.64	99.96	100.00
100	81.17	81.84	86.67	82.20	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 35.4163150
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	98.40	97.47	78.89	113.82	99.62	99.70	94.91	99.54
15	94.79	94.35	60.63	114.98	98.10	99.72	95.72	99.31
20	92.50	92.66	55.23	101.08	90.24	99.41	94.61	99.27
25	92.59	82.30	51.01	75.66	77.68	97.47	94.65	99.41
30	92.40	65.93	42.30	55.47	63.37	87.98	94.65	99.56
35	93.21	49.03	34.28	40.18	48.32	64.18	94.85	99.64
40	93.47	38.91	28.30	31.73	37.33	47.50	94.79	99.66
50	94.77	22.51	17.15	17.85	18.97	25.78	95.31	99.90
75	96.40	6.08	5.15	4.73	3.19	6.81	96.44	99.96
100	97.17	1.70	1.39	1.07	0.57	1.84	97.17	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.50
Beta Value: 100.00
Population Mean: 50.0000000
Number of Test Runs: 5050
Detection Limit: 35.4163150
Averaged Percentage Non-detects: 60.00%
Distribution Check: Average of means: 49.866609
Distribution Check: Average of stdvs: 69.517187
Average of NDs per 100 observations: 60.112100

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	35.416315	4.376238	0	25	138	553	1530	2804	0	0	0	0
15	35.416315	8.294653	0	0	4	11	69	145	380	763	1114	1327
20	35.416315	11.800198	0	0	0	0	2	8	25	73	182	369
25	35.416315	14.876436	0	0	0	0	0	0	0	3	18	46
30	35.416315	17.965941	0	0	0	0	0	0	0	0	1	1
35	35.416315	20.993267	0	0	0	0	0	0	0	0	0	0
40	35.416315	23.957624	0	0	0	0	0	0	0	0	0	0
50	35.416315	29.986535	0	0	0	0	0	0	0	0	0	0
75	35.416315	44.969703	0	0	0	0	0	0	0	0	0	0
100	35.416315	59.959208	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	8632
15	1237	0	0	0	0	0	0	0	0	0	0	0	1475
20	595	846	970	890	711	379	0	0	0	0	0	0	297
25	102	218	442	593	752	837	735	592	416	199	97	0	50
30	3	26	73	136	244	388	562	711	791	686	575	853	5
35	0	0	5	10	32	95	154	271	418	528	651	2886	0
40	0	0	0	2	3	13	22	49	97	188	285	4391	0
50	0	0	0	0	0	0	0	1	2	5	6	5036	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	53	0	53	0	0	53	0	53	0	0
15	93	0	93	0	0	93	0	93	0	0
20	61	0	61	0	0	61	0	61	0	0
25	29	0	29	0	0	29	0	29	0	0
30	16	0	16	0	0	16	0	16	0	0
35	3	0	3	0	0	3	0	3	0	0
40	2	0	2	0	0	2	0	2	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	68	64	53	102	0	0	0	2804
15	1134	1239	516	1673	0	0	0	4441
20	1789	1989	1191	2279	0	0	0	4391
25	1909	2116	1392	2303	0	0	0	4663
30	2001	2213	1536	2344	0	0	0	4566
35	2109	2301	1667	2398	0	0	0	4754
40	2145	2355	1724	2414	0	0	0	4676
50	2295	2508	1938	2509	0	0	0	4765
75	2349	2628	2065	2509	0	0	0	4940
100	2405	2770	2177	2556	0	0	0	4974

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	68	64	53	102	0	0
15	1134	1239	516	1673	0	0
20	1789	1989	1191	2279	0	0
25	1909	2116	1392	2303	0	0
30	2001	2213	1536	2344	0	0
35	2109	2301	1667	2398	0	0
40	2145	2355	1724	2414	0	0
50	2295	2508	1938	2509	0	0
75	2349	2628	2065	2509	0	0
100	2405	2770	2177	2556	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	53	0	53	0	0	0	0
15	0	93	0	93	0	0	0	0
20	0	72	35	66	4	65	0	0
25	0	64	131	43	33	210	0	0
30	0	54	173	30	101	249	0	0
35	0	71	246	36	199	307	0	0
40	0	99	268	52	287	316	0	0
50	0	155	299	90	445	334	0	0
75	0	292	369	210	825	355	0	0
100	0	345	465	273	1149	405	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	53	0	53	0	0	0	0
15	0	93	0	93	0	0	0	0
20	0	72	33	66	5	68	0	0
25	0	67	134	43	32	210	0	0
30	0	54	168	31	101	250	0	0
35	0	74	244	37	198	306	0	0
40	0	98	265	49	281	313	0	0
50	0	152	304	94	452	330	0	0
75	0	293	369	208	839	363	0	0
100	0	345	461	268	1151	406	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	12	0	13	0	0	0	0
20	0	29	33	22	4	67	0	0
25	0	42	134	21	33	207	0	0
30	0	40	169	20	102	247	0	0
35	0	72	249	35	195	305	0	0
40	0	99	265	47	279	316	0	0
50	0	150	303	92	445	332	0	0
75	0	292	370	211	824	355	0	0
100	0	347	462	269	1149	401	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	12	0	12	0	0	0	0
20	0	28	35	22	3	69	0	0
25	0	45	134	22	32	202	0	0
30	0	40	171	17	107	247	0	0
35	0	73	246	36	198	307	0	0
40	0	96	263	49	276	315	0	0
50	0	155	299	94	446	330	0	0
75	0	290	368	209	826	354	0	0
100	0	341	462	269	1143	404	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	21	0	0	0	0	0
15	0	17	0	0	0	0	0
20	0	19	0	0	0	0	0
25	0	3	0	0	0	0	0
30	0	3	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	658	0	658	0	0	0	0
15	0	765	0	765	0	0	0	0
20	0	512	0	512	0	0	0	0
25	0	231	0	231	0	0	0	0
30	0	116	0	116	0	0	0	0
35	0	43	0	43	0	0	0	0
40	0	23	0	23	0	0	0	0
50	0	3	0	3	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 10. G(0.75,100) Detection Limit Fixed at 25 (Censoring Level = 34.67%)

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	124.8558	146.0423	542.5274	362.9283	870.3433	562.0057
15	115.4622	103.1760	332.2343	268.5142	483.9855	380.2456
20	111.0667	96.8941	241.2087	216.7778	338.0393	297.7974
25	107.0499	84.2015	203.5161	188.3518	275.9057	250.9383
30	105.5222	82.7189	180.0347	170.1972	239.3849	222.9946
35	103.4960	76.0461	164.0739	157.4605	214.0198	202.9751
40	102.1399	74.6324	152.0817	147.7035	195.6317	188.2653
50	99.7149	70.2823	137.1194	134.4650	172.2267	167.7302
75	96.0887	64.9437	118.5183	117.3791	142.9944	141.0536
100	94.0821	62.4824	109.6463	109.0002	128.9710	127.8650

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	127.1087	126.3464	141.5583	135.2424	151.0773
15	108.8265	108.1744	118.2747	109.7109	133.9132
20	99.8839	99.1813	106.2097	100.2318	124.7135
25	93.3593	92.5570	97.9646	93.5325	117.7432
30	90.3261	89.3072	93.8863	90.3494	114.3521
35	87.0292	85.8667	89.9530	86.9825	111.1382
40	84.8179	83.5113	87.2609	84.7277	108.7962
50	81.2652	79.7439	83.0776	81.1362	104.9397
75	75.5282	73.6506	76.6293	75.3795	99.3978
100	72.4097	70.3209	73.1847	72.2722	96.3029

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	103.7380	101.7767	114.9710	108.0998	126.3702
15	90.3893	88.8964	98.1018	89.4880	115.6039
20	85.4317	84.0399	90.7325	84.8710	110.6170
25	81.3568	79.9817	85.3037	80.9678	106.1439
30	79.9600	78.4116	83.0549	79.5914	104.3533
35	77.6890	76.0449	80.2528	77.3511	102.1432
40	76.3417	74.5837	78.5014	76.0236	100.6362
50	74.0484	72.1312	75.6691	73.7694	97.9879
75	69.9166	67.7233	70.9187	69.6931	93.9838
100	67.7055	65.3501	68.4185	67.5221	91.7534

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	116.7336	115.6538	129.7143	118.0962	124.0201	115.4597
15	102.1143	101.4040	109.5702	102.8724	112.3374	96.7003
20	95.0275	94.4286	100.2321	95.3993	107.5216	88.5139
25	89.2131	88.5454	93.1908	89.4913	103.2792	82.3040
30	86.8070	85.8498	90.0031	86.8417	101.6861	79.3037
35	83.7536	82.6706	86.4130	83.7096	99.5612	75.8023
40	81.8482	80.5760	84.0682	81.7537	98.1779	73.4377
50	78.6885	77.1508	80.4172	78.5304	95.7474	69.6987
75	73.5189	71.5839	74.5819	73.3518	92.0240	63.3572
100	70.7295	68.5947	71.4808	70.5810	89.9968	59.8867

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1026.8311	0.02%	123.9146	0.00%	333.6670
15	0.00%	426.7405	0.02%	103.2517	0.00%	195.2585
20	0.00%	305.8068	0.00%	96.7389	0.00%	161.6414
25	0.00%	249.8525	0.00%	92.2731	0.00%	143.1611
30	0.00%	221.5418	0.00%	90.6965	0.00%	134.2349
35	0.00%	202.9191	0.00%	88.7036	0.00%	127.6951
40	0.00%	190.0698	0.00%	87.5417	0.00%	123.1147
50	0.00%	171.0108	0.00%	85.5444	0.00%	115.9906
75	0.00%	148.3406	0.00%	82.6775	0.00%	107.1280
100	0.00%	137.7471	0.00%	81.3074	0.00%	102.6908

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	116.235	153.793	161.244	102.299	100.559	115.149	125.816
15	108.579	614.746	1044.752	90.003	86.603	90.316	116.048
20	105.182	91.247	276.068	85.562	80.650	86.492	111.195
25	101.634	120.483	359.757	81.805	75.636	83.115	106.996
30	100.429	83.770	91.702	80.515	73.925	82.115	105.377
35	98.582	87.795	82.296	78.267	71.159	80.096	103.358
40	97.375	96.287	80.517	76.863	69.438	78.854	101.997
50	95.164	77.095	77.774	74.495	66.744	76.666	99.586
75	91.708	72.663	73.103	70.044	61.923	72.399	96.005
100	89.796	70.159	70.470	67.541	59.281	69.962	94.013

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	163.733	113.023	120.861	111.508	99.434	4312.523	199.433
15	137.863	95.020	98.548	92.071	83.635	92.627	149.144
20	126.013	88.487	90.775	85.321	76.489	86.772	132.277
25	116.975	84.080	85.903	80.648	70.705	82.671	121.990
30	112.534	83.122	84.466	79.596	69.182	81.917	117.079
35	108.612	80.765	81.900	77.202	66.248	79.728	112.894
40	105.787	79.417	80.363	75.804	64.663	78.636	110.059
50	101.634	77.308	77.937	73.721	62.555	76.661	105.741
75	95.747	72.893	73.282	69.574	58.736	72.531	99.862
100	92.694	70.369	70.648	67.206	56.824	70.145	96.789

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	120.466	124.297	126.224	112.083	119.988	113.255	134.256
15	110.894	110.520	111.992	98.417	102.768	99.157	121.498
20	106.895	99.187	100.232	91.750	93.218	92.434	115.163
25	103.070	90.939	91.831	86.392	86.021	87.199	110.087
30	101.671	86.720	87.559	83.926	82.353	84.987	107.961
35	99.692	83.247	83.993	80.903	78.554	82.161	105.540
40	98.369	81.020	81.692	78.941	75.870	80.363	103.891
50	95.998	77.761	78.389	75.775	71.664	77.388	101.071
75	92.302	72.749	73.179	70.474	64.931	72.466	96.983
100	90.232	70.046	70.384	67.625	61.119	69.831	94.752

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	124.662	136.692	133.766	121.344	144.906	126.293	147.656
15	112.428	810.510	122.810	106.197	121.495	107.958	129.550
20	107.841	109.534	108.989	98.278	108.385	98.366	120.789
25	103.757	98.460	98.022	91.757	99.225	91.543	114.361
30	102.302	91.207	91.027	88.196	93.934	88.127	111.313
35	100.251	86.657	86.781	84.647	88.882	84.786	108.361
40	98.812	83.344	83.570	82.137	85.064	82.400	106.275
50	96.369	79.009	79.331	78.119	79.307	78.710	102.968
75	92.511	73.405	73.675	71.872	70.360	73.106	98.157
100	90.430	70.408	70.750	68.595	65.256	70.202	95.560

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	193.0856	194.2275	216.8978	201.8937	223.1177	188.6990
15	169.7285	170.9668	184.1275	174.5911	197.2343	168.7155
20	156.4184	157.8973	166.1930	159.5779	182.1570	158.2746
25	145.3136	146.6658	152.5054	147.5879	169.9185	149.4138
30	138.9866	140.0837	144.6073	140.5773	163.0028	144.8156
35	132.7074	133.6139	137.3078	133.9304	156.5984	140.0100
40	127.9906	128.6973	131.8112	128.9363	151.6586	136.4744
50	120.2933	120.6714	123.1403	120.8841	143.5908	130.5849
75	108.0839	107.8434	109.7606	108.3284	131.4564	121.5436
100	100.9325	100.3136	102.0842	101.0515	124.3170	116.2765

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	116.3081	167.3074	120.3609	124.6790	124.4610
15	108.7131	136.7318	110.8271	112.2475	112.6112
20	105.2953	124.3425	106.9032	107.7290	107.6975
25	101.7165	115.4387	103.0480	103.7751	103.3392
30	100.4716	111.1308	101.6498	102.3373	101.7154
35	98.6076	107.3244	99.6946	100.1988	99.5631
40	97.3846	104.6601	98.3679	98.8466	98.1969
50	95.1660	100.7125	96.0234	96.3583	95.7492
75	91.7110	95.1380	92.2887	92.5060	92.0240
100	89.7837	92.2264	90.2343	90.4337	89.9968

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	124.020	2320.058	2310.885	116.086	121.106	7462.089	127.235
15	112.337	103.600	97.356	100.592	102.007	14023.891	115.935
20	107.522	95.208	91.309	92.784	91.630	595.674	111.010
25	103.279	89.325	86.734	87.004	84.304	174.281	106.788
30	101.686	86.575	84.752	84.333	80.657	87.687	105.201
35	99.561	83.524	82.120	81.284	76.890	84.386	103.148
40	98.178	81.525	80.421	79.263	74.348	82.202	101.785
50	95.747	78.314	77.575	76.000	70.342	78.762	99.377
75	92.024	73.108	72.727	70.674	63.911	73.338	95.812
100	89.997	70.307	70.070	67.776	60.341	70.451	93.848

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	90.45	90.22	94.16	91.37	94.65	74.97	73.43	84.59	73.39	88.77
15	86.93	86.48	92.01	87.41	95.62	65.54	64.04	75.04	64.67	89.05
20	83.28	82.77	90.00	83.58	96.48	63.08	61.21	70.29	62.32	90.97
25	78.32	77.29	84.83	78.36	96.30	58.71	56.28	64.91	58.16	90.97
30	76.14	74.48	82.28	76.12	97.03	56.85	54.20	62.61	56.34	92.59
35	72.97	70.63	78.12	72.79	97.23	53.68	50.00	58.20	52.99	92.51
40	70.26	67.35	75.72	70.00	97.29	51.37	48.00	55.72	50.95	93.41
50	64.40	60.63	69.07	64.00	97.68	46.08	41.70	49.72	45.27	93.96
75	50.40	44.44	54.12	49.88	98.04	33.76	28.18	36.38	33.25	94.73
100	39.47	32.55	42.02	39.03	98.50	25.54	19.62	27.17	25.11	95.33

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	89.56	83.16	N/A	N/A	100.00	100.00
15	90.16	76.26	N/A	N/A	100.00	99.98
20	92.50	68.23	N/A	N/A	100.00	100.00
25	92.51	60.61	N/A	N/A	100.00	100.00
30	94.40	55.86	N/A	N/A	100.00	100.00
35	94.42	48.24	N/A	N/A	100.00	100.00
40	95.17	44.66	N/A	N/A	99.98	99.98
50	95.90	35.48	N/A	N/A	100.00	100.00
75	97.07	19.41	N/A	N/A	100.00	100.00
100	97.94	11.81	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	84.44	83.64	90.99	84.73	88.22	83.56
15	78.36	77.76	85.69	78.88	87.31	72.65
20	75.54	74.93	82.68	75.76	89.01	67.17
25	71.37	70.50	77.11	71.61	88.65	60.22
30	68.89	67.24	74.63	68.89	90.46	56.26
35	64.98	63.13	70.76	64.88	89.90	50.24
40	63.51	60.41	68.04	63.23	91.35	46.44
50	57.55	53.59	61.84	57.17	91.76	37.58
75	44.31	38.50	47.66	43.94	92.36	20.85
100	34.40	28.27	37.16	34.07	92.97	11.39

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.94	0.02%	81.40	0.00%	96.89
15	0.00%	99.70	0.02%	76.95	0.00%	96.85
20	0.00%	99.68	0.00%	77.33	0.00%	97.80
25	0.00%	99.74	0.00%	75.82	0.00%	97.74
30	0.00%	99.70	0.00%	76.91	0.00%	98.20
35	0.00%	99.82	0.00%	76.63	0.00%	98.14
40	0.00%	99.82	0.00%	76.38	0.00%	98.32
50	0.00%	99.90	0.00%	76.63	0.00%	98.50
75	0.00%	99.94	0.00%	75.13	0.00%	98.81
100	0.00%	99.98	0.00%	74.71	0.00%	99.17

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.40	80.66	83.84	73.56	71.90	72.06	84.63	90.06
15	85.15	75.83	80.10	65.19	61.41	65.21	85.37	90.77
20	87.45	71.38	75.39	63.91	57.39	64.80	87.74	92.65
25	87.70	66.61	69.66	60.04	51.37	62.28	87.72	92.69
30	89.45	64.34	67.07	59.05	48.64	61.80	89.68	94.46
35	89.07	61.17	63.15	55.78	44.75	59.80	89.15	94.50
40	90.83	59.07	61.03	54.14	41.49	57.84	90.75	95.11
50	91.27	54.57	56.24	48.77	34.63	53.64	91.47	95.92
75	91.96	41.98	43.35	34.61	19.64	41.29	92.12	96.95
100	92.71	32.50	33.23	24.61	10.83	31.88	92.65	97.92

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.50	69.62	72.90	70.85	60.85	67.05	90.91	94.83
15	92.02	64.23	67.45	62.77	52.48	62.30	92.06	95.13
20	93.64	64.80	67.16	61.82	49.41	62.98	93.35	96.36
25	93.58	62.65	64.93	58.30	44.36	61.19	93.33	96.06
30	94.71	62.87	64.65	57.86	42.54	60.97	94.00	96.87
35	94.34	61.05	62.48	55.25	38.93	59.72	93.60	97.03
40	94.95	59.54	60.81	53.68	36.78	58.53	94.51	97.39
50	95.11	56.14	57.29	48.65	31.07	54.69	94.57	97.54
75	95.29	44.10	44.95	34.93	17.54	42.97	94.59	98.28
100	95.49	33.92	34.77	25.01	9.45	33.25	95.21	98.81

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.73	89.45	90.06	82.51	87.49	83.66	86.57	92.57
15	86.44	86.91	87.76	75.90	81.25	76.28	86.28	93.25
20	88.57	81.84	82.75	72.16	75.29	72.99	88.51	94.63
25	88.46	74.44	75.70	67.01	66.46	68.38	88.57	94.32
30	90.36	69.41	71.11	63.98	61.24	65.76	90.40	95.62
35	90.12	64.57	65.80	59.72	55.09	62.08	90.02	95.58
40	91.33	61.01	63.13	56.77	49.79	59.62	91.47	96.06
50	91.96	55.23	56.97	49.92	39.94	54.10	91.92	96.67
75	92.65	41.58	42.97	34.67	21.52	40.95	92.57	97.50
100	93.11	31.88	33.05	24.30	11.45	31.58	93.21	98.28

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.69	88.63	88.57	87.29	93.94	89.23	88.44	95.11
15	87.27	91.01	90.49	82.91	91.43	84.73	86.73	95.54
20	88.77	87.80	87.52	81.11	88.65	81.41	88.57	96.51
25	88.83	82.44	81.33	76.73	84.97	76.99	88.65	95.86
30	90.69	77.03	76.34	73.70	82.21	73.94	90.59	96.73
35	90.26	71.56	71.52	68.73	78.55	68.71	90.38	96.89
40	91.68	66.73	67.09	64.59	72.71	64.95	91.90	97.11
50	92.14	57.19	59.13	55.86	61.27	57.27	92.36	97.23
75	92.87	42.91	43.62	37.23	31.88	41.60	92.83	97.92
100	93.49	32.55	33.49	26.08	16.57	31.74	93.66	98.48

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	98.36	98.26	99.15	98.75	98.95	97.96
15	98.79	98.72	99.44	99.04	99.45	98.67
20	99.13	99.14	99.56	99.26	99.74	99.33
25	99.16	99.21	99.54	99.35	99.90	99.45
30	99.30	99.30	99.64	99.44	99.86	99.64
35	99.34	99.38	99.68	99.44	99.94	99.78
40	99.24	99.30	99.48	99.32	99.92	99.84
50	99.03	99.05	99.37	99.07	99.96	99.90
75	98.75	98.69	99.09	98.73	99.98	99.96
100	98.14	97.88	98.61	98.14	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.22	85.50	73.29	89.45	88.24	91.43	89.68	90.06
15	87.31	82.11	72.75	80.15	81.45	86.97	88.22	90.20
20	89.01	77.56	70.89	74.46	73.58	82.04	89.47	92.24
25	88.65	72.23	67.66	68.66	64.02	75.03	88.85	92.14
30	90.46	69.49	65.72	65.31	57.60	71.92	90.55	93.98
35	89.90	65.82	62.53	60.89	51.64	67.70	89.90	94.06
40	91.35	62.32	60.10	58.04	46.77	64.28	91.37	94.81
50	91.76	56.57	54.63	50.48	36.95	57.92	91.76	95.58
75	92.36	42.63	41.60	34.75	19.33	43.21	92.36	96.81
100	92.97	32.46	31.78	24.46	10.24	32.79	92.97	97.68

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Detection Limit: 25.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 75.037256
Distribution Check: Average of stdvs: 85.622995
Average of NDs per 100 observations: 34.658300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	25.000000	3.169505	75	458	993	1356	1346	822	0	0	0	0
15	25.000000	5.150891	5	72	292	599	918	1024	945	671	358	124
20	25.000000	6.899802	1	17	55	197	367	625	941	936	791	561
25	25.000000	8.694653	1	1	12	37	122	252	447	740	807	792
30	25.000000	10.334653	0	0	3	12	43	100	185	357	500	673
35	25.000000	12.153861	0	0	0	2	4	21	53	139	275	366
40	25.000000	13.837228	0	0	0	1	0	6	17	32	102	203
50	25.000000	17.228515	0	0	0	0	0	2	0	2	10	26
75	25.000000	25.982178	0	0	0	0	0	0	0	0	0	0
100	25.000000	34.645347	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	495
15	42	0	0	0	0	0	0	0	0	0	0	0	15
20	311	168	53	16	9	2	0	0	0	0	0	0	0
25	726	511	305	169	91	27	9	1	0	0	0	0	0
30	802	734	635	449	292	147	62	38	16	0	2	0	0
35	543	685	754	628	571	407	303	146	87	41	15	10	0
40	301	434	545	699	665	631	495	369	232	169	75	74	0
50	62	101	177	292	392	495	559	579	582	509	416	846	0
75	0	1	0	4	5	12	31	45	71	126	182	4573	0
100	0	0	0	0	0	0	0	0	0	1	6	5043	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	13	0	13	0	0	13	0	13	0	0
15	6	0	6	0	0	6	0	6	0	0
20	1	0	1	0	0	1	0	1	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	38	63	13	107	0	0	0	822
15	171	203	75	240	0	0	0	1195
20	124	160	67	162	0	0	0	559
25	66	104	34	98	0	0	0	602
30	48	72	33	62	0	0	0	265
35	27	52	15	36	0	0	0	299
40	21	39	9	27	0	0	0	149
50	6	14	5	7	0	0	0	70
75	2	3	2	2	0	0	0	31
100	1	2	1	1	0	0	0	2

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	38	63	13	107	0	0
15	171	203	75	240	0	0
20	124	160	67	162	0	0
25	66	104	34	98	0	0
30	48	72	33	62	0	0
35	27	52	15	36	0	0
40	21	39	9	27	0	0
50	6	14	5	7	0	0
75	2	3	2	2	0	0
100	1	2	1	1	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	13	0	13	0	0	0	0
15	0	6	0	6	0	0	0	0
20	0	1	0	1	0	4	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	1	0	0	0
35	0	0	0	0	2	0	0	0
40	0	0	0	0	1	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	13	0	13	0	0	0	0
15	0	6	0	6	0	0	0	0
20	0	1	0	1	0	4	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	1	0	0	0
35	0	0	0	0	2	0	0	0
40	0	0	0	0	1	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	1	0	1	0	4	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	1	0	0	0
35	0	0	0	0	2	0	0	0
40	0	0	0	0	1	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	1	0	1	0	4	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	1	0	0	0
35	0	0	0	0	2	0	0	0
40	0	0	0	0	1	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	1	0	0	0	0	0
15	0	1	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	244	0	244	0	0	0	0
15	0	63	0	63	0	0	0	0
20	0	11	0	11	0	0	0	0
25	0	2	0	2	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 11a. G(0.75,100) 10% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	116.5599	113.3187	311.9549	236.7017	370.5429	274.3916
15	109.6291	101.2182	206.3815	180.6715	246.5632	211.7836
20	105.9721	96.0787	169.5315	158.4383	196.4302	181.6760
25	102.6476	92.4045	150.7703	143.5210	172.7130	163.0279
30	100.8094	90.2330	140.4096	135.3252	158.2634	151.5662
35	98.7265	88.0192	131.2869	127.7782	146.9278	142.2880
40	96.8515	86.0258	125.2445	122.7902	138.8915	135.6718
50	94.9168	84.0520	117.6546	116.0659	128.8869	126.8160
75	91.5834	80.6660	107.1603	106.4109	115.2973	114.3301
100	89.0945	78.0778	101.3761	100.9243	107.8114	107.2353

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	117.2120	117.2349	121.5767	118.8335	124.7538
15	107.5468	107.3234	110.1400	108.4450	114.1272
20	102.8306	102.4161	104.6639	103.4353	109.0398
25	99.0023	98.4480	100.3795	99.4362	104.9363
30	96.8363	96.1763	97.9283	97.1625	102.6526
35	94.5879	93.8520	95.4739	94.8399	100.2541
40	92.5213	91.7107	93.2684	92.7218	98.1915
50	90.4156	89.5081	90.9708	90.5517	95.9550
75	86.7974	85.7152	87.1244	86.8617	92.2565
100	84.1321	82.9434	84.3581	84.1677	89.6101

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	109.8775	109.5748	113.4998	110.8798	117.1046
15	102.8191	102.3500	105.0771	103.4543	109.3129
20	99.1957	98.5821	100.8306	99.6484	105.3767
25	96.0274	95.3055	97.2737	96.3625	101.9566
30	94.2683	93.4621	95.2661	94.5240	100.0911
35	92.3345	91.4707	93.1499	92.5340	98.0122
40	90.4709	89.5432	91.1621	90.6300	96.1560
50	88.6889	87.6845	89.2070	88.7978	94.2445
75	85.4980	84.3445	85.8069	85.5491	90.9721
100	83.0540	81.8075	83.2690	83.0816	88.5449

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	117.6334	117.7475	122.0400	119.3724	120.4704	118.3995
15	108.3645	108.2608	111.0491	109.3872	111.4723	107.9835
20	103.7409	103.4680	105.6682	104.4461	107.0547	102.6595
25	99.9214	99.4971	101.3772	100.4260	103.3373	98.3457
30	97.7335	97.2002	98.8902	98.1165	101.2702	95.7708
35	95.4484	94.8338	96.3876	95.7465	99.0361	93.2328
40	93.3392	92.6462	94.1310	93.5781	97.0523	90.8515
50	91.1872	90.3903	91.7757	91.3517	94.9971	88.3657
75	87.4727	86.4870	87.8185	87.5527	91.5264	84.1010
100	84.7260	83.6236	84.9644	84.7719	88.9783	81.0276

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1139.8916	0.00%	282.3495	0.00%	641.2896
15	0.00%	435.1115	0.00%	180.4028	0.00%	289.2522
20	0.00%	308.3730	0.00%	150.6297	0.00%	222.1178
25	0.00%	253.3517	0.00%	135.9640	0.00%	191.5359
30	0.00%	223.3417	0.00%	126.9647	0.00%	173.8155
35	0.00%	203.8407	0.00%	120.0285	0.00%	160.9975
40	0.00%	190.3857	0.00%	115.2067	0.00%	153.0205
50	0.00%	173.1612	0.00%	109.2693	0.00%	142.1189
75	0.00%	151.6271	0.00%	101.0044	0.00%	127.9929
100	0.00%	140.4558	0.00%	95.9592	0.00%	119.9161

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	113.631	130.748	157.045	109.658	108.677	110.111	116.102
15	107.880	104.352	111.572	103.361	101.963	104.120	109.057
20	104.723	100.844	101.321	99.841	98.158	100.752	105.471
25	101.693	97.626	97.984	96.524	94.675	97.528	102.251
30	100.012	95.743	96.064	94.558	92.557	95.667	100.480
35	98.045	93.697	93.999	92.475	90.363	93.608	98.442
40	96.236	91.732	91.997	90.468	88.207	91.671	96.613
50	94.427	89.808	90.025	88.485	86.036	89.748	94.729
75	91.201	86.379	86.530	84.928	82.181	86.331	91.483
100	88.765	83.792	83.892	82.243	79.325	83.749	89.017

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	170.582	154.024	157.130	152.014	147.065	153.008	172.180
15	137.423	126.492	127.663	123.880	119.640	125.967	136.971
20	125.077	116.214	116.919	113.733	109.824	115.926	124.698
25	116.785	108.954	109.437	106.560	102.982	108.733	116.471
30	111.849	104.543	104.951	102.226	98.737	104.391	111.645
35	107.903	101.002	101.350	98.788	95.445	100.880	107.795
40	104.428	97.789	98.071	95.632	92.308	97.694	104.433
50	100.683	94.419	94.671	92.380	89.083	94.340	100.745
75	95.151	89.267	89.442	87.316	83.962	89.210	95.257
100	91.669	85.883	85.946	83.923	80.564	85.811	91.814

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	116.275	114.531	115.177	113.408	114.584	113.470	121.480
15	109.868	106.613	107.100	106.023	105.857	106.254	112.531
20	106.402	102.552	102.989	101.939	101.117	102.437	108.101
25	103.080	99.052	99.400	98.238	97.007	98.929	104.284
30	101.205	97.007	97.306	96.035	94.522	96.858	102.201
35	99.122	94.822	95.100	93.845	92.047	94.691	99.934
40	97.224	92.722	92.964	91.667	89.663	92.653	97.903
50	95.196	90.624	90.860	89.437	87.270	90.590	95.781
75	91.747	86.979	87.110	85.626	83.013	86.919	92.147
100	89.217	84.241	84.366	82.794	80.014	84.217	89.524

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	117.524	115.405	115.544	113.768	118.262	113.772	129.149
15	110.868	106.344	106.682	105.941	107.703	105.740	116.941
20	107.280	102.013	102.462	101.595	102.240	101.844	111.197
25	103.829	98.517	98.898	97.959	97.714	98.364	106.582
30	101.829	96.547	96.881	95.838	95.036	96.413	104.002
35	99.649	94.431	94.710	93.576	92.446	94.363	101.398
40	97.661	92.411	92.656	91.403	90.058	92.297	98.999
50	95.629	90.369	90.554	89.259	87.518	90.239	96.612
75	92.012	86.787	86.904	85.523	83.205	86.707	92.645
100	89.394	84.104	84.182	82.708	80.066	83.987	89.910

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	183.7197	185.2731	192.4824	188.5924	194.0749	183.8059
15	165.3986	166.8523	170.8904	168.3903	173.7224	165.8348
20	155.0770	156.3480	159.0364	157.1908	162.5160	155.8212
25	146.5724	147.6383	149.5638	148.1376	153.4062	147.5467
30	141.0226	141.9167	143.3890	142.2381	147.5201	142.2052
35	135.6726	136.4068	137.5839	136.6380	141.8645	137.0141
40	131.1554	131.7660	132.7554	131.9481	137.2412	132.6796
50	125.4072	125.8098	126.5825	125.9727	131.2216	127.1944
75	115.9372	115.9824	116.6079	116.2385	121.5093	118.2570
100	109.5094	109.3245	109.9598	109.6994	115.0338	112.2183

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	113.6403	167.7726	116.3674	117.4485	120.4708
15	107.8806	135.6541	109.9033	110.8360	111.4723
20	104.7292	123.7944	106.3795	107.1771	107.0547
25	101.6815	115.8450	103.0982	103.7793	103.3373
30	100.0186	111.0207	101.2351	101.8235	101.2702
35	98.0514	107.2812	99.1159	99.6421	99.0361
40	96.2403	103.9113	97.2190	97.7228	97.0523
50	94.4083	100.3068	95.2319	95.5718	94.9971
75	91.2091	94.9065	91.7721	92.0096	91.5264
100	88.7578	91.4719	89.1778	89.4166	88.9783

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	120.470	116.803	115.899	115.718	114.989	153.476	120.616
15	111.472	107.341	107.029	106.042	104.366	107.617	111.593
20	107.055	102.676	102.537	101.296	99.124	102.824	107.183
25	103.337	98.814	98.741	97.383	94.957	98.905	103.476
30	101.270	96.618	96.570	95.159	92.523	96.683	101.417
35	99.036	94.354	94.320	92.873	90.168	94.402	99.188
40	97.052	92.256	92.229	90.749	87.912	92.294	97.214
50	94.997	90.166	90.149	88.638	85.668	90.192	95.165
75	91.526	86.558	86.551	84.967	81.816	86.571	91.703
100	88.978	83.879	83.875	82.244	78.995	83.887	89.161

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	83.66	83.60	85.56	84.44	86.79	78.73	78.44	81.45	79.35	83.64
15	84.34	84.16	86.12	85.05	88.55	79.84	79.41	82.12	80.26	85.50
20	85.78	85.50	86.95	86.06	89.86	81.70	81.35	83.74	82.18	87.72
25	84.99	84.36	86.34	85.52	90.10	81.47	80.77	83.03	81.86	88.02
30	85.09	84.12	86.40	85.39	91.21	81.84	80.99	82.97	82.18	89.03
35	84.81	83.96	86.28	85.23	91.35	81.56	80.42	82.99	81.88	89.31
40	83.98	82.69	84.87	84.26	90.89	80.81	79.23	81.80	80.97	88.95
50	84.57	82.83	85.54	84.69	91.74	81.15	79.35	82.14	81.33	90.34
75	83.49	81.33	84.14	83.60	92.85	80.75	77.58	81.35	80.81	91.15
100	81.13	77.47	81.62	81.17	92.97	77.66	73.82	78.36	77.70	91.43

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	83.03	77.37	N/A	N/A	98.18	97.37
15	85.66	76.03	N/A	N/A	98.91	98.46
20	87.88	76.08	N/A	N/A	99.43	99.29
25	88.34	74.73	N/A	N/A	99.60	99.45
30	89.47	73.70	N/A	N/A	99.72	99.56
35	89.76	73.23	N/A	N/A	99.78	99.60
40	89.43	70.36	N/A	N/A	99.74	99.70
50	90.83	70.24	N/A	N/A	99.96	99.92
75	91.72	66.67	N/A	N/A	99.92	99.92
100	92.12	59.78	N/A	N/A	99.76	99.72

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	83.01	83.04	85.41	83.91	84.63	83.35
15	84.41	84.39	86.28	85.20	86.44	84.18
20	85.90	85.82	87.33	86.37	88.36	85.03
25	85.49	85.11	86.99	86.00	88.69	83.58
30	85.64	84.85	86.85	85.98	89.78	83.15
35	85.54	84.71	86.85	85.88	89.74	82.38
40	84.75	83.76	85.92	85.13	89.41	80.73
50	85.49	83.84	86.22	85.68	90.69	79.98
75	84.67	82.67	85.35	84.83	91.64	76.65
100	82.50	79.39	83.15	82.55	91.88	70.55

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.23	0.00%	94.28	0.00%	98.28
15	0.00%	99.60	0.00%	94.61	0.00%	98.87
20	0.00%	99.76	0.00%	94.83	0.00%	99.25
25	0.00%	99.92	0.00%	94.91	0.00%	99.43
30	0.00%	99.94	0.00%	95.47	0.00%	99.58
35	0.00%	99.90	0.00%	95.31	0.00%	99.54
40	0.00%	99.92	0.00%	95.47	0.00%	99.64
50	0.00%	100.00	0.00%	95.27	0.00%	99.86
75	0.00%	99.98	0.00%	95.78	0.00%	99.82
100	0.00%	100.00	0.00%	95.25	0.00%	99.84

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.64	79.66	80.28	78.46	77.49	78.69	81.58	82.79
15	84.28	81.15	81.88	80.44	78.89	81.15	84.53	85.37
20	87.05	83.72	84.14	82.69	80.36	83.39	86.97	87.60
25	87.49	83.25	83.58	81.84	79.54	83.07	87.50	87.98
30	88.67	83.50	83.76	82.16	79.15	83.19	88.73	89.23
35	88.97	83.56	83.94	81.72	78.32	83.43	88.93	89.45
40	88.57	82.38	82.89	80.34	76.85	82.26	88.55	89.15
50	90.36	82.99	83.25	80.59	75.70	82.79	90.20	90.55
75	91.23	82.53	82.89	79.03	71.50	82.42	91.39	91.56
100	91.41	79.72	80.04	74.97	64.93	79.76	91.50	91.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.60	87.84	88.57	87.50	84.71	87.35	90.69	91.60
15	93.01	88.95	89.39	88.32	85.11	88.69	92.48	92.83
20	93.19	90.10	90.08	88.75	85.94	89.76	92.69	93.15
25	93.19	89.54	89.82	88.06	84.59	89.37	92.73	93.17
30	93.96	89.70	90.06	87.86	83.64	89.74	93.70	93.94
35	93.88	89.56	89.92	87.54	83.07	89.64	93.62	93.86
40	93.64	88.04	88.48	86.30	81.43	88.02	93.19	93.72
50	94.18	88.22	88.83	85.54	79.60	88.14	93.66	94.32
75	94.89	87.01	87.19	83.52	75.25	86.87	94.63	95.01
100	94.69	84.44	84.79	79.47	68.61	84.24	94.36	94.91

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.61	81.96	82.22	81.19	81.74	81.03	82.40	84.97
15	85.52	83.11	83.52	82.46	82.42	82.67	85.52	86.99
20	87.92	84.89	85.43	84.38	83.56	84.34	87.96	89.05
25	88.32	84.57	84.87	83.64	82.24	84.28	88.26	89.13
30	89.49	84.50	84.93	83.50	81.58	84.38	89.50	90.46
35	89.68	84.69	85.01	83.03	80.79	84.61	89.88	90.57
40	89.56	84.06	84.06	82.06	78.83	83.56	89.41	90.38
50	90.75	84.20	84.32	82.02	77.90	83.92	90.99	91.45
75	91.86	83.58	83.68	80.99	73.62	83.13	92.00	92.55
100	92.20	80.97	81.43	76.36	67.49	80.67	92.10	92.67

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.83	81.80	81.94	80.83	84.14	81.01	82.91	88.08
15	85.88	82.77	82.89	82.26	84.14	81.74	85.56	89.47
20	88.10	83.92	84.51	83.88	84.65	83.92	87.98	90.46
25	88.51	83.88	84.38	83.33	83.29	83.58	88.69	90.51
30	89.74	83.80	84.26	83.07	82.28	83.98	89.86	91.29
35	90.08	83.74	84.32	83.01	81.37	83.70	90.02	91.72
40	89.60	83.21	83.33	81.86	79.82	82.97	89.56	91.15
50	91.21	83.33	83.76	81.68	78.04	83.50	90.95	92.16
75	92.20	83.25	83.39	79.76	74.06	83.13	91.90	92.63
100	92.24	80.42	80.63	76.16	67.15	79.98	92.28	93.11

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	96.45	96.61	97.23	96.83	97.29	96.42
15	98.44	98.55	98.87	98.71	98.97	98.46
20	98.97	99.03	99.09	99.03	99.21	98.97
25	99.09	99.17	99.25	99.19	99.41	99.11
30	99.47	99.50	99.56	99.50	99.62	99.50
35	99.54	99.58	99.64	99.58	99.76	99.62
40	99.56	99.58	99.62	99.60	99.70	99.62
50	99.78	99.78	99.82	99.78	99.92	99.82
75	99.78	99.78	99.82	99.78	99.92	99.86
100	99.78	99.76	99.80	99.80	99.88	99.82

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 4.2490486
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.63	82.85	81.84	82.18	81.52	83.56	84.63	84.73
15	86.44	83.50	83.25	82.38	80.85	83.84	86.44	86.55
20	88.36	85.19	85.03	84.02	81.25	85.45	88.36	88.51
25	88.69	84.26	84.04	82.73	79.60	84.46	88.69	88.85
30	89.78	84.20	84.02	82.59	78.83	84.28	89.78	89.94
35	89.74	84.34	84.16	82.18	77.88	84.46	89.74	89.86
40	89.41	83.03	82.91	80.51	76.18	83.13	89.41	89.70
50	90.69	83.52	83.47	80.77	74.91	83.54	90.69	90.95
75	91.64	82.77	82.75	79.17	70.75	82.81	91.64	91.86
100	91.88	80.04	80.02	74.85	63.76	80.04	91.88	92.24

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Detection Limit: 4.2490486
Averaged Percentage Non-detects: 10.00%
Distribution Check: Average of means: 74.897005
Distribution Check: Average of stdvs: 85.446070
Average of NDs per 100 observations: 10.024600

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	4.249049	1.016634	1713	1989	966	319	59	4	0	0	0	0
15	4.249049	1.510297	1077	1665	1325	700	222	46	12	2	1	0
20	4.249049	2.010891	618	1351	1455	941	446	167	55	15	1	1
25	4.249049	2.507327	343	1013	1339	1178	669	351	109	34	12	2
30	4.249049	2.989901	209	733	1166	1171	866	538	251	85	19	7
35	4.249049	3.475842	132	524	910	1119	1005	717	395	154	58	27
40	4.249049	4.031485	68	336	713	996	1010	843	573	297	137	47
50	4.249049	5.014851	20	135	385	695	979	871	793	555	317	183
75	4.249049	7.489505	1	13	46	182	356	562	665	822	740	617
100	4.249049	10.105545	1	3	6	23	63	180	304	431	549	664

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	4	1	0	0	0	0	0	0	0	0	0	0	0
35	8	0	1	0	0	0	0	0	0	0	0	0	0
40	19	8	1	1	0	1	0	0	0	0	0	0	0
50	73	25	15	3	1	0	0	0	0	0	0	0	0
75	436	276	159	95	41	27	6	3	2	1	0	0	0
100	614	639	512	402	277	160	110	56	29	8	14	5	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	1	3	0	3	0	0	0	4
15	1	1	0	2	0	0	0	3
20	0	1	0	1	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	1	3	0	3	0	0
15	1	1	0	2	0	0
20	0	1	0	1	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	6	0	6	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 11b. G(0.75,100) 15% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	116.4315	112.5104	371.4377	270.2455	483.0639	341.0759
15	109.5344	97.4143	235.1148	201.3304	301.2966	252.1098
20	106.0904	91.8462	188.1664	173.9500	231.8121	211.3899
25	103.5049	88.4984	165.7568	156.5742	199.7251	186.6014
30	100.3394	85.1692	150.0788	143.8642	178.0012	169.1488
35	98.9414	83.7124	140.1250	135.8600	164.2399	158.1439
40	97.8008	81.9562	133.9809	130.9876	154.5416	150.3395
50	95.4290	79.6664	124.0811	122.1798	140.7386	138.0892
75	92.0364	76.1651	111.3167	110.4439	123.4645	122.2523
100	89.7716	74.2905	104.1075	103.6033	114.3031	113.5937

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	116.9937	117.0014	123.2333	119.0604	128.1323
15	106.5833	106.3099	110.1359	107.6317	116.4200
20	101.6705	101.1440	104.1084	102.3196	111.1666
25	98.3488	97.6430	100.1382	98.7858	107.4859
30	94.7209	93.8926	96.1097	95.0283	103.6432
35	93.0354	92.1103	94.1544	93.2641	101.7585
40	91.5213	90.4792	92.4682	91.6963	100.3386
50	88.8181	87.6437	89.5186	88.9276	97.4853
75	84.8823	83.4860	85.2955	84.9238	93.4781
100	82.4055	80.9076	82.6897	82.4227	90.8792

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	107.0324	106.5752	112.1309	108.1039	117.7179
15	100.0276	99.4002	103.0769	100.6715	109.7701
20	96.5073	95.6818	98.6496	96.9261	105.9934
25	94.0814	93.1220	95.6775	94.3706	103.2364
30	91.0421	89.9932	92.2931	91.2452	99.9945
35	89.7869	88.6685	90.8029	89.9384	98.5429
40	88.5251	87.3023	89.3896	88.6387	97.3787
50	86.2762	84.9489	86.9215	86.3450	94.9782
75	82.9437	81.4330	83.3296	82.9654	91.5678
100	80.8095	79.2200	81.0772	80.8149	89.3057

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	115.7257	115.8096	121.8371	117.8729	119.6636	116.3663
15	106.3301	106.1769	109.9216	107.4708	110.8453	105.4214
20	101.7331	101.3377	104.2258	102.4566	106.7039	99.8256
25	98.5777	97.9974	100.4077	99.0754	103.7704	96.0178
30	94.9836	94.2824	96.4158	95.3435	100.3766	91.9642
35	93.3489	92.5438	94.5054	93.6174	98.8513	90.0143
40	91.8519	90.9276	92.8304	92.0600	97.6260	88.1382
50	89.1629	88.0994	89.8873	89.2968	95.1437	85.0207
75	85.2168	83.9188	85.6440	85.2721	91.6280	80.3965
100	82.7132	81.3024	83.0067	82.7395	89.3160	77.5539

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1043.1664	0.00%	201.3500	0.00%	513.4953
15	0.00%	417.8090	0.00%	144.0354	0.00%	246.4718
20	0.00%	304.4130	0.00%	126.5780	0.00%	198.0702
25	0.00%	252.7115	0.00%	117.0757	0.00%	174.1508
30	0.00%	219.4104	0.00%	109.5739	0.00%	157.6914
35	0.00%	202.5546	0.00%	105.6858	0.00%	147.9551
40	0.00%	190.6221	0.00%	102.7204	0.00%	142.2163
50	0.00%	172.2943	0.00%	98.0494	0.00%	132.2724
75	0.00%	151.3337	0.00%	91.9508	0.00%	120.0581
100	0.00%	140.6310	0.00%	88.7344	0.00%	113.5985

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	112.821	467.503	165.649	106.736	105.312	107.280	116.134
15	107.280	101.971	108.848	100.514	98.312	101.408	109.014
20	104.402	98.435	99.055	96.974	94.422	98.142	105.621
25	102.103	95.888	96.365	94.407	91.624	95.723	103.108
30	99.123	92.694	93.094	91.182	88.211	92.548	100.003
35	97.867	91.305	91.652	89.745	86.707	91.186	98.676
40	96.814	89.928	90.242	88.285	85.054	89.833	97.556
50	94.567	87.492	87.732	85.777	82.348	87.390	95.242
75	91.310	83.836	84.002	81.974	78.206	83.768	91.924
100	89.104	81.534	81.670	79.641	75.665	81.475	89.693

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	168.257	143.345	147.575	140.976	133.389	141.694	174.021
15	136.925	119.997	121.481	116.851	110.270	119.189	137.534
20	124.582	110.775	111.675	107.522	101.529	110.229	124.803
25	117.151	105.163	105.686	102.022	96.601	104.790	117.317
30	110.818	99.786	100.232	96.928	91.839	99.567	111.133
35	107.393	97.153	97.551	94.479	89.637	96.957	107.760
40	105.127	95.046	95.346	92.310	87.472	94.788	105.531
50	100.885	91.298	91.563	88.729	84.036	91.153	101.280
75	95.314	86.187	86.400	83.754	79.177	86.123	95.780
100	91.966	83.202	83.351	80.860	76.269	83.133	92.436

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	115.583	113.777	114.623	111.484	113.449	111.529	121.892
15	109.243	104.725	105.404	103.619	103.685	103.959	112.696
20	106.039	100.273	100.876	99.328	98.263	99.994	108.405
25	103.528	97.292	97.816	96.181	94.577	97.103	105.310
30	100.357	93.856	94.242	92.656	90.605	93.700	101.830
35	98.937	92.303	92.688	91.021	88.646	92.164	100.236
40	97.772	90.844	91.227	89.417	86.755	90.707	98.957
50	95.357	88.229	88.516	86.689	83.670	88.138	96.323
75	91.859	84.394	84.567	82.628	79.089	84.306	92.636
100	89.516	81.948	82.085	80.134	76.335	81.876	90.225

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	117.041	115.953	115.968	112.290	120.347	112.710	130.352
15	110.262	104.830	105.242	103.899	107.861	103.577	117.571
20	106.911	99.611	100.142	99.215	101.290	99.192	111.854
25	104.187	96.512	97.007	95.991	96.622	96.252	107.897
30	100.898	93.110	93.620	92.425	92.200	93.010	103.767
35	99.449	91.666	92.083	90.759	89.822	91.456	101.884
40	98.325	90.275	90.569	89.152	87.752	90.085	100.359
50	95.784	87.758	88.068	86.486	84.463	87.609	97.397
75	92.096	84.016	84.225	82.527	79.630	83.962	93.301
100	89.747	81.700	81.821	80.034	76.707	81.664	90.647

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	183.2281	185.0551	195.2276	189.5023	198.0023	182.5413
15	165.0291	166.7861	172.1909	168.6643	176.8985	165.0380
20	154.9083	156.4606	159.8798	157.3544	165.7254	155.5220
25	147.2056	148.4978	150.8615	148.9610	157.2451	148.3132
30	139.5190	140.5707	142.3496	140.8253	149.0854	141.0704
35	135.0203	135.8937	137.2929	136.0530	144.2178	136.9089
40	131.4729	132.1900	133.3795	132.3148	140.6454	133.7496
50	124.8715	125.3202	126.2634	125.4598	133.7443	127.6822
75	114.8795	114.8789	115.6744	115.1841	123.5180	118.6519
100	108.4531	108.1762	108.9852	108.6408	116.9094	112.7988

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	112.8094	164.3878	115.5873	116.8505	119.6661
15	107.2790	134.5684	109.2733	110.1906	110.8453
20	104.3719	122.8453	105.9944	106.9347	106.7039
25	102.1035	115.8716	103.5634	104.1954	103.7704
30	99.1169	109.8001	100.3420	100.9699	100.3766
35	97.8580	106.5815	98.9156	99.4367	98.8513
40	96.8257	104.4807	97.8132	98.2537	97.6260
50	94.5515	100.2992	95.3591	95.7219	95.1437
75	91.3013	94.9413	91.8878	92.1445	91.6280
100	89.1078	91.7336	89.5030	89.7266	89.3160

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	119.664	114.681	112.704	113.302	112.824	407.207	120.088
15	110.845	104.983	104.167	103.359	101.369	105.589	111.216
20	106.704	100.164	99.720	98.419	95.705	100.490	107.076
25	103.770	96.984	96.713	95.194	92.049	97.186	104.163
30	100.377	93.446	93.254	91.648	88.240	93.590	100.798
35	98.851	91.845	91.706	90.030	86.442	91.951	99.275
40	97.626	90.334	90.224	88.433	84.660	90.419	98.052
50	95.144	87.740	87.669	85.820	81.854	87.797	95.585
75	91.628	83.935	83.902	81.927	77.689	83.964	92.095
100	89.316	81.592	81.572	79.583	75.225	81.610	89.796

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	84.90	84.87	87.68	85.86	89.29	78.33	77.86	82.13	78.81	85.29
15	84.87	84.75	87.03	85.56	90.04	78.34	77.41	81.52	79.07	86.89
20	83.62	83.13	85.90	84.06	90.89	77.98	77.13	80.46	78.36	87.60
25	83.72	83.05	85.84	84.20	91.23	78.50	77.54	80.63	78.73	88.40
30	82.81	81.84	84.57	83.19	91.74	77.41	75.62	79.23	77.72	89.01
35	83.01	81.74	84.85	83.25	92.53	77.68	75.82	79.47	77.80	89.80
40	82.77	81.23	84.50	83.01	92.83	78.22	75.62	79.47	78.22	90.28
50	81.90	79.56	83.35	82.14	93.27	76.48	73.45	77.90	76.69	90.93
75	79.39	75.90	80.44	79.45	94.18	74.22	69.64	75.17	74.22	92.16
100	76.55	71.09	77.25	76.59	93.94	70.69	64.67	71.76	70.65	91.78

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	84.55	77.05	N/A	N/A	99.37	98.87
15	86.69	72.29	N/A	N/A	99.84	99.68
20	87.68	69.04	N/A	N/A	99.92	99.86
25	88.53	68.32	N/A	N/A	99.92	99.90
30	89.11	65.70	N/A	N/A	99.98	99.92
35	90.06	64.89	N/A	N/A	99.98	99.96
40	90.51	62.50	N/A	N/A	99.96	99.94
50	91.19	59.58	N/A	N/A	100.00	99.98
75	92.63	52.46	N/A	N/A	99.98	99.98
100	92.48	46.14	N/A	N/A	99.98	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	83.48	83.58	86.61	84.52	85.54	83.66
15	83.78	83.57	86.39	84.55	86.99	82.85
20	83.15	82.73	85.32	83.78	87.64	80.79
25	83.54	82.83	85.49	83.84	88.42	80.44
30	82.71	81.56	84.46	83.01	88.79	78.22
35	82.71	81.76	84.65	83.09	89.82	77.33
40	82.99	81.50	84.32	83.13	90.08	76.95
50	81.92	80.00	83.47	82.12	90.83	73.27
75	79.82	76.59	80.73	79.88	91.86	65.94
100	77.03	72.40	77.70	77.05	91.74	58.08

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.52	0.00%	91.05	0.00%	98.02
15	0.00%	99.72	0.00%	90.04	0.00%	98.53
20	0.00%	99.76	0.00%	90.34	0.00%	98.65
25	0.00%	99.84	0.00%	90.44	0.00%	98.91
30	0.00%	99.84	0.00%	89.01	0.00%	98.93
35	0.00%	99.94	0.00%	90.06	0.00%	99.31
40	0.00%	99.94	0.00%	89.33	0.00%	99.37
50	0.00%	99.96	0.00%	89.47	0.00%	99.62
75	0.00%	100.00	0.00%	88.69	0.00%	99.60
100	0.00%	99.98	0.00%	87.52	0.00%	99.80

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.53	79.64	80.81	77.79	76.59	78.22	82.53	84.36
15	85.11	80.40	81.37	78.95	75.92	79.80	85.09	86.55
20	86.22	80.10	80.67	78.32	75.27	79.66	86.08	87.45
25	87.50	80.69	81.35	78.97	74.95	80.46	87.49	88.28
30	87.90	79.72	80.32	77.68	72.51	79.43	87.76	88.65
35	88.95	80.16	80.34	77.52	72.12	79.50	89.03	89.82
40	89.25	80.20	80.51	77.37	70.79	80.20	89.31	90.32
50	90.20	78.89	79.43	75.58	66.85	78.87	90.26	90.99
75	91.58	76.44	76.95	71.15	59.07	76.44	91.62	92.51
100	91.33	73.03	73.74	66.06	51.78	72.91	91.35	92.40

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.41	84.49	86.01	85.11	80.44	84.65	90.57	92.04
15	92.79	86.36	87.01	85.27	79.82	86.08	92.04	92.79
20	93.25	86.42	86.91	84.26	78.10	86.12	92.55	93.60
25	93.11	86.42	86.63	83.90	78.12	86.08	92.40	93.39
30	93.45	85.41	85.78	82.89	75.90	85.29	92.89	93.64
35	94.12	85.37	85.74	82.42	75.01	85.11	93.47	94.22
40	94.20	85.33	85.62	81.92	73.72	85.09	93.78	94.46
50	94.40	84.50	84.87	80.04	69.76	84.06	94.06	94.81
75	94.97	81.01	81.45	75.74	61.56	81.05	94.55	95.41
100	94.30	77.78	78.12	70.18	53.03	77.33	94.06	94.97

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	83.68	83.54	83.80	81.21	82.91	81.41	83.54	86.87
15	86.08	82.77	83.41	81.60	82.00	81.88	86.14	88.06
20	86.93	81.64	82.16	80.61	79.52	81.23	87.21	89.13
25	88.30	82.14	82.51	80.69	78.89	81.64	88.16	89.70
30	88.75	81.25	81.33	79.33	76.30	80.77	88.65	90.08
35	89.90	81.50	81.86	79.35	75.15	80.89	89.96	91.13
40	89.88	81.23	81.86	79.09	74.08	81.01	90.12	91.58
50	90.91	80.10	80.73	77.01	69.80	79.92	91.15	92.06
75	92.12	77.58	77.96	72.93	61.96	77.27	92.04	93.27
100	91.84	74.32	74.89	67.92	54.08	73.98	91.82	92.87

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.02	84.08	84.16	81.88	86.32	81.82	84.18	89.43
15	86.42	82.50	82.91	81.98	85.17	81.82	86.44	90.04
20	87.60	81.17	81.82	80.93	83.39	81.05	87.29	90.99
25	88.57	81.15	81.76	80.63	82.28	80.89	88.40	91.35
30	89.07	79.76	80.59	79.17	79.41	79.84	88.85	91.47
35	90.02	80.00	80.61	79.03	77.98	80.00	90.02	92.22
40	90.50	80.08	80.63	78.63	76.69	80.22	90.55	92.24
50	91.13	78.81	79.74	76.97	72.38	78.85	91.41	93.21
75	92.12	76.46	77.35	72.87	63.45	76.34	92.36	93.84
100	92.20	73.29	74.00	67.43	55.01	73.01	91.92	93.33

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	97.44	97.58	98.14	97.83	98.22	97.31
15	98.36	98.41	98.77	98.57	99.19	98.28
20	98.97	99.01	99.17	99.11	99.45	98.95
25	99.23	99.27	99.41	99.29	99.62	99.25
30	99.21	99.25	99.31	99.25	99.64	99.27
35	99.49	99.54	99.64	99.54	99.86	99.62
40	99.68	99.68	99.68	99.68	99.90	99.76
50	99.64	99.66	99.70	99.70	99.94	99.74
75	99.72	99.72	99.76	99.72	99.96	99.86
100	99.72	99.72	99.74	99.74	99.98	99.94

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 7.4280324
Percentage Non-detects: 15.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	85.54	83.08	81.21	82.58	82.28	84.46	85.54	85.70
15	86.99	82.71	81.72	81.31	79.49	83.49	86.99	87.39
20	87.64	81.23	80.65	79.58	76.67	81.72	87.64	88.10
25	88.42	82.02	81.50	79.96	75.88	82.12	88.42	88.91
30	88.79	80.61	80.28	78.12	72.63	80.87	88.79	89.31
35	89.82	80.69	80.48	77.74	71.21	80.85	89.82	90.32
40	90.08	80.65	80.40	77.45	69.60	80.87	90.08	90.69
50	90.83	79.21	79.11	75.33	65.43	79.31	90.83	91.23
75	91.86	76.73	76.61	71.09	57.29	76.77	91.86	92.73
100	91.74	73.21	73.17	65.92	50.12	73.23	91.74	92.46

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Detection Limit: 7.4280324
Averaged Percentage Non-detects: 15.00%
Distribution Check: Average of means: 74.782318
Distribution Check: Average of stdvs: 85.373058
Average of NDs per 100 observations: 15.053800

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	7.428032	1.493465	973	1754	1451	636	202	34	0	0	0	0
15	7.428032	2.251089	444	1181	1405	1109	604	222	73	10	2	0
20	7.428032	3.019802	190	660	1173	1230	927	526	229	86	22	6
25	7.428032	3.749703	86	392	787	1098	1071	809	462	221	95	24
30	7.428032	4.523168	25	221	523	861	956	976	701	433	214	82
35	7.428032	5.238020	16	96	313	636	862	915	895	639	360	181
40	7.428032	6.011683	15	47	176	451	660	824	877	746	545	341
50	7.428032	7.492475	0	22	57	174	335	524	729	757	799	595
75	7.428032	11.253663	0	0	3	7	26	81	141	252	455	538
100	7.428032	14.978020	0	0	0	1	0	5	17	41	92	144

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	11
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	1	0	0	0	0	0	0	0	0	0	0	0	0
25	3	2	0	0	0	0	0	0	0	0	0	0	0
30	41	13	4	0	0	0	0	0	0	0	0	0	0
35	83	35	16	2	1	0	0	0	0	0	0	0	0
40	210	96	38	15	8	1	0	0	0	0	0	0	0
50	439	294	168	90	35	20	8	1	3	0	0	0	0
75	643	625	601	508	408	327	173	126	71	37	17	11	0
100	234	354	400	478	520	548	550	457	389	303	192	325	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	2	0	2	0	0	2	0	2	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	9	13	3	18	0	0	0	34
15	2	5	1	3	0	0	0	12
20	1	2	1	1	0	0	0	1
25	1	1	0	1	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	9	13	3	18	0	0
15	2	5	1	3	0	0
20	1	2	1	1	0	0
25	1	1	0	1	0	0
30	0	1	0	1	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	2	0	2	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	2	0	2	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	16	0	16	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 11c. G(0.75,100) 20% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	118.2732	117.2008	436.7208	306.5188	605.5012	411.9933
15	111.7205	97.3542	263.4012	221.8209	357.4764	293.1952
20	107.0597	89.8206	206.1605	188.7724	264.6111	238.5614
25	103.9134	84.7400	177.2548	166.3827	223.1142	206.6722
30	101.1909	81.9108	159.1212	151.8730	196.5625	185.6191
35	100.1586	80.3340	148.8785	143.8591	180.4394	172.9157
40	98.1973	78.1685	140.5787	137.1106	167.5139	162.3878
50	96.3844	76.0149	129.2020	127.0465	151.7673	148.5507
75	92.4354	72.2380	113.8085	112.8486	130.1204	128.6844
100	90.5590	70.5234	106.4766	105.9215	119.8941	119.0569

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	119.0360	118.9089	127.3911	121.3779	134.1213
15	107.8135	107.5097	112.4646	108.9609	121.2675
20	101.1223	100.5361	104.2592	101.7662	114.2362
25	96.9925	96.1900	99.2527	97.3981	109.5502
30	93.5997	92.6435	95.3562	93.8682	105.9363
35	92.0472	90.9486	93.4737	92.2368	104.2942
40	89.6375	88.4486	90.8372	89.7702	101.9194
50	87.3013	85.9371	88.1905	87.3732	99.4311
75	82.5976	80.9915	83.1203	82.6087	94.5332
100	80.2749	78.5291	80.6387	80.2672	92.1738

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	105.6976	104.8847	112.4145	106.4670	120.1187
15	98.9789	98.2203	102.9163	99.5339	112.3481
20	94.1145	93.1318	96.8332	94.4246	107.2570
25	91.2296	90.0875	93.2199	91.4252	103.8428
30	88.6016	87.3451	90.1645	88.7215	101.0057
35	87.5742	86.2042	88.8542	87.6526	99.8896
40	85.5389	84.1023	86.6217	85.5837	97.8888
50	83.8016	82.2255	84.6123	83.8153	95.9924
75	79.9381	78.1721	80.4219	79.9209	91.9200
100	78.0556	76.1789	78.3953	78.0306	89.9908

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	115.7790	115.6957	123.6159	118.0593	120.7206	115.8464
15	106.3154	106.0917	110.8122	107.5237	112.3560	104.7629
20	100.1260	99.6391	103.2269	100.8042	106.9806	97.3399
25	96.3753	95.6803	98.6297	96.8199	103.5412	92.8493
30	93.1428	92.3028	94.8899	93.4533	100.6334	89.0581
35	91.7255	90.7200	93.1494	91.9422	99.4992	87.1838
40	89.3328	88.2333	90.5423	89.4877	97.4362	84.4409
50	87.1159	85.8409	88.0147	87.2054	95.5455	81.7143
75	82.5163	80.9897	83.0455	82.5377	91.4798	76.3257
100	80.2319	78.5584	80.6003	80.2311	89.5629	73.6071

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1034.6288	0.00%	164.6561	0.00%	445.3826
15	0.00%	428.9650	0.00%	127.6296	0.00%	230.8977
20	0.00%	305.5934	0.00%	112.8310	0.00%	183.1947
25	0.00%	253.3146	0.00%	105.6878	0.00%	161.5211
30	0.00%	220.7576	0.00%	100.4941	0.00%	147.9901
35	0.00%	205.0101	0.00%	98.1308	0.00%	141.1158
40	0.00%	191.5078	0.00%	95.0673	0.00%	134.4617
50	0.00%	174.6604	0.00%	91.9159	0.00%	126.3084
75	0.00%	151.4173	0.00%	86.7254	0.00%	114.6224
100	0.00%	141.6277	0.00%	84.5092	0.00%	109.3592

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	113.656	557.347	246.122	104.965	103.202	105.486	118.205
15	108.741	101.592	110.312	99.391	96.610	100.336	111.343
20	104.674	96.417	123.050	94.430	90.929	95.796	106.661
25	101.873	93.371	93.989	91.498	87.772	93.052	103.554
30	99.392	90.533	91.032	88.648	84.738	90.275	100.883
35	98.480	89.391	89.808	87.475	83.456	89.185	99.881
40	96.615	87.248	87.639	85.326	81.144	87.083	97.969
50	94.951	85.277	85.581	83.282	78.930	85.140	96.198
75	91.164	81.022	81.244	78.927	74.245	80.925	92.329
100	89.354	78.936	79.098	76.752	71.826	78.851	90.478

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	170.001	135.318	140.833	132.633	122.674	132.682	184.718
15	138.739	115.376	117.359	111.886	103.374	114.264	141.054
20	125.083	105.520	106.712	101.859	93.816	104.732	126.257
25	117.150	100.553	101.255	97.013	89.641	99.983	118.124
30	111.415	96.097	96.601	92.732	85.949	95.661	112.400
35	108.504	94.074	94.458	90.825	84.277	93.695	109.433
40	104.915	91.141	91.523	88.096	81.666	90.836	105.964
50	101.425	88.329	88.554	85.386	79.352	88.113	102.350
75	95.126	82.879	83.071	80.145	74.396	82.733	96.156
100	92.231	80.252	80.385	77.593	71.848	80.132	93.260

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	116.696	115.397	116.595	111.085	114.420	111.403	124.608
15	110.760	105.427	106.320	103.258	103.891	103.640	115.372
20	106.358	98.802	99.515	97.264	96.376	98.020	109.651
25	103.271	94.927	95.518	93.590	91.743	94.555	105.928
30	100.650	91.707	92.261	90.300	87.915	91.490	102.857
35	99.580	90.352	90.829	88.818	85.982	90.138	101.599
40	97.612	88.055	88.476	86.389	83.232	87.840	99.434
50	95.782	85.916	86.251	84.083	80.441	85.775	97.382
75	91.737	81.454	81.689	79.452	75.079	81.368	93.097
100	89.791	79.273	79.454	77.151	72.445	79.196	91.058

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	118.634	119.857	118.817	114.044	125.731	114.887	134.383
15	111.722	107.026	107.152	104.555	111.382	104.384	120.933
20	107.108	98.998	99.296	98.057	102.246	97.935	113.596
25	104.018	94.375	94.823	93.809	96.051	93.979	108.821
30	101.276	91.235	91.641	90.569	91.386	90.958	105.183
35	100.113	89.743	90.207	88.991	88.865	89.611	103.469
40	98.076	87.453	87.893	86.474	85.828	87.293	101.068
50	96.166	85.353	85.730	84.112	82.315	85.246	98.587
75	91.980	81.115	81.330	79.471	76.272	80.959	93.822
100	89.940	79.018	79.193	77.180	73.335	78.899	91.566

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	186.3185	188.3429	201.5069	193.7411	205.6979	184.5580
15	167.9685	169.8954	176.8023	172.1553	183.6234	167.4880
20	155.5398	157.1838	161.5453	158.2099	169.9631	156.1421
25	146.9113	148.3062	151.2556	148.7802	160.3110	148.3500
30	139.5921	140.7231	142.9476	140.9757	152.4872	141.7655
35	135.5061	136.4470	138.2127	136.5976	148.1299	138.2692
40	130.4545	131.2121	132.7191	131.3280	142.9920	133.7764
50	124.4491	124.9037	126.1085	125.0546	136.6860	128.5825
75	113.2622	113.2061	114.2064	113.5638	125.1468	118.7935
100	107.0944	106.7197	107.7340	107.2762	118.8886	113.5176

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	113.6733	166.9515	116.7782	118.5639	120.7388
15	108.7432	135.9634	110.7893	111.7229	112.3579
20	104.6595	123.0358	106.3099	107.1964	106.9821
25	101.8781	115.5453	103.2869	104.0245	103.5412
30	99.3699	110.1241	100.5898	101.2081	100.6334
35	98.5065	107.4641	99.6014	100.1122	99.4992
40	96.6179	104.0944	97.5981	98.0969	97.4362
50	94.9678	100.7384	95.7678	96.1426	95.5455
75	91.1725	94.6863	91.7397	91.9463	91.4798
100	89.3520	91.8851	89.8002	89.9529	89.5629

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	120.721	113.831	110.286	112.867	113.456	228.573	121.579
15	112.356	104.969	103.368	103.041	101.175	111.669	113.149
20	106.981	98.413	97.482	96.408	93.464	99.031	107.808
25	103.541	94.572	94.001	92.536	88.995	94.954	104.377
30	100.633	91.340	90.930	89.288	85.414	91.614	101.480
35	99.499	89.914	89.612	87.809	83.620	90.117	100.347
40	97.436	87.631	87.389	85.520	81.095	87.795	98.313
50	95.545	85.455	85.297	83.269	78.542	85.562	96.431
75	91.480	81.087	81.010	78.844	73.694	81.141	92.425
100	89.563	78.948	78.901	76.661	71.301	78.981	90.528

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	85.96	85.86	89.25	87.03	90.85	76.03	75.25	81.80	76.44	86.32
15	84.73	84.55	88.10	85.47	91.60	76.24	75.54	80.26	76.51	87.82
20	82.83	82.32	86.02	83.54	92.95	74.79	73.70	78.22	75.07	88.61
25	82.36	81.56	85.07	82.77	93.01	74.16	72.46	76.87	74.38	89.39
30	81.35	80.14	83.50	81.56	92.75	72.81	70.55	75.39	72.85	89.49
35	80.42	78.71	82.61	80.59	93.88	72.46	70.04	74.73	72.50	90.50
40	80.44	78.30	82.59	80.81	94.34	71.62	68.57	73.62	71.74	91.43
50	78.75	75.86	80.32	78.81	94.32	70.32	66.75	72.00	70.32	91.56
75	72.22	67.58	73.98	72.22	94.65	64.73	59.11	65.90	64.67	91.82
100	68.34	61.41	69.54	68.18	95.84	59.43	52.38	60.40	59.35	93.39

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	85.39	77.29	N/A	N/A	99.60	99.33
15	87.54	71.63	N/A	N/A	99.88	99.86
20	88.51	65.69	N/A	N/A	100.00	100.00
25	89.54	62.60	N/A	N/A	99.98	99.96
30	89.68	59.84	N/A	N/A	99.98	99.94
35	90.97	57.50	N/A	N/A	100.00	100.00
40	91.88	54.25	N/A	N/A	100.00	100.00
50	92.02	50.24	N/A	N/A	99.98	99.98
75	92.57	40.26	N/A	N/A	99.98	99.98
100	94.16	32.63	N/A	N/A	99.96	99.96

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	83.08	82.99	87.36	84.08	85.80	82.77
15	82.78	82.69	86.08	83.65	87.19	81.25
20	81.20	80.80	84.16	81.79	87.72	78.14
25	80.87	79.96	83.56	81.14	88.51	76.26
30	79.95	78.57	82.51	80.16	88.91	72.93
35	79.40	77.79	81.52	79.60	89.86	71.23
40	79.07	76.75	81.62	79.29	90.77	68.87
50	77.76	75.31	79.58	77.88	90.69	65.03
75	71.33	67.31	73.07	71.37	91.13	53.05
100	67.88	61.23	69.23	67.88	92.55	43.39

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.82	0.00%	87.13	0.00%	97.80
15	0.00%	99.82	0.00%	86.36	0.00%	98.08
20	0.00%	99.88	0.00%	85.01	0.00%	98.61
25	0.00%	100.00	0.00%	84.48	0.00%	98.61
30	0.00%	99.80	0.00%	84.10	0.00%	98.75
35	0.00%	99.98	0.00%	83.64	0.00%	99.13
40	0.00%	99.96	0.00%	84.50	0.00%	98.91
50	0.00%	99.96	0.00%	83.15	0.00%	98.97
75	0.00%	100.00	0.00%	81.09	0.00%	99.47
100	0.00%	99.96	0.00%	80.53	0.00%	99.72

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.65	78.35	80.32	75.50	73.94	75.80	82.67	85.54
15	84.99	79.23	80.53	76.93	74.06	77.54	85.13	87.37
20	86.28	77.37	78.55	75.01	70.02	76.63	86.10	88.36
25	87.27	77.52	78.12	74.67	68.77	77.11	87.25	89.15
30	87.78	75.88	76.87	72.63	66.30	75.64	87.88	89.50
35	88.89	75.80	76.53	72.48	65.23	75.52	88.95	90.81
40	90.12	74.93	75.78	71.07	61.76	74.59	90.04	91.70
50	90.24	73.74	74.77	69.11	58.87	73.43	90.08	91.82
75	90.53	67.70	68.16	61.27	47.01	67.17	90.65	92.42
100	92.48	62.91	63.39	54.44	36.95	62.46	92.26	94.14

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.11	79.94	82.91	80.48	74.02	79.21	90.50	92.34
15	92.53	82.83	83.64	81.39	73.33	81.98	91.72	92.99
20	93.52	81.74	82.67	79.35	70.16	81.27	92.51	94.20
25	93.37	82.40	82.73	79.07	69.27	81.45	92.85	94.10
30	93.23	81.50	81.72	76.95	66.93	80.87	92.73	94.12
35	94.02	80.83	81.35	76.57	65.23	80.32	93.49	94.59
40	94.53	80.32	80.89	75.27	62.51	79.92	93.98	95.05
50	94.28	78.85	79.45	73.13	59.80	78.55	93.80	95.07
75	94.14	72.02	72.57	64.48	47.47	71.27	93.78	95.17
100	95.05	67.62	68.00	57.88	37.74	67.05	94.79	96.10

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.14	83.60	84.50	80.61	83.23	80.65	83.98	88.10
15	86.16	82.73	83.54	80.61	81.49	80.77	86.10	89.23
20	87.17	80.75	81.09	78.69	77.64	79.15	87.11	90.12
25	88.08	78.99	79.74	77.11	75.07	78.42	88.22	90.77
30	88.77	77.39	78.50	75.50	71.41	77.05	88.95	90.95
35	89.98	77.19	77.76	74.55	69.39	76.50	89.96	91.80
40	90.83	76.22	77.33	73.17	65.94	75.84	90.89	92.75
50	90.81	75.17	75.94	70.79	62.04	74.87	90.75	92.77
75	91.39	68.79	69.39	62.95	49.43	68.61	91.29	93.19
100	92.93	63.90	64.83	56.00	39.47	63.58	92.99	94.69

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.87	85.01	84.85	82.34	88.24	82.83	84.65	90.83
15	86.46	83.98	84.24	81.56	87.37	81.62	86.40	91.39
20	87.78	80.93	81.23	79.94	84.65	79.31	87.78	92.16
25	88.57	78.53	79.58	78.02	82.44	78.14	88.55	92.36
30	89.03	77.27	77.49	76.48	78.99	76.61	88.87	92.30
35	89.94	76.14	76.97	75.31	75.64	76.22	90.02	93.23
40	91.07	74.95	75.76	73.50	72.91	75.07	91.13	93.54
50	91.09	73.94	74.85	70.97	67.07	73.37	91.05	93.76
75	91.52	67.33	67.84	62.53	52.69	67.09	91.45	93.80
100	92.93	63.56	64.00	56.00	42.14	62.42	93.05	94.99

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	97.67	97.83	98.67	98.18	98.69	97.41
15	98.43	98.55	98.95	98.73	99.17	98.34
20	99.21	99.21	99.39	99.25	99.60	99.21
25	99.15	99.19	99.47	99.25	99.68	99.25
30	99.39	99.41	99.50	99.43	99.64	99.45
35	99.52	99.56	99.70	99.58	99.88	99.68
40	99.52	99.54	99.66	99.56	99.94	99.82
50	99.33	99.35	99.41	99.37	99.86	99.52
75	99.56	99.58	99.62	99.62	99.94	99.82
100	99.72	99.70	99.78	99.74	99.96	99.94

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 11.1292961
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	85.80	82.86	78.59	82.54	82.61	85.25	85.84	86.55
15	87.19	82.28	80.14	81.01	79.52	83.47	87.21	88.14
20	87.72	79.82	78.53	77.58	73.90	80.48	87.72	88.87
25	88.51	79.01	78.04	76.18	70.77	79.60	88.51	89.58
30	88.91	77.33	76.50	73.76	66.87	77.82	88.91	89.82
35	89.86	76.63	76.00	73.05	65.07	76.93	89.86	90.93
40	90.77	75.80	75.03	71.39	61.43	76.12	90.77	91.80
50	90.69	74.32	73.92	68.97	57.19	74.59	90.69	91.98
75	91.13	67.66	67.43	61.13	44.85	67.88	91.13	92.55
100	92.55	62.81	62.63	54.18	34.61	62.89	92.55	94.02

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Detection Limit: 11.1292961
Averaged Percentage Non-detects: 20.00%
Distribution Check: Average of means: 75.077608
Distribution Check: Average of stdvs: 85.630055
Average of NDs per 100 observations: 19.987300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	11.129296	1.971287	523	1381	1548	1033	446	119	0	0	0	0
15	11.129296	2.963762	161	693	1205	1282	913	513	199	68	13	3
20	11.129296	4.027723	61	300	669	1029	1054	923	562	281	106	55
25	11.129296	4.994455	23	111	360	659	933	1023	850	583	293	133
30	11.129296	5.971683	5	45	175	410	696	886	896	739	558	321
35	11.129296	6.959802	5	18	85	218	409	675	809	803	744	581
40	11.129296	8.053465	0	3	31	115	240	421	619	731	795	708
50	11.129296	10.018416	0	1	2	13	45	162	267	436	598	723
75	11.129296	15.007921	0	0	0	0	0	7	15	36	68	121
100	11.129296	20.003960	0	0	0	0	0	0	1	1	3	8

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	35
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	8	2	0	0	0	0	0	0	0	0	0	0	0
25	61	17	4	0	0	0	0	0	0	0	0	0	0
30	179	82	38	12	8	0	0	0	0	0	0	0	0
35	358	182	95	53	7	5	0	0	3	0	0	0	0
40	527	375	245	130	67	31	5	5	0	1	1	0	0
50	702	662	502	386	251	150	86	39	14	7	3	1	0
75	220	349	395	503	546	552	568	486	403	296	199	286	0
100	12	33	55	103	162	251	313	405	473	523	499	2208	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	1	0	1	0	0	1	0	1	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	21	34	2	50	0	0	0	119
15	10	13	1	15	0	0	0	84
20	3	8	1	4	0	0	0	10
25	1	4	0	2	0	0	0	4
30	2	6	0	4	0	0	0	0
35	2	2	1	2	0	0	0	3
40	0	0	0	0	0	0	0	1
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	21	34	2	50	0	0
15	10	13	1	15	0	0
20	3	8	1	4	0	0
25	1	4	0	2	0	0
30	2	6	0	4	0	0
35	2	2	1	2	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	1	0	1	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	55	0	55	0	0	0	0
15	0	4	0	4	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 11d. G(0.75,100) 25% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	118.5475	126.1845	472.1317	324.0662	706.6612	469.0916
15	112.7391	97.6667	288.9631	239.5374	405.5936	327.0133
20	108.2726	89.9448	218.8343	199.0817	292.8946	261.7651
25	105.5653	83.9005	187.2679	174.9536	244.2482	224.7661
30	102.1984	79.5334	167.6471	159.3821	212.8732	199.9510
35	100.7926	77.1799	155.4514	149.7642	194.2187	185.3216
40	99.3603	75.6858	144.7887	141.0103	178.6723	172.7297
50	96.9339	72.7735	132.5088	130.1428	160.0683	156.3531
75	93.3917	69.0867	116.0409	115.0055	135.8378	134.2000
100	91.1764	66.9045	107.5643	106.9742	123.7018	122.7581

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	119.7869	119.5403	130.2681	127.1034	138.3862
15	107.9263	107.4914	113.9254	108.9842	125.2446
20	100.7903	100.1923	104.7503	101.3970	117.5036
25	96.7005	95.8608	99.5592	97.0571	112.8966
30	92.3778	91.3632	94.5988	92.5894	108.3463
35	90.1001	88.9245	91.9287	90.2288	106.2527
40	88.3318	87.0485	89.8367	88.4118	104.1011
50	84.9999	83.5214	86.1314	85.0195	100.8449
75	80.3989	78.6495	81.0688	80.3696	96.0483
100	77.5430	75.6196	78.0107	77.5020	93.1568

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	102.9777	101.9724	111.2761	107.9904	120.7413
15	96.2882	95.2682	101.2881	96.4409	113.5295
20	91.7534	90.6854	95.1251	91.8994	108.5291
25	89.2082	87.9489	91.6994	89.2714	105.5223
30	85.8585	84.4682	87.8153	85.8629	101.9524
35	84.1736	82.6506	85.7981	84.1447	100.4500
40	83.0319	81.4350	84.3786	82.9914	98.9147
50	80.4041	78.6505	81.4270	80.3423	96.3511
75	76.8874	74.9287	77.5028	76.8183	92.6117
100	74.6071	72.5096	75.0411	74.5418	90.2797

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	113.9535	113.6676	123.6392	116.1745	119.9017	113.7655
15	104.8844	104.6232	110.3225	106.0256	112.3727	102.2567
20	98.6791	98.1578	102.4268	99.3461	107.3231	95.0181
25	95.0811	94.3645	97.8465	95.5076	104.3777	90.6021
30	91.0317	90.1049	93.1827	91.2624	100.8163	85.8873
35	88.9159	87.7968	90.6970	89.0487	99.2857	83.2051
40	87.3232	86.0875	88.8076	87.4092	97.8247	81.3114
50	84.1470	82.7129	85.2668	84.1721	95.2843	77.4937
75	79.7999	78.0947	80.4652	79.7748	91.6593	72.2709
100	77.0603	75.1783	77.5257	77.0225	89.4077	68.9956

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1043.8245	0.02%	140.7084	0.00%	405.3609
15	0.00%	433.5227	0.00%	115.7265	0.00%	217.4510
20	0.00%	310.4790	0.00%	105.3882	0.00%	174.8075
25	0.00%	256.3446	0.00%	100.1715	0.00%	155.3473
30	0.00%	221.6133	0.00%	95.0638	0.00%	141.4936
35	0.00%	205.9697	0.00%	92.7107	0.00%	135.0757
40	0.00%	192.3963	0.00%	91.0463	0.00%	129.4969
50	0.00%	173.9003	0.00%	87.8685	0.00%	121.3990
75	0.00%	151.9317	0.00%	84.0834	0.00%	111.2960
100	0.00%	140.8703	0.00%	81.9058	0.00%	105.9241

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	112.759	177.081	443.560	102.202	100.533	113.998	118.868
15	108.728	141.041	253.293	96.500	93.361	97.320	112.586
20	105.004	110.642	521.132	92.259	88.139	93.537	107.977
25	102.726	156.966	92.709	89.512	84.874	91.112	105.236
30	99.567	88.252	98.663	86.042	81.130	87.796	101.918
35	98.294	86.451	87.021	84.258	79.109	86.138	100.558
40	97.020	85.166	85.646	83.001	77.821	84.926	99.153
50	94.706	82.333	82.713	80.106	74.717	82.151	96.768
75	91.349	78.407	78.639	76.106	70.466	78.251	93.278
100	89.199	75.825	76.030	73.464	67.579	75.708	91.097

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	162.653	122.228	128.732	121.147	110.189	3410.988	181.251
15	138.577	108.456	110.875	105.149	95.826	106.984	142.821
20	125.146	100.735	102.027	96.973	88.461	99.463	127.427
25	118.081	96.430	97.379	92.678	83.842	95.544	120.031
30	111.458	91.955	92.656	88.417	79.951	91.354	113.383
35	108.235	89.631	90.097	86.108	77.689	89.119	110.036
40	105.401	87.970	88.418	84.638	76.592	87.551	107.178
50	101.193	84.487	84.803	81.324	73.587	84.182	102.954
75	95.331	79.709	79.936	76.788	69.734	79.532	97.088
100	92.094	76.757	76.938	73.902	66.955	76.627	93.883

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	116.049	116.573	117.924	109.548	114.545	110.034	125.951
15	110.803	105.925	106.950	101.543	103.140	101.991	117.069
20	106.651	98.122	99.007	95.708	95.307	96.396	111.198
25	104.148	93.856	94.659	92.008	90.443	93.048	107.855
30	100.806	89.644	90.240	87.994	85.605	89.186	104.004
35	99.418	87.494	88.078	85.729	82.778	87.132	102.395
40	98.012	85.949	86.440	84.126	80.719	85.685	100.723
50	95.521	82.824	83.258	80.863	76.777	82.594	98.017
75	91.907	78.652	78.954	76.483	71.510	78.502	94.119
100	89.637	76.035	76.236	73.736	68.226	75.919	91.731

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	118.644	123.864	122.577	114.308	130.491	116.524	136.717
15	111.832	110.675	110.357	104.577	114.126	104.688	123.296
20	107.426	100.354	100.270	97.903	104.073	97.543	115.505
25	104.895	94.875	94.941	93.606	97.686	93.464	111.141
30	101.426	89.834	90.215	89.142	91.528	89.321	106.581
35	99.947	87.374	87.883	86.744	88.056	87.130	104.575
40	98.497	85.653	86.035	84.802	85.205	85.391	102.561
50	95.941	82.549	82.878	81.367	80.366	82.398	99.460
75	92.169	78.432	78.722	76.782	73.725	78.278	94.972
100	89.813	75.866	76.060	74.014	69.932	75.743	92.323

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	185.6858	187.3212	204.0547	193.6404	209.1798	182.7777
15	168.7051	170.5426	179.2484	173.2043	188.4365	167.8643
20	156.1628	157.8511	163.2538	159.0544	174.1123	156.8836
25	147.7404	149.1931	152.8856	149.7745	164.6442	149.7130
30	139.3264	140.5097	143.3273	140.7909	155.7412	142.4026
35	134.4903	135.4472	137.7501	135.6239	150.8802	138.4674
40	130.0529	130.8088	132.7305	130.9506	145.9592	134.6714
50	122.8656	123.2969	124.8493	123.4755	138.6874	128.7175
75	111.7964	111.6786	112.9341	112.0892	127.2743	119.5209
100	104.9516	104.4798	105.7249	105.1203	120.3500	113.8862

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	112.7871	161.3882	116.0451	118.4654	119.9838
15	108.7636	135.8068	110.8019	111.8550	112.3891
20	105.0196	122.8633	106.6585	107.4427	107.3294
25	102.7073	116.2416	104.1453	104.8871	104.3787
30	99.5767	110.1253	100.7901	101.3227	100.8162
35	98.2873	106.9859	99.3888	99.9509	99.2857
40	97.0149	104.3637	97.9888	98.4724	97.8247
50	94.6970	100.3734	95.5277	95.9308	95.2843
75	91.3397	94.8136	91.9139	92.1489	91.6593
100	89.1992	91.6956	89.6379	89.7954	89.4077

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	119.902	112.718	107.156	112.263	114.135	4205.925	121.454
15	112.373	104.147	101.310	101.804	100.576	125.930	113.837
20	107.323	97.348	95.717	95.295	92.522	98.455	108.772
25	104.378	93.484	92.460	91.334	87.767	94.138	105.801
30	100.816	89.437	88.705	87.259	83.110	89.901	102.305
35	99.286	87.257	86.694	85.037	80.501	87.615	100.814
40	97.825	85.717	85.289	83.478	78.664	85.989	99.345
50	95.284	82.581	82.289	80.277	75.016	82.768	96.861
75	91.659	78.428	78.284	76.052	70.183	78.522	93.298
100	89.408	75.819	75.729	73.376	67.175	75.877	91.083

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	86.11	85.76	91.05	87.35	92.42	73.15	72.14	80.49	72.83	85.62
15	86.04	85.82	90.42	86.73	94.02	73.50	72.63	78.79	73.56	89.52
20	82.67	82.36	86.81	83.09	93.90	71.05	69.78	75.86	71.13	89.13
25	82.95	82.28	86.08	83.29	94.50	71.94	69.96	75.52	71.96	90.63
30	79.35	77.96	82.75	79.56	94.34	68.63	66.22	71.66	68.51	90.75
35	78.24	76.42	81.52	78.40	95.29	67.05	64.10	70.14	66.91	91.98
40	77.33	74.83	80.02	77.49	95.98	65.58	62.28	68.67	65.37	92.48
50	74.28	71.05	77.01	74.24	95.92	62.61	58.48	65.21	62.51	92.69
75	65.17	59.88	67.09	64.99	96.48	54.22	48.38	56.04	54.02	93.33
100	58.57	50.97	60.57	58.30	96.53	47.39	40.04	48.81	47.15	93.47

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	85.19	78.62	N/A	N/A	99.92	99.74
15	89.47	72.09	N/A	N/A	99.96	99.94
20	89.45	65.66	N/A	N/A	100.00	100.00
25	90.93	61.28	N/A	N/A	100.00	100.00
30	91.09	55.81	N/A	N/A	99.98	99.98
35	92.50	51.98	N/A	N/A	99.98	99.98
40	93.11	49.77	N/A	N/A	100.00	100.00
50	93.52	42.48	N/A	N/A	100.00	100.00
75	94.48	30.89	N/A	N/A	100.00	99.98
100	94.91	22.48	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	81.83	81.28	87.85	82.79	85.31	81.43
15	81.79	81.63	86.61	82.54	88.20	78.71
20	79.61	79.14	83.61	80.08	87.92	74.95
25	79.94	79.12	83.31	80.22	89.56	73.50
30	76.61	75.27	79.77	76.76	89.21	68.55
35	75.62	73.87	78.51	75.66	90.81	65.09
40	74.35	71.97	77.65	74.43	91.23	62.22
50	71.50	68.55	74.24	71.58	91.33	55.15
75	62.95	57.92	64.97	62.77	91.80	41.11
100	56.16	49.43	58.40	56.04	92.10	28.93

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.80	0.02%	83.16	0.00%	97.56
15	0.00%	99.76	0.00%	82.57	0.00%	97.86
20	0.00%	99.88	0.00%	81.07	0.00%	98.00
25	0.00%	99.96	0.00%	82.30	0.00%	98.32
30	0.00%	99.88	0.00%	79.82	0.00%	98.55
35	0.00%	99.90	0.00%	80.02	0.00%	98.50
40	0.00%	99.98	0.00%	79.37	0.00%	99.03
50	0.00%	99.96	0.00%	78.99	0.00%	99.15
75	0.00%	100.00	0.00%	75.70	0.00%	99.35
100	0.00%	100.00	0.00%	74.38	0.00%	99.52

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	81.21	76.74	79.39	72.24	71.21	71.98	81.31	85.49
15	86.10	78.08	80.26	73.82	69.66	74.75	86.12	89.60
20	86.32	75.47	76.99	72.02	66.28	73.72	86.44	89.31
25	88.61	76.14	77.41	72.51	65.31	74.85	88.67	90.87
30	88.08	72.63	73.68	69.23	61.15	71.80	88.12	90.85
35	89.76	71.62	72.61	67.54	58.12	71.09	89.76	92.30
40	90.69	70.59	71.68	66.22	56.22	69.94	90.71	93.05
50	90.85	67.88	68.55	62.30	49.64	67.58	90.73	93.43
75	91.27	58.89	59.39	51.74	35.62	58.28	91.43	94.36
100	91.96	51.92	52.73	43.39	24.50	51.39	91.78	94.79

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.59	74.62	77.73	76.10	68.06	73.07	90.00	92.57
15	93.41	77.07	79.35	75.80	66.95	76.32	92.50	94.53
20	93.37	77.07	78.46	74.13	63.88	75.98	92.38	94.81
25	94.00	78.55	79.72	74.71	62.77	77.64	93.13	95.01
30	93.74	75.88	76.69	71.60	58.83	75.39	93.15	94.69
35	94.44	75.23	75.90	70.38	55.74	74.75	93.82	95.68
40	94.83	74.57	75.58	68.79	54.75	73.60	94.30	96.22
50	94.55	71.64	72.08	65.01	48.44	70.93	94.28	96.02
75	94.97	62.40	62.81	53.82	34.73	61.74	94.46	96.73
100	94.81	55.27	56.04	45.19	24.02	54.44	94.44	96.89

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	82.89	83.98	84.69	78.77	83.29	79.72	82.95	88.89
15	87.21	84.34	85.17	79.27	81.66	79.58	87.17	91.60
20	87.23	79.33	80.48	76.35	76.18	77.16	87.43	91.21
25	89.45	78.53	79.86	76.32	74.04	77.64	89.47	92.04
30	89.07	74.67	75.56	72.00	68.02	73.84	89.11	92.34
35	90.73	73.21	74.18	70.20	64.28	72.38	90.71	93.39
40	91.41	71.82	72.69	67.90	61.01	70.99	91.21	94.08
50	91.35	68.22	69.58	63.66	53.25	68.14	91.23	94.08
75	91.96	59.62	60.38	52.85	38.02	59.07	92.06	95.21
100	92.40	52.51	53.01	44.00	26.30	52.04	92.40	95.45

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	84.26	86.16	85.66	82.26	89.66	83.62	84.46	92.51
15	87.56	86.55	86.44	83.09	89.74	82.95	87.74	93.56
20	87.68	82.38	81.96	80.04	85.76	79.80	87.60	93.09
25	89.76	80.69	80.73	79.15	84.63	79.01	89.68	93.74
30	89.23	75.68	75.96	74.99	80.24	74.75	89.60	93.39
35	90.95	73.54	74.26	72.32	76.75	73.03	90.73	94.53
40	91.49	71.19	72.48	69.64	72.22	70.97	91.54	95.13
50	91.50	68.16	68.69	65.45	63.74	67.43	91.70	95.13
75	92.26	58.59	59.39	53.68	44.38	58.71	92.36	95.76
100	92.38	51.54	52.59	45.58	30.22	51.23	92.46	95.96

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	97.93	97.94	98.83	98.43	98.81	97.56
15	98.58	98.59	99.26	98.84	99.43	98.53
20	98.89	98.93	99.27	99.00	99.49	98.87
25	99.21	99.24	99.48	99.34	99.76	99.29
30	99.31	99.34	99.50	99.37	99.80	99.49
35	99.46	99.54	99.68	99.54	99.88	99.68
40	99.62	99.64	99.78	99.64	99.96	99.80
50	99.62	99.64	99.74	99.64	99.98	99.90
75	99.62	99.60	99.64	99.62	99.92	99.90
100	99.39	99.33	99.47	99.41	99.98	99.92

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.3407527
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	85.31	82.28	75.33	82.89	83.49	86.38	85.45	86.40
15	88.20	82.19	77.96	80.03	79.13	84.69	88.20	89.92
20	87.92	78.41	75.90	75.77	72.93	80.00	87.92	89.50
25	89.56	78.46	76.91	75.45	69.82	79.49	89.56	90.87
30	89.21	74.75	73.33	71.37	63.66	75.60	89.21	90.91
35	90.81	73.15	71.98	68.99	59.60	73.82	90.81	92.34
40	91.23	71.62	70.46	66.55	56.40	72.42	91.23	92.97
50	91.33	68.22	67.37	62.26	48.63	68.77	91.33	93.37
75	91.80	58.61	58.22	51.39	33.52	58.97	91.80	94.32
100	92.10	51.74	51.27	43.11	22.85	51.98	92.10	94.75

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Detection Limit: 15.3407527
Averaged Percentage Non-detects: 25.00%
Distribution Check: Average of means: 74.964187
Distribution Check: Average of stdvs: 85.487210
Average of NDs per 100 observations: 25.014900

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	15.340753	2.457030	276	921	1477	1297	753	326	0	0	0	0
15	15.340753	3.724752	70	318	828	1169	1121	821	438	190	76	16
20	15.340753	4.996634	19	93	343	675	981	1034	828	558	312	134
25	15.340753	6.173465	5	35	140	324	643	840	926	810	598	395
30	15.340753	7.456436	2	10	50	139	316	552	738	852	796	602
35	15.340753	8.796436	0	0	8	50	130	280	476	631	784	795
40	15.340753	9.923564	0	0	0	8	72	141	309	456	603	677
50	15.340753	12.527129	0	0	1	2	6	18	63	133	221	377
75	15.340753	18.744158	0	0	0	0	0	1	1	0	8	16
100	15.340753	25.009505	0	0	0	0	0	0	0	0	0	1

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	107
15	3	0	0	0	0	0	0	0	0	0	0	0	2
20	55	11	4	2	1	0	0	0	0	0	0	0	0
25	197	87	31	13	6	0	0	0	0	0	0	0	0
30	461	264	150	71	25	15	5	2	0	0	0	0	0
35	642	529	346	194	109	41	22	7	4	1	1	0	0
40	731	668	481	414	236	130	74	28	13	6	3	0	0
50	517	585	608	648	550	482	341	237	128	74	34	25	0
75	32	61	119	178	230	338	423	485	514	536	501	1607	0
100	1	2	1	8	17	26	60	98	126	167	256	4287	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	11	0	11	0	0	11	0	11	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	35	45	12	82	0	0	0	326
15	41	68	16	68	0	0	0	285
20	18	26	11	29	0	0	0	73
25	6	17	4	14	0	0	0	50
30	6	12	2	8	0	0	0	22
35	4	6	2	4	0	0	0	13
40	2	2	2	2	0	0	0	3
50	0	0	0	0	0	0	0	1
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	35	45	12	82	0	0
15	41	68	16	68	0	0
20	18	26	11	29	0	0
25	6	17	4	14	0	0
30	6	12	2	8	0	0
35	4	6	2	4	0	0
40	2	2	2	2	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	11	0	11	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	1	0	0	1	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	11	0	11	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	1	0	0	1	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	1	0	0	1	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	1	0	0	1	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	1	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	100	0	100	0	0	0	0
15	0	13	0	13	0	0	0	0
20	0	2	0	2	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 11e. G(0.75,100) 40% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	130.5095	159.5869	580.8268	384.7894	960.1998	613.5323
15	118.2309	108.2852	355.1529	283.6232	521.8827	405.3321
20	113.6925	109.2270	252.0294	225.3679	358.0664	313.5714
25	110.1698	89.0087	213.2365	196.4872	292.5228	264.6977
30	107.5768	89.5229	186.0800	175.3375	249.5295	231.5425
35	105.6329	79.2654	168.6823	161.5278	222.1259	210.0587
40	104.1649	78.9424	155.9657	151.2283	201.7527	193.7604
50	101.5368	73.5334	138.5153	135.7270	175.7636	170.9473
75	98.4651	65.0535	120.6396	119.4211	145.6443	143.5683
100	96.0958	61.8552	110.1461	109.4749	130.0039	128.8360

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	133.4519	132.4261	150.3078	166.5371	159.9521
15	111.1112	109.8533	123.2134	166.5340	140.6207
20	100.5453	99.6950	108.6601	100.5844	129.6961
25	93.2120	92.3119	99.3774	93.0656	123.1659
30	88.6159	87.6157	93.3499	88.4422	118.0361
35	85.0711	83.9617	88.9528	84.8688	114.5584
40	82.6023	81.3297	85.8250	82.3674	111.7721
50	78.4300	76.9558	80.8366	78.1685	107.3037
75	72.6706	70.7683	74.1362	72.4216	101.8947
100	68.9249	66.8405	69.9598	68.7058	98.1230

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	106.0967	103.8097	119.0998	134.3507	131.1275
15	87.6567	85.2164	97.4315	296.8595	117.3987
20	82.3477	80.7187	89.0589	81.1038	112.1471
25	77.6287	76.0444	82.8016	76.6712	108.2470
30	75.2422	73.6307	79.3128	74.5124	105.3229
35	73.0790	71.4152	76.4549	72.4626	103.1831
40	71.8004	69.9992	74.6272	71.2470	101.5232
50	69.2108	67.2719	71.3552	68.7358	98.5587
75	65.5164	63.2280	66.8465	65.1610	95.0887
100	62.9394	60.5324	63.8891	62.6551	92.4118

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	120.3366	118.8559	135.3002	121.2239	128.2429	118.5286
15	101.2028	99.7884	110.2268	101.4062	112.9798	93.5951
20	94.0096	93.1660	100.0093	94.2003	108.1305	85.4568
25	87.4334	86.7270	92.1788	87.5650	104.3236	78.3944
30	83.5494	82.6238	87.4725	83.4863	101.7333	74.2146
35	80.4274	79.4690	83.6809	80.3184	99.7648	70.7813
40	78.3952	77.2693	81.1113	78.2456	98.3189	68.1489
50	74.6252	73.1917	76.7764	74.3479	95.6260	64.1249
75	69.6150	67.7197	70.9870	69.3348	92.5578	57.7835
100	66.2539	64.1220	67.2405	66.0087	90.1526	53.8824

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1072.0465	0.08%	121.5956	0.00%	310.7056
15	0.00%	418.2990	0.02%	100.3710	0.00%	193.6437
20	0.00%	300.6674	0.00%	95.6660	0.00%	157.7590
25	0.00%	246.5775	0.00%	91.9437	0.00%	141.4679
30	0.00%	215.0747	0.00%	89.8804	0.00%	131.2730
35	0.00%	196.3326	0.00%	88.4344	0.00%	125.2257
40	0.00%	183.2133	0.00%	87.4593	0.00%	120.8724
50	0.00%	164.6584	0.00%	85.6181	0.00%	113.7081
75	0.00%	143.7012	0.00%	83.7185	0.00%	106.0333
100	0.00%	132.6465	0.00%	82.3296	0.00%	101.4484

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	119.922	284.761	211.603	104.662	103.075	178.043	131.837
15	109.048	257.639	445.478	86.223	83.597	439.229	119.529
20	105.774	1372.438	197.926	82.496	77.881	82.890	114.248
25	102.674	207.594	340.696	77.878	71.828	78.711	110.443
30	100.503	212.508	285.464	75.751	68.682	77.079	107.640
35	98.781	77.768	155.530	73.781	66.032	75.320	105.623
40	97.525	120.541	77.215	72.434	64.002	74.289	104.116
50	95.061	72.917	96.585	69.984	61.164	72.065	101.464
75	92.239	68.956	69.605	66.119	56.374	68.553	98.394
100	89.949	66.272	66.730	63.485	53.412	65.983	96.048

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	163.989	110.372	118.687	108.259	95.457	74893.997	208.130
15	138.566	88.132	91.833	85.226	79.907	9539470.721	155.945
20	126.474	83.314	85.770	80.538	73.720	81.356	135.558
25	118.389	78.029	80.371	74.974	66.876	76.125	125.883
30	113.000	76.234	78.148	72.960	63.584	74.650	119.772
35	108.952	74.284	76.004	70.958	60.612	72.949	115.413
40	106.140	73.422	74.872	69.896	59.031	72.234	112.377
50	101.560	71.367	72.467	67.764	56.118	70.444	107.631
75	96.378	68.301	68.954	64.688	51.912	67.739	102.311
100	92.885	65.877	66.314	62.455	49.524	65.527	98.790

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	124.765	130.736	133.024	115.595	125.341	117.141	141.111
15	111.648	115.583	117.086	97.178	103.985	98.367	125.877
20	107.540	103.861	105.077	90.487	93.699	91.240	118.779
25	104.150	93.739	94.740	84.711	85.967	85.436	113.994
30	101.757	86.477	87.350	81.101	80.697	81.981	110.509
35	99.900	81.796	82.629	78.155	76.749	79.231	108.065
40	98.511	78.659	79.435	76.036	73.683	77.223	106.215
50	95.898	74.410	75.176	72.382	68.983	73.808	103.098
75	92.823	69.403	69.983	67.204	61.805	69.053	99.505
100	90.375	66.197	66.640	63.837	57.353	65.893	96.855

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	130.264	619.443	615.884	127.883	155.778	134.859	156.329
15	113.696	133.020	132.191	108.100	126.776	111.749	135.550
20	108.486	119.963	119.794	99.413	111.900	100.222	125.240
25	104.887	107.800	107.533	92.714	102.089	93.030	119.115
30	102.418	96.983	96.611	87.976	94.653	88.052	114.534
35	100.485	90.282	90.076	84.071	89.381	84.245	111.389
40	98.983	84.487	84.289	81.106	85.150	81.511	109.033
50	96.230	77.878	78.100	76.422	78.794	76.962	105.301
75	93.052	71.045	71.416	69.710	69.110	70.802	100.861
100	90.587	67.228	67.589	65.570	63.197	67.016	97.866

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

n	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	200.3023	200.8657	227.2196	209.6795	232.9088	194.5721
15	170.8514	171.5234	188.3115	175.7735	203.6265	170.6438
20	157.3523	158.4255	168.7656	160.6922	186.8323	159.8905
25	146.1226	147.2455	154.8666	148.5218	175.8412	152.0480
30	137.8003	138.7500	144.7111	139.5328	166.7606	146.0175
35	131.3470	132.2255	137.0161	132.6179	160.1802	141.4392
40	126.4224	127.1614	131.0413	127.4064	154.7812	137.8259
50	117.8638	118.2217	121.3650	118.4410	145.9564	131.6180
75	105.8166	105.5973	107.9141	106.0159	134.2731	123.5386
100	97.7664	97.1328	99.2216	97.8332	126.2622	117.8077

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	120.0556	170.3950	124.6123	130.1068	129.0758
15	109.3238	139.6092	111.5688	113.4686	113.9350
20	106.0105	125.9249	107.4338	108.3033	108.5862
25	102.8580	117.5541	104.0911	104.7965	104.6190
30	100.6416	112.1911	101.7337	102.3408	101.8713
35	98.8855	108.0880	99.8882	100.3666	99.8594
40	97.5820	105.2381	98.5028	98.9600	98.3546
50	95.0742	100.7332	95.8620	96.2184	95.6885
75	92.2468	95.7279	92.8130	93.0681	92.5578
100	89.9474	92.4040	90.4022	90.5673	90.1526

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	128.243	115.841	104.645	120.995	127.688	20159.373	132.720
15	112.980	103.650	94.874	101.259	105.207	20406.420	118.434
20	108.131	96.254	90.547	93.074	93.384	99.597	113.337
25	104.324	89.727	85.642	86.660	85.253	252.969	109.611
30	101.733	84.784	81.896	82.504	79.619	86.567	106.995
35	99.765	81.603	79.372	79.356	75.673	82.954	105.038
40	98.319	79.300	77.574	77.030	72.436	80.366	103.613
50	95.626	75.522	74.352	73.277	67.871	76.231	101.031
75	92.558	70.264	69.664	67.833	60.882	70.621	98.064
100	90.153	66.889	66.513	64.407	56.569	67.111	95.767

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	93.89	93.58	96.51	94.42	95.82	77.29	75.43	88.08	74.89	90.61
15	89.22	88.93	94.88	89.92	96.44	63.02	60.61	74.94	60.65	90.20
20	84.28	83.86	92.22	84.32	96.87	59.07	57.05	67.56	57.76	91.49
25	78.22	77.39	87.60	77.82	97.60	53.05	50.65	61.33	51.72	92.08
30	73.52	72.02	82.61	73.17	97.78	49.78	47.29	56.30	48.99	93.29
35	69.45	67.37	76.87	68.95	97.96	45.64	42.71	52.04	44.73	93.50
40	65.68	63.03	73.37	64.95	98.30	41.98	38.24	48.08	40.97	93.70
50	57.96	54.20	63.90	57.33	98.42	35.84	32.02	40.34	34.93	94.16
75	41.98	36.50	46.10	41.41	98.87	24.40	19.68	27.41	23.88	95.70
100	28.34	22.95	31.19	27.78	99.13	16.10	11.58	17.72	15.64	96.38

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	92.93	85.63	N/A	N/A	100.00	100.00
15	92.79	81.36	N/A	N/A	100.00	100.00
20	93.84	74.94	N/A	N/A	100.00	100.00
25	95.21	66.63	N/A	N/A	100.00	100.00
30	95.72	63.18	N/A	N/A	100.00	100.00
35	96.44	54.71	N/A	N/A	100.00	100.00
40	96.83	48.85	N/A	N/A	100.00	100.00
50	97.25	37.86	N/A	N/A	100.00	100.00
75	98.51	19.09	N/A	N/A	100.00	100.00
100	99.11	9.65	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	87.76	86.81	93.81	87.89	90.59	86.51
15	78.51	77.20	86.82	78.82	88.42	71.03
20	74.11	73.04	81.98	74.20	88.89	63.60
25	68.35	67.13	75.67	68.40	89.66	55.80
30	63.75	62.20	70.76	63.49	90.77	49.39
35	59.30	57.33	66.03	59.02	90.87	42.69
40	55.82	53.35	61.75	55.49	91.11	36.73
50	47.88	44.01	53.67	47.32	91.84	28.10
75	34.18	29.37	37.77	33.49	93.33	13.35
100	22.82	18.34	24.75	22.34	94.04	5.64

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.08%	83.53	0.00%	97.21
15	0.00%	99.35	0.02%	77.30	0.00%	96.75
20	0.00%	99.23	0.00%	77.88	0.00%	97.25
25	0.00%	99.21	0.00%	77.94	0.00%	97.60
30	0.00%	99.45	0.00%	78.22	0.00%	97.92
35	0.00%	99.47	0.00%	77.86	0.00%	97.98
40	0.00%	99.58	0.00%	78.71	0.00%	98.12
50	0.00%	99.64	0.00%	78.46	0.00%	98.16
75	0.00%	99.82	0.00%	80.02	0.00%	98.97
100	0.00%	99.90	0.00%	79.64	0.00%	99.13

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.91	83.95	86.61	76.09	74.12	74.00	86.89	93.45
15	85.58	76.37	81.01	62.84	59.23	61.90	86.18	93.78
20	87.25	72.40	77.21	60.00	54.50	60.56	87.92	94.28
25	88.36	65.01	69.08	55.49	47.74	57.01	88.89	95.52
30	89.88	59.84	63.00	52.99	43.19	55.21	90.12	96.00
35	90.06	55.79	58.35	49.68	38.15	52.19	90.40	96.61
40	90.36	52.44	54.81	46.06	33.84	49.97	90.59	96.79
50	91.37	46.06	48.10	40.24	27.14	44.73	91.37	97.39
75	93.11	33.86	35.15	27.70	14.44	32.91	93.07	98.53
100	93.80	22.57	23.58	17.01	6.36	22.28	93.86	99.03

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.33	67.23	72.48	68.12	58.97	66.24	92.06	96.24
15	92.44	58.33	62.88	57.66	46.85	55.47	92.95	96.10
20	93.86	58.22	61.60	56.08	44.16	56.27	94.51	96.93
25	94.48	55.09	58.26	51.55	38.59	52.44	94.81	97.52
30	94.79	54.24	56.51	49.92	34.52	51.98	95.03	97.78
35	95.05	51.89	54.16	46.78	30.71	50.23	95.05	98.00
40	94.87	49.92	52.04	44.08	28.06	47.93	94.87	98.28
50	94.77	45.72	47.54	38.50	22.78	44.40	94.51	98.44
75	95.82	34.38	35.37	27.17	11.88	33.41	95.64	99.27
100	96.32	23.19	23.54	16.99	5.01	22.57	95.98	99.45

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.31	92.77	93.49	85.76	90.67	86.69	88.79	95.31
15	87.50	89.21	90.20	75.41	83.37	77.01	87.58	95.41
20	88.75	85.23	85.86	70.44	75.62	70.93	88.34	95.80
25	89.47	77.25	78.44	63.99	67.31	65.25	89.31	96.61
30	90.59	68.89	70.30	59.25	58.93	61.09	90.50	96.91
35	90.83	61.19	62.85	54.76	51.41	56.82	90.67	97.31
40	91.23	55.78	57.47	49.98	44.01	52.98	91.09	97.60
50	91.72	46.12	48.57	41.54	33.72	45.11	91.88	97.92
75	93.54	32.57	34.26	26.93	15.75	31.72	93.52	98.93
100	94.14	21.64	22.53	16.50	6.91	21.07	94.20	99.27

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.64	89.11	88.91	90.79	96.95	92.46	91.31	96.99
15	88.95	92.30	91.98	85.29	92.32	87.29	88.65	96.97
20	89.23	91.70	91.33	81.35	88.63	82.45	88.63	97.01
25	89.92	87.94	87.70	78.15	85.10	78.03	89.29	97.82
30	90.97	82.04	81.27	74.43	81.77	74.41	90.77	97.78
35	91.13	74.95	74.59	68.53	78.03	68.81	90.91	98.16
40	91.58	67.47	67.41	63.27	73.37	63.54	91.23	98.04
50	92.08	54.30	55.17	51.68	62.40	52.67	91.86	98.53
75	93.90	35.05	35.86	31.09	29.81	33.84	93.82	99.29
100	94.44	22.71	23.74	18.48	11.41	21.82	94.28	99.41

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.02	99.02	99.56	99.38	99.39	98.65
15	98.45	98.29	99.37	98.66	99.07	98.48
20	99.09	98.93	99.65	99.11	99.58	99.29
25	99.20	99.23	99.60	99.31	99.70	99.58
30	99.21	99.24	99.60	99.28	99.84	99.72
35	99.15	99.14	99.64	99.21	99.86	99.78
40	99.12	99.15	99.56	99.19	99.92	99.86
50	98.70	98.80	99.48	98.78	99.98	99.86
75	97.93	97.97	98.79	97.99	100.00	99.98
100	96.71	96.55	97.62	96.71	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 31.3145979
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.59	88.67	72.55	96.06	92.36	94.67	92.36	93.27
15	88.42	84.10	70.91	83.42	85.54	91.25	90.34	92.85
20	88.89	78.78	68.83	75.00	76.12	85.35	90.20	93.56
25	89.66	72.24	64.61	67.96	66.53	77.19	90.48	94.69
30	90.77	66.81	61.11	62.27	57.09	70.73	91.17	95.37
35	90.87	62.06	57.37	57.01	49.49	65.11	91.09	96.18
40	91.11	58.02	54.16	52.77	42.00	60.55	91.23	96.44
50	91.84	49.82	46.97	43.58	31.82	51.96	91.90	97.01
75	93.33	34.83	33.49	28.16	14.63	35.60	93.33	98.28
100	94.04	22.63	22.12	17.15	5.98	23.29	94.04	98.93

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Detection Limit: 31.3145979
Averaged Percentage Non-detects: 40.00%
Distribution Check: Average of means: 75.144724
Distribution Check: Average of stdvs: 85.713600
Average of NDs per 100 observations: 39.954400

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	31.314598	3.519208	46	246	693	1316	1553	1196	0	0	0	0
15	31.314598	5.944356	5	26	113	304	699	906	1037	913	613	328
20	31.314598	7.933663	0	0	20	56	201	381	665	825	919	808
25	31.314598	10.068317	0	0	1	9	34	102	195	405	573	760
30	31.314598	12.026733	0	0	0	3	5	13	48	120	260	437
35	31.314598	14.048713	0	0	0	0	1	2	11	33	64	169
40	31.314598	15.979406	0	0	0	0	0	1	1	11	17	61
50	31.314598	20.009109	0	0	0	0	0	0	0	2	0	1
75	31.314598	29.976040	0	0	0	0	0	0	0	0	0	0
100	31.314598	40.066931	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	1060
15	106	0	0	0	0	0	0	0	0	0	0	0	48
20	585	310	165	94	18	3	0	0	0	0	0	0	2
25	825	749	576	426	224	108	37	16	8	2	0	0	0
30	547	728	803	627	553	395	263	158	49	30	9	2	0
35	271	400	578	662	706	607	550	370	274	198	83	71	0
40	98	183	278	437	499	610	662	639	539	388	255	371	0
50	4	19	40	59	141	218	285	409	498	596	583	2195	0
75	0	0	0	0	0	0	0	5	11	17	29	4988	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	40	0	40	0	0	40	0	40	0	0
15	15	0	15	0	0	15	0	15	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	59	52	40	87	0	0	0	1196
15	272	321	117	414	0	0	0	1960
20	238	287	123	318	0	0	0	1175
25	187	250	98	259	0	0	0	1397
30	129	172	81	166	0	0	0	906
35	101	150	58	133	0	0	0	996
40	77	122	44	103	0	0	0	626
50	40	69	25	48	0	0	0	502
75	15	34	12	16	0	0	0	330
100	1	11	0	1	0	0	0	130

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	59	52	40	87	0	0
15	272	321	117	414	0	0
20	238	287	123	318	0	0
25	187	250	98	259	0	0
30	129	172	81	166	0	0
35	101	150	58	133	0	0
40	77	122	44	103	0	0
50	40	69	25	48	0	0
75	15	34	12	16	0	0
100	1	11	0	1	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	40	0	40	0	0	0	0
15	0	15	0	15	0	0	0	0
20	0	0	0	0	0	2	0	0
25	0	0	2	0	2	5	0	0
30	0	0	2	0	3	2	0	0
35	0	1	1	0	7	1	0	0
40	0	0	0	0	3	1	0	0
50	0	0	0	0	2	0	0	0
75	0	0	0	0	8	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	40	0	40	0	0	0	0
15	0	15	0	15	0	0	0	0
20	0	0	0	0	0	3	0	0
25	0	0	2	0	2	6	0	0
30	0	0	2	0	3	2	0	0
35	0	1	1	0	6	1	0	0
40	0	0	0	0	3	1	0	0
50	0	0	0	0	2	0	0	0
75	0	0	0	0	8	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	4	0	0
25	0	0	2	0	3	6	0	0
30	0	0	2	0	3	2	0	0
35	0	0	1	0	6	1	0	0
40	0	0	0	0	3	1	0	0
50	0	0	0	0	2	0	0	0
75	0	0	0	0	8	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	2	0	0
25	0	0	2	0	3	6	0	0
30	0	0	2	0	3	2	0	0
35	0	1	1	0	6	1	0	0
40	0	0	0	0	3	1	0	0
50	0	0	0	0	2	0	0	0
75	0	0	0	0	8	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	4	0	0	0	0	0
15	0	1	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	381	0	381	0	0	0	0
15	0	152	0	152	0	0	0	0
20	0	27	0	27	0	0	0	0
25	0	10	0	10	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 11f. G(0.75,100) 50% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	141.0404	189.1045	594.5123	394.2846	1069.5598	678.2635
15	126.5901	122.0611	380.0119	300.7514	577.4644	442.7315
20	119.8370	133.0426	269.1373	238.4929	385.8503	334.6237
25	116.7721	103.2784	223.7220	204.9747	310.9150	279.4146
30	113.5657	112.1547	193.8146	181.7907	263.1331	242.7447
35	111.5895	92.6618	173.9622	166.0970	231.3483	217.9059
40	110.1506	98.9199	161.4114	156.1343	209.6939	200.7563
50	107.9780	91.8495	144.3007	141.1296	182.2748	176.8778
75	104.3638	74.2344	121.4964	120.2179	147.4004	145.1551
100	102.2206	74.4403	111.4235	110.7033	130.7801	129.5216

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	145.4256	143.7279	165.9231	180.3129	173.5683
15	120.0569	117.1432	137.5144	119.0778	154.4576
20	104.0423	101.7434	117.0595	395.4216	141.1751
25	94.4727	93.0719	104.3962	93.2901	132.8765
30	87.0948	86.0918	95.0212	86.2307	126.4812
35	82.8868	81.8277	89.2255	82.1009	121.8324
40	79.3009	78.1928	84.6931	78.6132	118.9045
50	74.1963	72.8420	78.3050	73.5267	114.3443
75	67.1625	65.4731	69.6330	66.6282	106.9911
100	62.3054	60.3510	64.0963	61.8464	102.9749

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	112.1516	108.7540	127.7968	140.6761	138.2364
15	86.7051	81.8425	100.6765	80.4873	121.7478
20	76.2275	72.5321	86.4084	2965.5824	114.3443
25	70.9958	68.6993	78.7877	68.3735	110.8575
30	66.5303	64.8480	72.8738	64.7822	107.3821
35	64.8495	63.1412	70.1032	63.3724	105.1985
40	62.6709	60.9451	67.2443	61.4457	103.7090
50	59.8948	57.9718	63.4460	58.8479	101.2303
75	56.2917	54.1339	58.5000	55.5689	97.0401
100	53.0337	50.6562	54.6695	52.4493	94.5084

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	127.9251	125.4726	145.6883	127.7774	135.7568	124.7327
15	103.2496	99.4113	115.4924	101.2556	116.2478	91.4842
20	91.7929	89.2056	100.0611	90.5143	108.6900	78.2697
25	85.0952	83.7546	91.4725	84.4833	105.6099	71.4146
30	79.0176	78.1914	84.2731	78.9201	102.3883	65.6131
35	75.7296	74.9057	80.1041	75.3489	100.5646	62.0894
40	72.7618	71.9979	76.5178	72.5693	99.2214	58.4165
50	68.1079	67.1146	71.2057	67.7375	97.0491	53.7193
75	61.9846	60.5500	64.0128	61.6032	93.5390	47.2108
100	57.6714	55.8969	59.1649	57.2430	91.3365	42.1012

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1084.6960	0.14%	122.3311	0.08%	265.5286
15	0.00%	400.9735	0.16%	102.2712	0.00%	183.4620
20	0.00%	270.6154	0.16%	96.4826	0.00%	152.0719
25	0.00%	223.0196	0.04%	94.6813	0.00%	137.7094
30	0.00%	192.2998	0.00%	92.6064	0.00%	127.7116
35	0.00%	176.0887	0.00%	91.7310	0.00%	121.9708
40	0.00%	164.3118	0.00%	91.0146	0.00%	118.2026
50	0.00%	148.1093	0.00%	89.9711	0.00%	112.5017
75	0.00%	128.9158	0.00%	88.5560	0.00%	104.8834
100	0.00%	118.7108	0.00%	87.5710	0.00%	100.7955

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	126.515	309.741	384.026	110.339	108.932	188.371	142.988
15	111.771	1349.443	401.527	83.584	83.801	82.794	129.383
20	106.130	989.577	1090.442	74.833	73.314	4396.425	121.967
25	103.926	610.975	426.360	71.175	67.449	70.791	118.140
30	101.159	380.993	661.662	67.434	62.141	67.506	114.467
35	99.600	838.851	446.687	65.922	59.029	66.433	112.107
40	98.417	174.909	169.964	63.666	55.816	64.618	110.499
50	96.484	83.407	124.031	60.973	51.644	62.372	108.159
75	93.223	76.434	62.261	57.726	46.395	59.752	104.424
100	91.140	57.406	58.456	54.347	42.071	56.707	102.247

GAMMA DISTRIBUTION

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Alpha Value: 0.75
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Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	163.949	110.386	118.710	105.088	93.448	153524.847	229.909
15	137.303	84.015	88.635	79.087	79.758	85.445	167.235
20	126.496	75.894	78.351	72.298	76.372	376228701.176	144.833
25	119.847	71.404	73.555	68.303	70.247	68.354	142.122
30	113.969	66.678	68.755	64.106	63.019	64.337	126.444
35	110.040	65.007	67.107	62.297	58.759	62.789	121.853
40	107.458	62.431	64.637	60.180	55.732	60.988	118.879
50	103.440	59.873	62.032	56.996	49.995	58.346	114.524
75	97.381	57.738	59.265	54.351	42.869	56.677	108.152
100	94.143	54.925	56.123	51.345	38.856	54.117	104.957

GAMMA DISTRIBUTION

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Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	132.598	142.969	146.242	122.686	135.067	124.659	153.594
15	115.261	132.513	134.855	98.523	111.361	101.071	137.437
20	108.303	120.137	121.854	87.657	97.244	89.300	127.863
25	105.500	108.755	109.996	82.319	88.396	83.031	122.697
30	102.462	97.319	97.861	77.377	81.378	77.946	118.273
35	100.773	87.279	87.929	74.499	76.566	75.030	115.204
40	99.456	80.332	81.025	71.711	72.477	72.373	113.195
50	97.361	71.894	72.679	67.673	66.829	68.498	110.287
75	93.800	63.767	64.605	61.756	58.346	63.004	105.780
100	91.603	59.390	60.098	57.415	52.561	58.977	103.264

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	140.484	160.296	155.986	140.506	174.826	151.451	171.197
15	118.936	151.673	152.690	114.400	141.088	122.757	150.160
20	109.920	145.090	146.320	100.907	119.413	105.004	136.989
25	106.394	134.249	135.351	94.125	106.625	95.806	129.534
30	103.157	122.497	122.769	87.941	97.421	88.624	123.792
35	101.296	108.162	108.220	83.967	90.991	84.318	119.621
40	99.932	98.410	98.488	80.095	85.438	80.604	117.028
50	97.738	84.582	84.484	75.132	78.394	75.677	113.316
75	94.084	68.948	69.359	67.105	67.711	67.775	107.665
100	91.771	62.976	63.404	61.757	60.567	62.689	104.647

GAMMA DISTRIBUTION

Censoring Type: 1
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Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	210.9375	211.4416	241.9414	222.1146	245.7662	203.8552
15	175.6093	174.3612	198.9116	180.0288	214.5018	176.6793
20	157.4756	156.5937	173.2672	160.1580	195.2748	163.3691
25	146.4782	146.6575	158.2402	148.7790	183.2995	156.4283
30	136.2160	136.7896	145.6497	138.1672	173.3081	149.8165
35	129.2696	129.9358	137.0117	130.5908	165.8534	145.3286
40	123.6494	124.1699	130.1749	124.7520	160.7779	142.0776
50	114.7444	115.1435	119.8279	115.3699	152.5341	136.8462
75	100.7040	100.6574	103.7734	100.8978	138.6364	128.0549
100	91.7635	91.3084	93.9364	91.7311	130.7255	122.8989

GAMMA DISTRIBUTION

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Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	126.6196	175.6051	132.2220	140.3855	138.1599
15	112.3822	143.4953	114.8443	118.4150	120.6067
20	106.8616	131.0119	107.9184	109.2189	112.7149
25	104.6802	123.0849	105.2224	105.7628	109.3291
30	101.8360	116.3783	102.2376	102.5950	105.3607
35	100.2519	112.0022	100.5796	100.8250	103.2663
40	99.0008	108.8050	99.3526	99.6058	101.5295
50	96.8747	104.0730	97.2866	97.5317	98.4391
75	93.3788	97.2332	93.7937	94.0144	94.1361
100	91.1962	93.8441	91.5851	91.7761	91.4650

GAMMA DISTRIBUTION

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Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	135.757	121.324	106.750	130.219	140.249	19677.537	142.872
15	116.248	110.490	97.089	108.206	117.206	60166.200	126.460
20	108.690	100.505	90.233	95.169	100.185	323299.576	119.120
25	105.610	93.506	85.899	88.023	89.715	16171.417	115.820
30	102.388	84.851	78.992	81.926	81.922	88.461	112.508
35	100.565	80.660	76.263	78.196	76.648	83.357	110.605
40	99.221	77.358	73.752	74.730	72.164	79.263	109.197
50	97.049	72.199	69.664	70.087	66.117	73.774	107.109
75	93.539	65.544	64.287	63.337	57.034	66.304	103.686
100	91.336	60.964	60.164	58.684	51.052	61.441	101.670

GAMMA DISTRIBUTION

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Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	98.32	98.00	99.30	98.46	98.44	87.86	86.14	95.85	85.37	93.09
15	95.93	95.49	98.84	96.18	97.21	59.50	55.15	78.07	53.60	91.41
20	89.99	89.27	97.49	89.35	97.27	49.53	45.94	63.94	44.83	91.54
25	80.75	79.64	94.73	78.95	97.96	42.96	40.06	53.39	40.16	92.81
30	71.66	70.26	87.61	69.94	98.16	36.29	34.20	45.96	34.71	93.37
35	65.09	63.07	78.69	63.41	98.63	32.10	29.31	40.18	30.38	94.42
40	57.91	55.58	70.85	56.51	99.07	28.28	25.78	34.28	27.21	94.59
50	47.15	43.64	57.31	45.80	99.19	21.17	18.53	25.98	20.28	95.70
75	28.00	24.14	33.25	26.71	99.52	10.97	8.73	12.93	10.36	97.29
100	14.85	11.62	17.90	14.32	99.84	5.43	4.00	6.24	5.11	97.43

GAMMA DISTRIBUTION

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Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	97.82	92.87	N/A	N/A	100.00	100.00
15	97.35	91.26	N/A	N/A	100.00	100.00
20	97.39	85.75	N/A	N/A	100.00	100.00
25	98.38	83.62	N/A	N/A	100.00	100.00
30	98.75	82.01	N/A	N/A	100.00	100.00
35	98.99	77.19	N/A	N/A	100.00	100.00
40	99.45	72.41	N/A	N/A	100.00	100.00
50	99.54	65.02	N/A	N/A	100.00	100.00
75	99.82	42.21	N/A	N/A	100.00	100.00
100	99.98	30.51	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

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Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	95.46	94.85	98.08	95.39	95.98	94.14
15	79.23	76.51	91.72	77.91	91.23	67.96
20	71.14	68.79	82.06	70.65	89.88	54.22
25	62.42	61.34	75.10	61.77	90.71	45.49
30	55.74	54.63	64.79	55.63	91.31	37.29
35	48.94	47.46	58.44	48.28	91.70	30.00
40	42.28	40.73	50.64	42.05	92.26	25.05
50	33.26	30.75	39.38	32.44	93.21	16.36
75	18.08	15.07	21.73	17.21	94.57	5.82
100	9.29	7.11	10.58	8.89	95.15	1.72

GAMMA DISTRIBUTION

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Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.14%	92.84	0.08%	98.75
15	0.00%	99.66	0.16%	85.30	0.00%	97.88
20	0.00%	98.16	0.16%	83.90	0.00%	97.50
25	0.00%	97.92	0.04%	85.99	0.00%	97.92
30	0.00%	97.76	0.00%	86.81	0.00%	98.08
35	0.00%	97.92	0.00%	88.44	0.00%	98.02
40	0.00%	97.78	0.00%	89.35	0.00%	98.20
50	0.00%	97.92	0.00%	90.75	0.00%	98.28
75	0.00%	98.48	0.00%	94.02	0.00%	98.97
100	0.00%	98.44	0.00%	95.45	0.00%	99.21

GAMMA DISTRIBUTION

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Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	93.15	92.97	94.42	86.82	81.74	85.49	92.34	98.08
15	88.32	81.64	88.04	59.22	58.65	56.69	89.05	98.02
20	87.98	75.29	82.72	51.04	47.80	49.39	89.01	98.30
25	89.56	68.26	76.17	45.80	41.41	45.96	90.95	98.79
30	90.42	59.28	66.67	41.88	34.97	42.66	91.80	99.13
35	91.17	51.07	56.84	38.16	30.04	39.46	92.95	99.17
40	91.78	43.45	47.31	34.30	25.74	36.37	93.15	99.50
50	92.91	33.81	36.99	27.90	18.79	30.50	93.90	99.64
75	94.24	20.48	21.95	16.38	8.45	19.28	94.95	99.80
100	95.01	11.11	11.84	8.06	3.13	10.53	95.31	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
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Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.42	68.80	76.87	68.69	59.94	61.64	93.21	98.73
15	92.28	50.56	56.19	48.55	41.13	45.50	93.07	98.51
20	92.71	45.92	50.27	42.89	34.18	40.90	94.40	98.83
25	94.59	41.64	45.95	39.50	29.86	38.89	96.57	99.17
30	95.13	39.20	42.53	36.33	24.92	36.43	97.15	99.41
35	95.39	37.33	39.82	33.31	21.00	34.51	97.96	99.58
40	95.78	34.50	36.80	30.60	18.59	32.62	98.30	99.70
50	96.08	29.61	31.52	25.17	13.51	27.51	98.08	99.74
75	96.97	19.27	20.46	15.22	6.08	18.19	97.72	99.90
100	96.97	10.85	11.47	7.39	2.17	10.26	97.13	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	95.07	97.72	98.18	94.28	96.81	94.51	94.79	98.63
15	90.61	95.40	95.96	77.54	89.35	80.12	89.86	98.91
20	89.64	92.28	93.08	67.20	81.13	69.35	88.85	99.01
25	90.67	86.94	87.89	60.06	71.45	60.82	90.04	99.23
30	91.19	76.74	77.73	52.54	60.49	53.26	90.71	99.43
35	91.82	63.41	65.45	46.25	50.31	47.20	91.31	99.50
40	92.46	52.16	53.78	40.08	40.90	41.33	92.20	99.68
50	93.47	37.56	39.65	30.74	27.75	32.71	93.23	99.78
75	94.77	19.12	20.74	15.58	10.46	18.45	94.59	99.88
100	95.25	9.64	10.69	7.37	3.46	9.52	95.43	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	96.79	88.75	88.93	97.33	99.43	98.16	97.41	99.23
15	92.95	91.16	91.36	89.94	95.98	92.04	92.10	99.37
20	91.11	94.52	94.63	82.10	91.13	84.72	89.68	99.52
25	91.21	95.14	95.14	77.88	85.75	79.66	89.96	99.56
30	91.56	92.02	92.05	73.82	79.25	74.44	90.85	99.70
35	91.90	86.20	86.20	69.85	75.94	70.70	90.91	99.68
40	92.57	77.54	77.54	62.81	71.02	63.91	91.70	99.78
50	93.31	61.68	61.13	50.84	63.02	52.40	92.95	99.88
75	95.01	26.13	27.02	22.79	33.41	24.63	94.53	99.92
100	95.47	11.60	12.65	9.17	10.19	11.15	95.29	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.82	99.80	99.96	99.88	99.88	99.64
15	99.52	99.39	99.90	99.56	99.62	99.62
20	99.33	99.09	99.87	99.36	99.62	99.76
25	99.34	99.23	99.81	99.33	99.64	99.82
30	99.17	99.15	99.89	99.36	99.84	99.94
35	99.01	98.99	99.67	99.10	99.82	99.94
40	98.93	98.97	99.73	99.10	99.96	100.00
50	98.21	98.22	99.36	98.36	99.96	100.00
75	95.77	96.03	97.77	95.92	99.98	100.00
100	89.42	89.19	92.26	89.22	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 45.4166978
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	95.98	94.90	75.68	107.52	97.82	98.71	93.33	97.98
15	91.23	91.75	68.46	97.79	94.12	98.26	93.27	97.41
20	89.88	86.04	65.80	83.35	85.21	95.33	91.60	97.23
25	90.71	77.50	61.96	71.11	74.12	88.89	92.77	98.08
30	91.31	66.97	55.94	61.78	62.81	76.40	92.97	98.48
35	91.70	59.84	50.75	54.45	52.55	65.52	93.27	98.77
40	92.26	51.83	44.65	46.60	42.32	56.77	93.39	99.33
50	93.21	41.27	36.16	36.00	28.61	44.18	93.96	99.49
75	94.57	22.81	20.71	18.63	10.22	24.12	94.71	99.72
100	95.15	11.56	10.71	8.34	3.23	12.08	95.19	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Detection Limit: 45.4166978
Averaged Percentage Non-detects: 50.00%
Distribution Check: Average of means: 74.782082
Distribution Check: Average of stdvs: 85.360360
Average of NDs per 100 observations: 50.145300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	45.416698	4.029901	6	83	347	915	1666	2033	0	0	0	0
15	45.416698	7.207129	0	4	14	69	247	514	822	1089	1049	768
20	45.416698	9.944752	0	0	0	5	22	71	190	405	560	873
25	45.416698	12.460000	0	0	0	1	2	13	29	81	157	322
30	45.416698	15.057822	0	0	0	0	0	1	3	7	17	57
35	45.416698	17.476634	0	0	0	0	0	0	0	0	1	19
40	45.416698	19.982178	0	0	0	0	0	0	0	1	0	3
50	45.416698	25.044158	0	0	0	0	0	0	0	0	0	0
75	45.416698	37.388515	0	0	0	0	0	0	0	0	0	0
100	45.416698	50.067129	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3137
15	474	0	0	0	0	0	0	0	0	0	0	0	312
20	919	790	568	385	180	82	0	0	0	0	0	0	25
25	512	666	760	794	658	471	301	173	69	32	9	0	4
30	124	262	433	564	689	714	661	583	404	254	150	127	1
35	24	55	120	224	323	468	594	735	663	612	467	745	0
40	6	11	19	50	106	191	293	418	499	603	628	2222	0
50	0	0	2	0	1	10	17	39	78	120	209	4574	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	43	0	43	0	0	43	0	43	0	0
15	38	0	38	0	0	38	0	38	0	0
20	25	0	25	0	0	25	0	25	0	0
25	6	0	6	0	0	6	0	6	0	0
30	4	0	4	0	0	4	0	4	0	0
35	0	0	0	0	0	0	0	0	0	0
40	1	0	1	0	0	1	0	1	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	52	22	43	39	0	0	0	2033
15	442	473	193	699	0	0	0	3380
20	546	638	295	802	0	0	0	2924
25	529	616	328	695	0	0	0	3267
30	488	573	316	646	0	0	0	2893
35	408	495	264	508	0	0	0	3222
40	393	501	265	496	0	0	0	2850
50	290	393	205	361	0	0	0	2843
75	155	234	116	192	0	0	0	2932
100	118	184	89	133	0	0	0	2756

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	52	22	43	39	0	0
15	442	473	193	699	0	0
20	546	638	295	802	0	0
25	529	616	328	695	0	0
30	488	573	316	646	0	0
35	408	495	264	508	0	0
40	393	501	265	496	0	0
50	290	393	205	361	0	0
75	155	234	116	192	0	0
100	118	184	89	133	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	43	0	43	0	0	0	0
15	0	38	0	38	0	0	0	0
20	0	28	4	25	0	8	0	0
25	0	9	14	8	3	26	0	0
30	0	6	16	5	8	27	0	0
35	0	0	15	0	10	20	0	0
40	0	3	5	1	16	10	0	0
50	0	7	11	3	27	11	0	0
75	0	2	3	1	30	3	0	0
100	0	0	1	0	28	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	43	0	43	0	0	0	0
15	0	38	0	38	0	0	0	0
20	0	28	4	25	0	11	0	0
25	0	9	15	8	3	25	0	0
30	0	6	16	6	10	27	0	0
35	0	0	16	0	8	20	0	0
40	0	3	5	1	16	10	0	0
50	0	7	12	2	25	12	0	0
75	0	2	4	1	30	3	0	0
100	0	0	1	0	27	1	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	2	0	2	0	0	0	0
20	0	10	4	7	0	10	0	0
25	0	5	15	4	2	24	0	0
30	0	3	16	2	8	27	0	0
35	0	0	14	0	9	20	0	0
40	0	2	5	0	16	8	0	0
50	0	7	11	1	26	12	0	0
75	0	2	4	1	31	3	0	0
100	0	0	1	0	27	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	2	0	2	0	0	0	0
20	0	10	4	7	0	10	0	0
25	0	5	14	4	3	25	0	0
30	0	3	16	3	8	26	0	0
35	0	0	16	0	9	20	0	0
40	0	2	5	0	15	10	0	0
50	0	6	11	3	26	12	0	0
75	0	2	3	1	28	3	0	0
100	0	0	1	0	27	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	7	4	0	0	0	0
15	0	8	0	0	0	0	0
20	0	8	0	0	0	0	0
25	0	2	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	541	0	541	0	0	0	0
15	0	382	0	382	0	0	0	0
20	0	180	0	180	0	0	0	0
25	0	59	0	59	0	0	0	0
30	0	24	0	24	0	0	0	0
35	0	5	0	5	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 11g. G(0.75,100) 60% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	158.3421	224.4594	549.7226	375.5795	1151.3548	736.0000
15	139.8791	143.0502	393.0173	310.3898	623.9642	475.5898
20	130.9857	155.8029	281.1623	247.9428	408.2800	351.8087
25	126.3698	122.4005	228.9287	208.8599	321.8896	287.5840
30	123.6968	141.4351	200.6577	187.4757	271.4930	249.3079
35	121.7739	110.0760	180.5730	171.8240	238.6696	223.9376
40	120.3422	124.0376	166.1648	160.4056	214.7193	205.0261
50	117.4147	117.7884	145.7381	142.3794	183.8002	178.0385
75	113.7819	95.1607	123.1150	121.7282	147.0777	144.6912
100	111.8429	90.3101	112.5648	111.7901	129.8255	128.4976

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	164.4926	161.6565	187.9262	252.4748	190.7215
15	136.6989	130.2465	159.9636	2005.7237	171.2129
20	116.0722	110.5139	135.5601	206.4206	155.4977
25	102.1352	97.5581	117.7433	97.1791	144.5716
30	91.8523	88.6363	104.5506	1186.6305	137.8418
35	84.2898	82.2716	94.8787	81.5333	132.5113
40	79.1959	77.4730	88.2102	76.8462	128.5139
50	71.5009	70.1320	78.3810	69.7781	122.1215
75	61.2090	59.7997	65.4791	60.1085	113.8885
100	55.3460	53.6828	58.4392	54.4515	109.4171

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	126.5793	121.6981	144.3462	206.1725	149.7683
15	92.7233	82.8051	111.2351	7711.0221	127.6209
20	75.0263	66.6806	89.9723	777.1291	117.1443
25	67.0836	60.8644	78.2646	59.2135	112.0771
30	61.2948	56.9370	70.2963	4760.1921	109.4777
35	57.0681	54.3322	64.7093	53.4055	107.7488
40	54.2816	51.9775	60.9985	51.2932	106.1889
50	50.2739	48.4448	55.5229	48.1705	103.1858
75	44.7124	42.9617	48.1692	43.4298	99.4108
100	41.3006	39.3196	43.9387	40.2639	97.1994

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	143.4918	139.7783	163.4652	142.0264	149.6437	139.1653
15	110.4869	101.5050	127.0347	102.3399	122.7916	93.5495
20	95.5169	87.9345	106.3219	88.6992	111.7090	74.3326
25	86.2019	80.7437	94.3817	80.9726	106.8059	65.6944
30	79.1609	75.4034	85.8149	75.9018	104.2097	59.5085
35	73.3709	71.3600	79.1819	71.5007	102.7061	55.0101
40	69.7631	68.2182	74.6195	68.2603	101.3733	51.5173
50	63.6716	62.8043	67.5526	62.8594	98.6570	45.6938
75	55.0193	54.1521	57.6302	54.4136	95.2692	37.2515
100	49.9092	48.9934	51.8050	49.4069	93.3712	31.7678

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1200.9951	0.93%	134.4861	0.06%	247.7615
15	0.00%	375.8504	1.05%	111.5501	0.06%	180.1064
20	0.00%	233.0611	0.69%	104.4564	0.00%	150.7891
25	0.00%	184.5121	0.24%	101.8773	0.00%	135.1355
30	0.00%	160.1604	0.32%	100.7789	0.00%	126.8208
35	0.00%	146.7859	0.12%	100.2171	0.00%	122.0292
40	0.00%	137.2703	0.04%	99.7756	0.00%	118.2653
50	0.00%	122.6403	0.02%	98.7304	0.00%	112.0879
75	0.00%	106.6323	0.00%	97.6929	0.00%	105.0493
100	0.00%	98.9259	0.00%	97.1974	0.00%	101.5289

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	139.127	377.706	428.591	124.330	125.079	334.661	160.934
15	117.415	471.692	644.167	85.161	88.507	12901.301	144.581
20	108.642	1150.307	918.259	70.714	75.496	1167.597	135.709
25	104.894	1914.538	2263.007	65.041	67.529	62.962	130.156
30	102.885	170309.205	924.962	60.539	60.950	6587.804	126.538
35	101.712	1758.144	918.162	57.965	56.841	56.786	123.711
40	100.583	1424.834	1282.416	55.609	53.179	54.861	121.830
50	98.098	2248.769	688.258	52.035	47.110	51.920	118.314
75	94.964	835.235	76.849	46.865	38.864	47.654	114.148
100	93.161	46.203	76.138	43.036	33.526	44.397	112.042

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	168.967	122.334	129.864	113.652	103.710	377336.025	267.845
15	137.648	89.101	96.553	76.450	84.823	1334701439.285	184.661
20	125.689	80.805	81.078	71.796	88.725	24016305.197	158.312
25	119.874	74.633	74.043	69.419	89.642	70.007	145.166
30	115.724	68.169	67.838	62.614	79.631	883051502.189	137.876
35	112.843	63.749	63.299	59.611	76.246	59.085	133.233
40	110.103	58.746	59.496	56.204	69.071	55.688	129.722
50	105.165	53.722	55.095	50.990	58.430	50.930	124.111
75	99.343	46.417	48.245	44.892	47.031	45.294	117.715
100	96.298	42.307	43.909	40.381	40.973	41.278	114.579

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	146.561	162.528	166.653	137.391	152.484	140.283	172.708
15	122.307	155.235	158.241	104.325	124.606	108.677	154.847
20	111.647	148.225	150.771	88.942	109.013	93.793	143.824
25	106.878	140.124	142.253	81.236	97.230	83.276	136.403
30	104.402	127.917	128.817	76.261	88.789	77.190	131.785
35	102.931	114.814	114.979	72.683	81.994	72.782	128.011
40	101.654	104.354	104.440	69.778	77.225	69.860	125.572
50	98.971	86.606	86.932	64.901	69.502	65.042	121.174
75	95.581	62.828	63.789	57.321	58.405	57.726	115.982
100	93.631	54.103	54.999	52.370	51.399	53.063	113.371

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	156.493	178.350	486.311	158.851	200.590	173.209	192.459
15	128.808	165.956	560.280	124.326	159.172	138.215	170.891
20	114.942	758.363	171.989	104.629	135.522	117.707	156.951
25	108.500	166.299	172.619	94.598	118.131	100.474	146.410
30	105.343	159.248	163.735	88.457	106.177	91.145	139.599
35	103.590	149.522	152.360	83.903	96.676	84.830	134.476
40	102.213	137.784	140.335	80.273	90.481	80.958	131.067
50	99.406	115.681	116.698	74.129	80.959	74.506	125.360
75	95.843	78.733	79.337	65.086	67.368	65.534	118.601
100	93.845	63.198	63.542	59.085	58.928	59.876	115.319

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	229.4259	229.3202	263.6138	241.7671	263.1587	220.7063
15	183.9071	178.3318	216.0491	183.7426	226.6866	187.6352
20	161.2879	156.3268	182.6593	160.6860	202.6870	171.3121
25	147.3012	143.7059	163.3705	146.2945	188.0243	162.4777
30	137.5270	135.0912	150.2521	137.2778	179.2093	157.1003
35	128.6567	127.7853	139.3142	129.0243	172.2123	153.2063
40	122.6081	122.0757	131.4878	122.8912	166.4763	149.9797
50	111.8446	111.8765	118.6723	112.1783	156.6485	143.9437
75	95.7414	95.7545	99.9407	95.8276	143.0224	135.7436
100	85.9927	85.9301	88.9512	85.9626	135.1211	131.0651

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	138.6421	181.8825	145.7438	157.2795	153.1541
15	118.0154	147.7330	121.1576	127.9576	135.0060
20	110.0682	136.4343	110.5724	113.8162	127.6711
25	106.8361	130.7113	105.9168	107.1003	127.0133
30	105.0757	126.7979	103.5672	103.9754	123.5421
35	103.9996	122.5557	102.3131	102.2270	124.5364
40	102.8027	119.0993	101.1116	101.0606	122.6117
50	100.2596	112.5388	98.6193	98.4181	120.5548
75	96.7047	104.0313	95.4349	95.3566	111.7241
100	94.4366	99.0414	93.5848	93.5771	103.5136

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	149.644	131.543	114.559	147.766	160.512	32948.066	160.109
15	122.792	115.063	97.444	121.115	136.394	592006.223	139.792
20	111.709	2443.292	2426.753	104.596	117.251	764957.531	130.289
25	106.806	103.476	91.102	94.023	102.446	673635.099	125.378
30	104.210	96.520	86.411	86.361	91.936	686698.901	122.564
35	102.706	89.435	81.078	80.552	83.015	89.607	120.494
40	101.373	85.419	78.492	76.330	77.688	83.735	119.057
50	98.657	74.358	69.469	69.671	68.589	75.049	116.234
75	95.269	61.775	59.121	59.887	56.059	63.440	112.825
100	93.371	55.834	54.181	53.922	48.404	56.952	111.048

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	99.96	99.96	100.00	99.98	99.98	99.46	99.33	99.86	99.01	99.27
15	99.88	99.78	99.98	99.88	99.86	61.86	55.37	93.38	50.34	91.78
20	99.60	99.52	99.94	99.47	99.52	44.98	38.50	64.82	36.73	91.07
25	96.63	96.36	99.98	95.49	98.69	34.91	30.30	49.49	28.99	91.41
30	78.86	76.42	99.50	73.78	97.88	28.37	24.46	39.48	23.68	92.30
35	66.03	64.00	94.53	62.20	97.72	23.33	20.57	31.61	20.00	93.68
40	57.04	54.63	80.21	53.15	98.06	18.77	16.42	25.69	16.46	94.75
50	40.06	37.88	56.52	37.45	97.60	12.18	10.46	16.74	10.83	95.21
75	17.49	14.85	24.55	15.94	98.87	4.36	3.41	5.68	3.86	97.47
100	7.25	6.06	10.30	6.81	99.47	1.39	0.93	1.84	1.19	98.34

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	99.94	98.70	N/A	N/A	100.00	100.00
15	99.90	98.76	N/A	N/A	100.00	100.00
20	99.84	97.83	N/A	N/A	100.00	100.00
25	99.94	99.23	N/A	N/A	100.00	100.00
30	100.00	96.39	N/A	N/A	100.00	100.00
35	99.96	96.86	N/A	N/A	100.00	100.00
40	100.00	93.37	N/A	N/A	100.00	100.00
50	100.00	91.81	N/A	N/A	100.00	100.00
75	100.00	96.12	N/A	N/A	100.00	100.00
100	100.00	84.00	N/A	N/A	100.00	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	99.84	99.82	99.96	99.84	99.70	99.78
15	85.45	80.81	99.26	82.97	96.65	71.15
20	72.27	67.37	88.09	68.70	94.00	49.60
25	59.64	56.60	76.37	56.82	93.21	38.26
30	50.19	47.44	64.83	47.82	92.89	29.27
35	41.93	40.26	54.85	40.43	93.96	23.01
40	35.50	33.62	44.88	33.77	95.05	18.02
50	23.85	22.52	30.68	22.87	95.01	9.82
75	9.07	8.05	11.48	8.67	96.34	2.83
100	3.25	2.55	4.29	2.94	97.49	0.71

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	0.93%	99.96	0.06%	99.90
15	0.00%	99.90	1.05%	99.28	0.06%	99.48
20	0.00%	96.69	0.69%	98.84	0.00%	99.01
25	0.00%	93.01	0.24%	98.51	0.00%	98.42
30	0.00%	91.45	0.32%	98.97	0.00%	98.32
35	0.00%	91.27	0.12%	99.35	0.00%	98.26
40	0.00%	91.60	0.04%	99.66	0.00%	98.93
50	0.00%	90.34	0.02%	99.82	0.00%	98.89
75	0.00%	88.14	0.00%	100.00	0.00%	99.11
100	0.00%	86.63	0.00%	100.00	0.00%	99.29

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	98.77	99.78	98.65	100.28	94.04	98.87	99.15	99.96
15	94.65	90.47	94.50	62.33	64.36	58.40	91.88	99.92
20	91.68	82.70	89.91	46.45	48.40	42.80	92.08	99.92
25	91.86	78.88	87.83	39.35	38.64	36.64	92.67	99.96
30	92.00	69.94	79.04	33.44	32.63	32.14	93.58	100.00
35	93.33	60.98	70.36	29.94	26.91	29.12	95.17	100.00
40	94.51	52.75	61.08	26.17	22.74	26.40	95.70	100.00
50	94.67	35.41	41.62	19.48	15.82	20.07	96.51	100.00
75	96.16	13.21	15.04	9.07	6.12	10.25	98.53	100.00
100	97.37	5.40	6.25	4.03	2.42	4.73	99.19	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	98.34	89.66	96.11	88.32	73.41	83.94	93.74	99.98
15	94.77	51.16	58.37	46.79	42.22	40.59	90.87	99.94
20	93.66	39.16	45.47	35.16	30.91	31.20	91.68	99.92
25	95.37	34.21	39.05	31.04	25.47	28.43	92.59	99.98
30	95.70	29.20	33.84	26.76	20.94	25.12	93.78	100.00
35	96.63	26.00	30.04	23.85	17.28	22.87	95.21	99.98
40	97.80	23.26	26.60	21.39	14.46	20.68	95.74	100.00
50	97.78	18.60	20.94	16.47	9.48	16.56	96.51	100.00
75	98.16	9.70	10.74	7.99	3.73	8.57	98.50	100.00
100	98.38	4.70	5.15	3.55	1.56	4.41	99.29	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.50	99.94	99.96	99.82	99.94	99.84	99.78	99.98
15	96.77	99.05	99.32	90.97	98.48	92.38	95.56	99.96
20	94.08	97.65	97.57	69.16	93.52	73.84	92.14	99.96
25	93.56	95.31	95.27	57.62	85.83	59.65	91.68	100.00
30	93.07	90.03	90.54	48.34	74.04	48.76	91.31	100.00
35	94.06	80.09	80.98	41.98	62.79	41.98	92.77	100.00
40	95.07	69.66	70.36	34.53	50.98	35.34	93.80	100.00
50	95.21	45.84	47.25	24.28	33.21	24.41	94.04	100.00
75	96.50	14.02	15.17	8.75	9.69	9.87	96.10	100.00
100	97.56	4.54	5.29	3.35	2.97	4.05	97.39	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.74	86.00	86.10	99.96	100.00	99.98	99.92	100.00
15	98.12	84.69	84.85	98.14	99.27	98.99	97.98	99.98
20	96.14	89.01	89.20	84.86	96.44	89.09	94.20	100.00
25	94.69	93.74	93.80	76.93	91.58	79.91	92.48	100.00
30	93.68	95.23	95.49	71.38	82.68	72.95	91.74	100.00
35	94.44	94.01	94.83	68.40	75.51	69.02	92.00	100.00
40	95.47	90.94	91.83	65.19	69.67	64.97	93.11	100.00
50	95.29	79.77	80.68	52.66	60.80	53.77	93.56	100.00
75	96.65	35.44	35.62	22.61	41.81	23.44	95.27	100.00
100	97.56	10.31	10.60	6.49	18.68	7.43	96.87	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	100.00	100.00	100.00	100.00	100.00	100.00
15	99.98	99.96	99.98	99.98	99.98	99.98
20	99.85	99.80	100.00	99.79	99.84	100.00
25	99.50	99.35	100.00	99.46	99.68	100.00
30	99.40	98.93	99.98	99.40	99.60	100.00
35	98.70	98.56	99.91	98.88	99.56	100.00
40	98.93	98.87	99.88	99.05	99.82	100.00
50	98.06	98.04	99.49	98.20	99.74	100.00
75	91.52	91.63	96.03	91.55	99.84	100.00
100	78.57	78.78	85.16	78.65	99.86	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 63.4887781
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.70	98.23	81.27	117.46	99.94	99.88	91.84	99.94
15	96.65	96.18	69.29	117.96	99.54	99.82	90.04	99.90
20	94.00	95.09	65.15	110.15	95.33	99.92	91.03	99.88
25	93.21	93.02	62.95	94.53	87.11	99.84	91.98	99.92
30	92.89	81.34	55.90	74.26	77.21	97.78	92.67	100.00
35	93.96	68.17	49.92	60.54	65.84	85.76	94.00	99.98
40	95.05	57.63	42.65	50.11	55.33	69.49	94.04	100.00
50	95.01	38.77	30.38	33.51	36.02	44.69	95.03	100.00
75	96.34	15.52	13.03	12.93	11.07	17.33	96.89	100.00
100	97.49	6.48	5.54	5.01	3.29	7.25	97.84	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 0.75
Beta Value: 100.00
Population Mean: 75.0000000
Number of Test Runs: 5050
Detection Limit: 63.4887781
Averaged Percentage Non-detects: 60.00%
Distribution Check: Average of means: 75.022806
Distribution Check: Average of stdvs: 85.452353
Average of NDs per 100 observations: 59.966400

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	63.488778	4.377426	0	23	125	592	1493	2817	0	0	0	0
15	63.488778	8.261188	0	0	1	12	59	166	409	777	1119	1300
20	63.488778	11.756436	0	0	0	0	1	3	25	87	198	332
25	63.488778	14.945149	0	0	0	0	1	0	1	5	9	45
30	63.488778	18.029901	0	0	0	0	0	0	0	0	0	6
35	63.488778	20.986931	0	0	0	0	0	0	0	0	0	0
40	63.488778	23.968317	0	0	0	0	0	0	0	0	0	0
50	63.488778	30.011485	0	0	0	0	0	0	0	0	0	0
75	63.488778	44.999010	0	0	0	0	0	0	0	0	0	0
100	63.488778	60.035050	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	8837
15	1207	0	0	0	0	0	0	0	0	0	0	0	1389
20	638	907	947	865	651	396	0	0	0	0	0	0	259
25	102	229	381	604	728	815	792	599	423	218	98	0	49
30	9	19	61	140	236	402	561	662	787	686	568	913	6
35	0	2	4	13	35	81	152	278	437	523	638	2887	1
40	0	0	1	1	1	14	31	48	93	188	292	4381	0
50	0	0	0	0	0	0	0	0	1	4	9	5036	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	62	0	62	0	0	62	0	62	0	0
15	97	0	97	0	0	97	0	97	0	0
20	75	0	75	0	0	75	0	75	0	0
25	31	0	31	0	0	31	0	31	0	0
30	35	0	35	0	0	35	0	35	0	0
35	4	0	4	0	0	4	0	4	0	0
40	6	0	6	0	0	6	0	6	0	0
50	2	0	2	0	0	2	0	2	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	63	8	62	24	0	0	0	2817
15	582	595	202	939	0	0	0	4403
20	960	1048	534	1322	0	0	0	4404
25	1034	1186	627	1379	0	0	0	4658
30	1079	1203	711	1388	0	0	0	4579
35	1041	1170	724	1295	0	0	0	4763
40	1039	1160	727	1245	0	0	0	4673
50	974	1124	715	1158	0	0	0	4757
75	818	963	642	922	0	0	0	4947
100	747	932	597	830	0	0	0	4975

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	63	8	62	24	0	0
15	582	595	202	939	0	0
20	960	1048	534	1322	0	0
25	1034	1186	627	1379	0	0
30	1079	1203	711	1388	0	0
35	1041	1170	724	1295	0	0
40	1039	1160	727	1245	0	0
50	974	1124	715	1158	0	0
75	818	963	642	922	0	0
100	747	932	597	830	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	62	0	62	0	0	0	0
15	0	97	0	97	0	0	0	0
20	0	78	4	75	0	15	0	0
25	0	40	31	33	4	56	0	0
30	0	44	46	38	15	72	0	0
35	0	11	44	7	23	74	0	0
40	0	21	47	14	41	72	0	0
50	0	17	60	8	69	68	0	0
75	0	30	44	13	118	44	0	0
100	0	28	40	19	172	39	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	62	0	62	0	0	0	0
15	0	97	0	97	0	0	0	0
20	0	78	4	75	0	15	0	0
25	0	40	30	33	4	58	0	0
30	0	44	47	38	16	74	0	0
35	0	11	43	7	21	73	0	0
40	0	19	47	13	42	70	0	0
50	0	17	60	7	73	69	0	0
75	0	31	44	14	119	42	0	0
100	0	27	40	19	167	39	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	21	0	21	0	0	0	0
20	0	27	4	24	0	15	0	0
25	0	21	33	14	4	59	0	0
30	0	25	46	18	16	73	0	0
35	0	7	43	4	24	72	0	0
40	0	14	49	9	40	73	0	0
50	0	17	58	7	73	68	0	0
75	0	30	43	13	119	43	0	0
100	0	29	38	19	167	38	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	21	0	21	0	0	0	0
20	0	27	4	24	0	16	0	0
25	0	21	31	14	4	58	0	0
30	0	23	46	19	16	71	0	0
35	0	8	44	4	23	73	0	0
40	0	16	46	9	41	71	0	0
50	0	17	61	8	68	68	0	0
75	0	30	44	13	118	45	0	0
100	0	28	40	21	169	40	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	47	3	0	0	0	0
15	0	53	3	0	0	0	0
20	0	35	0	0	0	0	0
25	0	12	0	0	0	0	0
30	0	16	0	0	0	0	0
35	0	6	0	0	0	0	0
40	0	2	0	0	0	0	0
50	0	1	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	754	0	754	0	0	0	0
15	0	786	0	786	0	0	0	0
20	0	546	0	546	0	0	0	0
25	0	276	0	276	0	0	0	0
30	0	162	0	162	0	0	0	0
35	0	55	0	55	0	0	0	0
40	0	27	0	27	0	0	0	0
50	0	7	0	7	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 12. G(2,30) Detection Limit Fixed at 25 (Censoring Level = 20.33%)

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	82.9072	88.5257	247.9389	185.2521	342.8985	249.3032
15	78.6532	75.9531	155.2799	135.9450	203.3812	173.9037
20	76.7566	72.1722	122.1726	114.7196	152.3146	140.9383
25	75.0864	69.3398	108.1430	103.4561	130.6406	123.5106
30	74.1625	68.0116	98.3331	95.3513	116.9414	112.2973
35	73.0927	66.6324	92.0763	90.0750	107.9249	104.7769
40	72.5416	65.8854	87.9150	86.5739	101.9016	99.7695
50	71.5892	64.6812	82.5963	81.7699	94.1901	92.8552
75	69.8547	62.6869	75.5999	75.2423	84.0938	83.4974
100	68.6992	61.3905	72.1776	71.9721	79.1079	78.7581

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	83.8652	83.5395	87.9597	88.5488	88.3810
15	77.0984	76.9453	79.4453	77.5760	80.9953
20	74.1993	74.0741	75.7377	74.5063	77.7478
25	71.9609	71.7950	73.0988	72.1566	75.4304
30	70.7557	70.5545	71.6222	70.8869	73.9826
35	69.4527	69.2249	70.1542	69.5427	72.5849
40	68.7354	68.4810	69.3203	68.7999	71.8502
50	67.5286	67.2307	67.9620	67.5630	70.5949
75	65.4456	65.0828	65.6997	65.4510	68.4568
100	64.0409	63.6370	64.2186	64.0367	67.1510

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	77.5501	76.9862	80.8498	81.3233	81.5166
15	72.7647	72.4753	74.7511	72.9026	76.5080
20	70.8722	70.6491	72.2077	71.0159	74.3688
25	69.1372	68.8856	70.1392	69.2271	72.5854
30	68.3579	68.0815	69.1298	68.4168	71.5750
35	67.3102	67.0145	67.9400	67.3460	70.4392
40	66.7902	66.4730	67.3187	66.8124	69.9056
50	65.8661	65.5132	66.2614	65.8724	68.9370
75	64.1791	63.7742	64.4144	64.1708	67.1967
100	62.9738	62.5346	63.1398	62.9612	66.0904

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	81.8838	81.5302	85.7810	82.7217	83.1627	82.2532
15	75.9772	75.8501	78.2697	76.4561	77.6661	75.8084
20	73.4687	73.3745	74.9970	73.7925	75.3468	72.9028
25	71.3900	71.2505	72.5257	71.6019	73.4220	70.5194
30	70.3198	70.1458	71.1895	70.4664	72.3698	69.2695
35	69.0787	68.8773	69.7840	69.1818	71.2001	67.8567
40	68.4156	68.1875	69.0049	68.4917	70.6025	67.0635
50	67.2779	67.0055	67.7155	67.3212	69.5605	65.7202
75	65.2778	64.9381	65.5350	65.2885	67.7191	63.4129
100	63.9042	63.5212	64.0840	63.9035	66.4896	61.8480

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	277.8804	0.02%	84.1834	0.00%	109.4712
15	0.00%	173.6784	0.00%	76.2083	0.00%	92.5818
20	0.00%	143.8268	0.00%	73.4186	0.00%	86.3502
25	0.00%	129.0670	0.00%	71.2958	0.00%	82.4546
30	0.00%	119.6423	0.00%	70.2137	0.00%	79.8960
35	0.00%	113.4115	0.00%	69.1321	0.00%	77.9726
40	0.00%	109.3251	0.00%	68.5840	0.00%	76.7866
50	0.00%	103.0412	0.00%	67.6401	0.00%	74.8528
75	0.00%	94.6728	0.00%	66.0976	0.00%	71.9778
100	0.00%	90.1607	0.00%	65.0928	0.00%	70.2608

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	79.422	363.251	383.569	78.565	78.731	87.954	82.987
15	75.821	456.108	92.303	74.353	74.053	74.656	78.595
20	74.171	96.172	77.954	72.321	71.719	72.650	76.631
25	72.574	70.943	167.114	70.434	69.682	70.777	74.976
30	71.737	69.860	77.098	69.413	68.531	69.774	74.060
35	70.698	68.670	68.815	68.245	67.260	68.606	73.011
40	70.192	68.014	68.160	67.576	66.500	67.963	72.464
50	69.273	66.916	67.032	66.456	65.218	66.864	71.530
75	67.558	64.980	65.072	64.486	63.002	64.940	69.818
100	66.385	63.651	63.727	63.128	61.494	63.611	68.673

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	92.594	86.071	86.692	86.697	84.249	7757.121	101.717
15	83.621	78.368	78.507	78.388	76.063	78.489	87.223
20	79.586	75.354	75.409	74.957	72.794	75.333	82.311
25	76.690	72.937	72.967	72.348	70.289	72.832	79.201
30	75.014	71.526	71.619	70.917	68.960	71.424	77.412
35	73.373	70.047	70.138	69.442	67.520	69.956	75.708
40	72.509	69.208	69.294	68.581	66.675	69.130	74.788
50	71.057	67.826	67.936	67.198	65.276	67.763	73.334
75	68.703	65.549	65.644	64.924	62.983	65.504	70.953
100	67.208	64.051	64.121	63.441	61.448	64.019	69.496

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	80.533	82.714	83.499	79.200	81.556	79.359	86.114
15	76.481	76.406	76.934	74.513	75.659	74.526	80.576
20	74.710	73.210	73.586	72.407	72.766	72.457	78.068
25	73.015	70.974	71.293	70.472	70.469	70.620	76.098
30	72.121	69.866	70.099	69.461	69.153	69.668	75.011
35	71.021	68.644	68.857	68.272	67.759	68.511	73.792
40	70.498	68.002	68.181	67.638	66.960	67.901	73.156
50	69.514	66.911	67.077	66.492	65.568	66.853	72.075
75	67.724	64.999	65.091	64.527	63.268	64.944	70.172
100	66.509	63.661	63.742	63.159	61.699	63.619	68.935

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	81.282	83.589	84.101	79.371	86.236	80.152	90.643
15	76.713	77.024	77.386	74.344	78.612	74.298	83.320
20	74.923	73.155	73.483	72.169	74.893	71.990	79.975
25	73.204	70.656	70.986	70.232	72.166	70.161	77.635
30	72.255	69.500	69.742	69.255	70.542	69.268	76.203
35	71.161	68.286	68.499	68.087	68.953	68.168	74.805
40	70.588	67.664	67.886	67.473	67.980	67.572	74.033
50	69.604	66.658	66.809	66.348	66.441	66.557	72.750
75	67.792	64.816	64.910	64.424	63.851	64.758	70.595
100	66.542	63.514	63.599	63.078	62.161	63.477	69.223

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	116.3566	116.7357	123.7497	120.1961	123.2894	114.4075
15	106.0163	106.4923	110.4306	108.0840	111.1523	105.0553
20	100.3494	100.8306	103.2888	101.6741	104.6411	100.0863
25	95.9597	96.3876	98.1269	96.8919	99.9204	96.1939
30	92.9085	93.2777	94.5600	93.5979	96.4852	93.5172
35	90.0917	90.4087	91.4192	90.6251	93.4782	91.0163
40	88.2532	88.5279	89.3541	88.6820	91.5574	89.4371
50	85.2102	85.4109	86.0156	85.5060	88.3850	86.8196
75	80.0761	80.1448	80.5341	80.2240	83.1080	82.3744
100	76.8043	76.7860	77.1153	76.8930	79.8987	79.5740

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	79.2430	92.6973	80.3906	81.3875	83.2534
15	75.6282	83.2422	76.2170	76.8150	77.7728
20	73.9782	79.2858	74.4255	74.8602	75.6790
25	72.3950	76.5457	72.7406	73.0272	73.9918
30	71.5460	74.8931	71.7983	72.0949	73.0771
35	70.4891	73.2438	70.7129	70.9591	71.9001
40	70.0090	72.4601	70.1631	70.3546	71.8036
50	69.1074	71.1544	69.1880	69.2785	71.3999
75	67.4377	68.8518	67.4140	67.4097	70.9856
100	66.3548	67.5155	66.2397	66.1102	71.6210

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	83.163	81.394	79.577	82.270	82.655	1532.115	84.500
15	77.666	76.462	75.508	75.923	75.414	241.834	79.224
20	75.347	73.637	73.099	73.147	72.185	73.982	76.998
25	73.422	71.442	71.082	70.949	69.786	71.675	75.172
30	72.370	70.260	70.016	69.765	68.468	70.421	74.176
35	71.200	69.005	68.819	68.515	67.114	69.127	73.062
40	70.603	68.291	68.147	67.790	66.312	68.387	72.487
50	69.561	67.111	67.015	66.594	65.000	67.175	71.512
75	67.719	65.093	65.046	64.557	62.803	65.125	69.773
100	66.490	63.723	63.694	63.172	61.319	63.744	68.624

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	91.33	90.89	94.05	91.82	92.42	82.71	81.60	87.65	82.44	87.29
15	89.72	89.45	93.01	90.28	92.51	81.28	80.42	84.95	81.31	87.03
20	89.05	88.85	91.52	89.31	92.18	81.74	81.23	84.50	81.86	87.72
25	87.96	87.58	89.96	88.26	91.98	79.88	79.11	82.79	80.00	87.21
30	87.80	87.23	89.56	87.98	92.20	80.67	80.02	82.97	80.67	87.74
35	86.69	85.80	88.69	86.97	91.66	79.13	77.98	81.43	79.21	87.50
40	86.48	85.70	88.36	86.57	92.12	79.23	77.92	81.29	79.21	87.94
50	85.47	84.36	87.01	85.49	91.90	78.10	76.77	79.94	78.10	87.90
75	83.49	81.84	84.93	83.45	92.38	76.73	74.10	77.92	76.57	88.91
100	79.54	76.77	80.42	79.50	91.58	72.24	69.17	73.58	72.08	88.38

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	90.63	87.29	N/A	N/A	99.82	99.74
15	92.10	83.09	N/A	N/A	100.00	99.98
20	93.03	81.89	N/A	N/A	100.00	100.00
25	93.23	78.48	N/A	N/A	100.00	99.98
30	94.40	77.87	N/A	N/A	100.00	100.00
35	94.63	74.97	N/A	N/A	100.00	99.98
40	95.72	74.32	N/A	N/A	100.00	100.00
50	95.98	72.04	N/A	N/A	99.98	99.98
75	96.91	66.99	N/A	N/A	99.98	99.96
100	97.56	59.56	N/A	N/A	99.96	99.96

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	88.66	88.14	92.07	89.20	89.82	88.83
15	86.79	86.53	90.49	87.28	89.37	86.18
20	86.77	86.53	89.74	87.25	90.20	85.60
25	86.04	85.60	88.26	86.24	89.92	83.72
30	86.22	85.66	88.30	86.42	90.38	83.13
35	84.71	84.08	87.15	84.83	90.30	81.39
40	84.79	83.96	86.75	84.91	90.97	80.00
50	84.06	82.79	85.62	84.08	91.21	77.13
75	82.50	80.57	83.47	82.48	92.06	71.66
100	78.30	75.78	79.45	78.24	91.23	63.58

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.80	0.02%	85.22	0.00%	96.53
15	0.00%	99.96	0.00%	84.02	0.00%	96.79
20	0.00%	100.00	0.00%	85.50	0.00%	96.87
25	0.00%	99.92	0.00%	84.55	0.00%	96.81
30	0.00%	100.00	0.00%	85.60	0.00%	97.19
35	0.00%	99.98	0.00%	84.91	0.00%	97.09
40	0.00%	100.00	0.00%	85.64	0.00%	97.72
50	0.00%	100.00	0.00%	85.98	0.00%	97.56
75	0.00%	100.00	0.00%	88.02	0.00%	97.98
100	0.00%	100.00	0.00%	85.88	0.00%	98.28

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	85.88	86.95	87.29	84.61	84.79	85.33	85.35	90.83
15	87.09	86.99	87.72	84.63	83.92	85.05	86.48	92.34
20	88.69	86.69	87.11	85.27	83.88	85.78	87.62	93.11
25	88.57	85.54	85.92	84.22	82.02	85.25	87.66	93.15
30	89.35	85.74	86.10	84.63	82.00	85.45	88.10	94.36
35	89.50	84.10	84.51	82.73	79.58	83.74	87.84	94.55
40	90.26	84.02	84.61	82.69	78.36	83.88	88.83	95.60
50	90.57	82.93	83.17	81.09	75.43	82.97	88.95	95.92
75	91.84	81.31	81.45	78.50	69.45	81.07	90.12	96.97
100	90.85	76.65	77.25	73.31	61.19	76.57	89.72	97.54

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.54	84.91	85.35	86.99	84.91	86.69	89.35	94.75
15	92.55	86.47	86.47	87.58	84.08	87.64	90.51	95.76
20	93.19	87.96	87.90	87.74	83.82	88.28	90.91	95.70
25	92.81	87.52	87.54	86.55	81.54	87.54	90.57	95.86
30	93.23	87.80	87.94	86.83	81.56	87.62	91.09	96.69
35	92.87	86.81	86.83	85.17	79.27	86.57	90.65	96.69
40	93.45	86.34	86.83	84.73	77.64	86.26	91.15	97.27
50	93.74	85.39	85.86	83.25	75.31	85.13	91.41	97.27
75	93.82	83.50	83.56	80.10	68.93	83.11	91.84	97.86
100	92.91	78.95	79.39	75.25	60.50	78.65	91.92	98.28

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.23	90.26	91.01	85.84	89.27	86.16	86.97	92.77
15	87.94	88.79	89.41	84.71	87.19	84.57	87.27	94.12
20	89.31	86.91	87.66	84.99	86.04	84.93	88.57	94.14
25	89.09	85.17	85.90	83.88	83.76	83.92	87.98	94.51
30	90.00	85.27	85.86	84.36	83.33	84.46	88.85	95.39
35	90.06	83.56	84.14	82.36	81.15	83.23	88.83	95.29
40	90.75	83.39	84.28	82.40	80.02	83.09	89.21	96.20
50	91.21	82.83	83.39	80.75	76.87	82.59	89.23	96.55
75	92.18	80.95	81.60	78.67	70.89	80.65	90.77	97.25
100	91.05	76.85	77.39	73.35	62.59	76.63	89.52	97.80

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.18	90.14	90.04	86.53	92.95	87.43	88.81	95.09
15	88.08	89.43	90.22	85.03	92.40	84.99	88.77	95.74
20	89.39	86.95	87.68	85.05	90.51	84.63	89.45	95.66
25	89.15	84.51	85.15	83.33	89.05	83.15	88.71	95.72
30	90.14	84.69	85.17	83.72	87.80	83.66	89.58	96.34
35	90.16	82.48	83.47	81.86	85.45	82.32	89.52	96.55
40	90.57	82.34	83.31	81.78	84.40	81.90	90.08	97.01
50	91.13	81.72	82.26	80.40	81.21	81.41	89.66	97.21
75	92.18	80.16	80.42	78.16	74.81	79.76	90.51	97.68
100	91.07	75.74	76.46	72.93	66.12	75.41	88.59	98.10

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.03	99.05	99.41	99.31	99.31	98.81
15	99.62	99.58	99.78	99.72	99.72	99.47
20	99.66	99.66	99.80	99.70	99.70	99.64
25	99.76	99.76	99.84	99.80	99.82	99.78
30	99.78	99.78	99.92	99.80	99.80	99.86
35	99.80	99.80	99.86	99.82	99.84	99.86
40	99.92	99.90	100.00	99.92	99.94	100.00
50	99.86	99.88	99.90	99.90	99.92	99.94
75	99.92	99.92	99.94	99.92	99.94	100.00
100	99.92	99.92	99.96	99.94	99.94	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.82	88.66	83.92	91.28	89.47	91.76	88.24	91.54
15	89.37	88.03	85.50	87.30	86.51	89.70	87.92	92.51
20	90.20	87.43	86.10	86.55	84.69	88.40	88.04	92.99
25	89.92	86.38	85.25	85.09	81.96	86.99	87.21	93.11
30	90.38	86.42	85.64	85.07	81.68	86.89	87.70	94.32
35	90.30	84.89	84.20	83.37	78.91	85.23	87.21	94.50
40	90.97	84.63	84.16	83.13	77.41	85.09	87.78	95.47
50	91.21	83.68	83.11	81.64	74.20	84.08	88.24	95.82
75	92.06	81.52	81.35	79.03	68.44	81.70	88.48	96.85
100	91.23	77.15	76.91	73.50	59.72	77.31	88.34	97.49

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 30.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Detection Limit: 25.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 59.996716
Distribution Check: Average of stdvs: 42.107053
Average of NDs per 100 observations: 20.274600

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	25.000000	1.981980	554	1328	1527	1068	442	131	0	0	0	0
15	25.000000	3.074851	154	599	1169	1258	1002	548	207	85	22	4
20	25.000000	4.059406	51	257	686	1027	1071	917	602	272	116	36
25	25.000000	5.153069	21	123	302	625	908	943	877	636	329	183
30	25.000000	6.088119	4	40	145	389	636	862	951	775	559	319
35	25.000000	7.143762	1	16	63	198	407	613	787	808	741	600
40	25.000000	8.134257	1	4	28	101	236	417	571	715	763	780
50	25.000000	10.152079	0	0	4	20	53	114	295	420	518	716
75	25.000000	15.168911	0	0	0	1	1	5	7	32	54	114
100	25.000000	20.392871	0	0	0	0	0	0	1	1	1	5

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	46
15	2	0	0	0	0	0	0	0	0	0	0	0	0
20	12	3	0	0	0	0	0	0	0	0	0	0	0
25	71	19	9	3	0	1	0	0	0	0	0	0	0
30	225	98	27	15	2	3	0	0	0	0	0	0	0
35	376	241	104	61	25	7	1	0	1	0	0	0	0
40	580	366	222	136	92	27	7	4	0	0	0	0	0
50	707	673	538	383	265	155	101	52	18	12	2	4	0
75	175	326	402	501	551	592	582	495	393	305	191	323	0
100	14	36	60	87	155	202	283	340	474	424	514	2453	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	7	0	7	0	0	7	0	7	0	0
15	1	0	1	0	0	1	0	1	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	7	0	7	2	0	0	0	131
15	2	3	1	3	0	0	0	113
20	0	1	0	0	0	0	0	15
25	0	0	0	0	0	0	0	13
30	0	0	0	0	0	0	0	3
35	0	0	0	0	0	0	0	1
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	7	0	7	2	0	0
15	2	3	1	3	0	0
20	0	1	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	7	0	7	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	7	0	7	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	1	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	121	0	121	0	0	0	0
15	0	12	0	12	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 13a. G(2,100) 10% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	271.6905	277.0797	665.3303	521.0911	790.5125	606.8583
15	259.9593	255.3719	449.3448	403.0484	544.7276	479.4821
20	251.9469	243.3678	375.8505	356.1335	439.8726	412.3960
25	246.8432	237.2989	336.8258	324.3977	387.8912	370.3714
30	244.0331	233.8266	315.0592	306.6152	356.7498	344.8833
35	240.1877	229.5940	296.6360	290.9294	332.9165	324.8039
40	238.2722	227.4184	285.8885	281.9614	317.2451	311.6938
50	233.7761	222.1237	270.4734	267.9587	296.0275	292.4836
75	228.4890	216.5523	249.4930	248.3897	268.5882	266.9953
100	224.9768	212.9285	238.8267	238.1972	254.6460	253.7187

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	274.7858	274.5997	282.1205	277.3761	284.1634
15	258.0611	257.9619	262.4883	259.6063	265.9237
20	248.1650	247.9571	251.2381	249.1972	255.4230
25	242.2068	241.9132	244.4919	242.9374	248.9122
30	238.8820	238.5066	240.6859	239.4317	245.3480
35	234.7134	234.2809	236.1818	235.1399	240.9623
40	232.5433	232.0503	233.7680	232.8825	238.6697
50	227.5753	226.9754	228.4953	227.8053	233.6793
75	221.9219	221.1892	222.4567	222.0314	227.7330
100	218.1942	217.3859	218.5618	218.2561	223.9120

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	263.3593	262.8951	269.4900	264.8574	272.0044
15	250.7548	250.4818	254.6423	251.8741	258.3720
20	242.5842	242.2167	245.3442	243.3789	249.7251
25	237.6787	237.2547	239.7597	238.2565	244.3187
30	234.9879	234.4975	236.6462	235.4296	241.4149
35	231.2835	230.7499	232.6427	231.6295	237.5081
40	229.4545	228.8687	230.5939	229.7311	235.5661
50	224.9135	224.2320	225.7755	225.1013	231.0133
75	219.9430	219.1511	220.4501	220.0325	225.7571
100	216.5596	215.7037	216.9104	216.6095	222.2818

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	273.9527	273.8317	281.3441	276.6815	277.0775	275.7219
15	258.1034	258.1101	262.6935	259.8271	261.4607	258.7353
20	248.5067	248.4149	251.7272	249.6819	251.9947	248.0973
25	242.6610	242.4805	245.0667	243.5027	246.1449	241.6361
30	239.3860	239.1213	241.2895	240.0249	242.9329	237.8562
35	235.2199	234.8936	236.7713	235.7194	238.7994	233.3325
40	233.0661	232.6767	234.3605	233.4660	236.7069	230.8412
50	228.0849	227.5841	229.0567	228.3595	231.9312	225.2986
75	222.3992	221.7521	222.9635	222.5336	226.3978	218.9267
100	218.6217	217.8889	219.0085	218.6998	222.7712	214.7524

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	1263.7748	0.00%	317.1100	0.00%	379.2934
15	0.00%	688.4312	0.00%	279.1296	0.00%	319.3935
20	0.00%	545.3284	0.00%	261.4754	0.00%	294.2979
25	0.00%	477.8385	0.00%	252.0665	0.00%	279.9071
30	0.00%	440.8758	0.00%	246.7952	0.00%	271.8901
35	0.00%	415.4334	0.00%	241.1475	0.00%	264.1323
40	0.00%	397.7984	0.00%	238.2053	0.00%	259.6977
50	0.00%	372.3325	0.00%	232.0017	0.00%	251.5046
75	0.00%	340.4148	0.00%	225.3161	0.00%	241.6554
100	0.00%	324.3464	0.00%	221.2570	0.00%	235.9425

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	265.316	598.711	265.907	263.860	263.862	264.442	270.873
15	255.374	276.287	320.295	252.859	252.221	253.432	259.065
20	248.079	245.275	245.819	244.546	243.261	245.195	251.190
25	243.397	240.223	240.682	239.450	237.835	240.118	246.234
30	240.812	237.341	237.765	236.487	234.617	237.241	243.536
35	237.158	233.451	233.855	232.595	230.469	233.373	239.783
40	235.359	231.471	231.821	230.595	228.196	231.387	237.930
50	230.975	226.735	227.044	225.762	222.998	226.671	233.509
75	225.875	221.407	221.619	220.349	217.112	221.345	228.341
100	222.421	217.815	217.974	216.703	213.220	217.758	224.875

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	314.839	302.678	304.595	304.016	300.846	302.691	323.208
15	281.955	273.707	274.568	273.270	269.929	273.814	284.983
20	266.618	259.224	259.972	258.010	254.387	259.237	269.206
25	257.147	250.753	251.300	249.435	245.689	250.577	259.513
30	251.739	245.651	246.234	244.304	240.599	245.533	254.015
35	246.115	240.325	240.777	238.988	235.203	240.167	248.451
40	243.074	237.325	237.710	235.964	232.075	237.242	245.334
50	237.012	231.260	231.584	229.858	225.841	231.172	239.371
75	229.670	224.300	224.492	222.909	218.746	224.175	232.025
100	225.174	219.881	220.056	218.552	214.347	219.795	227.542

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	268.326	269.515	270.502	265.840	269.148	265.735	279.458
15	257.435	255.430	256.095	254.115	255.649	254.035	264.371
20	249.863	246.377	246.968	245.714	246.052	245.922	255.047
25	244.872	241.105	241.664	240.560	240.148	240.843	249.228
30	242.130	238.079	238.622	237.490	236.603	237.970	245.966
35	238.260	234.161	234.580	233.498	232.216	234.026	241.885
40	236.344	232.121	232.532	231.399	229.835	231.978	239.725
50	231.797	227.335	227.636	226.447	224.330	227.209	234.972
75	226.428	221.790	222.021	220.811	218.040	221.740	229.245
100	222.842	218.109	218.255	217.049	213.926	218.053	225.543

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	269.644	270.425	271.423	264.926	274.195	265.242	291.357
15	258.528	255.075	255.620	253.169	258.538	252.866	271.473
20	250.585	245.322	245.975	244.862	248.091	244.688	260.169
25	245.401	240.093	240.648	239.864	241.784	239.801	252.948
30	242.693	237.269	237.729	236.953	237.913	237.076	248.965
35	238.770	233.408	233.830	232.930	233.439	233.248	244.324
40	236.716	231.448	231.807	230.895	230.828	231.365	241.863
50	232.088	226.751	227.093	226.017	225.181	226.612	236.540
75	226.638	221.409	221.651	220.504	218.622	221.312	230.184
100	223.007	217.788	217.996	216.855	214.406	217.800	226.232

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	384.8592	385.9730	399.5157	393.1772	399.2857	382.5191
15	353.4679	354.7542	362.8291	358.6059	364.4565	352.4505
20	333.3376	334.6471	339.9512	336.8922	342.7481	333.1493
25	319.4392	320.5907	324.3752	322.0445	327.7112	319.7926
30	310.5126	311.5441	314.4037	312.5315	318.1776	311.2828
35	301.2197	302.1283	304.3741	302.8294	308.4103	302.3295
40	295.2897	296.1013	297.9061	296.6032	302.1701	296.7100
50	284.2936	284.9398	286.2314	285.2339	290.9107	286.2874
75	268.8034	269.1358	269.8975	269.3017	274.8527	271.6540
100	258.9690	259.0999	259.7006	259.2836	264.8117	262.4021

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	265.2927	313.8728	268.2278	269.8032	277.3379
15	255.3995	280.9218	257.3578	258.1984	261.8056
20	248.1816	265.9564	249.6550	250.5125	252.3486
25	243.4100	256.6008	244.7629	245.2860	246.4212
30	240.9036	251.4136	242.0555	242.3705	243.2209
35	237.2225	245.8783	238.1711	238.5254	239.1145
40	235.4421	242.7986	236.2562	236.5768	237.0107
50	231.0395	236.7877	231.7375	231.9388	232.0199
75	225.9159	229.5280	226.4020	226.4774	226.5080
100	222.4542	225.0273	222.8313	222.9581	222.7953

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	277.077	274.326	272.294	274.546	273.815	742.395	278.346
15	261.461	258.862	258.000	257.962	256.015	259.450	262.955
20	251.995	248.541	248.109	247.551	244.869	248.879	253.630
25	246.145	242.534	242.269	241.548	238.570	242.752	247.893
30	242.933	239.120	238.935	238.106	234.896	239.274	244.722
35	238.799	234.872	234.735	233.847	230.507	234.988	240.644
40	236.707	232.629	232.524	231.573	228.077	232.720	238.595
50	231.931	227.563	227.490	226.445	222.705	227.626	233.935
75	226.398	221.856	221.821	220.705	216.739	221.887	228.495
100	222.771	218.106	218.085	216.942	212.857	218.126	224.935

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	89.11	89.01	91.60	90.08	91.52	84.91	84.69	87.39	85.37	88.04
15	89.11	89.07	90.77	89.60	91.68	85.82	85.64	87.45	86.32	89.03
20	89.88	89.74	91.09	90.20	92.42	86.48	86.24	88.04	86.87	90.40
25	89.43	89.23	90.44	89.82	92.42	86.28	85.86	87.62	86.71	90.32
30	89.39	89.07	90.55	89.74	92.79	86.30	85.94	87.68	86.50	90.81
35	88.97	88.61	89.98	89.23	92.61	85.96	85.76	87.33	86.26	90.71
40	89.13	88.79	89.86	89.29	92.71	86.67	86.30	87.70	86.89	90.81
50	88.95	88.40	89.66	89.09	92.91	86.38	85.47	86.99	86.48	91.19
75	87.98	87.33	88.65	88.06	93.52	85.84	84.95	86.34	85.86	91.86
100	87.74	86.51	88.26	87.80	94.02	85.25	83.76	85.78	85.29	92.85

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	88.28	87.08	N/A	N/A	99.39	99.05
15	89.90	85.80	N/A	N/A	99.52	99.27
20	91.45	85.17	N/A	N/A	99.68	99.62
25	92.00	84.14	N/A	N/A	99.96	99.88
30	92.65	84.83	N/A	N/A	99.80	99.78
35	92.44	83.66	N/A	N/A	99.98	99.96
40	92.63	83.94	N/A	N/A	99.96	99.96
50	93.21	82.24	N/A	N/A	99.96	99.94
75	94.18	79.92	N/A	N/A	99.94	99.92
100	95.23	77.37	N/A	N/A	99.94	99.92

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	88.20	88.12	90.75	89.13	89.33	88.99
15	88.75	88.77	90.46	89.43	90.06	88.89
20	89.66	89.54	90.97	90.16	91.11	89.25
25	89.35	89.31	90.57	89.62	91.19	88.67
30	89.35	89.15	90.57	89.58	91.64	88.22
35	89.07	88.69	90.08	89.41	91.27	87.60
40	89.09	88.83	90.02	89.37	91.41	87.62
50	89.13	88.63	89.68	89.31	91.56	86.46
75	88.40	87.66	88.91	88.46	92.20	84.50
100	88.14	87.11	88.59	88.22	93.15	82.18

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.43	0.00%	90.55	0.00%	97.23
15	0.00%	99.60	0.00%	90.65	0.00%	97.17
20	0.00%	99.78	0.00%	90.93	0.00%	97.23
25	0.00%	99.96	0.00%	90.81	0.00%	97.60
30	0.00%	99.92	0.00%	90.75	0.00%	97.76
35	0.00%	99.98	0.00%	90.34	0.00%	98.04
40	0.00%	100.00	0.00%	90.32	0.00%	97.50
50	0.00%	100.00	0.00%	90.36	0.00%	97.68
75	0.00%	100.00	0.00%	90.00	0.00%	98.36
100	0.00%	100.00	0.00%	90.14	0.00%	98.46

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.08	86.24	86.59	85.60	85.50	85.78	85.90	88.16
15	87.90	87.45	87.68	86.79	86.55	87.33	87.98	89.64
20	89.72	88.40	88.59	88.10	87.01	88.38	89.88	91.21
25	89.90	88.30	88.59	87.56	86.61	88.22	89.98	91.64
30	90.48	88.42	88.50	87.76	86.12	88.24	90.53	92.46
35	90.48	88.02	88.34	87.47	85.60	88.22	90.48	92.28
40	90.83	88.20	88.48	87.68	85.62	88.14	90.73	92.50
50	91.15	88.04	88.42	87.07	84.20	88.04	91.29	93.07
75	91.86	87.54	87.74	86.20	82.30	87.33	91.82	94.02
100	92.87	87.33	87.25	85.50	79.35	86.99	92.89	95.07

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	92.38	89.56	89.49	90.71	89.64	89.96	91.70	93.45
15	93.19	91.07	91.05	91.25	90.06	91.13	92.46	93.96
20	93.60	91.70	91.90	91.56	89.90	91.66	93.35	94.57
25	93.58	91.27	91.39	91.05	88.91	91.19	93.37	94.57
30	94.00	91.50	91.72	90.95	88.61	91.25	94.10	95.27
35	93.78	91.03	91.17	90.38	87.86	90.97	93.56	94.85
40	93.90	91.01	91.09	90.32	87.41	91.05	93.76	95.03
50	93.86	90.61	90.71	89.58	86.20	90.36	93.98	95.25
75	94.06	89.84	89.74	88.46	83.98	89.47	94.14	95.88
100	94.67	89.25	89.52	87.50	81.11	89.09	94.81	96.46

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.69	87.94	88.26	85.80	87.39	86.20	86.57	90.50
15	88.65	87.96	88.48	87.11	87.90	87.11	88.28	91.45
20	90.10	88.69	88.87	88.08	88.46	88.30	90.00	92.34
25	90.55	88.44	88.91	88.16	87.84	88.06	90.22	92.63
30	91.09	88.50	88.87	88.26	87.45	88.26	90.99	93.29
35	90.95	88.14	88.50	87.64	86.69	88.02	90.97	93.13
40	91.13	88.63	88.65	88.04	86.67	88.28	91.13	93.37
50	91.50	88.46	88.55	87.50	85.54	88.28	91.56	93.88
75	92.28	87.52	87.84	86.63	83.33	87.49	92.26	94.55
100	93.01	87.25	87.47	85.92	80.75	87.27	92.89	95.62

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.15	87.76	88.24	85.54	89.54	85.68	87.13	92.97
15	88.67	87.70	87.88	86.71	89.41	86.40	88.59	93.25
20	90.46	87.58	88.12	87.43	89.35	87.19	90.20	93.76
25	90.71	87.50	87.88	87.62	88.89	87.66	90.59	93.72
30	91.21	87.68	88.20	87.62	88.51	87.29	91.01	94.36
35	91.25	87.37	87.80	87.15	88.10	87.43	91.11	93.90
40	91.23	87.80	88.04	87.43	87.60	87.58	90.93	94.24
50	91.52	87.54	87.82	87.11	86.38	87.27	91.43	94.53
75	92.38	87.13	87.43	86.22	83.88	87.29	92.30	95.15
100	93.35	86.97	87.13	85.27	81.37	86.85	93.09	95.70

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.09	99.11	99.45	99.29	99.33	99.07
15	99.47	99.41	99.60	99.52	99.52	99.33
20	99.58	99.60	99.66	99.66	99.66	99.54
25	99.86	99.86	99.90	99.88	99.88	99.86
30	99.74	99.76	99.82	99.78	99.82	99.76
35	99.88	99.90	99.90	99.90	99.90	99.90
40	99.90	99.90	99.92	99.90	99.94	99.90
50	99.92	99.92	99.94	99.92	99.94	99.94
75	100.00	100.00	100.00	100.00	100.00	100.00
100	99.96	99.96	99.96	99.96	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 53.1811608
Percentage Non-detects: 10.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.33	88.82	87.35	89.15	88.48	89.82	89.49	89.84
15	90.06	89.29	88.61	88.89	87.98	89.66	90.40	90.87
20	91.11	89.52	89.25	89.09	87.58	89.76	91.29	91.90
25	91.19	89.35	89.15	88.73	86.81	89.39	91.29	92.18
30	91.64	89.27	89.03	88.83	86.12	89.37	91.96	92.77
35	91.27	88.89	88.71	88.20	85.52	88.93	91.78	92.65
40	91.41	88.87	88.75	88.20	85.37	88.91	91.98	92.65
50	91.56	88.87	88.79	87.56	83.76	88.93	91.74	93.11
75	92.20	87.78	87.76	86.65	81.60	87.78	92.44	94.18
100	93.15	87.43	87.35	85.76	78.55	87.47	93.29	95.19

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Detection Limit: 53.1811608
Averaged Percentage Non-detects: 10.00%
Distribution Check: Average of means: 199.811622
Distribution Check: Average of stdvs: 140.343230
Average of NDs per 100 observations: 9.996200

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	53.181161	0.996832	1779	1956	946	301	57	11	0	0	0	0
15	53.181161	1.518614	993	1766	1344	663	211	59	12	1	1	0
20	53.181161	2.022772	601	1314	1440	1022	454	181	33	4	1	0
25	53.181161	2.505347	359	1048	1283	1137	717	328	137	33	6	2
30	53.181161	3.000990	227	709	1134	1185	911	504	256	85	24	14
35	53.181161	3.511881	121	503	921	1090	1061	680	381	197	59	31
40	53.181161	3.984554	101	348	689	992	1024	829	565	312	132	38
50	53.181161	5.055842	25	145	405	675	897	910	719	599	372	173
75	53.181161	7.482970	1	14	77	168	336	557	682	798	745	605
100	53.181161	9.992079	0	2	9	30	75	172	320	431	606	652

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1	0	0	0	0	0	0	0	0	0	0	0	0
35	6	0	0	0	0	0	0	0	0	0	0	0	0
40	14	5	1	0	0	0	0	0	0	0	0	0	0
50	79	33	14	3	1	0	0	0	0	0	0	0	0
75	455	285	163	85	48	17	8	4	2	0	0	0	0
100	653	577	514	397	243	175	94	48	31	8	4	9	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	0	0	0	0	0	0	0	11
15	0	0	0	0	0	0	0	2
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	0	0	0	0	0	0
15	0	0	0	0	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	25	0	25	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 13b. G(2,100) 15% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	269.3909	276.5763	384.8153	342.7828	380.6482	340.2689
15	257.3236	260.2698	317.0190	299.7960	320.0259	302.2689
20	250.7470	252.1732	290.1668	281.8771	293.3669	284.7162
25	245.4597	245.9817	275.3873	269.5789	279.2699	273.1047
30	241.6317	241.6614	266.2259	261.9611	269.7279	265.2002
35	239.1194	238.8799	260.7597	257.5754	264.0475	260.6630
40	236.7754	236.2362	255.3837	253.0979	258.4311	256.0017
50	232.8998	232.1534	247.4677	245.9424	250.2351	248.6091
75	226.6342	225.6180	236.8029	236.0291	239.1247	238.2975
100	223.2131	222.0869	231.0395	230.5606	232.9944	232.4827

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	274.1601	274.1649	275.0841	274.5764	275.3834
15	258.6468	258.6484	259.2869	258.9323	259.6651
20	250.8377	250.8289	251.3461	251.0640	251.7424
25	245.0088	244.9884	245.4448	245.2020	245.8489
30	240.8719	240.8429	241.2520	241.0375	241.6866
35	238.1409	238.1007	238.5062	238.2982	238.9856
40	235.6732	235.6237	236.0011	235.8127	236.4899
50	231.7357	231.6765	232.0089	231.8499	232.4783
75	225.3642	225.2786	225.5739	225.4472	226.0974
100	221.9795	221.8805	222.1452	222.0423	222.6689

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	269.7085	269.6928	270.5100	270.0298	270.8599
15	256.1684	256.1535	256.7501	256.4102	257.1551
20	249.1352	249.1131	249.6076	249.3350	250.0211
25	243.7330	243.7015	244.1437	243.9077	244.5601
30	239.8353	239.7969	240.1962	239.9870	240.6406
35	237.2491	237.2001	237.5980	237.3945	238.0859
40	234.8982	234.8407	235.2128	235.0281	235.7087
50	231.1414	231.0761	231.4054	231.2490	231.8798
75	224.9575	224.8674	225.1620	225.0367	225.6887
100	221.6738	221.5714	221.8362	221.7341	222.3619

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	276.6964	276.7142	277.6662	277.1579	277.1462	277.0289
15	260.7460	260.7643	261.4310	261.0690	261.2128	260.9555
20	252.6959	252.7049	253.2444	252.9539	253.1653	252.8081
25	246.6420	246.6395	247.1138	246.8628	247.1132	246.6787
30	242.3641	242.3524	242.7755	242.5536	242.8411	242.3304
35	239.5267	239.5048	239.9226	239.7071	240.0412	239.4274
40	236.9925	236.9609	237.3478	237.1526	237.5061	236.8347
50	232.8961	232.8531	233.1920	233.0272	233.3865	232.6677
75	226.3234	226.2527	226.5499	226.4187	226.8427	225.9204
100	222.8062	222.7206	222.9849	222.8784	223.3164	222.3059

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	592.8543	0.00%	422.0453	0.00%	436.6821
15	0.00%	403.3530	0.00%	339.2990	0.00%	347.1567
20	0.00%	351.0304	0.00%	309.1660	0.00%	315.2299
25	0.00%	325.1859	0.00%	292.3169	0.00%	297.5771
30	0.00%	309.4958	0.00%	280.5875	0.00%	285.4532
35	0.00%	301.1464	0.00%	273.3229	0.00%	278.2081
40	0.00%	292.6289	0.00%	267.3721	0.00%	271.9591
50	0.00%	279.8607	0.00%	258.7203	0.00%	262.7414
75	0.00%	264.6245	0.00%	246.1119	0.00%	249.8957
100	0.00%	256.2044	0.00%	239.9291	0.00%	243.4167

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	265.626	265.470	265.655	265.496	265.449	265.555	267.762
15	255.164	254.902	255.012	254.885	254.739	254.919	256.037
20	249.291	248.964	249.050	248.886	248.718	248.945	249.807
25	244.369	244.022	244.093	243.951	243.713	243.991	244.719
30	240.786	240.363	240.457	240.262	240.049	240.352	241.055
35	238.385	237.928	238.046	237.820	237.520	237.932	238.653
40	236.142	235.686	235.790	235.576	235.236	235.692	236.377
50	232.431	231.969	232.068	231.833	231.490	231.972	232.607
75	226.311	225.800	225.875	225.663	225.160	225.793	226.463
100	222.969	222.459	222.521	222.310	221.737	222.458	223.101

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	315.703	314.293	314.838	314.469	314.495	314.427	312.370
15	282.714	281.681	282.054	281.615	281.516	281.821	280.909
20	268.236	267.330	267.599	267.159	266.898	267.336	266.962
25	258.236	257.323	257.642	257.230	256.936	257.495	257.358
30	251.834	251.124	251.366	250.911	250.524	251.127	251.367
35	247.627	246.832	247.025	246.730	246.176	246.948	247.252
40	244.132	243.428	243.638	243.189	242.671	243.419	243.915
50	238.432	237.834	237.958	237.571	237.073	237.804	238.260
75	230.177	229.522	229.688	229.335	228.664	229.549	230.166
100	225.748	225.140	225.253	224.957	224.260	225.167	225.788

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	268.390	268.275	268.352	268.043	268.401	268.089	274.670
15	257.337	256.973	257.054	256.932	257.113	256.902	260.415
20	251.058	250.691	250.793	250.655	250.622	250.618	252.926
25	245.917	245.438	245.440	245.368	245.386	245.423	247.157
30	242.024	241.597	241.721	241.508	241.436	241.606	242.985
35	239.543	239.042	239.112	238.944	238.810	239.028	240.274
40	237.201	236.713	236.712	236.629	236.402	236.684	237.841
50	233.258	232.783	232.820	232.681	232.413	232.748	233.733
75	226.868	226.363	226.421	226.237	225.830	226.317	227.173
100	223.362	222.857	222.911	222.724	222.273	222.870	223.602

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	269.561	269.361	269.464	268.796	269.716	268.768	284.686
15	258.248	257.597	257.772	257.563	258.083	257.625	265.980
20	251.895	251.314	251.166	251.145	251.513	251.283	256.629
25	246.446	245.850	245.891	245.859	246.026	245.802	249.709
30	242.604	242.023	242.042	241.917	241.980	241.962	244.983
35	239.994	239.321	239.337	239.327	239.380	239.351	241.874
40	237.500	236.966	236.974	236.930	236.873	237.016	239.158
50	233.477	232.940	232.940	232.933	232.803	232.901	234.663
75	227.030	226.442	226.517	226.429	226.142	226.483	227.707
100	223.512	222.953	222.950	222.840	222.540	222.931	223.956

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	383.8229	383.9608	385.8085	385.0205	385.7750	383.6600
15	352.1775	352.3642	353.6253	353.0399	353.7395	352.2370
20	333.9728	334.1684	335.1450	334.6675	335.3220	334.1526
25	319.7929	319.9806	320.8041	320.3895	321.0173	320.0355
30	309.7178	309.8931	310.5979	310.2328	310.8649	309.9822
35	302.5225	302.6990	303.3669	303.0138	303.6850	302.8346
40	296.3928	296.5565	297.1477	296.8294	297.4920	296.7222
50	285.9839	286.1190	286.6079	286.3416	286.9584	286.3292
75	270.1439	270.2404	270.6113	270.4052	271.0460	270.5361
100	260.8295	260.8932	261.1909	261.0275	261.6464	261.2319

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	265.5737	315.2992	268.4250	269.4345	277.1462
15	255.1434	282.3034	257.3784	258.4841	261.2128
20	249.2436	267.9785	251.0463	251.8227	253.1653
25	244.3772	258.0815	245.8504	246.5575	247.1132
30	240.7645	251.7597	242.1030	242.6010	242.8411
35	238.4146	247.5814	239.5485	240.0053	240.0412
40	236.1647	244.0201	237.1478	237.5962	237.5061
50	232.4320	238.4030	233.2282	233.5333	233.3865
75	226.3190	230.1107	226.9026	227.0426	226.8427
100	222.9737	225.7269	223.4113	223.5290	223.3164

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	277.146	276.900	276.805	276.835	276.615	277.017	277.189
15	261.213	260.877	260.845	260.775	260.461	260.915	261.279
20	253.165	252.791	252.798	252.679	252.298	252.811	253.234
25	247.113	246.712	246.736	246.588	246.157	246.725	247.176
30	242.841	242.421	242.449	242.294	241.824	242.431	242.908
35	240.041	239.576	239.610	239.435	238.890	239.584	240.110
40	237.506	237.026	237.061	236.878	236.298	237.031	237.575
50	233.386	232.918	232.955	232.769	232.168	232.922	233.453
75	226.843	226.325	226.358	226.160	225.441	226.327	226.913
100	223.316	222.798	222.825	222.630	221.867	222.799	223.384

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	88.99	88.99	89.21	89.13	89.29	87.78	87.78	88.12	87.86	88.18
15	89.58	89.58	89.92	89.80	90.00	88.75	88.73	88.99	88.89	89.21
20	90.12	90.10	90.36	90.22	90.53	89.58	89.56	89.84	89.66	89.98
25	90.99	90.99	91.25	91.11	91.45	90.34	90.32	90.57	90.48	90.83
30	91.35	91.33	91.56	91.45	91.76	90.77	90.75	91.05	90.83	91.39
35	91.29	91.27	91.58	91.45	91.84	90.87	90.77	91.09	90.97	91.45
40	91.07	90.99	91.21	91.13	91.60	90.46	90.44	90.71	90.53	90.97
50	91.76	91.72	91.94	91.84	92.36	91.31	91.27	91.50	91.37	91.86
75	92.55	92.48	92.77	92.61	93.05	92.10	92.00	92.38	92.20	92.81
100	92.38	92.22	92.65	92.46	93.03	92.12	92.04	92.20	92.16	92.83

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	87.54	89.27	N/A	N/A	97.25	95.39
15	89.11	89.68	N/A	N/A	97.17	95.88
20	90.16	90.51	N/A	N/A	96.91	95.92
25	91.15	91.23	N/A	N/A	96.71	96.10
30	91.72	91.01	N/A	N/A	96.89	96.32
35	91.82	91.21	N/A	N/A	97.35	96.87
40	91.72	91.25	N/A	N/A	97.27	96.77
50	92.55	91.49	N/A	N/A	97.37	97.07
75	93.25	92.28	N/A	N/A	97.76	97.47
100	93.33	92.14	N/A	N/A	97.94	97.82

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	89.47	89.47	89.72	89.58	89.56	89.52
15	90.10	90.10	90.46	90.36	90.38	90.26
20	90.67	90.67	90.91	90.81	90.91	90.73
25	91.50	91.50	91.72	91.58	91.72	91.50
30	91.86	91.88	92.06	91.98	92.10	91.90
35	91.90	91.88	92.14	92.02	92.22	91.84
40	91.70	91.66	91.92	91.78	92.12	91.58
50	92.26	92.24	92.57	92.42	92.75	92.12
75	93.05	93.01	93.21	93.17	93.37	92.69
100	93.11	93.05	93.17	93.15	93.39	92.57

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	98.10	0.00%	97.45	0.00%	97.82
15	0.00%	98.63	0.00%	97.64	0.00%	98.18
20	0.00%	98.71	0.00%	98.10	0.00%	98.48
25	0.00%	98.77	0.00%	97.92	0.00%	98.42
30	0.00%	98.95	0.00%	98.12	0.00%	98.50
35	0.00%	99.31	0.00%	98.55	0.00%	98.99
40	0.00%	99.43	0.00%	98.46	0.00%	99.17
50	0.00%	99.23	0.00%	98.34	0.00%	98.85
75	0.00%	99.52	0.00%	98.65	0.00%	99.11
100	0.00%	99.80	0.00%	99.15	0.00%	99.62

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.42	86.46	86.48	86.42	86.40	86.34	86.44	86.93
15	88.44	88.30	88.42	88.30	88.14	88.24	88.34	88.75
20	89.60	89.52	89.47	89.43	89.39	89.47	89.56	89.74
25	90.55	90.42	90.46	90.48	90.32	90.46	90.65	90.79
30	91.17	91.05	90.99	90.89	90.71	91.01	91.31	91.41
35	91.56	91.21	91.29	91.05	90.85	91.15	91.58	91.62
40	91.15	91.05	91.07	90.93	90.75	90.89	91.33	91.50
50	92.10	91.88	91.82	91.80	91.39	91.82	92.22	92.28
75	93.15	92.73	92.73	92.63	92.04	92.63	93.15	93.17
100	93.23	92.79	92.81	92.65	91.98	92.87	93.21	93.25

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	92.93	92.61	92.91	92.79	93.07	92.81	92.91	92.40
15	93.39	93.25	93.35	93.31	93.23	93.23	93.49	93.23
20	93.98	93.68	93.84	93.78	93.76	93.80	94.04	93.68
25	94.26	93.90	94.12	93.84	93.84	93.98	94.22	94.06
30	94.36	94.00	94.30	94.04	93.62	94.10	94.28	94.28
35	94.93	94.87	94.91	94.61	94.40	94.89	95.21	94.87
40	94.61	94.26	94.18	94.18	93.64	94.04	94.42	94.51
50	94.53	94.34	94.38	94.18	93.80	94.32	94.67	94.61
75	94.97	94.65	94.71	94.61	94.00	94.77	94.91	94.87
100	94.91	94.26	94.53	94.18	93.72	94.59	95.11	95.13

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.05	86.87	86.85	86.75	87.09	86.93	87.05	88.79
15	88.91	88.83	88.73	89.05	88.89	88.69	89.01	89.96
20	89.96	90.04	90.12	89.84	89.92	90.04	90.12	90.67
25	91.13	90.89	90.99	91.03	90.89	90.83	91.07	91.64
30	91.45	91.35	91.37	91.35	91.25	91.54	91.84	92.14
35	92.14	91.66	91.78	91.60	91.58	91.86	91.84	92.40
40	91.72	91.47	91.47	91.49	91.41	91.39	91.96	92.40
50	92.50	92.12	92.40	92.18	92.00	92.32	92.63	92.93
75	93.50	92.95	92.91	93.11	92.59	93.09	93.60	93.49
100	93.56	93.19	92.95	92.89	92.55	92.93	93.45	93.54

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.19	87.13	87.21	87.03	87.33	86.83	87.31	90.87
15	89.07	88.83	89.19	88.81	89.09	88.99	89.17	91.43
20	90.42	90.12	90.12	89.96	90.16	89.94	90.44	91.70
25	91.03	90.81	90.77	90.77	91.05	91.05	91.39	92.46
30	91.88	91.66	91.50	91.19	91.41	91.41	91.88	92.75
35	92.26	91.39	91.49	91.62	91.66	91.54	92.14	93.13
40	92.04	91.43	91.47	91.60	91.39	91.56	91.90	92.69
50	92.53	92.00	92.24	92.00	92.08	92.26	92.79	93.31
75	93.21	92.93	93.09	92.99	92.61	92.83	93.39	93.82
100	93.56	93.03	93.01	92.69	92.34	93.07	93.56	93.92

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	98.81	98.81	98.89	98.87	98.87	98.77
15	99.33	99.33	99.35	99.35	99.35	99.31
20	99.68	99.68	99.68	99.68	99.68	99.68
25	99.76	99.76	99.76	99.76	99.76	99.76
30	99.84	99.84	99.84	99.84	99.84	99.84
35	99.82	99.84	99.84	99.84	99.84	99.84
40	99.92	99.92	99.92	99.92	99.92	99.92
50	99.92	99.92	99.92	99.92	99.92	99.92
75	99.94	99.94	99.94	99.94	99.94	99.94
100	99.94	99.94	99.94	99.94	99.94	99.94

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 15.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.56	89.56	89.54	89.52	89.47	89.58	89.56	89.60
15	90.38	90.22	90.20	90.18	89.98	90.22	90.38	90.40
20	90.91	90.77	90.79	90.75	90.59	90.79	90.91	90.93
25	91.72	91.52	91.52	91.50	91.33	91.52	91.72	91.74
30	92.10	91.94	91.92	91.88	91.49	91.94	92.10	92.10
35	92.22	91.90	91.94	91.84	91.49	91.92	92.22	92.22
40	92.12	91.68	91.70	91.60	91.19	91.68	92.12	92.22
50	92.75	92.32	92.32	92.26	91.78	92.34	92.75	92.85
75	93.37	93.07	93.13	92.93	92.20	93.07	93.37	93.41
100	93.39	93.07	93.09	93.01	92.04	93.07	93.39	93.49

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Detection Limit: 15.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 199.899099
Distribution Check: Average of stdvs: 140.474794
Average of NDs per 100 observations: 1.013000

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	15.000000	0.102376	4559	465	26	0	0	0	0	0	0	0
15	15.000000	0.154653	4332	658	57	3	0	0	0	0	0	0
20	15.000000	0.198416	4129	842	77	2	0	0	0	0	0	0
25	15.000000	0.245941	3911	1043	89	7	0	0	0	0	0	0
30	15.000000	0.301980	3730	1135	168	15	1	1	0	0	0	0
35	15.000000	0.375644	3460	1320	236	31	3	0	0	0	0	0
40	15.000000	0.421980	3312	1387	315	31	4	1	0	0	0	0
50	15.000000	0.502574	3027	1579	378	61	5	0	0	0	0	0
75	15.000000	0.791485	2304	1788	714	201	39	3	0	1	0	0
100	15.000000	1.022178	1828	1838	964	310	88	19	2	1	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	0	0	0	0	0	0
15	0	0	0	0	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 13c. G(2,100) 20% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	276.2615	297.5972	883.8908	649.9131	1202.5963	864.1957
15	264.2233	255.0875	530.3105	462.6714	695.4092	592.9915
20	255.5146	239.8571	414.0842	388.1619	517.1546	477.7050
25	251.9765	232.9351	365.1573	349.1718	443.1723	418.7225
30	247.5650	227.3195	331.3283	321.0790	395.9600	379.9249
35	245.0782	223.5216	312.0100	305.0638	366.3879	355.5009
40	242.3809	220.4185	295.7068	291.1260	343.9219	336.6155
50	237.3355	214.8939	274.6957	271.9267	314.6194	310.1024
75	232.7248	209.3425	252.6095	251.4049	281.8863	279.8612
100	228.8960	205.0087	240.9378	240.2504	264.9074	263.7232

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	279.2916	278.4581	293.3102	289.8264	295.4086
15	259.0045	258.6554	266.7289	260.7491	272.1150
20	247.0574	246.6003	252.1473	248.0573	258.8446
25	241.9108	241.3619	245.6088	242.5804	253.0902
30	236.4330	235.7715	239.2908	236.8771	247.2088
35	233.1869	232.4158	235.4925	233.4987	243.7372
40	230.0023	229.1581	231.9161	230.2261	240.1872
50	224.1458	223.1739	225.5595	224.2642	234.0585
75	218.3737	217.1789	219.2061	218.3958	228.2935
100	213.7344	212.4180	214.3162	213.7236	223.8626

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	257.6228	256.0643	268.9070	265.0219	272.0193
15	244.7697	244.0388	251.3149	245.4763	257.4355
20	236.0753	235.2944	240.4967	236.5324	247.6866
25	232.8243	231.9965	236.0870	233.1558	243.9291
30	228.5558	227.6473	231.1035	228.7630	239.2990
35	226.1870	225.1911	228.2592	226.3226	236.7270
40	223.6741	222.6255	225.4052	223.7611	233.8593
50	218.7406	217.5920	220.0313	218.7682	228.6659
75	214.2453	212.9141	215.0168	214.2233	224.1855
100	210.2548	208.8249	210.7986	210.2169	220.4035

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	272.4690	271.5556	285.7933	275.5625	277.2307	273.8659
15	255.4038	255.1396	262.9840	257.1978	261.1803	255.0935
20	244.7141	244.3664	249.7766	245.7731	250.9123	242.9023
25	240.2048	239.7504	243.9092	240.9361	246.7658	237.4158
30	235.0446	234.4749	237.9171	235.5424	241.8221	231.5812
35	232.0534	231.3763	234.3773	232.4121	239.0347	228.0344
40	229.0276	228.2750	230.9601	229.2919	236.1378	224.5864
50	223.3666	222.4815	224.7962	223.5154	230.7546	218.2897
75	217.8627	216.7470	218.7065	217.9030	225.8135	211.7654
100	213.3135	212.0674	213.9030	213.3147	221.7361	206.6242

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	2023.6554	0.06%	280.9336	0.00%	368.8764
15	0.00%	973.3403	0.00%	257.3448	0.00%	312.3525
20	0.00%	727.0311	0.00%	244.5091	0.00%	287.4567
25	0.00%	623.1050	0.00%	239.9789	0.00%	276.7594
30	0.00%	560.9451	0.00%	234.8314	0.00%	267.2313
35	0.00%	521.9242	0.00%	232.1914	0.00%	261.7437
40	0.00%	493.8168	0.00%	229.5202	0.00%	256.8298
50	0.00%	451.3858	0.00%	224.4958	0.00%	248.3476
75	0.00%	404.0861	0.00%	220.4547	0.00%	239.9702
100	0.00%	379.8784	0.00%	217.0944	0.00%	234.3057

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	264.645	733.207	780.037	261.240	261.736	279.195	276.588
15	254.991	319.777	254.253	250.226	249.240	251.195	263.989
20	246.970	296.386	290.761	240.849	238.907	241.979	255.116
25	243.939	238.502	239.113	236.869	234.345	238.016	251.608
30	239.700	233.488	234.031	232.055	229.144	233.204	247.216
35	237.347	230.576	231.076	229.106	225.825	230.353	244.800
40	234.732	227.665	228.115	226.226	222.636	227.483	242.127
50	229.792	222.160	222.568	220.675	216.622	222.005	237.132
75	225.278	216.860	217.159	215.221	210.353	216.705	232.598
100	221.389	212.477	212.707	210.763	205.442	212.348	228.805

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	310.305	286.024	288.581	288.524	279.481	3356.964	338.189
15	281.059	263.397	263.934	263.872	256.248	264.123	292.641
20	265.460	251.505	251.666	250.063	242.937	251.417	274.552
25	257.903	245.631	245.858	243.668	236.889	245.255	265.865
30	250.591	239.177	239.479	237.113	230.700	238.928	258.368
35	246.507	235.400	235.640	233.299	226.902	235.057	254.074
40	242.520	231.742	232.073	229.686	223.418	231.446	249.921
50	235.705	225.245	225.559	223.182	216.948	224.977	243.047
75	229.048	218.799	219.091	216.723	210.321	218.646	236.377
100	224.135	213.840	214.062	211.839	205.294	213.722	231.533

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	268.455	275.554	278.053	263.744	271.705	264.486	287.283
15	257.088	256.752	258.398	250.683	254.463	250.697	270.472
20	248.729	244.084	245.298	241.111	242.433	241.354	259.903
25	245.489	238.824	239.856	237.134	236.989	237.586	255.342
30	240.988	233.504	234.339	232.191	231.212	232.913	250.324
35	238.489	230.599	231.287	229.281	227.524	230.170	247.405
40	235.801	227.661	228.294	226.414	224.204	227.321	244.402
50	230.601	222.220	222.708	220.848	217.823	221.965	238.903
75	225.824	216.945	217.265	215.375	211.229	216.742	233.755
100	221.796	212.501	212.776	210.869	206.109	212.371	229.672

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	271.096	278.950	280.370	264.475	288.266	267.305	302.438
15	257.924	259.120	260.246	250.136	264.027	249.688	279.507
20	249.460	243.768	244.732	240.148	249.215	239.805	266.391
25	246.076	237.785	238.641	236.366	242.304	236.087	260.286
30	241.386	232.128	232.994	231.447	235.702	231.541	254.325
35	238.865	229.402	230.075	228.765	231.347	228.968	250.673
40	236.111	226.583	227.279	225.809	227.502	226.240	247.322
50	230.913	221.324	221.898	220.344	220.530	221.048	241.133
75	226.063	216.324	216.658	215.048	213.103	216.129	235.124
100	221.933	212.069	212.320	210.647	207.614	211.942	230.653

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	389.0537	390.3303	414.2943	401.9340	412.9102	382.5074
15	356.2631	357.8653	370.8450	363.2045	373.3925	353.1237
20	334.4355	336.0309	344.1860	338.8480	348.7246	333.5674
25	322.2344	323.6751	329.3399	325.3401	335.0748	322.9667
30	310.4274	311.6579	315.8953	312.7270	322.3701	312.3727
35	302.5592	303.6356	306.9513	304.3479	313.9644	305.5459
40	295.1687	296.0882	298.7928	296.5995	305.9976	298.9663
50	282.6122	283.2777	285.2503	283.5911	292.8951	287.7920
75	267.0658	267.3006	268.5728	267.5593	277.0609	274.5045
100	256.1708	256.1208	257.1936	256.4674	266.2562	265.1404

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	264.1674	311.1295	268.0350	271.4011	277.6532
15	254.4011	279.8089	256.4208	258.0837	261.7829
20	246.3507	264.6026	247.8788	249.2583	251.6241
25	243.3022	257.1812	244.5457	245.7222	247.8298
30	239.1056	250.2620	240.0497	240.9867	243.5445
35	236.8503	246.4278	237.4787	238.2323	242.5739
40	234.1879	242.3658	234.7130	235.3448	239.0786
50	229.2207	235.7565	229.5608	229.9560	236.7524
75	224.9875	229.7235	224.8798	224.7619	237.5867
100	221.2343	224.9579	220.9224	220.6671	236.2910

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	277.231	495.926	489.669	273.769	275.268	6438.453	281.652
15	261.180	257.131	253.999	255.525	253.776	455.273	266.213
20	250.912	245.628	243.877	243.574	240.436	247.612	256.345
25	246.766	240.416	239.296	238.600	234.692	240.976	252.315
30	241.822	234.865	234.074	233.238	228.906	235.386	247.627
35	239.035	231.667	231.080	230.003	225.311	232.057	245.026
40	236.138	228.597	228.141	226.941	222.025	228.902	242.229
50	230.755	222.837	222.532	221.153	215.917	223.043	237.094
75	225.814	217.231	217.082	215.464	209.689	217.334	232.460
100	221.736	212.720	212.627	210.921	204.857	212.785	228.651

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	91.13	90.87	94.04	91.82	92.53	82.19	81.43	87.27	81.98	87.03
15	90.00	89.86	92.61	90.53	92.38	81.78	81.41	85.38	81.86	87.50
20	88.34	88.16	90.93	88.71	91.80	80.63	80.06	84.08	80.85	86.85
25	89.15	88.91	91.27	89.43	92.69	81.68	81.05	84.81	81.82	88.57
30	88.50	87.98	90.44	88.67	92.91	81.33	80.67	83.70	81.41	88.85
35	87.49	86.99	89.43	87.64	92.40	80.83	79.80	82.85	80.79	88.75
40	87.13	86.46	88.83	87.17	92.42	80.16	79.17	82.10	80.24	88.69
50	84.95	84.14	86.48	85.07	91.37	78.53	77.17	80.20	78.48	87.94
75	82.77	81.31	83.88	82.79	91.88	76.00	73.66	77.27	75.98	88.51
100	79.54	77.41	80.53	79.50	91.68	72.63	69.70	74.00	72.51	88.46

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	90.26	87.01	N/A	N/A	99.96	99.86
15	91.98	84.54	N/A	N/A	100.00	99.98
20	92.34	81.35	N/A	N/A	99.98	99.98
25	94.02	80.95	N/A	N/A	100.00	100.00
30	94.95	78.21	N/A	N/A	100.00	100.00
35	95.05	77.19	N/A	N/A	100.00	100.00
40	95.47	75.86	N/A	N/A	100.00	100.00
50	95.25	72.08	N/A	N/A	100.00	99.96
75	96.53	67.05	N/A	N/A	100.00	100.00
100	97.43	60.30	N/A	N/A	100.00	99.96

GAMMA DISTRIBUTION

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Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	88.01	87.54	92.16	88.90	89.50	88.59
15	87.19	86.95	90.75	87.84	89.90	87.21
20	86.42	86.31	89.19	86.69	89.33	85.41
25	87.66	87.33	89.86	87.86	91.13	85.31
30	86.63	86.22	88.93	86.85	91.15	83.68
35	86.18	85.49	87.76	86.26	91.31	82.42
40	85.72	84.79	87.39	85.90	91.49	81.01
50	83.62	82.61	85.29	83.80	90.87	77.78
75	81.96	80.20	83.01	81.90	91.33	72.10
100	78.46	76.57	79.49	78.44	91.78	64.57

GAMMA DISTRIBUTION

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Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.92	0.06%	84.90	0.00%	96.75
15	0.00%	100.00	0.00%	84.91	0.00%	96.77
20	0.00%	99.98	0.00%	84.53	0.00%	96.75
25	0.00%	100.00	0.00%	86.67	0.00%	97.11
30	0.00%	100.00	0.00%	85.90	0.00%	97.43
35	0.00%	100.00	0.00%	86.08	0.00%	97.50
40	0.00%	100.00	0.00%	86.57	0.00%	97.47
50	0.00%	100.00	0.00%	85.50	0.00%	97.15
75	0.00%	100.00	0.00%	86.30	0.00%	97.68
100	0.00%	100.00	0.00%	86.26	0.00%	98.32

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
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Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	85.76	86.98	87.25	84.63	84.38	85.15	85.25	90.51
15	87.50	87.80	88.36	85.88	85.15	86.04	86.93	91.86
20	87.72	86.28	86.65	84.46	83.01	85.43	87.03	92.48
25	89.98	87.31	87.56	86.02	83.82	86.71	89.17	93.94
30	90.18	86.10	86.63	84.83	82.24	85.92	89.03	94.75
35	90.46	85.37	85.76	83.92	80.97	85.17	89.54	95.01
40	90.69	84.59	85.23	83.31	79.66	84.59	89.27	95.35
50	90.16	82.77	83.37	81.09	75.84	82.53	88.79	95.27
75	90.99	80.67	81.29	78.18	69.43	80.59	89.52	96.50
100	91.41	77.21	77.64	73.90	61.88	76.89	90.02	97.35

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
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Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.45	85.01	85.07	86.79	84.50	86.46	89.35	95.15
15	92.71	87.28	87.11	88.42	84.93	88.24	90.71	95.68
20	92.75	87.70	87.52	87.41	83.45	87.82	90.79	96.06
25	93.70	89.07	88.81	88.24	83.56	88.95	91.74	96.10
30	94.00	88.38	88.53	86.99	82.00	88.51	92.20	97.05
35	93.72	87.86	87.84	86.42	80.81	87.56	92.06	96.99
40	93.84	87.39	87.60	85.49	79.37	87.13	91.76	97.17
50	93.17	85.01	85.25	83.35	75.72	84.61	91.15	97.05
75	93.21	82.69	83.07	80.08	69.27	82.46	92.10	97.70
100	93.54	79.33	79.58	75.78	61.41	78.85	91.70	98.28

GAMMA DISTRIBUTION

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Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.97	90.30	90.77	85.39	89.15	85.90	86.77	92.69
15	88.20	89.29	89.92	85.07	87.74	85.29	87.72	93.64
20	88.36	87.05	87.54	84.51	85.70	84.95	87.64	94.20
25	90.73	86.91	87.72	85.56	85.82	86.00	89.66	94.99
30	90.77	85.68	86.40	84.53	83.78	84.97	89.56	95.60
35	91.01	84.99	85.68	83.78	82.63	84.48	89.74	95.76
40	91.09	84.38	85.09	83.19	81.27	84.00	89.88	96.10
50	90.61	82.55	83.17	80.97	77.27	81.92	88.99	96.12
75	91.19	80.26	81.15	78.12	71.21	80.04	89.49	96.91
100	91.68	77.29	77.74	74.26	63.29	76.85	89.82	97.58

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.56	89.72	90.10	85.94	92.65	87.15	88.48	95.17
15	88.26	89.80	90.26	85.33	92.38	85.33	88.36	95.49
20	88.50	86.71	86.93	84.00	90.50	83.72	88.32	95.74
25	90.57	86.34	86.83	85.21	89.90	85.15	90.18	96.12
30	90.91	84.81	85.37	84.20	88.22	83.90	90.51	96.71
35	91.21	84.04	84.48	83.09	86.63	83.33	90.24	96.71
40	91.07	83.49	84.32	82.48	84.89	82.99	90.42	96.83
50	90.57	81.54	82.26	80.53	81.07	81.13	89.45	96.57
75	91.37	79.54	80.30	77.50	74.40	78.95	89.82	97.50
100	91.41	75.90	76.89	73.47	66.67	76.16	89.13	98.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.15	99.01	99.56	99.31	99.31	98.89
15	99.60	99.62	99.72	99.70	99.70	99.52
20	99.70	99.70	99.82	99.72	99.76	99.70
25	99.72	99.76	99.88	99.84	99.84	99.72
30	99.86	99.86	99.92	99.86	99.86	99.90
35	99.86	99.92	99.94	99.92	99.94	99.94
40	99.86	99.86	99.90	99.88	99.90	99.94
50	99.82	99.84	99.88	99.84	99.90	99.96
75	99.86	99.86	99.90	99.86	99.90	100.00
100	99.92	99.90	99.92	99.92	99.94	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 82.4388309
Percentage Non-detects: 20.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.50	89.11	84.08	91.08	89.56	91.58	89.03	91.37
15	89.90	88.59	86.51	88.12	87.62	89.94	87.82	92.34
20	89.33	87.10	85.50	86.03	84.30	87.88	87.15	92.55
25	91.13	88.06	87.09	87.13	84.14	88.73	88.65	94.04
30	91.15	86.77	85.88	85.41	81.80	87.31	88.06	94.75
35	91.31	86.06	85.31	84.48	80.50	86.63	88.71	94.87
40	91.49	85.58	85.01	83.88	78.59	85.92	88.28	95.35
50	90.87	83.41	82.87	81.64	74.65	83.68	87.58	95.23
75	91.33	81.33	81.01	78.46	68.32	81.41	88.51	96.40
100	91.78	77.74	77.58	74.38	60.57	77.86	88.71	97.29

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Detection Limit: 82.4388309
Averaged Percentage Non-detects: 20.00%
Distribution Check: Average of means: 200.033413
Distribution Check: Average of stdvs: 140.524582
Average of NDs per 100 observations: 20.003100

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	82.438831	1.992079	548	1331	1521	1042	479	129	0	0	0	0
15	82.438831	2.994455	197	665	1148	1237	1002	482	231	64	19	4
20	82.438831	4.021980	48	280	695	1038	1101	896	540	286	112	39
25	82.438831	4.957030	15	136	389	703	926	992	810	525	303	156
30	82.438831	5.985347	5	49	170	407	675	886	897	748	550	345
35	82.438831	6.959010	2	20	88	213	423	701	789	814	725	531
40	82.438831	7.957822	0	4	33	110	254	439	619	794	770	701
50	82.438831	9.997030	0	1	6	20	58	134	285	432	640	664
75	82.438831	14.907921	0	0	0	1	1	8	16	32	76	120
100	82.438831	20.042574	0	0	0	0	0	0	0	0	6	10

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	34
15	1	0	0	0	0	0	0	0	0	0	0	0	0
20	12	2	1	0	0	0	0	0	0	0	0	0	0
25	68	22	4	1	0	0	0	0	0	0	0	0	0
30	194	84	29	5	5	0	1	0	0	0	0	0	0
35	364	214	90	49	16	11	0	0	0	0	0	0	0
40	531	364	227	111	60	21	7	3	2	0	0	0	0
50	709	648	520	417	222	145	76	37	18	13	3	2	0
75	237	347	441	478	573	576	543	481	356	280	197	287	0
100	17	28	68	114	166	224	309	408	443	476	524	2257	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	13	0	13	0	0	13	0	13	0	0
15	1	0	1	0	0	1	0	1	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	13	0	13	3	0	0	0	129
15	1	1	1	2	0	0	0	88
20	0	1	0	0	0	0	0	15
25	0	0	0	0	0	0	0	5
30	0	0	0	0	0	0	0	1
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	13	0	13	3	0	0
15	1	1	1	2	0	0
20	0	1	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	13	0	13	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	13	0	13	0	0	0	0
15	0	1	0	1	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	3	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	117	0	117	0	0	0	0
15	0	10	0	10	0	0	0	0
20	0	3	0	3	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 13d. G(2,100) 25% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	279.5769	310.7394	925.9606	674.0640	1323.7942	939.3119
15	265.4656	256.2325	555.1792	479.7915	743.8971	627.4507
20	258.2712	243.7964	428.8647	400.2825	545.1488	500.7917
25	254.0313	232.5271	371.6637	354.6320	461.1837	434.0449
30	250.5188	226.6802	339.3833	328.2345	411.4907	393.6430
35	246.5861	220.5920	315.2855	307.9126	377.3058	365.2659
40	244.5756	217.8801	299.3762	294.4854	353.7202	345.6394
50	240.7038	212.3475	280.1485	277.1083	324.9029	319.8221
75	234.7860	205.6430	253.5323	252.2632	286.4529	284.2220
100	231.2935	201.5377	241.3466	240.6339	268.2477	266.9525

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	283.0762	281.7408	299.8596	318.0355	300.1918
15	258.5409	258.0721	268.2931	263.3907	273.5972
20	247.1442	246.6814	253.4929	248.1109	260.7453
25	240.6169	239.9802	245.2607	241.1398	253.3378
30	235.8053	235.0495	239.3775	236.1503	247.9965
35	230.7710	229.9172	233.6669	230.9796	242.5739
40	228.0617	227.1085	230.4659	228.1899	239.3462
50	222.8040	221.6802	224.6153	222.8345	234.3028
75	215.3652	214.0222	216.4298	215.3184	226.2567
100	211.0314	209.5489	211.7698	210.9675	221.7877

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	256.8562	254.4940	270.1900	287.5530	271.5706
15	240.0226	239.0839	248.1645	302.1525	254.5568
20	232.9456	232.1047	238.3905	233.1636	246.3703
25	228.7122	227.7354	232.7591	228.7529	241.3593
30	225.5524	224.4802	228.7022	225.5673	237.7276
35	221.5846	220.4459	224.1592	221.5461	233.3893
40	219.7704	218.5539	221.9231	219.7073	231.0691
50	215.5896	214.2285	217.2276	215.4904	227.1222
75	209.8747	208.3505	210.8532	209.7651	220.8013
100	206.4580	204.8250	207.1434	206.3559	217.2457

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	273.2214	271.6798	288.8098	275.8517	277.9246	274.0145
15	252.4099	251.9890	261.6373	253.9734	259.3279	251.3704
20	242.9286	242.5085	249.0843	243.8445	250.6332	240.5141
25	237.2787	236.6869	241.8144	237.7921	245.4667	233.7982
30	233.1072	232.4007	236.6156	233.4594	241.6767	228.6969
35	228.4114	227.6083	231.2628	228.6318	237.2636	223.4437
40	226.0088	225.1090	228.3827	226.1507	235.0652	220.5307
50	221.0564	219.9834	222.8488	221.0990	230.7949	214.6534
75	214.0995	212.8048	215.1572	214.0616	224.4410	206.7437
100	210.0066	208.5699	210.7417	209.9492	220.7465	202.0390

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	2287.5106	0.08%	272.7685	0.00%	363.2940
15	0.00%	1074.6083	0.02%	249.8512	0.00%	307.6619
20	0.00%	794.7975	0.00%	241.1238	0.00%	286.2385
25	0.00%	680.0976	0.00%	236.3411	0.00%	274.7821
30	0.00%	601.8859	0.00%	233.1157	0.00%	266.6388
35	0.00%	557.4398	0.00%	229.3431	0.00%	259.7242
40	0.00%	524.3099	0.00%	227.7338	0.00%	255.5942
50	0.00%	479.0840	0.00%	224.2333	0.00%	248.6814
75	0.00%	421.8579	0.00%	219.6905	0.00%	238.9567
100	0.00%	393.9354	0.00%	217.1537	0.00%	233.7333

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	264.766	628.365	410.883	261.180	262.426	339.585	280.487
15	253.070	1085.975	806.499	247.233	246.281	367.197	265.712
20	246.700	295.721	321.038	239.675	237.600	240.824	258.173
25	242.684	350.824	237.671	234.657	232.069	235.880	253.832
30	239.554	232.403	232.987	230.481	227.301	231.809	250.304
35	235.607	227.770	228.275	226.057	222.539	227.384	246.380
40	233.718	225.284	225.781	223.600	219.733	224.980	244.389
50	229.825	220.365	220.799	218.608	214.023	220.120	240.542
75	223.899	213.465	213.831	211.656	206.266	213.278	234.687
100	220.400	209.434	209.731	207.533	201.622	209.267	231.224

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	305.738	279.259	281.622	281.519	271.785	99942.862	344.082
15	278.852	256.506	256.784	257.818	248.378	432894.772	295.628
20	265.024	247.543	247.478	246.477	237.892	247.767	278.153
25	256.155	241.220	241.200	239.365	231.644	240.982	268.143
30	250.700	236.477	236.635	234.269	226.638	236.096	261.855
35	244.600	231.224	231.391	228.947	221.693	230.871	255.633
40	241.433	228.319	228.626	226.030	218.881	227.997	252.254
50	235.833	222.748	222.976	220.430	213.104	222.396	246.562
75	227.702	214.952	215.214	212.669	205.410	214.674	238.491
100	223.124	210.467	210.740	208.243	200.835	210.294	233.947

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	269.322	280.201	283.405	264.275	274.665	265.091	291.986
15	255.321	258.233	260.339	247.739	253.184	247.646	273.023
20	248.470	244.740	246.367	239.378	241.713	239.558	263.389
25	244.149	237.284	238.521	234.157	234.849	234.524	258.008
30	240.842	232.144	233.131	230.107	229.410	230.806	253.663
35	236.671	227.126	227.992	225.577	224.166	226.421	249.279
40	234.705	224.733	225.525	223.264	221.089	224.194	246.894
50	230.594	219.904	220.576	218.381	215.116	219.544	242.533
75	224.451	213.225	213.666	211.543	206.981	212.980	235.979
100	220.833	209.274	209.597	207.450	202.190	209.079	232.179

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	273.132	286.405	287.666	267.032	297.443	271.568	308.867
15	256.346	264.010	264.955	248.386	267.891	248.290	283.361
20	249.247	246.467	247.422	239.445	252.461	238.647	270.730
25	244.690	237.556	238.376	233.898	243.221	233.404	263.706
30	241.388	231.319	232.398	229.985	236.484	229.732	258.275
35	237.115	226.192	227.079	225.299	230.176	225.331	253.140
40	235.083	223.816	224.615	223.074	226.316	223.279	250.172
50	230.952	219.049	219.818	218.193	219.484	218.713	245.066
75	224.602	212.781	213.125	211.454	210.032	212.427	237.556
100	220.951	208.839	209.133	207.364	204.490	208.685	233.339

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	390.7430	392.0226	419.7132	405.2242	416.8494	382.6699
15	355.4397	356.9104	372.7071	362.8622	374.7343	351.6804
20	334.9533	336.5099	346.4005	339.6351	351.0761	334.3546
25	321.3214	322.6604	329.6950	324.5423	335.7114	322.8647
30	310.7280	311.9490	317.1582	313.1103	324.0609	314.0483
35	300.6032	301.6307	305.7809	302.4326	313.2157	305.3169
40	293.9285	294.8067	298.2051	295.3818	305.8113	299.8001
50	282.5763	283.1930	285.7460	283.5634	294.3682	290.4640
75	264.6659	264.8107	266.4722	265.1383	275.5635	275.5373
100	253.9968	253.8395	255.2181	254.2699	264.6530	266.6956

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	263.8464	306.4753	268.5359	273.6218	277.8098
15	251.9353	276.6827	254.1322	256.5360	260.0323
20	245.5469	263.6113	246.9870	248.8780	252.7641
25	241.1998	254.6749	242.4995	244.1643	247.1356
30	238.0841	249.3487	239.1354	240.6276	245.7285
35	234.0844	243.5602	234.8318	236.0491	245.4863
40	231.9936	240.0692	232.7589	234.0899	241.8301
50	228.2842	235.1177	228.6315	229.4257	248.2652
75	222.3908	227.2783	222.3250	222.9362	260.6064
100	219.0494	223.0928	218.7019	218.8991	270.8935

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	277.925	271.199	262.527	275.688	278.649	5322.434	284.325
15	259.328	256.822	251.798	253.453	252.855	2701.065	266.884
20	250.633	244.525	241.717	242.690	240.082	246.367	258.718
25	245.467	238.880	237.001	236.455	232.940	239.421	253.983
30	241.677	233.488	232.187	231.669	227.425	234.333	250.286
35	237.264	228.665	227.682	226.857	222.150	229.290	246.220
40	235.065	226.076	225.314	224.236	219.135	226.566	244.173
50	230.795	220.949	220.424	219.043	213.307	221.287	240.286
75	224.441	213.808	213.550	211.861	205.551	213.977	234.380
100	220.746	209.664	209.506	207.676	200.971	209.769	230.923

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	93.03	92.61	95.91	93.84	94.04	82.25	80.95	88.60	81.52	86.99
15	90.98	90.85	94.11	91.31	92.77	80.12	79.43	84.76	79.90	86.63
20	89.41	89.21	92.57	89.72	92.44	78.59	77.88	83.29	78.61	86.22
25	88.81	88.53	91.27	89.05	92.55	78.34	77.56	82.06	78.26	86.36
30	87.74	87.15	90.73	87.84	92.14	78.16	77.19	81.72	78.08	86.69
35	86.34	85.68	88.99	86.34	91.49	76.46	75.23	79.60	76.24	86.20
40	84.46	83.45	86.87	84.46	90.57	74.67	73.62	77.25	74.53	85.13
50	83.70	82.48	85.86	83.66	90.81	73.41	71.50	75.70	73.19	85.54
75	78.73	76.75	80.20	78.59	89.19	68.83	65.96	70.79	68.57	84.00
100	74.48	71.58	76.16	74.38	87.66	64.79	61.09	66.22	64.63	82.30

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	91.84	88.17	N/A	N/A	99.94	99.90
15	93.41	85.46	N/A	N/A	100.00	100.00
20	94.30	82.22	N/A	N/A	100.00	100.00
25	95.47	79.70	N/A	N/A	100.00	100.00
30	96.18	77.93	N/A	N/A	100.00	100.00
35	96.18	74.29	N/A	N/A	100.00	100.00
40	96.34	72.30	N/A	N/A	99.98	99.98
50	97.15	67.56	N/A	N/A	100.00	100.00
75	97.92	60.48	N/A	N/A	100.00	100.00
100	98.48	53.21	N/A	N/A	99.96	99.96

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	89.08	88.16	93.84	89.24	89.92	88.95
15	86.85	86.62	91.14	87.21	89.82	86.02
20	86.00	85.74	89.31	86.16	89.82	84.22
25	85.72	85.31	88.75	85.96	90.57	82.46
30	85.01	84.57	87.62	85.11	91.05	81.41
35	83.21	82.59	86.18	83.41	90.61	78.16
40	81.62	80.67	84.04	81.66	90.32	75.62
50	80.95	79.56	83.39	80.91	91.21	72.04
75	76.36	74.36	77.78	76.30	90.73	62.69
100	72.50	69.41	73.62	72.32	90.36	54.42

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.94	0.08%	84.42	0.00%	96.57
15	0.00%	100.00	0.02%	83.98	0.00%	96.51
20	0.00%	100.00	0.00%	84.91	0.00%	96.83
25	0.00%	100.00	0.00%	85.39	0.00%	97.21
30	0.00%	100.00	0.00%	86.00	0.00%	97.50
35	0.00%	100.00	0.00%	85.50	0.00%	97.37
40	0.00%	100.00	0.00%	85.27	0.00%	97.33
50	0.00%	100.00	0.00%	86.42	0.00%	97.74
75	0.00%	100.00	0.00%	86.73	0.00%	97.84
100	0.00%	100.00	0.00%	87.43	0.00%	98.16

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.06	88.48	88.50	84.57	85.49	85.41	85.27	92.42
15	87.62	88.21	88.83	85.12	84.06	85.39	86.40	93.70
20	88.46	87.70	88.28	84.87	83.58	85.60	86.83	94.55
25	89.41	86.55	87.11	84.55	82.14	85.68	86.99	95.47
30	89.90	85.49	85.78	83.98	80.59	84.91	87.56	96.18
35	89.62	83.47	83.92	81.58	78.24	82.89	87.17	96.08
40	89.33	81.27	81.82	79.64	75.23	81.05	86.67	96.32
50	90.48	80.55	80.75	78.12	71.92	80.28	87.25	97.19
75	90.30	75.52	76.36	72.48	62.06	75.43	86.46	97.98
100	89.94	71.41	71.88	67.43	53.39	70.97	85.74	98.48

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.48	83.24	83.64	84.83	81.88	84.51	89.49	95.68
15	92.73	84.60	84.88	86.65	82.14	86.42	89.58	96.34
20	92.97	86.06	85.68	86.40	81.41	86.44	89.50	96.65
25	93.29	86.91	86.87	85.96	80.00	87.13	89.94	97.52
30	94.20	86.79	86.65	85.35	79.11	86.38	89.76	97.74
35	93.35	85.17	85.19	83.27	76.04	84.95	89.17	97.84
40	92.73	83.05	83.50	81.13	73.70	82.97	88.48	97.84
50	93.58	82.55	82.99	79.64	69.92	82.08	88.95	98.24
75	92.97	77.47	78.04	73.92	60.22	76.89	87.13	98.67
100	92.42	72.87	73.41	68.71	51.74	72.51	86.14	99.05

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.76	92.08	92.87	86.53	90.85	87.09	87.17	94.71
15	88.28	90.57	91.37	85.03	87.84	84.73	87.41	95.17
20	88.75	88.75	89.64	84.08	86.26	84.16	87.64	95.68
25	89.82	86.46	87.27	83.64	84.30	84.12	88.57	96.48
30	90.67	84.77	85.52	82.97	82.51	83.56	88.53	96.99
35	90.28	82.38	83.45	80.69	79.70	81.80	88.32	96.85
40	90.16	80.59	81.27	78.73	76.59	79.90	87.78	96.87
50	90.95	79.35	80.55	77.35	72.99	79.39	88.38	97.76
75	90.63	74.93	75.98	72.42	63.60	74.79	87.15	98.22
100	90.20	70.77	71.70	67.23	54.89	70.40	86.28	98.63

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.01	91.11	91.29	88.57	95.47	89.92	90.02	96.38
15	88.67	91.76	91.92	85.88	94.30	86.02	88.67	96.53
20	88.97	89.43	89.90	84.93	92.97	84.61	88.89	96.97
25	90.08	86.50	87.17	83.88	91.29	83.50	89.72	97.49
30	90.57	84.36	85.19	83.35	89.07	82.93	90.08	97.70
35	90.14	82.00	82.61	80.91	86.81	80.87	89.05	97.60
40	89.82	79.94	80.53	79.03	83.43	79.05	89.03	97.64
50	90.99	78.53	79.49	77.56	79.72	77.98	89.49	98.28
75	90.73	74.18	75.33	71.96	70.14	73.62	88.36	98.55
100	90.14	69.70	70.61	67.25	60.40	69.31	86.48	99.03

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.25	99.25	99.66	99.47	99.47	98.93
15	99.66	99.66	99.88	99.74	99.74	99.64
20	99.68	99.66	99.76	99.74	99.74	99.70
25	99.80	99.74	99.86	99.82	99.84	99.82
30	99.90	99.90	99.92	99.90	99.90	99.92
35	99.82	99.86	99.94	99.86	99.86	100.00
40	99.90	99.88	99.94	99.94	99.94	99.96
50	99.88	99.92	99.98	99.96	99.96	99.98
75	99.94	99.94	99.96	99.94	99.94	100.00
100	99.88	99.88	99.90	99.88	99.90	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 96.1278763
Percentage Non-detects: 25.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	89.92	90.07	83.17	93.41	91.64	94.02	88.06	92.67
15	89.82	89.00	85.45	88.51	87.88	91.15	86.55	93.54
20	89.82	87.83	85.49	86.63	85.58	89.23	86.67	94.30
25	90.57	86.91	85.37	85.56	82.87	87.92	85.70	95.41
30	91.05	85.74	84.73	84.48	80.95	86.65	86.00	96.10
35	90.61	83.88	82.67	81.84	77.58	84.69	85.43	95.92
40	90.32	81.96	80.97	80.08	74.53	82.57	84.16	96.10
50	91.21	80.99	80.16	78.55	70.65	81.49	84.65	97.03
75	90.73	76.26	75.76	73.05	60.73	76.59	83.56	97.78
100	90.36	71.94	71.62	67.64	51.92	72.10	82.06	98.32

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Detection Limit: 96.1278763
Averaged Percentage Non-detects: 25.00%
Distribution Check: Average of means: 199.657508
Distribution Check: Average of stdvs: 140.109880
Average of NDs per 100 observations: 25.042300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	96.127876	2.413663	287	992	1433	1320	719	299	0	0	0	0
15	96.127876	3.739802	73	332	802	1094	1185	844	436	201	66	13
20	96.127876	4.975644	16	116	364	693	936	984	860	555	319	151
25	96.127876	6.261386	4	32	115	324	598	814	939	855	615	387
30	96.127876	7.429901	4	7	58	135	321	556	734	843	801	638
35	96.127876	8.785743	0	3	15	50	131	256	471	644	785	784
40	96.127876	9.965545	0	2	5	26	53	130	272	443	599	727
50	96.127876	12.558218	0	0	0	1	2	19	68	127	236	371
75	96.127876	18.802178	0	0	0	0	0	0	1	2	7	17
100	96.127876	25.051683	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	96
15	4	0	0	0	0	0	0	0	0	0	0	0	0
20	40	10	4	2	0	0	0	0	0	0	0	0	0
25	209	104	41	8	3	2	0	0	0	0	0	0	0
30	436	261	151	62	28	9	5	0	1	0	0	0	0
35	683	508	349	190	110	48	17	5	1	0	0	0	0
40	707	683	505	369	261	150	69	35	7	4	2	1	0
50	493	569	643	641	569	447	361	222	137	74	39	31	0
75	35	51	114	176	241	332	418	487	517	539	488	1625	0
100	0	0	3	8	13	34	39	86	112	180	249	4326	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	14	0	14	0	0	14	0	14	0	0
15	4	0	4	0	0	4	0	4	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	14	0	14	3	0	0	0	299
15	7	5	5	8	0	0	0	284
20	0	0	0	0	0	0	0	56
25	0	0	0	0	0	0	0	54
30	0	0	0	0	0	0	0	15
35	0	0	0	0	0	0	0	6
40	0	0	0	0	0	0	0	3
50	0	0	0	0	0	0	0	1
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	14	0	14	3	0	0
15	7	5	5	8	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	14	0	14	0	0	0	0
15	0	4	0	4	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	14	0	14	0	0	0	0
15	0	4	0	4	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	4	0	0	0	0	0
15	0	1	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	167	0	166	0	0	0	0
15	0	21	0	21	0	0	0	0
20	0	3	0	3	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 13e. G(2,100) 40% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	295.8777	367.8774	1041.6625	740.9789	1604.0367	1108.8970
15	279.7294	282.8378	647.6195	543.9507	884.9435	725.1548
20	271.5383	284.0867	473.3243	436.3067	622.5465	563.2932
25	265.9465	248.4183	399.9537	378.3444	514.8090	478.9846
30	262.3057	251.0478	360.9470	346.9569	454.2822	430.7222
35	259.1038	230.9892	332.5610	323.4304	412.0636	396.3249
40	256.5723	233.0473	312.1328	306.1973	381.5920	371.1427
50	252.3616	221.9120	287.6768	284.1107	344.5762	338.1290
75	246.7082	204.5059	257.9161	256.4454	298.3179	295.5159
100	244.0156	199.8253	245.1092	244.2826	277.2421	275.6182

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	302.0993	298.6356	327.8176	335.7566	319.3912
15	270.3264	266.6325	289.2196	269.5565	288.6283
20	251.8042	250.1839	264.4736	251.2627	269.2346
25	241.1690	239.7383	250.4142	240.4020	256.5018
30	233.6123	232.7379	240.9406	233.2920	249.1752
35	228.3119	227.3746	234.2423	227.9522	242.8497
40	224.3304	223.2358	229.2706	223.8661	237.7509
50	217.5706	216.3796	221.2946	217.1588	230.1868
75	208.5772	207.0868	210.8046	208.1939	218.9491
100	203.7696	202.0643	205.3428	203.4343	213.2716

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	260.9164	255.5768	280.7457	285.7787	273.2602
15	234.1726	228.7244	249.4736	233.2683	250.7536
20	223.6239	221.1470	234.2298	220.6486	240.8462
25	217.8914	215.7624	225.7721	215.6791	233.2015
30	213.1402	211.7666	219.4767	211.9140	228.8933
35	210.1608	208.7562	215.3392	209.1419	224.8889
40	207.9516	206.4128	212.2993	206.9743	221.5331
50	203.4709	201.8801	206.7868	202.7241	216.2464
75	197.8172	196.0036	199.8375	197.2714	208.3033
100	194.7436	192.7587	196.1866	194.3088	204.3390

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	281.8482	277.7917	304.4475	281.8645	284.6424	279.5894
15	251.5980	247.2189	268.2301	248.3301	259.7095	245.1192
20	237.8799	235.9913	249.3224	236.7510	250.1156	231.9576
25	230.0978	228.4659	238.6186	228.8057	243.5855	223.2336
30	223.9815	222.9707	230.7769	223.3023	239.4219	216.8164
35	219.8061	218.7145	225.3751	219.1705	235.9513	211.9493
40	216.7381	215.5184	221.3947	216.0654	233.1808	208.2661
50	211.0825	209.7556	214.6110	210.5371	228.5462	201.4967
75	203.6743	202.0729	205.8027	203.2285	222.2977	192.7426
100	199.6705	197.8695	201.1812	199.2975	219.2801	187.8570

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	2995.7471	1.01%	268.1206	0.02%	360.4018
15	0.00%	1240.9176	0.44%	247.5140	0.00%	308.4876
20	0.00%	878.6682	0.08%	241.6511	0.00%	286.3776
25	0.00%	718.3363	0.02%	237.8289	0.00%	273.5617
30	0.00%	627.7196	0.00%	235.6308	0.00%	265.9307
35	0.00%	572.0965	0.00%	233.8307	0.00%	260.0516
40	0.00%	533.0389	0.00%	232.4505	0.00%	255.6066
50	0.00%	475.8809	0.00%	230.0136	0.00%	248.5818
75	0.00%	410.8407	0.00%	227.1671	0.00%	239.6276
100	0.00%	380.4081	0.00%	226.0819	0.00%	235.3943

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	268.951	1344.777	3804.669	264.022	268.534	342.502	298.497
15	252.479	1518.829	798.422	243.563	244.184	254.093	282.678
20	245.989	502.862	1429.758	235.939	234.425	236.251	273.230
25	240.741	599.388	1745.260	229.779	227.078	230.647	266.882
30	237.296	424.073	394.547	225.015	221.521	226.107	262.888
35	234.258	714.942	227.213	221.211	217.146	222.459	259.489
40	231.826	349.826	222.819	218.100	213.713	219.481	256.836
50	227.556	3488.653	215.608	212.353	207.150	213.835	252.480
75	221.751	206.258	206.911	204.217	198.094	205.838	246.744
100	218.934	201.819	202.363	199.677	192.732	201.466	244.040

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	299.311	272.287	277.523	265.824	254.922	47272.644	381.122
15	277.028	242.970	244.557	242.599	230.022	2305.849	318.755
20	264.566	235.086	235.456	235.137	223.453	233.831	294.563
25	255.342	230.472	230.460	229.470	218.154	229.790	282.664
30	248.795	225.852	225.830	224.669	213.394	225.499	274.957
35	243.895	222.638	222.680	220.731	209.899	222.089	269.347
40	239.893	219.849	220.016	217.673	207.256	219.242	265.092
50	233.852	214.286	214.524	211.940	201.822	213.751	258.723
75	225.698	206.239	206.679	203.828	194.228	205.805	250.606
100	221.824	201.796	202.197	199.290	189.624	201.432	246.870

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	276.867	301.402	306.860	272.172	289.133	274.295	313.300
15	256.143	281.821	286.164	245.481	260.250	246.485	293.182
20	248.101	261.744	264.754	235.135	244.210	234.976	280.639
25	242.361	245.930	248.272	227.882	233.291	227.819	272.678
30	238.698	234.207	236.004	222.796	226.095	222.878	267.590
35	235.483	225.364	227.001	218.785	220.316	219.099	263.504
40	232.858	219.875	221.439	215.638	215.941	216.170	260.216
50	228.442	212.218	213.539	210.078	208.425	210.895	255.159
75	222.365	204.426	205.298	202.566	198.454	203.853	248.498
100	219.376	200.404	201.121	198.442	192.863	199.977	245.367

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	285.985	24094.550	674.441	284.737	337.290	295.214	335.570
15	258.912	297.597	299.867	255.773	298.120	262.348	308.444
20	249.122	1281.375	279.200	241.956	271.268	242.901	290.933
25	243.100	258.622	259.490	232.574	254.437	232.283	280.733
30	239.279	243.356	244.063	226.508	243.624	225.862	274.239
35	235.989	231.124	231.893	221.834	235.394	221.388	269.100
40	233.307	223.443	224.483	218.237	229.064	217.801	265.171
50	228.748	213.901	214.877	212.120	219.267	212.028	258.910
75	222.520	205.120	205.939	203.939	205.942	204.576	250.925
100	219.545	201.001	201.590	199.567	198.736	200.557	247.102

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	403.6265	403.5684	443.5897	420.5477	432.5835	391.0042
15	362.8619	361.7951	391.6091	370.1624	387.6662	359.0066
20	338.0080	338.3091	357.3859	342.8108	358.7139	341.2754
25	320.8901	321.4172	334.9825	323.9103	338.3037	328.7744
30	308.5195	309.3562	319.6337	310.9126	325.3126	320.3263
35	298.6167	299.3625	307.6072	300.3930	314.0211	313.1076
40	290.6323	291.1922	298.0781	291.9291	304.6880	307.1632
50	277.7071	278.0848	283.2397	278.5416	290.6163	297.8305
75	258.4962	258.3894	261.7126	258.7915	268.8839	284.0365
100	247.6582	247.2217	249.8788	247.7662	257.0602	276.6850

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	266.8813	297.6069	275.9324	289.2811	286.7726
15	250.1154	272.5198	253.5841	260.7142	270.0043
20	242.8452	259.2227	244.5884	249.6033	267.6079
25	236.3328	248.5905	238.1802	243.4629	267.7870
30	232.4951	242.3778	234.0194	238.8360	272.0696
35	228.8580	236.8942	230.3457	235.0355	284.5416
40	225.8143	232.2573	227.4498	232.3160	291.1669
50	220.9652	225.9521	222.3416	226.7460	308.4231
75	213.7900	216.0711	215.3090	219.7424	340.0752
100	210.2516	211.4156	211.8540	215.8179	377.8830

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	284.642	2480.810	2463.156	287.216	296.634	29293.740	299.263
15	259.710	257.572	244.425	258.937	266.116	229433.889	280.006
20	250.116	248.235	239.570	244.394	246.657	10376.280	270.872
25	243.586	240.450	234.354	234.731	234.578	71931.428	264.892
30	239.422	232.054	227.551	228.380	226.833	233.347	261.117
35	235.951	226.141	222.735	223.376	220.675	227.560	257.907
40	233.181	727.212	724.563	219.594	216.108	223.269	255.437
50	228.546	215.178	213.349	213.115	208.250	216.293	251.269
75	222.298	206.625	205.708	204.519	198.056	207.180	245.845
100	219.280	202.044	201.472	199.851	192.424	202.389	243.286

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	97.68	97.43	99.04	97.86	97.86	86.88	85.37	94.61	84.53	86.50
15	95.27	94.79	98.49	95.56	95.56	73.33	70.50	84.73	69.68	81.39
20	93.02	92.63	97.70	92.97	94.34	69.61	68.24	79.13	67.60	80.81
25	89.09	88.46	95.42	88.59	92.12	67.84	66.20	75.62	66.02	78.46
30	85.37	84.83	92.10	84.91	90.20	64.57	63.15	71.37	63.37	77.19
35	83.43	82.69	89.80	82.87	89.13	62.67	61.27	68.55	61.62	75.94
40	81.92	80.83	87.70	81.21	88.24	60.02	57.86	66.22	58.63	73.78
50	76.73	74.97	81.92	75.80	84.83	54.67	52.50	59.84	53.76	70.51
75	66.22	63.43	70.87	65.47	76.99	45.88	42.95	49.07	45.05	61.56
100	57.94	54.32	61.27	57.21	70.28	39.50	35.92	42.36	38.85	55.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	97.19	93.29	N/A	N/A	100.00	100.00
15	97.31	92.49	N/A	N/A	100.00	100.00
20	98.20	89.58	N/A	N/A	100.00	100.00
25	99.17	87.27	N/A	N/A	100.00	100.00
30	99.11	84.21	N/A	N/A	100.00	100.00
35	99.21	80.47	N/A	N/A	99.98	99.94
40	99.33	78.63	N/A	N/A	100.00	99.98
50	99.72	71.79	N/A	N/A	100.00	100.00
75	99.92	56.38	N/A	N/A	100.00	100.00
100	100.00	46.36	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	94.43	93.62	97.66	94.17	93.50	93.50
15	84.38	82.38	93.22	82.44	88.67	81.23
20	81.06	80.15	89.12	80.16	89.11	76.93
25	78.80	77.81	85.98	77.85	88.79	73.39
30	75.27	74.37	81.67	74.65	88.32	68.46
35	73.62	72.32	79.09	72.71	89.11	65.15
40	71.49	70.35	77.01	70.59	89.62	61.82
50	66.44	64.59	71.52	65.68	88.55	52.97
75	56.95	54.10	60.83	56.30	88.42	38.65
100	49.25	45.88	52.24	48.67	87.96	28.83

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	1.01%	91.02	0.02%	97.84
15	0.00%	100.00	0.44%	86.97	0.00%	96.83
20	0.00%	99.88	0.08%	88.98	0.00%	97.43
25	0.00%	99.88	0.02%	90.14	0.00%	97.66
30	0.00%	99.94	0.00%	91.23	0.00%	97.86
35	0.00%	99.88	0.00%	92.89	0.00%	97.70
40	0.00%	99.94	0.00%	93.98	0.00%	97.68
50	0.00%	99.96	0.00%	94.85	0.00%	97.86
75	0.00%	99.96	0.00%	96.93	0.00%	98.14
100	0.00%	100.00	0.00%	98.18	0.00%	98.71

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	88.97	93.25	93.47	88.36	88.87	89.07	86.34	97.50
15	85.50	91.51	92.85	81.36	81.41	80.91	83.70	97.90
20	87.23	90.92	92.67	81.53	79.98	81.49	84.40	98.61
25	87.47	88.81	90.28	80.06	77.11	80.75	82.87	99.39
30	87.09	85.15	86.53	77.82	74.38	78.69	81.72	99.23
35	88.28	81.98	82.87	76.28	71.72	77.50	81.33	99.27
40	88.51	80.04	81.05	75.15	70.40	76.71	80.04	99.43
50	87.86	72.93	74.00	69.03	62.34	71.43	77.52	99.76
75	87.88	62.10	63.27	58.02	46.99	61.03	70.83	99.92
100	87.58	53.82	54.79	49.11	35.62	52.75	65.68	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.20	77.38	79.69	78.24	76.71	75.82	84.89	98.46
15	89.80	75.40	75.42	78.06	71.56	74.87	84.20	98.81
20	92.22	77.86	77.58	79.70	71.58	78.75	84.57	98.95
25	92.34	78.41	78.04	78.57	69.60	78.67	82.30	99.54
30	92.04	76.97	76.65	76.36	66.97	77.17	80.48	99.50
35	92.61	76.69	76.32	75.29	64.79	76.61	79.62	99.58
40	92.63	76.16	76.02	73.88	62.95	75.82	77.05	99.72
50	91.86	71.31	71.74	67.98	54.61	70.65	73.62	99.82
75	91.27	61.68	62.65	57.05	40.83	61.21	64.91	99.98
100	90.67	53.68	54.36	48.57	31.01	52.97	59.15	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	92.20	97.35	97.70	92.89	96.18	93.21	92.63	98.42
15	87.49	95.52	96.08	82.83	91.49	83.82	86.08	98.61
20	88.36	92.97	94.22	80.26	87.21	80.22	86.24	98.99
25	88.12	89.41	90.77	77.47	82.36	77.56	85.21	99.56
30	87.80	83.66	85.03	74.42	77.80	74.93	83.58	99.52
35	89.05	78.61	80.40	72.73	74.00	72.91	83.86	99.50
40	89.39	75.68	77.45	70.79	71.92	71.29	83.13	99.56
50	88.34	68.10	69.98	65.17	62.67	66.06	81.21	99.82
75	88.38	58.10	60.08	54.75	47.11	56.89	77.15	99.94
100	88.20	50.89	52.04	46.71	36.36	49.88	74.02	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	94.50	89.88	89.82	96.28	99.11	97.21	96.28	99.13
15	89.27	93.78	93.92	90.99	98.42	92.61	90.22	99.29
20	88.65	96.12	96.45	87.72	97.64	88.06	88.71	99.41
25	88.30	94.14	94.00	84.02	96.40	83.82	88.42	99.74
30	88.16	89.29	89.84	79.98	94.06	79.27	87.23	99.70
35	89.25	84.32	85.13	77.62	90.67	76.79	87.19	99.78
40	89.19	79.33	81.29	75.03	87.92	74.00	86.28	99.86
50	88.77	71.19	72.36	68.61	79.05	68.10	84.22	99.88
75	88.50	59.74	61.17	57.35	61.66	58.65	81.19	99.98
100	88.28	51.70	53.13	48.71	47.58	50.83	78.50	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.68	99.64	99.92	99.82	99.82	99.50
15	99.74	99.72	99.94	99.80	99.80	99.80
20	99.62	99.56	99.96	99.66	99.70	99.78
25	99.80	99.78	99.98	99.82	99.84	99.96
30	99.84	99.86	99.94	99.84	99.84	99.96
35	99.70	99.66	99.88	99.72	99.80	99.92
40	99.78	99.78	99.94	99.78	99.82	99.98
50	99.72	99.72	99.90	99.74	99.80	100.00
75	99.52	99.52	99.78	99.52	99.78	100.00
100	99.25	99.19	99.54	99.25	99.66	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 137.6421342
Percentage Non-detects: 40.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	93.50	93.59	78.42	105.14	97.13	98.22	87.52	97.41
15	88.67	92.60	80.02	96.57	94.28	97.15	83.37	97.25
20	89.11	90.34	81.35	89.16	90.20	95.09	83.58	98.12
25	88.79	87.03	80.46	84.88	84.50	90.85	81.09	99.05
30	88.32	83.00	78.08	80.67	79.52	86.12	79.66	99.01
35	89.11	80.18	76.36	77.88	75.50	83.23	78.46	99.01
40	89.62	79.28	75.37	76.67	72.55	81.37	77.66	99.29
50	88.55	73.03	69.84	69.98	62.57	74.71	74.67	99.64
75	88.42	62.44	60.79	58.75	46.16	63.70	67.78	99.92
100	87.96	54.00	52.59	49.64	34.75	54.87	62.87	99.98

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Detection Limit: 137.6421342
Averaged Percentage Non-detects: 40.00%
Distribution Check: Average of means: 200.053493
Distribution Check: Average of stdvs: 140.554951
Average of NDs per 100 observations: 39.971300

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	137.642134	3.542178	32	217	713	1310	1575	1203	0	0	0	0
15	137.642134	5.989505	2	22	121	312	613	917	1061	931	634	315
20	137.642134	7.982772	1	1	13	53	162	398	630	860	931	791
25	137.642134	9.978218	0	1	4	9	29	94	227	428	611	773
30	137.642134	12.017426	0	0	1	1	6	25	60	115	261	412
35	137.642134	14.001386	0	0	0	0	1	5	8	25	98	156
40	137.642134	15.971089	0	0	0	0	0	0	1	11	22	44
50	137.642134	20.046931	0	0	0	0	0	0	0	1	2	2
75	137.642134	30.020198	0	0	0	0	0	0	0	0	0	0
100	137.642134	39.977426	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	994
15	122	0	0	0	0	0	0	0	0	0	0	0	48
20	607	321	178	75	25	4	0	0	0	0	0	0	2
25	777	785	562	354	228	102	41	19	2	3	1	0	0
30	571	711	757	682	564	372	243	159	77	24	7	2	0
35	261	431	563	691	646	626	569	381	278	162	80	69	0
40	110	185	292	414	538	612	680	546	540	418	264	373	0
50	8	12	38	74	137	218	309	376	469	546	556	2302	0
75	0	0	0	0	0	0	0	5	5	12	27	5001	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	42	0	42	0	0	42	0	42	0	0
15	22	0	22	0	0	22	0	22	0	0
20	5	0	5	0	0	5	0	5	0	0
25	1	0	1	0	0	1	0	1	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	42	0	42	11	0	0	0	1203
15	37	22	23	45	0	0	0	2002
20	12	11	5	31	0	0	0	1210
25	7	8	7	11	0	0	0	1312
30	4	5	3	5	0	0	0	884
35	0	0	0	0	0	0	0	970
40	0	1	0	0	0	0	0	637
50	0	0	0	0	0	0	0	487
75	0	0	0	0	0	0	0	318
100	0	0	0	0	0	0	0	138

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	42	0	42	11	0	0
15	37	22	23	45	0	0
20	12	11	5	31	0	0
25	7	8	7	11	0	0
30	4	5	3	5	0	0
35	0	0	0	0	0	0
40	0	1	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	42	0	42	0	0	0	0
15	0	22	0	22	0	0	0	0
20	0	5	0	5	0	0	0	0
25	0	1	0	1	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	42	0	42	0	0	0	0
15	0	22	0	22	0	0	0	0
20	0	5	0	5	0	0	0	0
25	0	1	0	1	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	3	0	3	0	0	0	0
20	0	1	0	1	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	3	0	3	0	0	0	0
20	0	1	0	1	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	51	1	0	0	0	0
15	0	22	0	0	0	0	0
20	0	4	0	0	0	0	0
25	0	1	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	461	0	461	0	0	0	0
15	0	237	0	237	0	0	0	0
20	0	51	0	51	0	0	0	0
25	0	16	0	16	0	0	0	0
30	0	2	0	2	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 13f. G(2,100) 50% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	316.3881	411.6726	1021.1562	734.2703	1692.9056	1172.2634
15	293.0074	307.5550	673.2240	561.1795	943.8718	765.5251
20	284.3396	327.3581	505.9021	461.8504	669.8796	600.1260
25	278.9166	271.4512	423.2466	397.6906	549.1020	507.0582
30	274.4334	289.6337	375.1604	359.0305	477.9829	450.6751
35	270.8187	251.2234	341.9855	331.5778	429.0097	410.9299
40	268.9023	268.1606	323.5941	316.5845	398.6787	386.4419
50	265.4304	253.4761	295.1673	291.1154	356.4647	349.0857
75	259.8701	222.7113	262.9578	261.2696	305.4371	302.2171
100	256.1534	222.5743	246.4191	245.5124	279.6827	277.8599

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	324.8632	319.8999	354.9332	463.8566	338.6861
15	285.2084	278.1274	311.0976	416.7834	300.2097
20	261.8754	256.5574	281.4773	1003.5859	278.9669
25	246.6700	243.7013	261.3441	243.7091	263.2633
30	236.3407	234.1620	247.9533	467.1969	251.9714
35	228.3055	227.0136	237.9006	226.7765	244.2736
40	222.8894	221.7239	231.0968	221.5630	238.9569
50	216.2550	215.1729	222.3185	215.2567	229.7663
75	204.5887	203.1816	208.3251	203.7687	216.0461
100	198.3204	196.7242	200.9500	197.6412	207.2847

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	276.5856	268.9781	299.5290	403.6711	283.0454
15	236.2883	225.7830	257.0215	818.9545	247.3795
20	219.5017	211.9367	235.7816	7745.1355	235.2486
25	211.2488	207.0512	223.7302	205.0155	228.0581
30	205.5647	202.4459	215.5661	738.4305	221.6523
35	200.7447	198.8142	209.1131	197.8269	217.4183
40	197.5814	195.8239	204.7910	195.2046	214.3054
50	195.0655	193.4752	200.4603	193.4183	209.0536
75	188.2306	186.3874	191.6169	187.0955	200.0035
100	184.7830	182.8110	187.1932	183.9139	193.9437

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	299.1540	293.2273	325.0475	297.0323	298.8520	294.8143
15	255.3657	246.3712	277.8940	246.1288	260.9177	244.0517
20	236.3340	229.8775	253.3823	229.4952	248.9422	223.9179
25	225.7668	222.1928	238.6947	221.6201	243.0531	214.9657
30	218.3513	215.8760	228.8322	215.1803	238.0419	207.3797
35	212.1630	210.7037	220.8206	210.0995	234.0517	201.5925
40	207.9191	206.4071	215.4852	206.0085	231.7301	196.8504
50	203.7697	202.3931	209.4355	202.3678	228.3217	191.9951
75	194.8980	193.2287	198.4524	193.8805	221.8506	181.3495
100	190.2868	188.4603	192.8012	189.4884	217.8135	175.9174

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	3345.6518	2.79%	283.3182	0.06%	368.9408
15	0.00%	1183.0350	2.26%	256.1367	0.04%	309.5800
20	0.00%	794.7078	1.19%	249.5355	0.00%	287.4005
25	0.00%	646.1627	0.24%	246.8961	0.00%	275.4453
30	0.00%	554.7613	0.18%	244.6464	0.00%	266.5511
35	0.00%	500.0287	0.04%	242.9144	0.00%	260.3935
40	0.00%	464.2339	0.02%	242.1741	0.00%	256.6777
50	0.00%	417.4086	0.00%	241.2282	0.00%	250.9242
75	0.00%	354.9699	0.00%	238.9411	0.00%	241.9277
100	0.00%	325.2572	0.00%	237.5162	0.00%	236.7739

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	281.067	542.361	651.328	277.073	284.424	616.695	319.920
15	252.455	1235.166	8936.365	244.203	247.986	1261.118	298.274
20	244.337	654.185	1541.384	231.562	231.860	11400.064	288.469
25	240.093	1144.984	1203.922	226.403	224.707	225.515	281.724
30	235.898	612.103	19065.037	221.264	218.056	987.193	276.335
35	232.380	311.435	886.206	216.829	212.845	216.958	272.248
40	230.358	380.237	726.866	213.453	208.375	213.919	269.923
50	227.344	506.760	252.706	209.653	203.715	210.625	266.075
75	221.326	202.772	289.314	200.179	193.291	201.526	260.143
100	217.470	196.731	197.659	194.668	187.137	196.133	256.308

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	304.139	276.223	281.601	269.488	261.670	561974.563	413.615
15	272.371	240.349	244.533	235.879	224.832	8597897.887	338.691
20	262.851	227.670	231.225	224.837	213.388	1941259856.341	311.365
25	255.339	222.676	225.070	221.356	208.855	218.739	297.578
30	248.390	219.025	220.490	217.495	204.662	13276862.324	288.777
35	242.649	214.252	215.700	213.123	200.150	212.790	281.961
40	239.288	211.758	213.081	210.172	196.327	210.372	278.247
50	234.085	209.262	210.173	207.254	193.871	208.260	272.136
75	225.580	200.970	201.686	198.484	186.078	200.199	264.009
100	220.514	195.872	196.494	193.433	181.655	195.190	259.049

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	291.561	324.862	331.422	288.805	309.423	292.024	336.218
15	258.024	305.473	311.677	248.271	271.837	251.239	311.186
20	247.222	289.458	294.679	232.989	251.218	233.326	298.033
25	242.021	270.130	273.975	225.687	238.666	224.999	289.107
30	237.434	252.730	255.584	219.318	228.574	218.800	282.338
35	233.675	238.618	240.849	214.501	221.530	214.007	277.305
40	231.528	226.700	229.047	210.558	215.591	210.353	274.316
50	228.302	213.114	215.047	206.383	208.137	206.488	269.465
75	221.992	199.160	200.570	197.062	194.972	197.787	262.370
100	217.964	193.842	195.027	192.057	187.752	193.112	257.937

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	303.924	333.875	336.491	309.132	370.107	323.656	361.291
15	263.840	1192.890	323.781	267.194	324.772	281.128	330.153
20	249.418	316.131	318.991	247.599	292.161	254.884	312.019
25	242.881	298.305	299.795	236.428	270.826	238.760	299.760
30	238.165	278.670	279.184	227.830	254.193	227.930	291.002
35	234.210	261.534	262.218	221.765	243.929	221.593	284.601
40	231.943	245.687	245.747	216.989	235.584	216.437	280.633
50	228.643	222.780	223.808	211.105	224.429	210.711	274.291
75	222.177	202.194	203.467	200.230	206.342	200.411	265.538
100	218.078	195.774	196.770	194.435	196.512	195.058	260.205

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	421.8320	421.0479	466.7187	439.7934	449.3311	407.8604
15	367.9196	363.8038	404.9190	373.0045	391.1660	365.4539
20	340.3229	337.0035	367.9110	342.2341	362.2267	348.4112
25	321.1538	319.8478	341.6917	322.8927	340.4857	336.9195
30	306.7174	306.1734	322.9282	307.8842	324.0174	327.7282
35	294.6543	294.8527	307.9166	295.8304	311.6821	320.1686
40	286.4538	286.6297	297.7854	287.2539	303.2720	315.6581
50	274.2464	274.4417	282.5699	274.6990	288.1891	307.5390
75	253.3608	253.1357	258.3637	253.3412	264.9060	294.6367
100	240.8277	240.2974	244.2751	240.6671	249.8030	286.2172

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	278.7693	296.8876	291.4549	312.0239	303.5070
15	249.5399	263.2747	255.2738	269.2838	281.3698
20	240.5851	254.8365	242.8263	252.3888	293.2997
25	235.2189	246.1174	236.6130	244.8873	303.6929
30	229.5871	237.8736	231.0424	239.1117	315.8909
35	225.9068	232.8590	226.7549	233.6489	332.4471
40	222.9076	228.7531	223.9661	230.5056	351.8540
50	218.0544	221.1114	219.7456	226.2370	375.9487
75	209.5336	209.6624	211.7333	217.2650	459.4768
100	203.6265	201.7905	206.4948	211.6118	482.9266

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	298.852	271.601	251.580	306.378	320.398	52474.649	319.407
15	260.918	258.893	240.045	269.593	284.337	588162.394	293.035
20	248.942	255.598	240.867	250.252	259.460	539459.272	283.243
25	243.053	247.899	236.974	238.915	244.173	6314.729	277.453
30	238.042	236.049	227.687	230.148	232.862	24605.023	272.798
35	234.052	229.631	222.978	223.659	224.949	230.268	269.192
40	231.730	221.467	216.072	218.655	218.341	224.251	267.258
50	228.322	216.233	212.593	212.475	209.896	216.770	263.961
75	221.851	203.227	201.360	201.182	195.923	204.362	258.654
100	217.814	197.162	196.006	195.097	188.344	197.863	255.164

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	99.90	99.90	99.98	99.90	99.90	97.31	96.85	99.28	96.22	96.48
15	99.26	99.15	99.86	99.41	99.39	72.77	68.00	90.64	65.98	79.17
20	98.53	98.26	99.86	98.34	98.36	64.53	60.81	79.89	58.79	75.58
25	94.62	94.34	99.62	93.86	95.70	59.75	57.62	72.21	56.02	72.30
30	89.59	88.79	98.39	88.00	93.37	57.45	55.31	66.93	54.22	70.55
35	84.04	83.21	94.57	82.53	90.16	52.44	50.81	61.56	49.94	67.31
40	79.96	79.01	90.59	78.24	88.44	49.23	47.54	57.33	47.05	65.15
50	74.73	73.29	83.37	73.19	84.14	45.66	43.74	51.88	43.76	60.67
75	59.21	56.59	66.24	57.78	71.94	32.53	29.66	36.79	31.03	47.72
100	46.97	44.02	52.22	45.96	59.23	24.24	21.56	27.31	23.19	36.85

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	99.84	97.59	N/A	N/A	100.00	100.00
15	99.58	97.86	N/A	N/A	100.00	100.00
20	99.82	96.58	N/A	N/A	100.00	100.00
25	99.86	96.98	N/A	N/A	100.00	100.00
30	99.94	93.38	N/A	N/A	100.00	100.00
35	99.96	94.96	N/A	N/A	100.00	100.00
40	99.98	92.02	N/A	N/A	100.00	100.00
50	100.00	90.29	N/A	N/A	100.00	100.00
75	100.00	85.12	N/A	N/A	100.00	100.00
100	100.00	78.45	N/A	N/A	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	99.22	99.05	99.86	99.13	98.04	98.95
15	86.43	83.05	98.03	82.10	91.03	80.67
20	78.58	75.63	91.36	74.69	88.30	71.31
25	73.16	71.24	85.03	70.40	88.57	66.20
30	69.57	67.73	79.93	66.89	88.67	60.34
35	65.30	63.87	75.06	62.98	87.47	55.64
40	61.11	59.96	70.04	59.52	87.66	50.61
50	57.27	55.47	64.71	55.51	88.46	44.40
75	42.63	39.78	48.38	41.09	87.70	27.13
100	32.53	30.22	36.59	31.56	86.42	17.11

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	2.79%	99.37	0.06%	99.74
15	0.00%	100.00	2.26%	97.53	0.04%	98.47
20	0.00%	99.07	1.19%	97.66	0.00%	98.04
25	0.00%	98.75	0.24%	98.43	0.00%	98.00
30	0.00%	98.57	0.18%	98.57	0.00%	98.00
35	0.00%	98.59	0.04%	99.11	0.00%	98.04
40	0.00%	98.77	0.02%	99.41	0.00%	98.16
50	0.00%	98.99	0.00%	99.76	0.00%	98.42
75	0.00%	99.07	0.00%	100.00	0.00%	98.65
100	0.00%	99.01	0.00%	100.00	0.00%	98.85

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	95.11	98.82	97.70	98.61	95.70	97.86	96.83	99.86
15	86.67	95.29	95.88	81.76	82.63	81.29	83.72	99.74
20	85.98	94.26	95.94	79.12	77.50	77.41	82.79	99.90
25	86.79	93.13	95.39	77.55	75.43	76.18	80.99	99.92
30	87.86	90.98	93.33	75.73	72.36	75.47	79.33	99.98
35	86.14	86.91	89.74	73.90	69.39	74.26	77.92	100.00
40	86.87	82.71	85.07	69.86	65.29	70.61	75.84	100.00
50	87.64	74.83	77.03	67.27	60.28	68.81	72.53	100.00
75	87.21	56.18	58.20	51.98	42.93	54.69	61.70	100.00
100	86.06	43.66	45.72	39.66	29.21	42.42	52.22	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	93.96	86.09	90.83	86.34	82.50	83.80	84.44	99.88
15	89.23	72.37	73.50	73.72	68.42	70.59	79.54	99.72
20	90.93	71.52	72.28	73.54	64.91	70.63	79.78	99.92
25	92.48	71.18	71.77	73.21	63.68	71.64	77.37	99.88
30	92.95	71.53	71.65	71.96	61.17	71.13	74.85	99.98
35	92.00	70.28	70.55	70.38	58.73	70.36	72.28	100.00
40	91.96	67.74	68.34	66.89	54.85	67.92	70.34	99.98
50	92.10	66.40	66.65	64.50	50.95	66.00	65.27	100.00
75	91.86	53.35	54.08	49.56	34.16	51.80	52.65	100.00
100	89.88	42.46	43.31	37.56	22.79	41.11	42.53	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	97.39	99.62	99.72	98.97	99.54	98.95	98.91	99.94
15	90.34	98.33	98.77	87.66	96.22	88.99	89.45	99.82
20	87.68	97.05	97.64	79.82	91.74	79.76	85.70	99.96
25	88.12	94.31	95.32	75.33	86.57	74.34	84.06	99.94
30	88.40	90.59	91.86	71.52	80.93	70.59	82.75	100.00
35	87.15	83.50	85.80	68.36	75.41	67.47	80.99	100.00
40	87.54	76.95	79.52	64.20	70.30	63.96	80.14	100.00
50	88.26	66.81	69.76	60.20	62.81	60.22	78.22	100.00
75	87.92	48.38	51.15	45.11	42.81	46.44	71.15	100.00
100	86.71	37.88	40.12	34.22	28.87	36.34	63.64	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	98.67	86.44	86.55	99.74	100.00	99.88	99.74	100.00
15	93.29	89.86	89.82	97.88	99.37	98.38	96.30	99.94
20	89.49	95.38	95.44	92.63	98.55	94.14	90.28	99.98
25	88.32	97.23	97.42	88.57	98.00	89.64	88.53	99.98
30	88.95	97.35	97.62	84.02	96.75	84.16	87.41	100.00
35	87.21	94.30	94.67	79.07	95.39	78.63	84.89	100.00
40	87.94	89.27	89.76	73.09	92.42	73.13	84.28	100.00
50	88.50	76.22	77.98	67.31	85.68	66.59	83.70	100.00
75	88.28	52.93	56.14	50.46	61.90	50.73	77.60	100.00
100	86.93	40.77	42.95	38.61	44.18	39.76	72.06	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	100.00	100.00	100.00	100.00	100.00	100.00
15	99.90	99.86	99.98	99.94	99.94	99.94
20	99.90	99.86	100.00	99.92	99.92	100.00
25	99.72	99.60	99.96	99.64	99.74	99.96
30	99.60	99.52	99.98	99.58	99.70	100.00
35	99.52	99.60	99.98	99.58	99.82	100.00
40	99.37	99.41	99.96	99.37	99.76	100.00
50	99.35	99.33	99.72	99.31	99.68	100.00
75	98.51	98.42	99.49	98.36	99.47	100.00
100	97.68	97.37	98.63	97.41	98.83	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 167.8346990
Percentage Non-detects: 50.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	98.04	97.24	80.26	115.61	99.74	99.82	88.69	99.86
15	91.03	95.43	76.20	109.58	98.79	99.88	81.80	99.62
20	88.30	96.02	80.51	100.27	95.62	99.70	81.58	99.80
25	88.57	92.78	80.20	91.79	90.87	98.85	80.73	99.88
30	88.67	88.79	77.86	86.14	86.50	95.56	78.87	99.94
35	87.47	83.23	75.19	80.28	80.89	89.25	79.03	99.96
40	87.66	78.33	70.57	75.14	74.75	83.92	76.93	99.98
50	88.46	72.99	67.23	69.96	66.06	76.16	73.47	100.00
75	87.70	56.42	52.99	52.53	44.44	58.59	63.80	100.00
100	86.42	44.44	41.98	40.00	29.49	45.76	55.27	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Detection Limit: 167.8346990
Averaged Percentage Non-detects: 50.00%
Distribution Check: Average of means: 199.769801
Distribution Check: Average of stdvs: 140.107897
Average of NDs per 100 observations: 50.072000

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	167.834699	4.008713	12	83	372	931	1636	2016	0	0	0	0
15	167.834699	7.254653	0	2	17	71	236	488	772	1100	1071	827
20	167.834699	9.976634	0	0	0	5	18	78	174	388	600	781
25	167.834699	12.440792	0	0	0	0	1	7	28	73	183	308
30	167.834699	14.964158	0	0	0	0	0	0	2	9	25	83
35	167.834699	17.489901	0	0	0	0	0	0	0	2	3	9
40	167.834699	20.067525	0	0	0	0	0	0	0	0	0	1
50	167.834699	24.904752	0	0	0	0	0	0	0	0	0	0
75	167.834699	37.507525	0	0	0	0	0	0	0	0	0	0
100	167.834699	49.972277	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	3055
15	466	0	0	0	0	0	0	0	0	0	0	0	309
20	942	815	626	369	188	66	0	0	0	0	0	0	27
25	542	648	761	758	709	484	299	152	67	22	8	0	5
30	156	257	368	572	733	758	636	537	407	270	131	106	0
35	27	71	124	226	362	471	549	688	656	600	487	775	0
40	1	7	23	45	115	178	285	420	503	616	635	2221	0
50	0	0	0	2	3	12	24	60	65	148	217	4519	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	69	0	69	0	0	69	0	69	0	0
15	62	0	62	0	0	62	0	62	0	0
20	32	0	32	0	0	32	0	32	0	0
25	12	0	12	0	0	12	0	12	0	0
30	6	0	6	0	0	6	0	6	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	69	0	69	14	0	0	0	2016
15	76	19	63	68	0	0	0	3464
20	63	47	39	103	0	0	0	3006
25	39	33	20	63	0	0	0	3260
30	26	30	18	40	0	0	0	2845
35	16	24	6	29	0	0	0	3206
40	7	7	3	10	0	0	0	2856
50	2	2	0	2	0	0	0	2713
75	0	0	0	0	0	0	0	3020
100	0	0	0	0	0	0	0	2748

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	69	0	69	14	0	0
15	76	19	63	68	0	0
20	63	47	39	103	0	0
25	39	33	20	63	0	0
30	26	30	18	40	0	0
35	16	24	6	29	0	0
40	7	7	3	10	0	0
50	2	2	0	2	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	69	0	69	0	0	0	0
15	0	62	0	62	0	0	0	0
20	0	32	0	32	0	0	0	0
25	0	12	0	12	0	0	0	0
30	0	6	0	6	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	69	0	69	0	0	0	0
15	0	62	0	62	0	0	0	0
20	0	32	0	32	0	0	0	0
25	0	12	0	12	0	0	0	0
30	0	6	0	6	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	5	0	5	0	0	0	0
25	0	2	0	2	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	11	0	11	0	0	0	0
20	0	5	0	5	0	0	0	0
25	0	2	0	2	0	0	0	0
30	0	1	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	141	3	0	0	0	0
15	0	114	2	0	0	0	0
20	0	60	0	0	0	0	0
25	0	12	0	0	0	0	0
30	0	9	0	0	0	0	0
35	0	2	0	0	0	0	0
40	0	1	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	707	0	707	0	0	0	0
15	0	519	0	519	0	0	0	0
20	0	223	0	223	0	0	0	0
25	0	92	0	92	0	0	0	0
30	0	28	0	28	0	0	0	0
35	0	4	0	4	0	0	0	0
40	0	1	0	1	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 13g. G(2,100) 60% Type 1 Censoring

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	342.6365	466.2235	964.4047	710.9879	1780.3897	1243.7604
15	316.0739	336.4879	712.8536	590.9205	1015.7460	818.1894
20	303.0776	373.0405	524.0103	475.8055	703.7624	626.3482
25	296.4334	304.5878	438.6192	409.7737	574.1286	526.6948
30	292.3142	331.1147	392.2693	373.3068	499.9074	468.5335
35	289.1948	282.9614	355.6189	343.5723	446.8088	426.1811
40	287.1558	311.0292	332.8696	324.9202	411.2677	397.4749
50	282.6991	297.0770	300.3915	295.8361	363.8651	355.5774
75	277.5455	254.0524	266.4168	264.5101	308.4142	304.8252
100	273.8339	260.1105	248.3231	247.2955	280.0851	278.0577

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	352.3272	346.8419	385.2489	480.5980	361.8377
15	313.0777	301.1245	347.1857	6346.3956	323.6418
20	285.7369	272.2684	313.7732	4228.3882	296.1515
25	262.9187	254.1565	285.3210	1265.0273	274.5280
30	247.4145	241.1090	265.9277	239.8523	261.1906
35	236.7348	232.4673	251.7537	231.0888	250.3731
40	229.0265	225.4330	242.0652	224.0230	243.2635
50	217.1677	215.4951	227.0449	214.3708	230.9401
75	201.7368	200.5799	207.9542	200.1500	214.4525
100	193.1136	191.7409	197.5909	191.7994	203.4496

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	299.4810	291.0815	324.4434	413.1708	299.4623
15	249.0442	231.8870	276.1554	23499.9963	251.7135
20	225.5403	206.4366	248.7973	41514.2544	230.7057
25	209.6658	197.2976	228.5903	5209.7250	220.2619
30	199.4585	190.6965	215.4301	186.3179	214.0492
35	195.0634	189.2555	208.2158	185.8480	209.6128
40	190.6326	185.8912	202.1114	182.9780	205.9890
50	184.6620	182.2923	193.5284	180.3902	199.5582
75	176.6432	174.9534	182.3257	174.4057	190.2063
100	172.1826	170.3342	176.3132	170.4753	183.0811

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	322.9056	316.3234	350.9133	319.8326	318.9644	317.8354
15	269.3139	254.2304	298.8752	251.6699	269.6316	251.5366
20	244.0097	226.8184	267.4600	224.2996	249.4991	219.9048
25	226.5821	215.4746	245.5091	213.1662	241.6731	206.4350
30	215.1969	207.6074	230.6364	205.4400	236.9838	195.5351
35	208.2813	203.1211	221.2740	200.9763	233.9552	191.4391
40	202.4261	198.3888	213.9660	196.4873	231.5567	186.1739
50	194.3376	192.2440	203.3301	190.7324	227.1123	179.4969
75	183.4750	181.9865	189.4688	181.4660	221.3883	167.5241
100	177.7572	176.0371	182.0833	176.1470	217.1118	160.8287

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	3770.4803	5.52%	307.5259	0.24%	382.6250
15	0.00%	1088.6687	7.09%	276.4690	0.14%	320.9320
20	0.00%	644.3896	7.17%	266.7500	0.02%	291.2870
25	0.00%	506.7102	4.75%	263.2330	0.00%	277.5639
30	0.00%	430.5762	2.65%	260.9912	0.02%	268.9867
35	0.00%	391.9709	2.02%	260.0460	0.00%	263.5464
40	0.00%	362.2118	1.11%	259.3140	0.00%	259.6850
50	0.00%	321.2802	0.38%	257.7207	0.00%	252.8590
75	0.00%	273.6219	0.10%	256.4417	0.00%	244.5485
100	0.00%	248.5596	0.00%	255.1611	0.00%	239.1971

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	298.985	902.108	873.713	298.872	308.735	611.923	346.857
15	259.192	1244.148	1348.951	253.142	260.603	39113.450	323.968
20	243.599	1634.642	3787.737	230.721	237.021	61557.036	310.971
25	238.156	2987.167	1850.172	222.360	226.041	7421.583	302.960
30	234.618	10687.573	1551.716	215.290	215.116	212.278	297.442
35	232.254	2480.955	6369.632	213.751	211.345	211.600	292.776
40	230.198	2886.312	2048.641	209.907	206.215	208.008	290.025
50	226.162	1610.503	2844.198	205.345	199.799	204.455	284.545
75	220.861	1144.831	226.769	195.729	187.629	196.104	278.380
100	216.780	192.566	244.248	189.318	180.510	190.081	274.348

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	313.801	297.944	305.139	284.823	280.692	513269.341	437.292
15	272.395	274.060	285.869	237.222	227.147	3698803734.497	373.510
20	257.954	234.283	243.312	217.410	212.355	35122575881.399	334.378
25	252.283	221.310	227.338	212.974	206.071	255632533.981	317.475
30	247.814	212.218	217.932	206.949	198.036	202.363	308.590
35	243.585	209.424	214.120	206.016	193.483	202.542	301.995
40	239.962	206.151	210.563	202.696	189.505	200.003	297.378
50	233.617	201.236	204.603	199.434	183.571	198.110	290.088
75	225.612	193.728	196.049	191.605	174.847	192.010	281.837
100	220.170	188.700	190.378	186.307	169.795	187.297	276.799

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	311.609	353.967	360.759	312.998	336.010	316.716	364.096
15	267.747	340.348	348.950	260.788	294.489	266.514	339.517
20	248.575	329.455	336.954	236.976	269.575	238.892	323.445
25	241.059	314.908	320.570	226.026	253.265	226.266	312.995
30	236.662	297.414	301.724	218.026	240.140	216.925	305.691
35	233.767	276.643	280.733	213.824	230.846	212.613	299.527
40	231.534	262.528	265.823	209.375	223.574	207.809	295.924
50	227.207	234.314	236.844	203.147	212.595	202.025	289.139
75	221.561	199.650	201.943	192.522	195.438	192.149	281.293
100	217.335	188.234	190.313	185.910	185.486	186.051	276.474

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	327.673	872.623	875.256	338.272	405.233	355.743	390.560
15	278.979	659.612	345.378	288.850	364.311	313.988	362.648
20	253.922	3152.670	5354.539	258.493	325.754	280.987	342.212
25	243.419	342.174	347.764	243.172	297.261	255.542	327.397
30	237.876	2787.628	338.168	232.629	276.964	238.424	317.680
35	234.507	318.857	320.644	226.314	262.409	228.045	309.142
40	232.075	304.093	305.415	220.372	251.633	220.402	304.151
50	227.677	267.369	268.057	211.959	235.583	211.066	295.731
75	221.838	212.693	213.748	198.496	212.679	198.015	285.461
100	217.489	193.957	195.730	190.305	199.114	190.152	279.628

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	444.7932	443.7196	492.7524	463.4199	469.4668	430.2578
15	384.6937	375.9109	431.3967	386.3272	405.3945	383.4964
20	347.5811	335.9344	385.1380	341.5377	365.0791	359.8872
25	323.4969	315.8435	352.7107	319.0931	338.5964	347.7315
30	306.7315	301.7211	330.4771	303.4795	322.3942	340.0337
35	294.2071	291.1828	313.6211	291.9822	309.2672	333.5641
40	284.3212	282.0676	301.1596	282.4080	299.6504	329.0927
50	268.1978	267.5111	280.9044	267.2406	282.6282	320.2480
75	245.3724	245.1296	253.3379	244.7361	258.4209	308.8180
100	231.4752	230.9152	237.0849	230.7560	241.9707	300.8957

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	298.4223	299.7277	313.7547	341.1676	332.2449
15	256.8191	260.0842	266.1215	287.9424	316.2781
20	240.2650	246.2071	244.7951	260.2651	327.9049
25	233.1895	238.0768	235.5512	247.4256	352.1605
30	228.2062	233.1477	229.6174	239.6995	377.5385
35	224.4589	227.4052	225.7385	234.4955	404.5322
40	221.0673	223.0379	222.4981	230.3167	438.8155
50	214.9453	214.3294	216.8250	223.5061	475.5012
75	205.7735	202.1930	209.0389	214.3283	568.6770
100	198.5209	192.9431	203.1234	207.9517	618.7543

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	318.964	283.549	261.311	332.753	349.415	84527.969	345.437
15	269.632	780.929	757.792	291.880	316.304	1802653.789	316.304
20	249.499	249.614	229.672	266.394	287.031	1962656.044	302.467
25	241.673	252.495	235.919	250.160	265.401	1946214.855	295.249
30	236.984	253.472	239.526	238.230	249.597	546327.746	290.828
35	233.955	245.175	233.813	230.363	237.850	53438.315	287.435
40	231.557	1013.279	1003.551	223.816	229.247	209519.620	285.315
50	227.112	226.193	219.351	214.397	216.794	220.885	280.911
75	221.388	202.029	198.530	200.000	197.741	204.159	276.035
100	217.112	193.421	191.206	191.604	187.187	194.852	272.539

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.54	100.00
15	100.00	100.00	100.00	100.00	100.00	79.86	73.60	100.00	71.50	83.82
20	100.00	100.00	100.00	99.94	100.00	65.16	56.28	83.62	53.35	71.01
25	100.00	100.00	100.00	99.92	100.00	57.21	51.23	73.61	47.64	65.47
30	99.82	99.80	100.00	99.52	99.96	49.99	45.88	65.56	42.40	61.11
35	93.48	92.46	100.00	90.18	97.54	45.86	43.03	59.47	40.30	58.36
40	86.15	84.79	99.68	82.73	93.41	41.25	38.97	52.86	36.73	54.89
50	75.43	74.08	90.24	71.94	86.30	34.77	32.95	43.78	31.88	48.04
75	54.65	52.51	66.32	51.92	67.39	22.50	20.97	27.78	20.79	34.75
100	38.65	36.87	46.71	36.61	50.04	13.35	12.22	16.81	12.57	23.43

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	100.00	100.00	N/A	N/A	100.00	100.00
15	100.00	100.00	N/A	N/A	100.00	100.00
20	100.00	100.00	N/A	N/A	100.00	100.00
25	100.00	100.00	N/A	N/A	100.00	100.00
30	100.00	100.00	N/A	N/A	100.00	100.00
35	100.00	100.00	N/A	N/A	100.00	100.00
40	100.00	100.00	N/A	N/A	100.00	100.00
50	100.00	100.00	N/A	N/A	100.00	100.00
75	100.00	100.00	N/A	N/A	99.98	99.98
100	100.00	100.00	N/A	N/A	99.96	99.96

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	100.00	100.00	100.00	100.00	99.94	100.00
15	97.22	96.82	100.00	88.32	96.87	85.86
20	79.10	73.31	96.03	67.95	89.90	68.22
25	69.98	65.24	87.71	61.54	87.54	60.50
30	63.08	59.96	79.36	57.16	87.98	52.34
35	58.85	56.42	73.81	54.25	88.77	48.81
40	53.38	51.38	66.38	49.43	87.96	44.10
50	45.67	43.91	55.77	42.73	87.94	35.43
75	30.81	29.04	37.18	29.01	86.83	19.54
100	20.03	18.47	24.26	18.74	86.10	10.91

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	100.00	5.52%	100.00	0.24%	100.00
15	0.00%	100.00	7.09%	100.00	0.14%	100.00
20	0.00%	97.33	7.17%	100.00	0.02%	99.50
25	0.00%	92.85	4.75%	100.00	0.00%	98.77
30	0.00%	91.64	2.65%	100.00	0.02%	98.14
35	0.00%	91.56	2.02%	100.00	0.00%	98.46
40	0.00%	90.51	1.11%	100.00	0.00%	98.20
50	0.00%	88.93	0.38%	100.00	0.00%	98.44
75	0.00%	84.26	0.10%	100.00	0.00%	98.65
100	0.00%	80.12	0.00%	100.00	0.00%	98.93

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.43	100.00	98.26	101.77	99.80	99.54	100.00	100.00
15	92.53	98.77	96.73	93.71	87.01	87.25	87.58	100.00
20	85.68	95.79	95.82	79.28	78.59	74.65	80.06	100.00
25	85.17	95.19	96.67	75.18	73.74	71.25	77.88	100.00
30	86.22	94.62	96.77	72.55	69.76	69.63	76.04	100.00
35	87.84	93.04	95.74	72.19	68.06	70.11	75.05	100.00
40	86.93	90.63	94.32	68.44	64.20	66.81	71.80	100.00
50	86.91	83.82	87.98	64.18	58.57	63.49	66.30	100.00
75	86.26	58.99	62.44	48.73	43.13	49.92	53.70	100.00
100	85.54	38.46	41.25	34.02	29.29	35.27	42.20	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	98.34	99.94	99.96	99.68	93.86	99.39	98.42	100.00
15	90.50	73.56	78.84	70.71	69.45	66.04	75.05	100.00
20	87.19	68.18	72.27	66.69	61.23	62.34	71.66	100.00
25	89.45	66.79	70.20	68.02	59.37	62.53	71.09	100.00
30	91.64	64.47	68.01	65.66	55.80	62.38	67.58	100.00
35	93.29	64.80	67.88	66.63	54.87	63.85	65.78	100.00
40	92.48	62.08	64.69	63.22	51.49	61.16	62.59	100.00
50	92.65	59.41	60.93	58.75	46.36	58.53	55.82	100.00
75	90.83	47.07	48.71	44.18	31.29	45.43	42.91	100.00
100	89.66	34.50	36.08	31.45	20.38	32.93	32.59	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.88	100.00	100.00	100.00	100.00	100.00	100.00	100.00
15	96.69	100.00	100.00	99.98	100.00	99.92	100.00	100.00
20	90.02	98.96	99.48	84.63	99.66	85.49	88.73	100.00
25	87.41	97.71	98.11	76.51	96.02	75.41	84.89	100.00
30	87.96	96.49	97.16	70.87	90.95	68.80	82.28	100.00
35	88.99	92.80	94.17	68.11	85.01	65.83	81.35	100.00
40	88.00	87.30	89.76	62.47	77.92	60.13	79.03	100.00
50	87.82	73.52	77.21	55.03	67.90	53.45	74.50	100.00
75	87.05	45.31	48.95	38.97	45.03	38.65	66.18	100.00
100	86.30	29.64	32.48	27.19	29.31	27.43	56.10	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	100.00	86.42	89.62	100.00	100.00	100.00	100.00	100.00
15	98.95	80.92	80.86	100.00	100.00	100.00	99.29	100.00
20	94.00	85.28	85.32	98.38	99.86	98.02	95.86	100.00
25	90.26	92.46	92.48	94.93	98.40	96.20	91.58	100.00
30	88.87	95.75	95.77	90.24	97.15	92.27	88.28	100.00
35	89.03	97.96	97.98	86.61	96.95	88.53	86.34	100.00
40	88.28	97.45	97.72	80.35	96.24	80.37	84.40	100.00
50	88.57	91.19	91.98	68.24	94.26	66.67	81.21	100.00
75	87.58	57.47	60.50	47.39	73.07	46.32	75.09	100.00
100	86.22	35.98	38.50	32.16	48.93	32.40	67.82	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	100.00	100.00	100.00	100.00	100.00	100.00
15	100.00	100.00	100.00	100.00	100.00	100.00
20	100.00	100.00	100.00	100.00	100.00	100.00
25	99.98	100.00	100.00	99.92	99.98	100.00
30	99.29	98.88	100.00	99.11	99.39	100.00
35	99.23	99.05	100.00	98.70	99.29	100.00
40	98.82	98.74	99.86	98.83	99.33	100.00
50	97.99	97.83	99.80	97.74	99.11	100.00
75	94.63	94.57	97.80	94.21	97.74	100.00
100	90.67	90.13	94.99	89.97	95.39	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 202.2313245
Percentage Non-detects: 60.000%

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	99.94	98.41	81.03	121.37	100.00	99.90	91.72	100.00
15	96.87	97.13	74.55	124.97	100.00	99.82	79.58	100.00
20	89.90	96.34	74.97	117.85	99.29	99.98	77.07	100.00
25	87.54	97.59	80.16	108.38	96.69	100.00	76.34	100.00
30	87.98	97.62	80.22	101.39	93.72	99.90	76.10	100.00
35	88.77	94.49	78.79	92.81	89.37	99.50	76.57	100.00
40	87.96	88.60	74.77	84.39	83.64	96.81	76.04	100.00
50	87.94	77.26	66.14	73.37	74.50	84.48	75.49	100.00
75	86.83	55.01	48.73	51.86	50.10	58.97	62.89	100.00
100	86.10	38.14	34.69	34.85	32.65	40.28	50.24	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 2.00
Beta Value: 100.00
Population Mean: 200.0000000
Number of Test Runs: 5050
Detection Limit: 202.2313245
Averaged Percentage Non-detects: 60.00%
Distribution Check: Average of means: 200.018178
Distribution Check: Average of stdvs: 140.370400
Average of NDs per 100 observations: 59.975100

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	202.231325	4.344950	1	22	139	594	1610	2684	0	0	0	0
15	202.231325	8.319406	0	0	2	8	52	158	378	745	1129	1308
20	202.231325	11.818812	0	0	0	0	3	5	22	85	201	384
25	202.231325	14.938812	0	0	0	0	0	1	3	5	16	55
30	202.231325	18.025347	0	0	0	0	0	0	0	0	1	3
35	202.231325	20.945545	0	0	0	0	0	0	0	0	0	1
40	202.231325	23.991485	0	0	0	0	0	0	0	0	0	0
50	202.231325	29.947723	0	0	0	0	0	0	0	0	0	0
75	202.231325	44.997822	0	0	0	0	0	0	0	0	0	0
100	202.231325	60.157822	0	0	0	0	0	0	0	0	0	0

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	8812
15	1270	0	0	0	0	0	0	0	0	0	0	0	1456
20	562	819	941	870	744	414	0	0	0	0	0	0	256
25	114	215	397	544	744	801	803	615	424	207	106	0	41
30	6	30	61	140	241	382	567	662	773	713	576	895	8
35	0	3	4	7	39	102	149	257	395	576	641	2876	2
40	0	1	1	1	5	11	35	52	103	189	284	4368	1
50	0	0	0	0	0	0	0	0	2	6	15	5027	0
75	0	0	0	0	0	0	0	0	0	0	0	5050	0
100	0	0	0	0	0	0	0	0	0	0	0	5050	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	88	0	88	0	0	88	0	88	0	0
15	155	0	155	0	0	155	0	155	0	0
20	128	0	128	0	0	128	0	128	0	0
25	63	0	63	0	0	63	0	63	0	0
30	33	0	33	0	0	33	0	33	0	0
35	19	0	19	0	0	19	0	19	0	0
40	3	0	3	0	0	3	0	3	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	88	0	88	23	0	0	0	2684
15	165	17	155	83	0	0	0	4452
20	208	112	138	226	0	0	0	4350
25	154	116	101	208	0	0	0	4641
30	137	135	75	199	0	0	0	4568
35	83	77	41	110	0	0	0	4745
40	54	69	23	96	0	0	0	4652
50	29	33	11	42	0	0	0	4740
75	3	6	2	7	0	0	0	4920
100	2	3	1	3	0	0	0	4966

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	88	0	88	23	0	0
15	165	17	155	83	0	0
20	208	112	138	226	0	0
25	154	116	101	208	0	0
30	137	135	75	199	0	0
35	83	77	41	110	0	0
40	54	69	23	96	0	0
50	29	33	11	42	0	0
75	3	6	2	7	0	0
100	2	3	1	3	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	88	0	88	0	0	0	0
15	0	155	0	155	0	0	0	0
20	0	128	0	128	0	0	0	0
25	0	63	0	63	0	0	0	0
30	0	34	1	33	0	2	0	0
35	0	19	1	19	0	1	0	0
40	0	3	1	3	0	1	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	88	0	88	0	0	0	0
15	0	155	0	155	0	0	0	0
20	0	128	0	128	0	0	0	0
25	0	63	0	63	0	0	0	0
30	0	34	1	33	0	2	0	0
35	0	19	1	19	0	1	0	0
40	0	3	1	3	0	1	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	35	0	36	0	0	0	0
20	0	30	0	29	0	0	0	0
25	0	21	0	21	0	0	0	0
30	0	12	1	11	0	2	0	0
35	0	7	1	7	0	1	0	0
40	0	1	1	1	0	1	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	35	0	35	0	0	0	0
20	0	30	0	29	0	0	0	0
25	0	22	0	21	0	0	0	0
30	0	12	1	11	0	2	0	0
35	0	7	1	7	0	1	0	0
40	0	1	1	1	0	1	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	279	12	0	0	0	0
15	0	358	7	0	0	0	0
20	0	362	1	0	0	0	0
25	0	240	0	0	0	0	0
30	0	134	1	0	0	0	0
35	0	102	0	0	0	0	0
40	0	56	0	0	0	0	0
50	0	19	0	0	0	0	0
75	0	5	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	889	0	889	0	0	0	0
15	0	1009	0	1009	0	0	0	0
20	0	765	0	765	0	0	0	0
25	0	398	0	398	0	0	0	0
30	0	219	0	219	0	0	0	0
35	0	96	0	96	0	0	0	0
40	0	48	0	48	0	0	0	0
50	0	11	0	11	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 14. G3,20) Detection Limit Fixed at 25 (Censoring Level = 13.06%)

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Miscellaneous UCL Methods

n			Adjusted	Approximate	Adjusted	Approximate
n	Kaplan-Meier	Winsor	Known Gamma	Known Gamma	Est. Gamma	Est. Gamma
10	77.9583	80.5640	191.0533	150.8776	244.6094	188.1668
15	75.0541	73.9927	125.3636	113.5423	157.3448	139.4490
20	73.4863	71.3752	105.0944	100.2256	124.5212	117.4040
25	71.9492	69.4945	93.8759	90.8969	108.1319	103.7966
30	71.2258	68.4098	88.1794	86.1644	98.9541	96.0887
35	70.4030	67.5651	83.4545	82.1082	92.3524	90.4354
40	69.8042	66.7927	80.4870	79.5683	87.9358	86.6416
50	68.9074	65.7749	76.4461	75.8782	82.2428	81.4457
75	67.4687	64.1201	71.4199	71.1690	75.2798	74.9286
100	66.5496	63.1231	68.8671	68.7234	71.9285	71.7251

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Tiku Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	78.8180	78.6809	81.1245	82.4925	80.6547
15	74.4675	74.4196	75.7714	74.8620	75.6505
20	72.3218	72.2776	73.2209	72.5880	73.2994
25	70.5521	70.4883	71.2049	70.7335	71.2820
30	69.6303	69.5481	70.1441	69.7622	70.2658
35	68.7108	68.6162	69.1242	68.8097	69.2453
40	68.0148	67.9054	68.3612	68.0921	68.4735
50	67.0166	66.8887	67.2713	67.0669	67.3715
75	65.4089	65.2496	65.5584	65.4303	65.6235
100	64.3958	64.2168	64.4988	64.4065	64.5274

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Schneider's Approximation Method

n	CMLE	RMLE	UMLE	EM	EM Check
10	75.3452	75.1269	77.2519	78.6004	76.8750
15	72.2717	72.1793	73.4054	72.5236	73.3465
20	70.6083	70.5286	71.4080	70.7982	71.5293
25	69.1654	69.0702	69.7547	69.2989	69.8588
30	68.4144	68.3039	68.8823	68.5120	69.0239
35	67.6400	67.5204	68.0192	67.7136	68.1551
40	67.0399	66.9067	67.3593	67.0973	67.4833
50	66.1942	66.0460	66.4309	66.2314	66.5387
75	64.7797	64.6050	64.9204	64.7948	64.9890
100	63.8724	63.6808	63.9701	63.8793	64.0007

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

ROS and Ad Hoc Methods Based on Student's t-Statistic

	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	78.1037	77.9681	80.3852	78.8298	78.8094	78.5737
15	74.1798	74.1506	75.5094	74.6101	74.8667	74.3676
20	72.1652	72.1438	73.0917	72.4638	72.8695	72.1201
25	70.4640	70.4227	71.1410	70.6711	71.1278	70.2389
30	69.5747	69.5149	70.1087	69.7272	70.2535	69.2184
35	68.6752	68.6020	69.1053	68.7908	69.3480	68.2298
40	67.9936	67.9052	68.3543	68.0849	68.6801	67.4512
50	67.0166	66.9085	67.2820	67.0771	67.7100	66.3518
75	65.4218	65.2797	65.5774	65.4489	66.1614	64.5771
100	64.4132	64.2497	64.5203	64.4277	65.1838	63.4629

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Using Land's H-Statistics

	LogDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	194.7716	0.04%	81.3828	0.00%	94.1376
15	0.00%	135.1352	0.00%	75.3405	0.00%	83.7759
20	0.00%	118.0907	0.00%	72.6502	0.00%	79.6865
25	0.00%	108.1575	0.00%	70.6686	0.00%	76.6980
30	0.00%	102.7511	0.00%	69.6170	0.00%	75.0869
35	0.00%	98.5405	0.00%	68.7103	0.00%	73.6949
40	0.00%	95.6138	0.00%	68.0180	0.00%	72.6855
50	0.00%	91.0846	0.00%	67.0504	0.00%	71.1659
75	0.00%	85.4888	0.00%	65.5816	0.00%	68.9933
100	0.00%	82.3400	0.00%	64.6983	0.00%	67.7016

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Std BOOT DL/2	Std BOOT CMLE	Std BOOT UMLE	Std BOOT RMLE	Std BOOT ROS	Std BOOT EM	Std BOOT KM
10	75.814	176.064	99.863	75.932	76.077	83.490	77.840
15	73.335	73.400	87.094	73.112	73.045	73.288	74.890
20	71.884	71.604	71.725	71.390	71.177	71.546	73.341
25	70.439	69.990	70.113	69.814	69.497	69.965	71.828
30	69.729	69.180	69.283	68.987	68.574	69.145	71.125
35	68.936	68.335	68.434	68.143	67.680	68.301	70.320
40	68.341	67.673	67.777	67.479	66.944	67.657	69.730
50	67.468	66.757	66.832	66.551	65.915	66.730	68.854
75	66.027	65.225	65.281	64.998	64.236	65.208	67.434
100	65.099	64.249	64.294	64.009	63.170	64.236	66.525

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Boot T DL/2	Boot T CMLE	Boot T UMLE	Boot T RMLE	Boot T ROS	Boot T EM	Boot T KM
10	84.957	82.321	82.699	83.190	82.372	9504.864	88.743
15	78.448	76.795	76.896	76.914	76.036	76.941	80.399
20	75.471	74.094	74.206	73.936	73.017	74.098	77.085
25	73.070	71.903	71.979	71.639	70.717	71.853	74.601
30	71.891	70.748	70.830	70.451	69.520	70.681	73.376
35	70.683	69.597	69.687	69.315	68.387	69.543	72.124
40	69.836	68.765	68.857	68.476	67.511	68.725	71.295
50	68.629	67.598	67.658	67.293	66.326	67.563	70.043
75	66.766	65.743	65.803	65.459	64.457	65.725	68.194
100	65.635	64.624	64.664	64.340	63.308	64.613	67.078

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	Percentile.Percentile DL/2	Percentile CMLE	Percentile UMLE	Percentile RMLE	Percentile ROS	Percentile EM	Percentile KM
10	76.393	77.614	77.979	75.973	77.276	76.012	80.037
15	73.745	73.761	74.015	73.110	73.768	73.085	76.231
20	72.207	71.742	71.941	71.469	71.769	71.465	74.340
25	70.701	70.047	70.212	69.907	69.979	69.948	72.605
30	69.987	69.218	69.372	69.077	68.999	69.150	71.764
35	69.143	68.379	68.503	68.232	68.054	68.327	70.856
40	68.531	67.738	67.842	67.551	67.278	67.682	70.200
50	67.618	66.804	66.894	66.618	66.189	66.775	69.222
75	66.131	65.262	65.319	65.058	64.426	65.247	67.677
100	65.178	64.276	64.321	64.054	63.320	64.263	66.702

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

n	BCA BOOT DL/2	BCA B00T CMLE	BCA B00T UMLE	BCA B00T RMLE	BCA B00T ROS	BCA B00T EM	BCA BOOT KM
10	76.719	78.318	78.618	75.683	79.086	75.869	83.093
15	73.915	73.787	74.004	72.806	74.808	72.700	78.142
20	72.342	71.489	71.667	71.192	72.590	71.097	75.676
25	70.803	69.762	69.918	69.672	70.599	69.627	73.621
30	70.050	68.958	69.098	68.872	69.543	68.880	72.607
35	69.222	68.140	68.275	68.057	68.514	68.088	71.550
40	68.592	67.517	67.613	67.415	67.673	67.477	70.777
50	67.668	66.623	66.712	66.489	66.536	66.604	69.659
75	66.151	65.143	65.198	64.947	64.658	65.116	67.952
100	65.185	64.176	64.230	63.972	63.486	64.166	66.904

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

UCLs based upon Chebyshev Inequality

	Cohen's	RMLE	UMLE	EM	EM Check	Kaplan-Meier
10	105.5212	105.6861	109.9929	108.0275	108.9966	104.3607
15	97.7089	97.9596	100.3771	99.1175	99.8285	97.1448
20	93.3081	93.5798	95.1754	94.2693	94.9222	93.0597
25	89.4759	89.7264	90.8391	90.1628	90.6726	89.4409
30	87.2578	87.4848	88.3265	87.7825	88.2544	87.3934
35	85.0814	85.2811	85.9367	85.4922	85.9026	85.3541
40	83.4610	83.6426	84.1733	83.7958	84.1569	83.8606
50	80.9394	81.0836	81.4568	81.1739	81.4642	81.5285
75	76.9220	76.9984	77.2160	77.0442	77.2301	77.8388
100	74.4155	74.4469	74.6127	74.4918	74.6088	75.5459

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Various EM Check Bootstrap Methods and Jackknife Method

n	Std Boot	Boot T	Percentile	BCA Boot	Jackknife
10	75.6265	84.3181	76.3071	76.7918	78.6501
15	73.0795	77.6970	73.5636	73.9680	74.5641
20	71.5840	74.7581	72.0057	72.3227	72.6331
25	70.0750	72.3190	70.4429	70.7421	70.6764
30	69.3209	71.1235	69.6607	69.9679	69.8982
35	68.4971	69.9317	68.7961	69.0844	69.0765
40	67.8520	69.0479	68.1511	68.4555	68.1645
50	66.9360	67.8053	67.1836	67.4509	67.5634
75	65.3881	65.8673	65.5976	65.8495	66.3225
100	64.3813	64.6920	64.5633	64.7854	65.2239

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Average of UCLs

Jackknife UCLs using various estimation methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	KM
10	78.809	78.261	77.415	78.572	78.548	980.899	79.464
15	74.867	74.566	74.210	74.291	73.886	74.748	75.689
20	72.869	72.344	72.146	72.123	71.529	72.479	73.812
25	71.128	70.542	70.420	70.320	69.628	70.626	72.125
30	70.254	69.598	69.511	69.369	68.610	69.661	71.325
35	69.348	68.671	68.606	68.443	67.659	68.718	70.456
40	68.680	67.959	67.908	67.722	66.884	67.996	69.825
50	67.710	66.962	66.928	66.722	65.834	66.987	68.896
75	66.161	65.342	65.326	65.092	64.137	65.355	67.432
100	65.184	64.329	64.319	64.071	63.077	64.337	66.510

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Tiku and Schneider's Approximation Methods

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Approx EM	Approx ECheck
10	90.98	90.79	93.24	91.74	91.86	85.65	85.33	88.82	85.92	87.33
15	90.46	90.42	92.16	90.99	91.47	85.56	85.31	87.98	85.90	87.09
20	90.59	90.51	91.92	90.99	91.47	85.92	85.80	88.00	86.22	87.47
25	90.20	90.02	91.68	90.67	91.23	86.26	86.00	87.72	86.48	87.45
30	90.67	90.51	91.80	90.79	91.33	87.37	87.09	88.67	87.64	88.30
35	90.16	89.94	91.31	90.38	90.75	86.67	86.08	87.82	86.85	87.70
40	89.07	88.79	89.98	89.25	89.74	85.64	85.25	86.91	85.86	86.48
50	89.70	89.43	90.53	89.84	90.30	86.16	85.47	87.27	86.32	87.29
75	88.28	87.66	89.03	88.40	88.73	85.05	84.10	85.82	85.17	85.78
100	87.33	86.10	87.90	87.33	87.62	83.58	82.10	84.30	83.62	83.92

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Miscellaneous UCL Methods

n	KM UCL	Winsor UCL	KnwAdj. Gamma	KnwApr Gamma	EstAdj Gamma	EstApt Gamma
10	90.00	89.22	N/A	N/A	99.62	99.43
15	91.39	87.90	N/A	N/A	99.94	99.86
20	92.87	86.65	N/A	N/A	99.92	99.90
25	93.31	85.54	N/A	N/A	99.96	99.94
30	94.02	85.49	N/A	N/A	100.00	100.00
35	94.18	85.62	N/A	N/A	100.00	99.98
40	94.36	83.86	N/A	N/A	99.98	99.96
50	95.31	82.83	N/A	N/A	99.92	99.90
75	95.82	80.83	N/A	N/A	99.94	99.92
100	96.48	78.00	N/A	N/A	99.96	99.92

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

ROS and Ad Hoc Methods Based on Student's t-Statistic

n	Cohen's UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL
10	89.52	89.23	92.35	90.30	90.20	89.88
15	89.25	89.17	91.41	89.94	90.34	89.74
20	89.60	89.52	91.47	90.10	90.93	89.39
25	89.62	89.45	91.17	90.08	91.01	88.79
30	90.10	89.94	91.35	90.51	91.60	89.33
35	89.76	89.43	90.99	90.06	91.47	88.24
40	88.89	88.69	89.72	89.03	90.57	87.01
50	89.43	89.05	90.28	89.54	91.58	86.85
75	88.22	87.47	88.77	88.32	91.13	83.98
100	87.17	86.18	87.74	87.19	91.29	80.67

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Using Land's H-Statistics

	LOGDL2		Delta		Helsel	
n	Failed	H-Stat	Failed	H-Stat	Failed	H-Stat
10	0.00%	99.60	0.04%	87.78	0.00%	96.36
15	0.00%	99.90	0.00%	87.56	0.00%	96.18
20	0.00%	99.92	0.00%	88.10	0.00%	96.81
25	0.00%	99.94	0.00%	88.26	0.00%	96.89
30	0.00%	99.98	0.00%	89.07	0.00%	97.23
35	0.00%	100.00	0.00%	88.99	0.00%	96.87
40	0.00%	100.00	0.00%	88.08	0.00%	96.81
50	0.00%	99.98	0.00%	89.25	0.00%	97.25
75	0.00%	100.00	0.00%	88.99	0.00%	97.56
100	0.00%	100.00	0.00%	89.43	0.00%	97.84

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Standard Bootstrap Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	86.87	87.99	88.10	87.36	87.41	87.86	86.32	90.00
15	87.96	88.73	89.03	88.20	88.02	88.38	87.37	91.31
20	89.25	88.83	89.37	88.36	88.00	88.85	88.12	92.61
25	89.60	88.87	89.19	88.34	87.50	88.59	88.55	93.09
30	90.53	89.41	89.68	89.05	87.88	89.41	89.43	93.98
35	90.53	88.97	89.11	88.36	86.97	88.77	88.93	94.18
40	89.78	88.18	88.38	87.33	85.45	88.14	87.74	94.16
50	91.03	88.83	89.13	87.86	84.99	88.71	88.87	95.29
75	90.69	87.52	87.80	86.32	82.26	87.50	87.68	95.78
100	90.99	86.44	86.57	84.59	78.83	86.24	86.42	96.44

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Bootstrap T methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	91.76	88.94	88.76	90.83	89.80	90.32	90.02	94.46
15	92.36	90.63	90.46	91.23	89.78	91.15	90.51	94.95
20	93.15	91.39	91.49	91.58	89.31	91.43	91.09	95.35
25	93.13	91.50	91.62	91.33	89.01	91.15	91.11	95.90
30	93.64	91.84	91.88	91.25	89.11	91.80	91.45	96.24
35	93.25	91.27	91.39	90.63	88.10	91.11	90.57	96.10
40	92.63	90.24	90.28	89.58	86.59	90.06	90.02	96.16
50	93.45	90.65	91.07	89.70	86.30	90.59	90.26	96.79
75	92.69	89.13	89.27	88.14	83.09	89.29	88.79	96.91
100	92.73	87.96	88.48	86.46	79.15	88.04	87.88	97.45

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various Percentile Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.66	89.84	90.28	87.13	89.05	87.21	87.25	92.22
15	88.63	89.33	89.68	87.58	89.11	87.50	88.04	92.71
20	89.60	89.01	89.37	88.26	89.13	88.06	88.69	93.84
25	90.00	88.65	89.09	88.14	88.77	88.32	88.95	94.46
30	91.07	89.33	89.80	88.85	88.95	89.21	90.02	94.79
35	90.99	88.95	89.33	88.50	88.02	88.81	89.68	94.93
40	90.30	87.98	88.63	87.37	86.61	87.90	88.83	95.05
50	91.39	88.69	89.05	87.78	86.16	88.65	89.82	95.58
75	90.97	87.47	87.62	86.46	83.13	87.47	88.46	96.24
100	91.19	86.28	86.51	84.75	80.04	86.46	87.78	96.75

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Various BCA Bootstrap methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	87.84	89.96	90.26	86.79	91.49	86.81	87.80	94.34
15	88.79	89.15	89.37	86.91	91.27	86.53	88.83	94.44
20	89.50	88.00	88.50	87.37	91.45	87.05	89.49	95.35
25	90.18	88.08	88.08	87.52	90.32	87.43	89.52	95.64
30	91.15	88.67	89.21	88.44	90.24	88.51	90.36	95.84
35	90.87	88.40	88.53	87.84	89.58	88.04	90.20	95.76
40	90.26	87.35	87.84	87.03	88.08	87.13	89.43	95.80
50	91.45	87.74	87.82	87.39	87.78	87.78	90.06	96.36
75	91.05	86.83	87.11	85.96	84.36	86.73	88.89	96.61
100	91.31	85.52	86.00	84.38	80.55	85.70	87.96	97.05

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

UCLs based upon Chebyshev Inequality

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	ECheck UCL	KM UCL
10	99.21	99.17	99.48	99.45	99.45	99.01
15	99.56	99.52	99.68	99.60	99.62	99.47
20	99.82	99.82	99.88	99.84	99.84	99.80
25	99.88	99.88	99.90	99.88	99.88	99.88
30	99.96	99.96	99.98	99.98	99.98	99.96
35	99.90	99.90	99.90	99.90	99.90	99.90
40	99.94	99.94	99.96	99.94	99.94	99.94
50	99.96	99.96	99.96	99.96	99.96	99.96
75	100.00	100.00	100.00	100.00	100.00	100.00
100	100.00	100.00	100.00	100.00	100.00	100.00

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Number of Bootstrap Runs: 1000
Detection Limit: 25.0000000
Percentage Non-detects: Unknown, Detection Limit Fixed by user

Percentage UCL > Population Mean

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	90.20	89.88	87.94	91.02	90.44	91.54	89.21	91.49
15	90.34	90.11	89.15	89.76	89.07	90.69	88.36	91.84
20	90.93	90.40	89.62	89.70	88.34	90.79	88.50	93.11
25	91.01	90.02	89.41	89.37	87.58	90.26	88.16	93.52
30	91.60	90.18	90.02	89.68	87.74	90.44	88.48	94.06
35	91.47	89.80	89.50	89.11	86.73	89.88	87.78	94.20
40	90.57	88.81	88.61	88.16	85.07	88.87	86.65	94.38
50	91.58	89.45	89.27	88.57	84.57	89.54	87.84	95.23
75	91.13	88.04	87.94	86.81	81.47	88.06	86.44	95.72
100	91.29	86.69	86.61	84.75	78.02	86.75	85.86	96.42

GAMMA DISTRIBUTION

Censoring Type: 1
Alpha Value: 3.00
Beta Value: 20.00
Population Mean: 60.0000000
Number of Test Runs: 5050
Detection Limit: 25.0000000
Averaged Percentage Non-detects: Unknown, Detection Limit Fixed by user
Distribution Check: Average of means: 59.971607
Distribution Check: Average of stdvs: 34.416160
Average of NDs per 100 observations: 13.194900

n	Detection Limit	Average # Non-detects	k=0	k=1	k=2	k=3	k=4	k=5	k=6	k=7	k=8	k=9
10	25.000000	1.322772	1222	1844	1288	545	130	21	0	0	0	0
15	25.000000	1.956832	640	1356	1488	953	433	139	31	4	4	2
20	25.000000	2.627525	308	927	1309	1170	743	392	138	52	9	2
25	25.000000	3.264950	140	554	1052	1216	1002	601	295	137	40	10
30	25.000000	3.951881	75	318	724	1048	1060	849	514	292	111	44
35	25.000000	4.593267	47	177	491	847	1006	951	656	473	240	101
40	25.000000	5.279208	15	108	304	644	799	969	853	587	426	200
50	25.000000	6.536634	8	36	134	304	539	702	876	807	622	481
75	25.000000	9.868317	0	0	8	30	81	182	329	460	598	660
100	25.000000	13.176832	0	0	0	1	4	22	53	116	198	326

n	k=10	k=11	k=12	k=13	k=14	k=15	k=16	k=17	k=18	k=19	k=20	k>20	Reject k>n-5
10	0	0	0	0	0	0	0	0	0	0	0	0	4
15	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
25	3	0	0	0	0	0	0	0	0	0	0	0	0
30	15	0	0	0	0	0	0	0	0	0	0	0	0
35	38	17	5	0	1	0	0	0	0	0	0	0	0
40	91	33	13	5	3	0	0	0	0	0	0	0	0
50	263	136	81	40	15	6	0	0	0	0	0	0	0
75	677	611	490	362	249	141	89	44	23	11	3	2	0
100	417	501	545	590	555	539	359	293	207	137	81	106	0

Failed Counts

n	Tiku CMLE	Tiku RMLE	Tiku. UMLE	Tiku. EM	Tiku ECheck	Approx CMLE	Approx RMLE	Approx UMLE	Aprox EM	Approx ECheck
10	4	0	4	0	0	4	0	4	0	0
15	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0

Student's t-Cutoff, Regression and None-Bootstrap Non-Parametric UCLs

n	Cohen UCL	RMLE UCL	UMLE UCL	EM UCL	DL/2 UCL	ROS UCL	KM UCL	Winsor UCL
10	4	0	4	1	0	0	0	21
15	0	0	0	0	0	0	0	10
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

UCLs based upon Chebyshev Inequality

n	Cohen	RMLE	UMLE	EM	ECheck	KM
10	4	0	4	1	0	0
15	0	0	0	0	0	0
20	0	0	0	0	0	0
25	0	0	0	0	0	0
30	0	0	0	0	0	0
35	0	0	0	0	0	0
40	0	0	0	0	0	0
50	0	0	0	0	0	0
75	0	0	0	0	0	0
100	0	0	0	0	0	0

Standard Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	4	0	4	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Bootstrap T-Cutoff using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	4	0	4	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Percentile Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

BCA Bootstrap using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

	H-Statistics			Gamma Statistics			
n	DL/2	DELTA	HELSEL	KnwADJ	KnwAPR	EstADJ	EstAPR
10	0	2	0	0	0	0	0
15	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Jackknife UCL using various Methods

n	DL/2	CMLE	UMLE	RMLE	ROS	EM	ECheck	KM
10	0	39	0	39	0	0	0	0
15	0	2	0	2	0	0	0	0
20	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0