Diagnostic Codes Used to Define Cohort

Disease Category	ICD-9 code	Description
Stroke	V57	BREATHING EXERCISES
Stroke	430	SUBARACHNOID HEMORRHAGE
Stroke	431	INTRACEREBRAL HEMORRHAGE
Stroke	432	INTRACRANIAL HEM NEC/NOS*
Stroke	4320	NONTRAUMATIC EXTRADURAL HEMORRHAGE
Stroke	4321	SUBDURAL HEMORRHAGE
Stroke	4329	UNSPECIFIED INTRACRANIAL HEMORRHAGE
Stroke	43301	OCCLUSION & STENOSIS OF BASILAR ARTERY, W/CEREBRAL INFARCTION
Stroke	43311	OCCLUSION & STENOSIS OF CAROTID ARTERY, W/ CEREBRAL INFARCTION
Stroke	43321	OCCLUSION & STENOSIS OF VERTEBRAL ARTERY, W/ CEREBRAL INFARCTION
Stroke	43331	OCCLUSION& STENOSIS OF MULTIPLE & BILATERAL ARTERIES, W/ CEREBRAL INF
Stroke	43381	OCCLUSION & STENOSIS OF OTHER SPECIFIED PRECEREBRAL ARTERY, W/ CEREBR
Stroke	43391	OCCLUSION & STENOSIS OF UNSPECIFIED PRECEREBRAL ARTERY W/ CEREBRAL IN
Stroke	434	CEREBRAL ARTERY OCCLUS*
Stroke	4340	CEREBRAL THROMBOSIS
Stroke	43400	CEREBRAL THROMBOSIS W/O MENTION OF CEREBRAL INFARCTION
Stroke	43401	CEREBRAL THROMBOSIS W/ CEREBRAL INFARCTION
Stroke	4341	CEREBRAL EMBOLISM
Stroke	43410	CEREBRAL EMBOLISM W/O MENTION OF CEREBRAL INFARCTION
Stroke	43411	CEREBRAL EMBOLISM W/ CEREBRAL INFARCTION
Stroke	4349	CEREBRAL ARTERY OCCLUSION, UNSPECIFIED
Stroke	43490	CEREBRAL ARTERY OCCLUSION, UNSPECIFIED, W/O MENTION OF CEREBRAL INFAR
Stroke	43491	CEREBRAL ARTERY OCCLUSION, UNSPECIFIED, W/ CEREBRAL INFARCTION
Stroke	436	ACUTE, BUT ILL-DEFINED, CEREBROVASCULAR DISEASE

Highlights

Table 14.1

National Overview

In FY-2000, the VHA had over seventy thousand (73,094) patients with either a primary or secondary diagnostic code of one or more of the Stroke codes listed above. This number represents approximately nineteen percent (18.63%) of the total patient population during the fiscal year (Table 14.1). As with most patients seen in the VHA, the majority of patients were male (98%), with only 2% female.

The age distribution of Stroke patients shows that 2.57% were under the age of 45, 11.44% were aged 45-54, 17.39% were between the ages of 55-64, 35.6% were aged 65-74 and 33.01% were 75 years of age or older. The proportion of Stroke patients who were married was similar to the overall VA patient population, at about sixty percent nationally (57.95%). The "Means Test" categories show that about a third (31.78%) were Priority 1 - 3 (service-connected injured) veterans over one-half 57.3% were Priority 5 (low income).

VISN Overview

The volume of patients with Stroke ranged from a high of 10,202 individuals in the South Central network (VISN 16) to a low of 874 in the Upper Midwest (VISN 13). One network had over three percent of their total patient population in this disease cohort: the South Central (VISN 16). The Ohio network (VISN 10) had the highest percentage of patients under the age of 45, with 3.72% in this age bracket. The Upstate New York network (VISN 2) had the largest proportion of patients in the over 75 age group with 40.99%.

Table 14.2

This table compares utilization by the Stroke **primary** diagnosis group for all conditions with utilization by all VA patients for all conditions. Note that for this table, only patients who had a primary diagnosis of Stroke were selected. If a patient had Stroke as a secondary diagnosis only, he/she is not included. Further, for our primary diagnosis Stroke group we examined all utilization that occurred during the fiscal year, both Stroke-specific and all other non-Stroke related medical care obtained.

As an example of what the data show and how to interpret the findings, examine the South Central network (VISN 16). In this particular network, 2.23% of the total patients seen at a VA facility in fiscal year 2000 had a primary diagnosis of Stroke. This group of patients accounted for 10.46% of the total bed-days of care in VISN 16, 8.63% of total discharges in VISN 16, and 4.05% of outpatient visits in VISN 4 made by all patients of VA health care services in the network for all medical conditions.

Table 14.3

Table 14.3 is similar to Table 14.2 except that patients who only had a **secondary** diagnosis of Stroke are examined rather than patients who had a primary diagnosis. This table compares utilization by the Stroke secondary diagnosis group for all health conditions they had during the year (i.e., includes both Stroke-specific utilization and utilization for all other non-Stroke care the patient may have received) with utilization by all VISN patients for all conditions.

Using the example of VISN 16, the data can be interpreted as follows: 1.23% of the patients in VISN 4 had at most a secondary

diagnosis of Stroke, but never a primary diagnosis. This group of patients accounted for 2.46% of the total bed-days of care, 2.27% of total discharges and 1.48% of outpatients visits utilized by all patients in the network for all conditions.

Table 14.4

Table 14.4 compares resource utilization specifically directed at treating Stroke. In other words, we examine the utilization for which the primary diagnosis (DXLSF) was a defining diagnosis for the Stroke, with utilization for all conditions by all patients in each network.

For example, in VISN 16 2.23% of the patients had some utilization for which the primary diagnosis was Stroke. Utilization specifically directed at treating the Stroke accounted for 2.38% of all bed-days of care, 1.76% of all discharges, and .48% of all outpatient visits.

Table 14.5

Table 14.5 combines the information from Tables 14.2 and 14.4, comparing utilization by the Stroke primary diagnosis group specifically directed at treating their condition with utilization by this same group for all conditions. For example, in VISN 16, 2.23% of the patients had some utilization for Stroke. These patients accounted for 47,506 bed-days of care in FY-2000, of which 10,834 or 22.81%, were utilized specifically for treating their Stroke (i.e., primary diagnosis (DXLSF) of Stroke). Similarly, 20.36% of the discharges for patients in the Stroke primary diagnosis group resulted from inpatient stays to treat their disease, and 11.98% of the

outpatient visits made by these patients were for specifically for the treatment of Stroke.

Costs

Cost data are reported for utilization of VA services by veteran VA users with Stroke are shown in Tables 14.6 and 14.7. Veterans with Stroke are identified by a Stroke diagnosis for at least one inpatient or outpatient service received. We separately report for veterans who had at least one primary diagnosis of Stroke and veterans whose only diagnoses of Stroke are secondary to another diagnosis. Costs are for VA utilization include inpatient, outpatient, and pharmacy services for all causes, not just for Stroke related use. That is, we report all VA costs for all causes for individuals identified as diabetics.

There were 77,550 individuals with at least one primary or secondary diagnosis of Stroke for whom cost data were available, and these costs averaged $13,831 per veteran. Breaking these costs down by whether or not the veteran had at least one primary diagnosis of Stroke, we have an average cost of $15,474 per veteran for those with at least one primary care diagnosis of Stroke and $10,169 per veteran for those with only secondary diagnoses of veterans.

Focusing on those with at least one primary diagnosis of Stroke, the $15,474 costs per veteran are distributed as follows: 45.35% are for inpatient medical/surgical services, 22.77% are for other inpatient services, 23.27% are for outpatient services, and 8.61% are for pharmaceutical services. Across VISNs, overall costs per veteran with a primary diagnosis of Stroke ranged from a low of $11,638 in VISN 15 to a high of $20,625 per veteran in VISN 13.

Veterans Integrated Service Network	Total Number of Patients	Patients with Stroke		Gender (%)		Age Group (%)					Marital Status (%)		Means Test Status (%)	
		N	(%)	M	F	<45	45-54	55-64	65-74	75+	Married	Not Married	Service Connected	Low Income
New England (1)	158,204	3,108	1.96	97.62	2.38	2.28	8.94	14.83	37.16	36.78	57.69	41.86	37.90	50.39
Upstate NY (2)	100,499	1,620	1.61	97.84	2.16	1.91	8.52	12.04	36.54	40.99	55.49	43.77	28.89	59.14
NY/NJ (3)	166,593	4,215	2.53	98.55	1.45	2.30	8.83	14.02	36.51	38.34	51.74	46.83	28.14	48.49
Stars and Stripes (4)	202,472	4,224	2.09	98.46	1.54	1.94	10.30	15.96	37.88	33.93	58.52	40.67	30.82	55.45
Capitol (5)	88,163	2,550	2.89	98.04	1.96	3.49	11.33	17.73	37.61	29.84	46.16	53.14	27.92	62.90
Mid-Atlantic (6)	161,081	3,344	2.08	97.97	2.03	3.71	13.10	17.19	34.39	31.61	59.75	39.08	39.20	53.92
Atlantic (7)	201,514	4,949	2.46	97.90	2.10	3.60	12.51	18.29	37.02	28.59	60.62	38.53	32.79	58.23
Sunshine (8)	308,906	7,044	2.28	97.84	2.16	2.20	9.89	15.84	35.78	36.29	64.57	33.38	34.71	53.78
Mid-South (9)	165,501	3,184	1.92	98.74	1.26	3.11	12.85	17.12	35.71	31.22	59.99	39.35	32.85	59.17
Ohio (10)	117,463	2,849	2.43	97.82	2.18	3.72	12.81	17.02	35.77	30.68	53.46	45.98	28.01	62.76
Vets in Partnership (11)	142,393	3,333	2.34	99.07	0.93	2.70	12.45	17.40	37.71	29.73	55.00	44.76	27.06	61.51
Great Lakes (12)	142,079	2,995	2.11	98.10	1.90	2.47	12.25	15.93	33.92	35.43	51.99	47.48	25.31	63.21
Upper Midwest (13)	96,279	874	0.91	97.60	2.40	2.29	8.92	14.07	38.33	36.38	54.92	44.28	34.32	51.03
Central Plains (14)	73,699	1,129	1.53	98.23	1.77	2.57	10.54	15.50	38.09	33.30	60.50	38.62	28.61	57.75
Heartland (15)	148,229	4,155	2.80	98.29	1.71	2.41	10.93	17.18	37.30	32.18	58.56	40.65	26.26	61.73
South Central (16)	294,286	10,202	3.47	98.18	1.82	2.65	13.65	20.54	33.96	29.19	59.79	38.56	29.63	62.37
Heart of Texas (17)	151,601	4,271	2.82	97.96	2.04	2.74	13.84	19.93	32.85	30.65	62.40	36.95	38.59	53.13
Southwest (18)	154,764	3,002	1.94	97.00	3.00	2.17	10.59	17.46	33.64	36.14	61.06	37.81	38.54	51.93
Rocky Mt. (19)	95,866	1,796	1.87	97.38	2.62	2.23	10.97	17.26	35.97	33.57	61.53	37.47	31.57	54.23
Northwest (20)	143,215	2,260	1.58	97.08	2.92	2.96	11.19	19.20	33.36	33.27	53.94	44.96	38.05	52.43
Sierra Pacific (21)	149,020	2,409	1.62	97.01	2.99	2.16	12.37	17.89	30.10	37.48	53.84	45.00	40.47	51.39
Desert Pacific (22)	178,204	3,743	2.10	97.11	2.89	2.91	12.53	22.17	32.54	29.84	47.72	51.16	33.48	57.57
National	3,314,672	73,094	2.21	98.00	2.00	2.57	11.44	17.39	35.60	33.01	57.95	41.01	31.78	57.30

Table 14.1: Overall Prevalence Statistics – Stroke, FY-2000

Table 14.2:
Overall Resource Utilization – Stroke (Primary Diagnosis Group) Compared to All Users, FY-2000

Veterans Integrated Service Network (VISN)	Total Patients	Total Patients Stroke		Bed Days of Care			Discharges			Outpatient Visits		
				Total	Stroke		Total	Stroke		Total	Stroke	
	N	N	%	N	N	%	N	N	%	N	N	%
New England (1)	158,204	2,286	1.44	303,134	12,991	4.29	24,413	1,333	5.46	1,990,550	52,425	2.63
Upstate NY (2)	100,499	1,170	1.16	120,203	7,651	6.37	11,871	710	5.98	1,093,796	28,989	2.65
NY/NJ (3)	166,593	2,740	1.64	405,186	19,436	4.80	24,128	1,539	6.38	1,854,064	68,656	3.70
Stars and Stripes (4)	202,472	2,731	1.35	284,688	12,519	4.40	24,122	1,335	5.53	1,846,937	54,343	2.94
Capitol (5)	88,163	1,844	2.09	222,405	16,057	7.22	17,107	1,338	7.82	1,007,572	37,392	3.71
Mid-Atlantic (6)	161,081	2,557	1.59	361,832	23,091	6.38	31,256	1,956	6.26	1,491,680	44,511	2.98
Atlantic (7)	201,514	3,481	1.73	369,514	25,728	6.96	29,275	2,055	7.02	1,891,761	62,028	3.28
Sunshine (8)	308,906	4,748	1.54	392,501	34,763	8.86	41,850	2,882	6.89	3,109,217	92,506	2.98
Mid-South (9)	165,501	2,397	1.45	316,108	20,880	6.61	34,579	2,115	6.12	1,483,519	41,049	2.77
Ohio (10)	117,463	2,098	1.79	191,574	14,472	7.55	18,945	1,274	6.72	1,327,847	43,403	3.27
Vets in Partnership (11)	142,393	2,465	1.73	311,786	16,283	5.22	23,779	1,600	6.73	1,368,643	47,010	3.43
Great Lakes (12)	142,079	2,411	1.70	334,130	20,285	6.07	30,157	1,926	6.39	1,715,017	54,998	3.21
Upper Midwest (13)	96,279	634	0.66	107,644	5,093	4.73	16,092	637	3.96	934,533	12,215	1.31
Central Plains (14)	73,699	820	1.11	76,697	3,970	5.18	9,898	521	5.26	674,604	17,474	2.59
Heartland (15)	148,229	2,406	1.62	211,861	12,349	5.83	25,568	1,547	6.05	1,458,394	40,205	2.76
South Central (16)	294,286	6,576	2.23	454,315	47,506	10.46	47,751	4,121	8.63	2,750,358	111,293	4.05
Heart of Texas (17)	151,601	2,639	1.74	297,463	17,118	5.75	25,932	1,673	6.45	1,544,273	52,557	3.40
Southwest (18)	154,764	2,079	1.34	167,362	10,065	6.01	23,822	1,348	5.66	1,574,259	42,338	2.69
Rocky Mt. (19)	95,866	1,171	1.22	132,102	7,478	5.66	15,065	808	5.36	959,415	23,333	2.43
Northwest (20)	143,215	1,639	1.14	181,076	9,923	5.48	24,296	1,205	4.96	1,488,150	32,798	2.20
Sierra Pacific (21)	149,020	1,689	1.13	214,370	8,378	3.91	19,163	846	4.41	1,630,530	34,322	2.10
Desert Pacific (22)	178,204	2,755	1.55	231,584	15,691	6.78	25,132	1,591	6.33	2,119,773	68,203	3.22
National	3,314,672	50,372	1.52	5,687,535	361,727	6.36	544,201	34,360	6.31	35,314,892	1,062,048	3.01

Table 14.3:
Overall Resource Utilization – Stroke (Secondary Diagnosis Group) Compared to All Users, FY-2000

Veterans Integrated Service Network (VISN)	Total Patients	Total Patients Stroke		Bed Days of Care			Discharges			Outpatient Visits		
				Total	Stroke		Total	Stroke		Total	Stroke	
	N	N	%	N	N	%	N	N	%	N	N	%
New England (1)	158,204	822	0.52	303,134	3,836	1.27	24,413	324	1.33	1,990,550	15,138	0.76
Upstate NY (2)	100,499	450	0.45	120,203	1,687	1.40	11,871	161	1.36	1,093,796	8,719	0.80
NY/NJ (3)	166,593	1,475	0.89	405,186	6,389	1.58	24,128	493	2.04	1,854,064	20,101	1.08
Stars and Stripes (4)	202,472	1,493	0.74	284,688	4,686	1.65	24,122	366	1.52	1,846,937	16,746	0.91
Capitol (5)	88,163	706	0.80	222,405	4,739	2.13	17,107	303	1.77	1,007,572	9,814	0.97
Mid-Atlantic (6)	161,081	787	0.49	361,832	5,221	1.44	31,256	452	1.45	1,491,680	11,478	0.77
Atlantic (7)	201,514	1,468	0.73	369,514	6,630	1.79	29,275	540	1.84	1,891,761	20,225	1.07
Sunshine (8)	308,906	2,296	0.74	392,501	8,798	2.24	41,850	844	2.02	3,109,217	31,516	1.01
Mid-South (9)	165,501	787	0.48	316,108	5,834	1.85	34,579	578	1.67	1,483,519	11,623	0.78
Ohio (10)	117,463	751	0.64	191,574	3,134	1.64	18,945	272	1.44	1,327,847	10,522	0.79
Vets in Partnership (11)	142,393	868	0.61	311,786	3,876	1.24	23,779	303	1.27	1,368,643	10,171	0.74
Great Lakes (12)	142,079	584	0.41	334,130	4,352	1.30	30,157	427	1.42	1,715,017	14,532	0.85
Upper Midwest (13)	96,279	240	0.25	107,644	1,485	1.38	16,092	188	1.17	934,533	3,649	0.39
Central Plains (14)	73,699	309	0.42	76,697	1,375	1.79	9,898	132	1.33	674,604	4,185	0.62
Heartland (15)	148,229	1,749	1.18	211,861	4,949	2.34	25,568	588	2.30	1,458,394	20,845	1.43
South Central (16)	294,286	3,626	1.23	454,315	11,182	2.46	47,751	1,083	2.27	2,750,358	40,797	1.48
Heart of Texas (17)	151,601	1,632	1.08	297,463	7,641	2.57	25,932	545	2.10	1,544,273	23,774	1.54
Southwest (18)	154,764	923	0.60	167,362	3,065	1.83	23,822	365	1.53	1,574,259	14,327	0.91
Rocky Mt. (19)	95,866	625	0.65	132,102	2,071	1.57	15,065	217	1.44	959,415	8,434	0.88
Northwest (20)	143,215	621	0.43	181,076	2,485	1.37	24,296	285	1.17	1,488,150	8,704	0.58
Sierra Pacific (21)	149,020	720	0.48	214,370	4,078	1.90	19,163	268	1.40	1,630,530	12,592	0.77
Desert Pacific (22)	178,204	988	0.55	231,584	3,226	1.39	25,132	325	1.29	2,119,773	17,379	0.82
National	3,314,672	22,722	0.69	5,687,535	100,739	1.77	544,201	9,059	1.66	35,314,892	335,271	0.95

Table 14.4:
Resource Utilization for Treatment of Stroke (Primary Diagnosis Group) Compared to Overall Resource Utilization by All Users, FY-2000

Veterans Integrated Service Network (VISN)	Total Patients	Total Patients Stroke		Bed Days of Care			Discharges			Outpatient Visits		
				Total	Stroke		Total	Stroke		Total	Stroke	
	N	N	%	N	N	%	N	N	%	N	N	%
New England (1)	158,204	2,286	1.44	303,134	2,599	0.86	24,413	257	1.05	1,990,550	3,987	0.20
Upstate NY (2)	100,499	1,170	1.16	120,203	2,174	1.81	11,871	181	1.52	1,093,796	2,873	0.26
NY/NJ (3)	166,593	2,740	1.64	405,186	3,657	0.90	24,128	273	1.13	1,854,064	8,965	0.48
Stars and Stripes (4)	202,472	2,731	1.35	284,688	2,495	0.88	24,122	252	1.04	1,846,937	8,078	0.44
Capitol (5)	88,163	1,844	2.09	222,405	3,060	1.38	17,107	269	1.57	1,007,572	3,424	0.34
Mid-Atlantic (6)	161,081	2,557	1.59	361,832	7,170	1.98	31,256	450	1.44	1,491,680	4,202	0.28
Atlantic (7)	201,514	3,481	1.73	369,514	6,103	1.65	29,275	454	1.55	1,891,761	8,159	0.43
Sunshine (8)	308,906	4,748	1.54	392,501	7,290	1.86	41,850	578	1.38	3,109,217	9,444	0.30
Mid-South (9)	165,501	2,397	1.45	316,108	5,034	1.59	34,579	438	1.27	1,483,519	4,795	0.32
Ohio (10)	117,463	2,098	1.79	191,574	2,486	1.30	18,945	215	1.13	1,327,847	5,374	0.40
Vets in Partnership (11)	142,393	2,465	1.73	311,786	2,321	0.74	23,779	246	1.03	1,368,643	5,309	0.39
Great Lakes (12)	142,079	2,411	1.70	334,130	3,776	1.13	30,157	348	1.15	1,715,017	5,272	0.31
Upper Midwest (13)	96,279	634	0.66	107,644	1,298	1.21	16,092	170	1.06	934,533	695	0.07
Central Plains (14)	73,699	820	1.11	76,697	717	0.93	9,898	111	1.12	674,604	1,589	0.24
Heartland (15)	148,229	2,406	1.62	211,861	3,182	1.50	25,568	374	1.46	1,458,394	4,359	0.30
South Central (16)	294,286	6,576	2.23	454,315	10,834	2.38	47,751	839	1.76	2,750,358	13,330	0.48
Heart of Texas (17)	151,601	2,639	1.74	297,463	4,772	1.60	25,932	410	1.58	1,544,273	6,448	0.42
Southwest (18)	154,764	2,079	1.34	167,362	2,545	1.52	23,822	316	1.33	1,574,259	4,909	0.31
Rocky Mt. (19)	95,866	1,171	1.22	132,102	1,516	1.15	15,065	181	1.20	959,415	2,257	0.24
Northwest (20)	143,215	1,639	1.14	181,076	2,220	1.23	24,296	311	1.28	1,488,150	3,730	0.25
Sierra Pacific (21)	149,020	1,689	1.13	214,370	1,717	0.80	19,163	191	1.00	1,630,530	3,018	0.19
Desert Pacific (22)	178,204	2,755	1.55	231,584	2,659	1.15	25,132	283	1.13	2,119,773	9,941	0.47
National	3,314,672	50,372	1.52	5,687,535	79,625	1.40	544,201	7,147	1.31	35,314,892	120,158	0.34

Table 14.5:
Resource Utilization for Treatment of Stroke Compared to Overall Utilization by the Stroke Cohort (Primary Diagnosis Group), FY-2000

Veterans Integrated Service Network (VISN)	Total Patients	Total Patients Stroke		Bed Days of Care			Discharges			Outpatient Visits		
				Total	Stroke		Total	Stroke		Total	Stroke	
	N	N	%	N	N	%	N	N	%	N	N	%
New England (1)	158,204	2,286	1.44	12,991	2,599	20.01	1,333	257	19.28	52,425	3,987	7.61
Upstate NY (2)	100,499	1,170	1.16	7,651	2,174	28.41	710	181	25.49	28,989	2,873	9.91
NY/NJ (3)	166,593	2,740	1.64	19,436	3,657	18.82	1,539	273	17.74	68,656	8,965	13.06
Stars and Stripes (4)	202,472	2,731	1.35	12,519	2,495	19.93	1,335	252	18.88	54,343	8,078	14.86
Capitol (5)	88,163	1,844	2.09	16,057	3,060	19.06	1,338	269	20.10	37,392	3,424	9.16
Mid-Atlantic (6)	161,081	2,557	1.59	23,091	7,170	31.05	1,956	450	23.01	44,511	4,202	9.44
Atlantic (7)	201,514	3,481	1.73	25,728	6,103	23.72	2,055	454	22.09	62,028	8,159	13.15
Sunshine (8)	308,906	4,748	1.54	34,763	7,290	20.97	2,882	578	20.06	92,506	9,444	10.21
Mid-South (9)	165,501	2,397	1.45	20,880	5,034	24.11	2,115	438	20.71	41,049	4,795	11.68
Ohio (10)	117,463	2,098	1.79	14,472	2,486	17.18	1,274	215	16.88	43,403	5,374	12.38
Vets in Partnership (11)	142,393	2,465	1.73	16,283	2,321	14.25	1,600	246	15.38	47,010	5,309	11.29
Great Lakes (12)	142,079	2,411	1.70	20,285	3,776	18.61	1,926	348	18.07	54,998	5,272	9.59
Upper Midwest (13)	96,279	634	0.66	5,093	1,298	25.49	637	170	26.69	12,215	695	5.69
Central Plains (14)	73,699	820	1.11	3,970	717	18.06	521	111	21.31	17,474	1,589	9.09
Heartland (15)	148,229	2,406	1.62	12,349	3,182	25.77	1,547	374	24.18	40,205	4,359	10.84
South Central (16)	294,286	6,576	2.23	47,506	10,834	22.81	4,121	839	20.36	111,293	13,330	11.98
Heart of Texas (17)	151,601	2,639	1.74	17,118	4,772	27.88	1,673	410	24.51	52,557	6,448	12.27
Southwest (18)	154,764	2,079	1.34	10,065	2,545	25.29	1,348	316	23.44	42,338	4,909	11.59
Rocky Mt. (19)	95,866	1,171	1.22	7,478	1,516	20.27	808	181	22.40	23,333	2,257	9.67
Northwest (20)	143,215	1,639	1.14	9,923	2,220	22.37	1,205	311	25.81	32,798	3,730	11.37
Sierra Pacific (21)	149,020	1,689	1.13	8,378	1,717	20.49	846	191	22.58	34,322	3,018	8.79
Desert Pacific (22)	178,204	2,755	1.55	15,691	2,659	16.95	1,591	283	17.79	68,203	9,941	14.58
National	3,314,672	50,372	1.52	361,727	79,625	22.01	34,360	7,147	20.80	1,062,048	120,158	11.31

Table 14.6: FY00 Cost of Stroke (Primary Diagnosis)										
Veterans Integrated Service Network	No. of Patients	Outpatient		Inpatient Med/Surg		Inpatient Other		Pharmacy		Total
		$	%	$	%	$	%	$	%	$
New England (1)	2,294	10,615,570	30.28%	15,955,436	45.51%	5,741,995	16.38%	2,749,123	7.84%	35,062,124
Upstate NY (2)	1,179	5,413,809	27.41%	8,480,651	42.94%	4,210,370	21.32%	1,646,554	8.34%	19,751,384
NY/NJ (3)	2,744	13,395,879	26.03%	22,495,983	43.71%	11,618,000	22.57%	3,960,000	7.69%	51,469,862
Stars and Stripes (4)	2,736	8,591,058	22.18%	16,123,195	41.63%	9,334,043	24.10%	4,682,676	12.09%	38,730,971
Capitol (5)	1,849	7,175,159	22.43%	16,385,363	51.23%	6,505,443	20.34%	1,918,483	6.00%	31,984,447
Mid-Atlantic (6)	2,569	7,569,679	19.30%	19,394,962	49.44%	8,818,726	22.48%	3,447,066	8.79%	39,230,433
Atlantic (7)	3,490	11,881,015	23.17%	23,480,168	45.79%	11,432,328	22.30%	4,483,151	8.74%	51,276,662
Sunshine (8)	4,773	16,590,183	25.14%	25,639,732	38.85%	17,360,110	26.30%	6,413,202	9.72%	66,003,228
Mid-South (9)	2,406	7,701,084	19.71%	20,646,516	52.85%	7,524,504	19.26%	3,190,574	8.17%	39,062,678
Ohio (10)	2,102	7,113,901	22.75%	12,295,594	39.32%	9,660,983	30.90%	2,196,722	7.03%	31,267,200
Vets in Partnership (11)	2,475	10,862,642	25.80%	15,357,687	36.47%	11,804,946	28.04%	4,079,468	9.69%	42,104,742
Great Lakes (12)	2,420	10,084,142	24.90%	18,043,653	44.56%	9,091,243	22.45%	3,276,075	8.09%	40,495,112
Upper Midwest (13)	637	2,041,966	15.54%	7,260,255	55.26%	3,089,976	23.52%	745,622	5.68%	13,137,820
Central Plains (14)	826	3,058,731	29.95%	4,186,175	40.99%	1,736,707	17.01%	1,231,004	12.05%	10,212,617
Heartland (15)	2,417	6,616,295	23.52%	13,290,439	47.25%	5,875,379	20.89%	2,346,665	8.34%	28,128,777
South Central (16)	6,595	22,362,764	23.15%	43,938,992	45.49%	19,682,337	20.38%	10,602,074	10.98%	96,586,166
Heart of Texas (17)	2,652	7,957,631	19.06%	21,165,538	50.70%	8,960,429	21.46%	3,665,784	8.78%	41,749,381
Southwest (18)	2,085	6,271,579	22.63%	14,246,513	51.40%	5,201,673	18.77%	1,994,975	7.20%	27,714,740
Rocky Mt. (19)	1,176	3,233,322	17.89%	9,180,791	50.81%	4,070,930	22.53%	1,584,576	8.77%	18,069,619
Northwest (20)	1,643	5,670,117	20.17%	13,030,365	46.36%	7,512,862	26.73%	1,895,200	6.74%	28,108,543
Sierra Pacific (21)	1,700	6,750,899	22.65%	11,476,043	38.51%	9,637,249	32.34%	1,939,262	6.51%	29,803,454
Desert Pacific (22)	2,764	11,786,894	24.34%	23,594,155	48.72%	9,747,631	20.13%	3,295,619	6.81%	48,424,299
National	53,532	192,744,318	23.27%	375,668,207	45.35%	188,617,861	22.77%	71,343,877	8.61%	828,374,262

Veterans Integrated Service Network	No. of Patients	Outpatient		Inpatient Med/Surg		Inpatient Other		Pharmacy		Total
		$	%	$	%	$	%	$	%	$
New England (1)	824	2,875,374	30.21%	4,358,836	45.79%	1,477,997	15.53%	806,002	8.47%	9,518,208
Upstate NY (2)	457	1,504,874	27.97%	1,990,616	36.99%	1,426,730	26.51%	458,969	8.53%	5,381,188
NY/NJ (3)	1,480	3,951,821	23.02%	8,088,912	47.12%	3,199,623	18.64%	1,925,758	11.22%	17,166,114
Stars and Stripes (4)	1,495	2,482,259	20.22%	4,960,192	40.41%	3,024,359	24.64%	1,808,918	14.74%	12,275,728
Capitol (5)	709	1,758,478	19.42%	4,772,164	52.71%	1,800,570	19.89%	721,557	7.97%	9,052,769
Mid-Atlantic (6)	790	2,126,328	19.19%	6,222,634	56.16%	1,738,066	15.69%	993,413	8.97%	11,080,441
Atlantic (7)	1,477	3,713,268	25.03%	7,080,705	47.74%	2,483,687	16.75%	1,554,680	10.48%	14,832,339
Sunshine (8)	2,305	5,257,033	26.97%	7,320,745	37.55%	4,262,428	21.86%	2,654,343	13.62%	19,494,550
Mid-South (9)	790	2,101,850	17.91%	6,402,823	54.55%	2,285,371	19.47%	947,121	8.07%	11,737,165
Ohio (10)	751	1,746,928	24.87%	2,900,116	41.28%	1,632,895	23.24%	744,815	10.60%	7,024,754
Vets in Partnership (11)	870	2,254,648	26.15%	3,306,705	38.35%	1,901,881	22.06%	1,159,819	13.45%	8,623,053
Great Lakes (12)	589	3,247,743	33.42%	4,184,242	43.05%	1,493,701	15.37%	793,694	8.17%	9,719,381
Upper Midwest (13)	240	609,879	15.26%	2,365,405	59.18%	700,555	17.53%	321,393	8.04%	3,997,232
Central Plains (14)	310	783,709	23.85%	1,643,216	50.01%	505,228	15.38%	353,462	10.76%	3,285,615
Heartland (15)	1,757	3,356,585	26.55%	5,874,816	46.47%	1,750,530	13.85%	1,660,175	13.13%	12,642,106
South Central (16)	3,637	7,238,809	25.96%	11,567,970	41.49%	4,137,526	14.84%	4,938,283	17.71%	27,882,588
Heart of Texas (17)	1,643	3,394,278	21.27%	7,510,526	47.05%	3,066,613	19.21%	1,990,257	12.47%	15,961,674
Southwest (18)	931	2,090,496	24.52%	4,321,107	50.67%	1,368,725	16.05%	746,883	8.76%	8,527,212
Rocky Mt. (19)	629	1,131,120	20.73%	2,912,520	53.38%	777,452	14.25%	635,195	11.64%	5,456,287
Northwest (20)	619	1,456,165	19.73%	3,929,684	53.25%	1,344,875	18.22%	649,423	8.80%	7,380,147
Sierra Pacific (21)	720	2,282,292	20.32%	4,502,556	40.08%	3,651,746	32.51%	796,161	7.09%	11,232,754
Desert Pacific (22)	995	2,908,957	24.29%	6,047,310	50.49%	1,744,402	14.56%	1,277,631	10.67%	11,978,300
National	24,018	58,272,894	23.86%	112,263,799	45.96%	45,774,963	18.74%	27,937,951	11.44%	244,249,605

Table 14.7:
FY00 Cost of Stroke (Secondary Diagnosis)

Map 14.1

Number of Patients

- No Patients
- 1 - 100
- 101 - 250
- 251 - 500
- Greater than 500
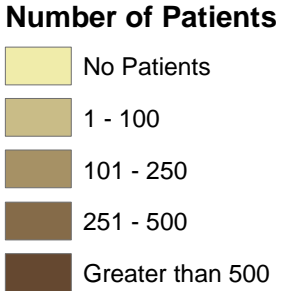
**Number of VA Patients with Stroke
by County FY-2000**

*VA Health Care Atlas
HSR&D SDR 01-175*

Source: VA Medical SAS Databases, FY-00

Created in ArcGIS 8 using ArcMap

Map 14.2

Alaska   *Pacific Ocean*
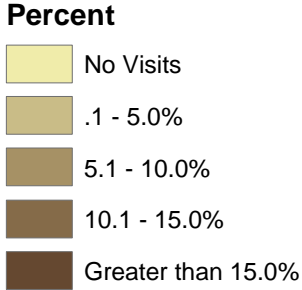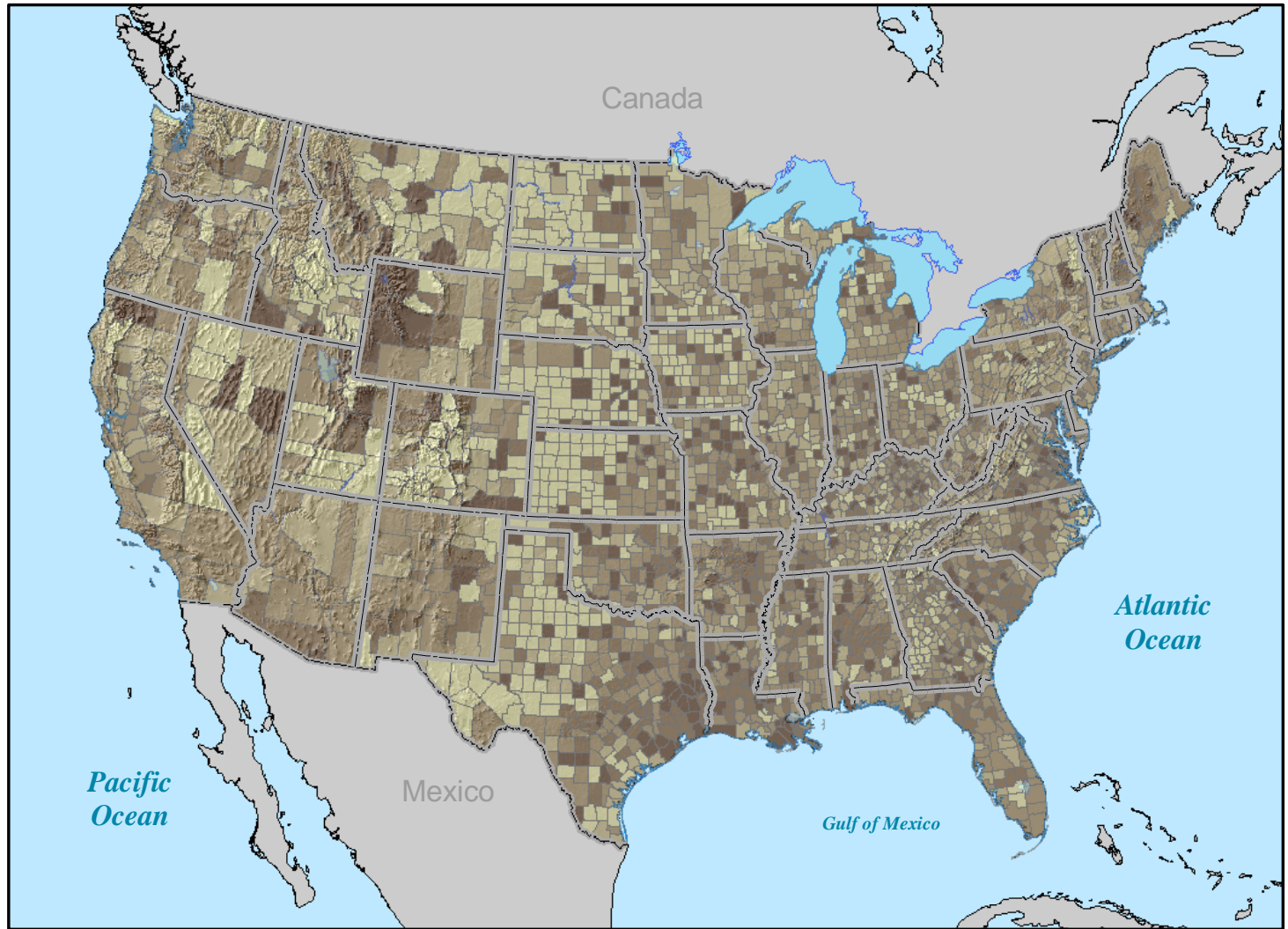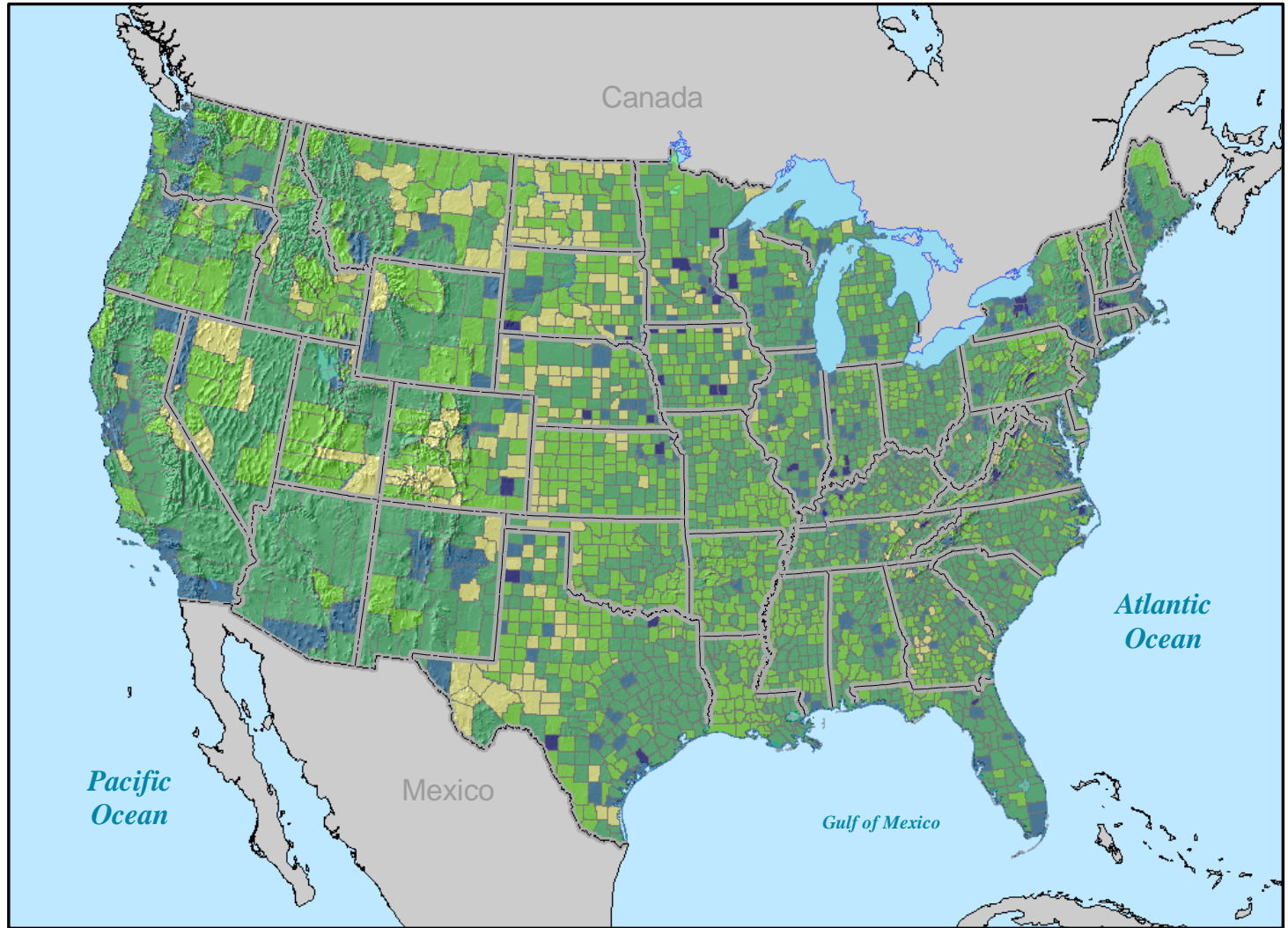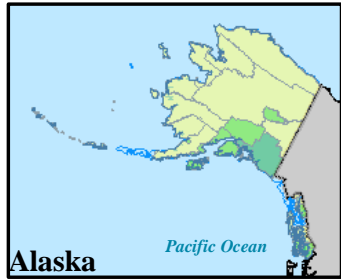
Pacific Ocean

Hawaii

Puerto Rico

Canada

Atlantic Ocean

Pacific Ocean

Mexico

Gulf of Mexico

Percent of Patients

No Patients

.1 - 5.0%

5.1 - 10.0%

10.1 - 15.0%

Greater than 15.0%

Percent of VA Patients with Stroke by County FY-2000

VA Health Care Atlas
HSR&D SDR 01-175

Source: VA Medical SAS Databases, FY-00

Created in ArcGIS 8 using ArcMap

Map 14.3

Alaska

Pacific Ocean

Hawaii

Pacific Ocean

Puerto Rico

Canada

Atlantic Ocean

Pacific Ocean

Mexico

Gulf of Mexico

Percent

- No Visits
- .1 - 5.0%
- 5.1 - 10.0%
- 10.1 - 15.0%
- Greater than 15.0%

Percent Disease-Specific Visits of Total Visits (Stroke) by County FY-2000

VA Health Care Atlas
HSR&D SDR 01-175

Source: VA Medical SAS Databases, FY-00

Created in ArcGIS 8 using ArcMap

Map 14.4

Percent

No Discharges

.1 - 5.0%

5.1 - 10.0%

10.1 - 15.0%

Greater than 15.0%

Canada

Pacific
Ocean

Mexico

Gulf of Mexico

Atlantic
Ocean

Pacific Ocean

Alaska

*Pacific
Ocean*

Hawaii

Puerto Rico

**Percent Disease-Specific Discharges of Total Discharges
(Stroke) by County FY-2000**

*VA Health Care Atlas
HSR&D SDR 01-175*

Source: VA Medical SAS Databases, FY-00

Created in ArcGIS 8 using ArcMap

Map 14.5

Canada

Alaska

Pacific Ocean

Hawaii

Pacific Ocean

Puerto Rico

Pacific Ocean

Mexico

Atlantic Ocean

Gulf of Mexico

Number

	No Visits
	.1 - 12.0
	12.1 - 24.0
	24.1 - 36.0
	More than 36.0

Average Number of Visits for Patients with Stroke by County FY-2000
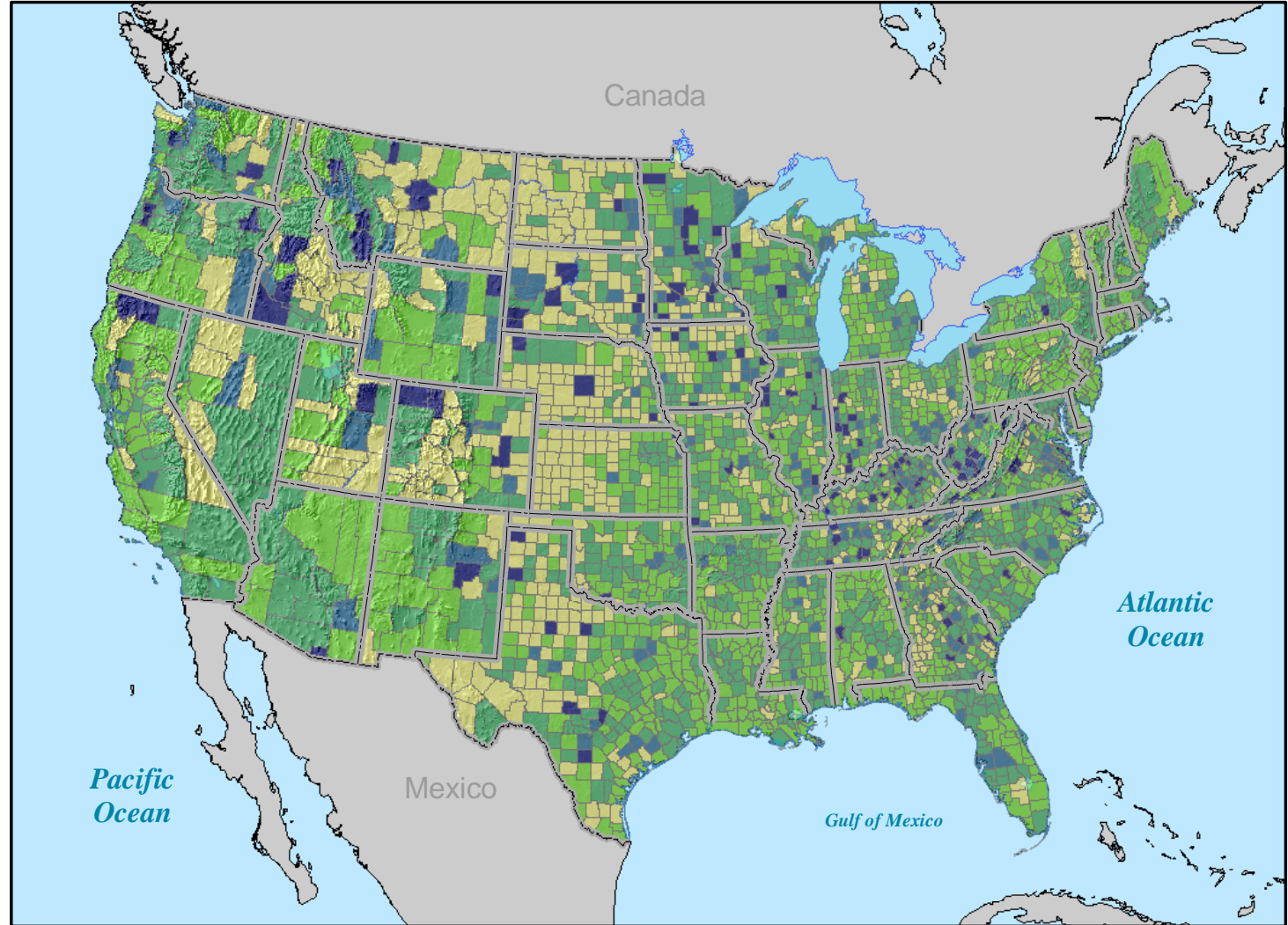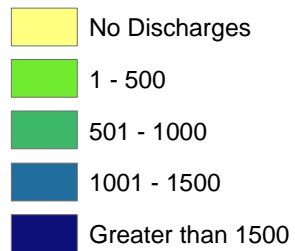
VA Health Care Atlas HSR&D SDR 01-175

Source: VA Medical SAS Databases, FY-00

Created in ArcGIS 8 using ArcMap

Map 14.6

Canada

Alaska
Pacific Ocean

Hawaii
Pacific Ocean

Puerto Rico

Atlantic Ocean

Pacific Ocean

Mexico

Gulf of Mexico

Number per 1,000

No Discharges

1 - 500

501 - 1000

1001 - 1500

Greater than 1500

Disease Specific Discharges per 1,000 Patients with Stroke by County FY-2000

VA Health Care Atlas
HSR&D SDR 01-175

Source: VA Medical SAS Databases, FY-00

Created in ArcGIS 8 using ArcMap

For More Information

Disability affects over 49 million Americans; over 7 percent of these individuals have disability related to brain dysfunction or neurological diseases. Disability-related costs total more than $170 billion per year and are expected to escalate with the aging of the population. The magnitude of the economic and social burden of disability related to diseases that affect the brain is exemplified by the number of acute stroke patients admitted to the Department of Veterans Affairs Medical Centers. Despite some recent advances in management of cute stroke (thrombolytic therapy) and brain trauma, there are not widely applicable therapies to reverse neurological damage. Therefore, it is essential that these patients receive the most appropriate rehabilitation care to enhance their recovery, minimize disability and improve quality of life. However, there are few studies that have evaluated the most cost-effective ways to organize and provide care or evaluate specific interventions to restore function and minimize disability.

Currently, there is not a Stroke QUERI, but Health Services Research and Development issued a request for applications to have one established in the near future. However, Stroke is the focus of the HSR&D/RR&D Center of Excellence in Gainesville, Florida. The Rehabilitation Outcomes Center (RORC) is directed by Pamela W. Duncan, Ph.D., an internationally and nationally known rehabilitation health services researcher. Researchers or other interested parties are encouraged to contact the RORC to learn more about VHA's current research foci and ongoing projects in the area of Stroke:

Pamela W. Duncan, Ph.D.
Research Service RORC (151B)
VA Medical Center
1601 SW Archer Road
Gainesville, FL 32608

Telephone: 352/376-1611 ext 6843
Fax: 352/271-4540
E-mail: pwduncan@hp.ufl.edu
Web Site: http://www.vard.org/rorc/index.html

Research Focus and Activities

RORC investigators are working on projects to:

- Examine population level effects of stroke rehabilitation services
- Evaluate the relationships between structure, process and outcomes of stroke rehabilitation
- Assess utilization of community-based nursing homes for rehabilitation
- Use VA databases to assess disability states and associated health care utilization patterns
- Develop new stroke-specific outcomes measures and assess different methods of acquiring outcomes data
- Describe stroke recovery and the influences of ethnic diversity
- Determine the appropriateness and cost-effectiveness of assistive technology for homebound veterans

A major focus of work is developing an Integrated Stroke Outcomes Database (ISOD) that links administrative and clinical data on stroke patients in VHA. This database will be a key resource for VA quality improvement initiatives, rational planning for rehabilitation services, research, and training and dissemination activities.

Some of the interesting projects ongoing at the RORC include:

- *Measuring Health Related Quality of Life of Veterans with Stroke*
- *Coordination of Hemiparetic Movement after Post-Stroke Rehabilitation*
- *Culturally Sensitive Models of Stroke Recovery and Caregiving After Discharge Home*
- *Optimal Locations for VA Traumatic Brain Injury Treatment Programs*
- *Constraint Induced Therapy: Patient and Caregiver Experiences*
- *Assessment of the National Prosthetics Patient Database: Preliminary Studies of Validity*
- *Developing Risk Adjustment Models for Stroke Rehabilitation Outcomes*
- *Low ADL Monitoring Program (LAMP). Combining Traditional and Advanced Technologies to Promote Independence for Veterans with Activities of Daily Living (ADL) Dependence.*
- *Development of SCI Mobility Measures: A Collaborative Effort*
- *Investigating Patient-Specific Cost Estimates for VA Rehabilitation Patients*