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Progress Toward Eliminating *Haemophilus influenzae* Type b Disease Among Infants and Children — United States, 1987–1997

Haemophilus influenzae type b (Hib) causes serious invasive diseases among previously healthy children aged <5 years. Before the availability of conjugate vaccines in 1988, Hib was the most common cause of bacterial meningitis among preschool-aged children (*1,2*). Since 1993, the incidence of Hib invasive disease (defined as illness clinically compatible with invasive disease such as meningitis or sepsis, with isolation of the bacterium from a normally sterile site) among children aged <5 years has declined >95% in the United States (*3*). This report describes the continued decline of reported Hib invasive disease cases and underscores the need for investigation of *Haemophilus influenzae* (Hi) invasive disease cases.

National Surveillance

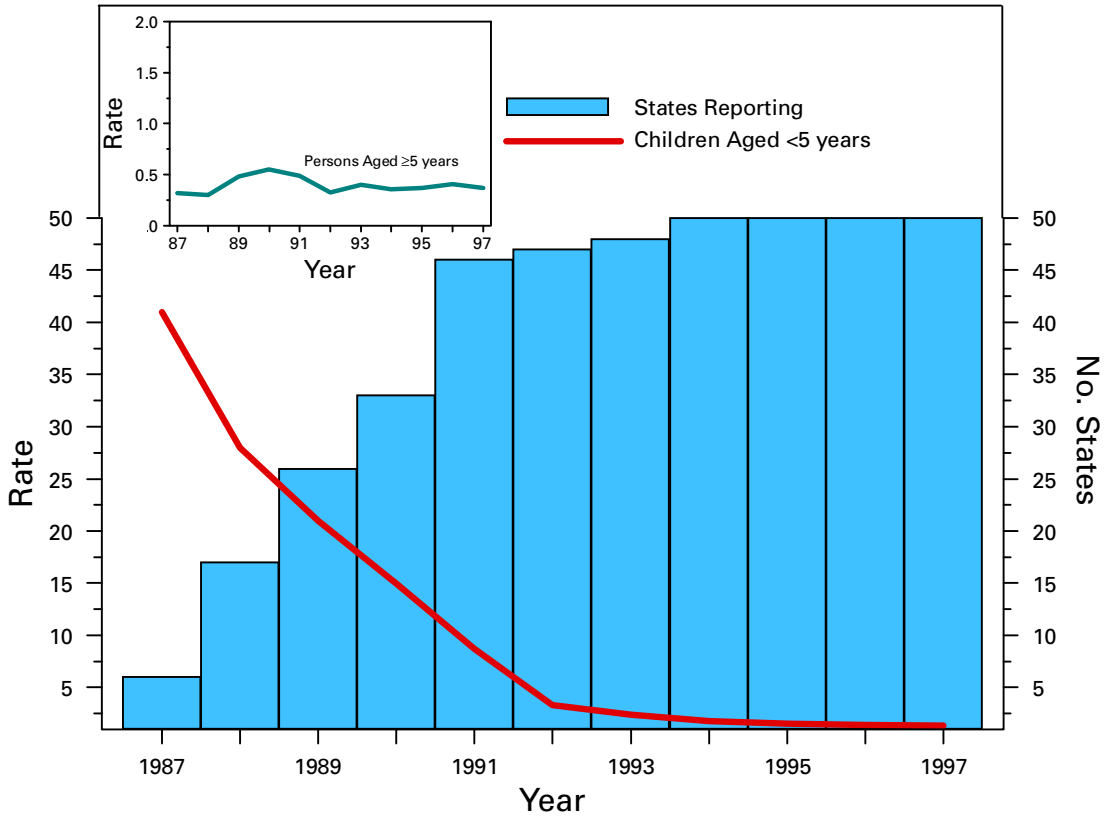
State health agencies and the District of Columbia provide weekly reports of provisional cases of Hi invasive disease to CDC through the National Electronic Telecommunications System for Surveillance (NETSS) (*4*). Case reports include basic demographic data about persons with Hi invasive disease, and supplemental information (e.g., the serotype that caused illness, clinical illness, outcome, and Hib vaccination status). For 1996 and 1997, all states were contacted approximately every 2 months to obtain supplemental information about cases of Hi invasive disease in children aged <5 years. Hi cases identified by the active laboratory-based surveillance system also are reported to CDC through NETSS or the National Bacterial Meningitis and Bacteremia Reporting System. Reported Hib vaccination doses were considered valid if administration dates were available and if they were given ≥14 days before illness onset. Rates were calculated using 1996 census data.

Among children aged <5 years, 280 cases of Hi invasive disease were reported in 1996 (incidence: 1.5 per 100,000 children), and 258 cases were reported in 1997 (incidence: 1.3 per 100,000 children). Incidence in 1996 and 1997 represented a decline of 97% from 1987 (41 per 100,000). From 1987 through 1997, the incidence of Hi disease varied slightly among persons aged ≥5 years (range: 0.3–0.6 per 100,000) (Figure 1).

For children aged <5 years, serotype data were available for 200 (71%) of 280 cases in 1996 and for 200 (78%) of 258 cases in 1997. Of the cases for which serotype was known, in 1996, Hib was the cause of illness in 63 (32%) cases, and in 1997, in 81 (41%) cases. By state, excluding Alaska, the average annual incidence of Hib invasive

Haemophilus influenzae — *Continued*

FIGURE 1. Incidence* of *Haemophilus influenzae* (Hi) invasive disease among children aged <5 years, incidence† of Hi invasive disease among persons aged ≥5 years, and number of states reporting Hi surveillance data — United States, 1987–1997§



*Per 100,000 children aged <5 years.
†Per 100,000 persons aged ≥5 years.
§Because of the low number of states reporting surveillance data during 1987–1990, rates for those years were race-adjusted using the 1990 U.S. population.

disease during 1996–1997 ranged from 0 to 2.9 per 100,000 children aged <5 years; in Alaska, the incidence was 15.1 per 100,000 children (Table 1). The incidence of nontype b Hi disease ranged from 0 to 3.7 (national rate: 0.7 per 100,000).

During 1996–1997, the average annual incidence of Hib invasive disease per 100,000 children aged <5 years varied by race/ethnicity: 0.5 among non-Hispanic whites, 0.7 among non-Hispanic blacks, 12.4 among American Indians/Alaskan Natives, 0.6 among Asians/Pacific Islanders, and 0.7 among Hispanics. Race/ethnicity data were missing for 12 (8%) children.

Active Laboratory-Based Surveillance in Selected Areas

Population-based surveillance for Hi invasive disease is part of a multistate active surveillance project coordinated by CDC. From 1989 through 1997, CDC collaborated with investigators in state and local health departments and universities in several geographically dispersed areas of the United States, with a median population of 1,060,505 children aged <5 years (range: 750,534 in 1989 to 1,605,777 in 1997). During 1989–1991, surveillance was conducted in eight Atlanta area counties, three San

Haemophilus influenzae — *Continued*

TABLE 1. Number and incidence* of *Haemophilus influenzae* (Hi) invasive disease among children aged <5 years†, by state and serotype — United States, 1996–1997

	Type b		Unknown		Nontype b§	
State	**No.**	**(Incidence)**	**No.**	**(Incidence)**	**No.**	**(Incidence)**
Alabama	0	(0.0)	2	(0.3)	5	(0.8)
Alaska	15	(15.1)	1	(1.0)	0	(0.0)
Arizona	6	(0.9)	2	(0.3)	20	(2.9)
Arkansas	1	(0.3)	0	(0.0)	0	(0.0)
California	16	(0.3)	19	(0.4)	51	(0.9)
Colorado	5	(0.9)	0	(0.0)	6	(1.1)
Connecticut	1	(0.2)	2	(0.4)	7	(1.6)
Delaware	1	(1.0)	0	(0.0)	0	(0.0)
District of Columbia	0	(0.0)	0	(0.0)	0	(0.0)
Florida	9	(0.5)	16	(0.8)	5	(0.3)
Georgia	5	(0.5)	6	(0.5)	14	(1.3)
Hawaii	1	(0.6)	1	(0.6)	1	(0.6)
Idaho	0	(0.0)	0	(0.0)	0	(0.0)
Illinois	12	(0.7)	4	(0.2)	11	(0.6)
Indiana	1	(0.1)	3	(0.4)	7	(0.9)
Iowa	1	(0.3)	0	(0.0)	2	(0.6)
Kansas	1	(0.3)	0	(0.0)	0	(0.0)
Kentucky	2	(0.4)	0	(0.0)	0	(0.0)
Louisiana	1	(0.2)	1	(0.2)	4	(0.6)
Maine	0	(0.0)	1	(0.7)	0	(0.0)
Maryland	7	(1.0)	3	(0.4)	10	(1.4)
Massachusetts	4	(0.5)	0	(0.0)	12	(1.5)
Michigan	4	(0.3)	1	(0.1)	4	(0.3)
Minnesota	4	(0.6)	3	(0.5)	11	(1.7)
Mississippi	0	(0.0)	0	(0.0)	0	(0.0)
Missouri	1	(0.1)	0	(0.0)	3	(0.4)
Montana	0	(0.0)	0	(0.0)	2	(1.8)
Nebraska	0	(0.0)	1	(0.4)	0	(0.0)
Nevada	0	(0.0)	1	(0.4)	0	(0.0)
New Hampshire	2	(1.3)	1	(0.7)	2	(1.3)
New Jersey	2	(0.2)	13	(1.1)	3	(0.3)
New Mexico	2	(0.7)	1	(0.4)	10	(3.7)
New York	3	(0.2)	3	(0.2)	12	(0.8)
New York City	6	(0.5)	2	(0.2)	10	(0.9)
North Carolina	2	(0.2)	7	(0.7)	2	(0.2)
North Dakota	0	(0.0)	0	(0.0)	0	(0.0)
Ohio	6	(0.4)	15	(1.0)	3	(0.2)
Oklahoma	1	(0.2)	3	(0.7)	7	(1.5)
Oregon	0	(0.0)	0	(0.0)	6	(1.4)
Pennsylvania	4	(0.3)	1	(0.1)	6	(0.4)
Rhode Island	1	(0.8)	0	(0.0)	1	(0.8)
South Carolina	1	(0.2)	1	(0.2)	0	(0.0)
South Dakota	3	(2.9)	1	(1.0)	0	(0.0)
Tennessee	1	(0.1)	12	(1.7)	3	(0.4)
Texas	7	(0.2)	0	(0.0)	2	(0.1)
Utah	1	(0.3)	0	(0.0)	3	(0.8)
Vermont	1	(1.4)	0	(0.0)	0	(0.0)
Virginia	0	(0.0)	6	(0.6)	1	(0.1)
Washington	1	(0.1)	4	(0.5)	3	(0.4)
West Virginia	0	(0.0)	1	(0.5)	0	(0.0)
Wisconsin	1	(0.2)	0	(0.0)	7	(1.0)
Wyoming	1	(1.6)	0	(0.0)	0	(0.0)
Total	**144**	**(0.4)**	**138**	**(0.3)**	**256**	**(0.7)**

*Per 100,000 population. 1996 census data were used to calculate average annual incidence.
†Number of cases during the 2-year period.
§Includes serotypes a, c, d, e, and f and non-typeable isolates.

Haemophilus influenzae — *Continued*

Francisco Bay area counties, four urban counties in Tennessee, and the entire state of Oklahoma. In 1992, Maryland was added. Missouri participated during 1992–1993. In 1995, a county in Tennessee was added, and Oklahoma discontinued participation. In 1996, Connecticut and Oregon and seven counties in Minnesota were added. In 1997, active surveillance in Georgia expanded to 20 counties, and surveillance in Minnesota expanded to the entire state. Information routinely obtained for cases of Hi invasive disease was similar to that collected by the national surveillance systems. Rates were calculated using census projections from 1989 through 1996 and were race-adjusted to the U.S. population (*3*).

From 1989 to 1997, the race-adjusted incidence of Hib invasive disease among children aged <5 years declined 99%, from 34 to 0.4 per 100,000. During 1996–1997, 79 cases of Hi invasive disease were reported among children aged <5 years. Of these, 14 (18%) were caused by Hib; 48 (61%), by nontype b Hi; and 17 (22%), by unknown serotypes. From 1989 to 1997, the median race-adjusted incidence of nontype b Hi invasive disease was 1.6 per 100,000 children (range: 1.1 to 3.8 per 100,000); the median incidence was higher among blacks (3.2) than among all others (1.4).

Vaccination History of Children with Hib Invasive Disease in 1996 and 1997

Of the 144 children with confirmed Hib invasive disease who were reported to CDC through national surveillance, 69 (48%) were aged <6 months and therefore were too young to have completed a three-dose primary Hib vaccination series (Table 2), and 75 (52%) children were eligible to have completed a primary series (aged ≥6 months). Of the 75 children, 48 (64%) were incompletely vaccinated or vaccination status was unknown, and 27 children had completed a primary series; 14 children also had received a booster dose. Five (4%) of 115 children with known outcome and Hib invasive disease died; the deceased children were aged <6 months and had received one or no Hib vaccine doses.

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TABLE 2. *Haemophilus influenzae* type b vaccination status of children aged <5 years who had *Haemophilus influenzae* type b (Hib) invasive disease, by age group — United States, 1996–1997*

Age (mos)	Total	Unknown vaccination status	No. of doses†				
			0	1	2	3	4
0– 1	**25**	1	24	—	—	—	—
2– 3	**23**	3	9	11	—	—	—
4– 5	**21**	3	3	10	5	—	—
6–11	**27**	7	6	3	6	5	—
12–59	**48**	14	8	3	1	10	12
Total	**144**	**28**	**50**	**27**	**12**	**15**	**12**

*Number of cases during the 2-year period.
†A primary series was completed by 27 children; 25 received a three-dose series and two received a two-dose series.

Haemophilus influenzae — *Continued*

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Editorial Note: Since 1988, when Hib conjugate vaccines were first licensed for children aged 18–59 months in the United States, with subsequent licensure in 1990 and widespread use in infants, the number of reported Hib invasive disease cases among children aged <5 years has declined 99%. However, surveillance data indicate that circulation of Hib continued and that some children remained susceptible to disease; susceptible children include those who do not respond or are too young to complete the primary series of Hib vaccination and those who are unvaccinated or undervaccinated. In the 1997 National Immunization Survey of children aged 19–35 months, the coverage level for receipt of three Hib vaccine doses by age 7 months was 61% (CDC, unpublished data, 1997); by age 24 months, coverage for three doses reached 93% (*5*). High coverage levels will help protect susceptible children in the community by herd immunity (i.e., by less frequent exposure to pharyngeal carriers of the organism) (*6*).

The small number of reported Hib cases among children who had completed a primary Hib vaccine series suggests that vaccine failure occurs infrequently. However, vaccination history was known for only 54 (72%) of the 75 Hib case-patients aged ≥6 months. Vaccination history is needed to determine whether Hib invasive disease results from vaccine failure or failure to vaccinate. Protection induced by vaccination is not absolute, and cases will continue to occur as long as the Hib organism circulates in populations.

Serotype information for Hi invasive disease cases is essential to monitor progress toward elimination. This information also is needed to monitor nontype b Hi invasive disease to determine whether there is an increase in invasive disease with another serotype or with nontypeable strains, and to measure the sensitivity of the surveillance system. In 1997, information about serotype had been reported for 78% of 258 cases, compared with 41% of 340 cases in 1994 (*3*). State health departments are encouraged to promote laboratory reporting of Hi cases and to identify laboratories that can perform serotyping on Hi isolates from children aged <15 years with invasive disease; if serotyping is not available, state health departments can contact CDC.

To strengthen national surveillance, the incidence of nontype b Hi invasive disease among children aged <5 years can be used to monitor the sensitivity of reporting; Hi invasive disease caused by any serotype and nontypeable strains, in addition to type b strains, is nationally notifiable (*7*). Although Hi invasive disease rates may vary by racial/ethnic groups, as was the case in the prevaccine era (*1–3,8*), the incidence of nontype b Hi invasive disease will occur within an expected range. For example, in California, the two regions of the state with active, laboratory-based surveillance had an incidence rate of nontype b Hi invasive disease of 1.5 per 100,000 children aged <5 years (*8*). In 1996 and 1997, 24 states reported annual rates of ≥0.5 nontype b Hi invasive disease cases per 100,000 children aged <5 years.

Age-appropriate vaccination starting at age 2 months continues to be the most important method to protect children from Hib invasive disease. Health-care providers

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should emphasize to parents the importance of vaccinating children against Hib invasive disease (*9*).

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Health Worker Performance After Training in Integrated Management of Childhood Illness — Western Province, Kenya, 1996–1997

Each year, approximately 12 million children die in developing countries before age 5 years; 70% of these deaths are caused by respiratory infections, diarrhea, malaria, measles, and malnutrition, alone or in combination (*1*). In 1994, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) developed the Integrated Management of Childhood Illness (IMCI) guidelines, which call for nonphysician health workers (HWs) to evaluate every sick child presenting to a first-level health facility (HF) for each of these conditions, regardless of the child's presenting complaint(s). Even though IMCI is being incorporated into the national health-care programs of many developing countries, little is known about HW performance after IMCI training. To measure the level of performance achieved and maintained by IMCI-trained HWs, during 1996–1997 CDC, the Kenya-Finland Primary Health Care Program, and the Ministry of Health of Kenya prospectively evaluated the level of performance achieved by IMCI-trained HWs at the end of training (EOT) and the level of performance maintained during the first 3 months post-training (1–3MPT) with monthly or bimonthly clinical supervision. This report summarizes the results of this evaluation, which indicate that HWs achieved reasonably high performance levels managing ill children with mild and moderate disease classifications but performed at a much lower level when managing severely ill children at EOT.

Health Worker Performance — Continued

The IMCI algorithm follows four main steps. First, the HW assesses for signs that indicate the child is severely ill and needs referral and asks whether the child has a cough or difficult breathing, diarrhea, fever, or an ear problem. A more detailed assessment is performed if any of these symptoms are present. Children are assessed for signs of malnutrition and anemia, and their vaccination status is checked. Second, the child is classified according to the assessment findings. IMCI classifications are organized into three categories of illness severity: severe, moderate, and mild. Third, the child is treated and, fourth, his caretaker is counseled.

During the evaluation and monitoring of HW performance, supervisors used observation checklists to record the care provided to sick children aged 2–59 months, then reassessed the children to evaluate the accuracy of HWs' classifications. After the reassessment of each child, the supervisors provided immediate, individual feedback to the HWs on their performance.

Overall performance scores were developed that gave equal weight to each assessment task, classification, treatment, or counseling message. Assessment and counseling performance scores were calculated by dividing the total number of tasks or messages required and completed for each child by the total number required. Classification and treatment scores were calculated by dividing the number of correct classifications made or treatments given by the number that should have been made or given. Correct classifications were based on signs and symptoms recorded by supervisors during their reassessment of the child. The principal performance scores were measures of sensitivity rather than specificity for two reasons: a child is likely to suffer more from the omission of treatments that should have been given than from the provision of treatments not required by the IMCI guidelines, and treatments not required by the guidelines may have been for diseases not covered by the guidelines.

A total of 478 children were observed during the EOT evaluation, and 307 children were observed during supervisory visits 1–3MPT. Because feedback was given to the HW after each child seen, only the first child seen during each supervisory visit (n=117) was included in the analysis of HW performance. Because fewer children were seen with severe classifications than with moderate or mild classifications, all children with severe classifications observed during supervisory visits were included in the analysis to ensure an adequate sample size of severe disease classifications.

In general, performance levels reached at EOT were maintained 1–3MPT. Overall scores for the completion of assessment tasks were 81% (8781 of 10,896) at EOT and 75% (1988 of 2662) at 1–3MPT. Overall classification scores were 79% (1535 of 1939) at EOT and 78% (394 of 505) at 1–3MPT. Overall treatment scores were 72% (680 of 951) at EOT and 67% (172 of 258) at 1–3MPT, and overall scores for counseling during these periods were 69% (3480 of 5069) and 67% (829 of 1237). Overall classification and treatment scores primarily reflect performance classifying and treating the more common moderate and mild disease classifications. Performance scores for the classification and treatment of severe disease were much lower (Table 1): only 31% of children's illnesses were correctly classified and 32% correctly treated at EOT and 24% correctly classified and 26% correctly treated at 1–3MPT. HW performance classifying and treating two potentially life-threatening moderate diseases (i.e., pneumonia and anemia) show declining trends.

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Health Worker Performance — Continued

TABLE 1. Number of cases of illnesses and percentage of illnesses correctly classified and treated by health workers trained in the Integrated Management of Childhood Illness (IMCI) guidelines at end of training (EOT) and 1–3 months post-training (1–3MPT) — Bungoma and Vihiga Districts, Kenya, 1996–1997*

	Correctly classified				Correctly treated†			
	EOT		1–3MPT		EOT		1–3MPT	
Classification	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Severe								
All severe classifications§	173	(31)	72	(24)	173	(32)	74	(26)
Severe pneumonia or very severe disease	71	(45)	25	(32)	71	(38)	25	(48)
Very severe febrile disease	48	(23)	24	(13)	48	(31)	24	(8)
Severe malnutrition	36	(19)	17	(18)	36	(11)	17	(6)
Moderate								
All moderate classifications§	677	(85)¶	156	(83)	656	(84)	152	(85)
Pneumonia	115	(90)	27	(78)	115	(88)	27	(67)
Malaria	384	(96)	96	(96)	384	(95)	96	(99)
Acute ear infection	32	(28)	7	(43)	32	(63)	7	(86)
Anemia	80	(73)	16	(56)	80	(54)	16	(38)
Mild								
All mild classifications§	1089	(83)	277	(90)				
No pneumonia, cough or cold	151	(69)	39	(77)			¶	
No dehydration	122	(80)	32	(88)	122	(61)	32	(75)
No anemia	391	(91)	98	(95)			¶	
Not very low weight	425	(82)	108	(90)			¶	

*Percentages and numbers refer to classifications. Each child may have multiple classifications.
†Correct medication prescribed (not including dosage) and child referred if indicated.
§Categories of severe and moderate disease, which include <7 cases seen are not listed individually but are included in the analysis of all classifications correctly classified and treated. Severe disease classifications from all children seen during each supervisory visit are included. Moderate and mild disease classifications from only the first child seen each supervisory visit are included.
¶Children with the moderate classification of very low weight or the mild classifications other than measles or no dehydration received only symptomatic treatment and counseling.

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Editorial Note: In this evaluation, HWs performed well overall at EOT in completing assessment tasks and in classifying and treating moderate disease, but performed poorly classifying and treating severe disease. With clinical supervision, performance levels during 1–3MPT were generally maintained at the level achieved by EOT. Further investigation is necessary to determine why HWs perform poorly in classifying and treating severe disease and to modify training and clinical supervision to improve HWs' performance. Further investigation also is needed to evaluate how HWs perform using IMCI when they are not being observed. Because HWs are observed managing only three children during each supervisory visit, HWs may demonstrate more accurate adherence to the IMCI guidelines than when working under greater time pressure. Consequently, performance scores may differ when measured by alternative methods, such as surveys in which HWs are evaluated throughout an entire day,

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or reviews of medical records that capture HWs assessment findings and management plans.

Since the early 1980s, symptom-specific algorithms and training programs developed by WHO have been incorporated into the national health programs of many developing countries. Training courses in symptom-specific programs have become one of the principal means for improving HW performance after basic training. However, a review of HF surveys conducted in 28 countries with national training programs in the control of diarrheal diseases indicated that a median of only 16% of cases were correctly assessed, and a median of only 20% of children were correctly rehydrated (*2*). A 1994 survey in Bungoma and Vihiga Districts of Kenya indicated that HWs trained in the control of diarrheal diseases performed at the same level as HWs not trained (CDC, unpublished data, 1994). Because most training programs do not evaluate the level of performance achieved by HWs at EOT and then measure performance after training, it is unknown whether HWs perform poorly after training because they do not reach a satisfactory level of performance by the EOT, or if they attain a satisfactory level by the EOT but are unable to maintain it after returning to their HFs.

The introduction of IMCI guidelines is expected to improve HWs' performance and, as a result, substantially reduce childhood mortality (WHO, unpublished data, 1997). Like symptom-specific programs, IMCI provides guidelines to HWs with little previous clinical training in classifying and treating children. A major advantage of IMCI over the symptom-specific programs is that IMCI requires the HW to assess the child for all main symptoms regardless of the child's presenting complaint.

The approach to training and supervision used in western Kenya allowed supervisors to monitor HW performance levels, identify and provide immediate feedback on the performance of individual HWs, and identify problems associated with inadequate skill levels at EOT or failure to maintain or apply skills after training. This approach should be considered in other countries where IMCI is being implemented.

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Virologic Surveillance and Progress Toward Poliomyelitis Eradication — Eastern Mediterranean Region, 1995–September 1998

In 1988, the Regional Committee of the Eastern Mediterranean Region (EMR)* of the World Health Organization (WHO) resolved to eliminate poliomyelitis by 2000. Substantial progress toward polio eradication has been achieved in the region (*1*). Surveillance for cases of acute flaccid paralysis (AFP) and examination of stool specimens from AFP cases for the presence of poliovirus provide critical data to target supplemental vaccination activities. This report summarizes the progress in AFP and poliovirus surveillance in EMR from 1995 through September 1998 and highlights the

*Member countries are Afghanistan, Bahrain, Cyprus, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen.

Poliomyelitis Eradication — Continued

importance of virologic investigations to determine whether viruses isolated represent indigenous transmission, importations, or laboratory contamination.

Laboratory Network

WHO has established a global laboratory network to support national polio eradication programs (*2*). Twelve laboratories constitute the regional network in EMR. National poliovirus laboratories (NPLs) in Iran, Iraq, Jordan, Morocco, Oman, Saudi Arabia, Sudan, and Syria process stool specimens from AFP cases to isolate and serotype poliovirus. Regional reference laboratories in Egypt, Kuwait, Pakistan, and Tunisia confirm the serotype of poliovirus isolated by NPLs and determine whether viruses are wild or vaccine-derived. Laboratory performance is monitored through programs of annual accreditation and proficiency testing. Nine of 12 network laboratories are accredited by WHO, and one laboratory was accredited provisionally pending improvement in timeliness of reporting; results from two nonaccredited laboratories are cross-checked by other accredited network laboratories. Ten network laboratories attained scores of ≥80% in the most recent proficiency test, and staff of the two laboratories that performed poorly have been retrained.

Circulation of Poliovirus

Approximately 3000 AFP cases were reported in EMR in 1997. From 1995 through June 1998, the nonpolio AFP rate has increased from 0.5 to 0.8 (per 100,000 children aged <15 years). At least one stool specimen has been collected from >80% of reported AFP cases, and "adequate stool specimens" (i.e., two stool samples collected at least 24 hours apart and within 14 days of paralysis onset) have been collected from 50% to 70% of all AFP cases reported (Table 1) since 1995. During this period no wild polioviruses were detected in Bahrain, Djibouti, Jordan, Kuwait, Lebanon, Libya,

TABLE 1. Cumulative data for indicators of field and laboratory performance in acute flaccid paralysis (AFP) surveillance — Eastern Mediterranean Region, 1995–June 30, 1998

Indicator	1995	1996	1997	1998
No. AFP cases	1727	1779	2878	831
Nonpolio AFP reporting rate*	0.5	0.7	0.9	0.8
Percentage of AFP cases with virologic investigation performed	73%	92%	84%	98%
Percentage of reported AFP cases with adequate stool samples† collected	43%	63%	53%	69%
Total no. stool samples received from AFP cases and contacts	4243	4281	5335	2115
Percentage of total samples received within 3 days after collection	54%	41%	46%	55%
Percentage of total samples received in good condition§	93%	94%	91%	92%
Percentage of total samples reported within 28 days	44%	46%	74%	75%
Percentage of total samples with nonpolio enteroviruses isolated	11%	11%	10%	9%

*Per 100,000 children aged <15 years.
†Two stool samples collected at least 24 hours apart and within 14 days of paralysis onset.
§Good condition means that on arrival 1) ice or frozen icepacks or a temperature indicator (showing <46 F [<8 C]) is in the container, 2) the specimen volume is adequate (>5 g), 3) no evidence of leakage or desiccation is present, and 4) appropriate documentation (laboratory request/reporting form) is completed.

Poliomyelitis Eradication — Continued

Morocco, Oman, Palestine, Qatar, Somalia, Tunisia, United Arab Emirates, and Yemen. In some countries, these negative findings may indicate the "true" absence of wild poliovirus circulation, but in other countries (e.g., Djibouti, Libya, Qatar, Somalia, United Arab Emirates, and Yemen) surveillance is either in early stages of implementation or inadequate to rule out continuing virus transmission.

Poliovirus type 1 remains endemic in Pakistan, Afghanistan, and Sudan, is contained to foci in Egypt and Iran, and has been isolated from a single AFP case in Syria with paralysis onset in March 1998. In 1997, poliovirus type 1 was isolated from two cases of AFP in Iraq, and through September 1998 wild poliovirus has not been isolated in the country. Poliovirus type 2 has not been isolated in the region during 1998, but was last isolated in Pakistan and Afghanistan in 1997. Poliovirus type 3 remains endemic in Pakistan and Afghanistan, and was isolated from one AFP case and a contact of another case in Iran and one case in Saudi Arabia in 1998. Although poliovirus type 3 was isolated in Iran in 1997, this serotype had been absent from Saudi Arabia since 1995. Epidemiologic and genomic sequencing data support transmission links of the 1998 Saudi Arabia case with Afghanistan and Pakistan. Poliovirus type 3 appears to have been eliminated from Egypt in 1996.

Genetic Characterization of Wild Poliovirus

Analysis of genetic sequences of selected poliovirus isolates has been conducted in specialized laboratories within the WHO global poliovirus laboratory network. These studies demonstrated a reduction in the number of circulating poliovirus genotypes and a reduced genetic sequence diversity among Pakistan and Egyptian poliovirus isolates. One poliovirus type 1 genotype circulated in Egypt from 1995 to 1998 during which sequence analysis of this genotype indicated a >80% reduction in the independent chains of transmission. Poliovirus type 3 from Egypt isolated from 1995 to 1996 belong to a single genotype, which appears to have been eliminated. Poliovirus type 1 isolates obtained in Pakistan during 1995–1997 belong to a single genotype, in contrast to those isolated from 1990 through 1992 when four different genotypes were detected (*3*).

Genetic studies have provided evidence of poliovirus transmission links among certain countries. Poliovirus type 1 isolates from the Iran (1997) and Pakistan (1995 to 1997) belonged to the same genotype and had >97% genetic sequence similarity. During 1997–September 1998, 17 wild poliovirus-associated cases were reported from Iran, 15 of which occurred in southeastern provinces; most had epidemiologic links to neighboring Pakistan or Afghanistan. To reduce the risk for importation of wild viruses from Pakistan and Afghanistan, joint cross-border polio vaccination activities were conducted in Iran, Pakistan, and Afghanistan in 1998 and will be repeated in 1999 and 2000.

In 1997, poliovirus transmission occurred in border areas of Turkey and Iraq, apparently facilitated by population movement and low oral poliovirus vaccine coverage. Six virologically confirmed poliovirus type 1 cases were detected in Turkey; all were in persons from Mardin province in the southeastern part of the country. In the same year, poliovirus type 1 was isolated from two of 28 persons reported with polio from Iraq: one was from Wasit province in the south and the other from Ninevah, a northern province near the southern border province of Mardin in Turkey. The 1997 poliovirus

Poliomyelitis Eradication — Continued

type 1 isolates from Turkey and Iraq belonged to the same genotype and genetic cluster and were closely related to 1994 Turkish isolates.

Epidemiologic and/or genetic sequence data showed that imported viruses contributed to previous polio outbreaks in some countries (e.g., Saudi Arabia, Jordan, and Oman) (*4–6*). The risk for wild poliovirus importation remains high in countries that have common borders or receive visitors (e.g., as tourists, refugees, pilgrims, or migrant workers) from countries where polio is endemic.

Genetic sequence analyses also were used to confirm that wild poliovirus laboratory contaminants were reported inadvertently in three different laboratories during 1995–1998. Eradication programs had been alerted to the possibility of contamination through unusual clusters of wild viruses from AFP cases without residual paralysis.

Reported by: Expanded Program on Immunization, Eastern Mediterranean Region, World Health Organization, Alexandria, Egypt. Global Program for Vaccines and Immunization, World Health Organization, Geneva, Switzerland. Respiratory and Enteric Virus Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases; Vaccine Preventable Disease Eradication Div, National Immunization Program, CDC.

Editorial Note: Virologic surveillance for polioviruses and genetic studies of poliovirus isolates provided critical data for programmatic action. These methods allow the attribution of individual isolates of poliovirus to either indigenous transmission (i.e., poliovirus reservoir), importation, or laboratory contamination, each of which require different interventions. The highest priority must be directed toward the identification of foci of poliovirus transmission (e.g., reservoirs of continuing circulation during low season) and targeting these areas for intense repeated vaccination campaigns to eliminate the last chains of transmission.

Genetic sequence information from Pakistan isolates has been a useful program monitoring tool. Improvement in surveillance resulted in an increase in the number of reported polio cases in 1997 compared with 1996, despite implementation of recommended polio eradication strategies. Molecular studies from poliovirus isolates, however, suggested a substantial decrease in biodiversity, with many lineages of poliovirus being eliminated successively. These molecular studies emphasize the need for coordinated efforts to eliminate the remaining poliovirus reservoirs in the Iraq/Turkey border area and in Pakistan, Afghanistan, and border areas of Iran. Genomic studies for investigation of suspected laboratory contamination also can avoid the implementation of costly vaccination campaigns planned in response to the reporting of wild viruses.

Several important factors delay progress toward the eradication target. Underestimation of the geographic spread of poliovirus may occur because of inadequate AFP surveillance in some countries affected by war, civil unrest, or weak health-care systems (e.g., Somalia, Djibouti, and Yemen). Polioviruses reported in Afghanistan were detected only after AFP surveillance was implemented in 1997. Inappropriate timing, collection, and/or transport of stool specimens also decrease the sensitivity of virus isolation (*7*).

Virologic data indicate that substantial progress has been made toward polio eradication in the region. Continued international support[†] will be essential, especially in

[†]The polio eradication initiative is supported by individual countries in which polio is endemic. In addition, external support for the EMR is provided primarily by WHO; United Nations Children's Fund (UNICEF); the governments of Canada, Denmark, Japan, Norway, United Kingdom, and United States (through U.S. Agency for International Development and CDC); and Rotary International.

Poliomyelitis Eradication — Continued

those countries where polio is endemic and human and financial resources are limited, to continue to improve field and laboratory surveillance for poliomyelitis. Further enhancement of these systems will be needed to ensure eradication of polio by 2000.

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Coronary Heart Disease Mortality Trends Among Whites and Blacks — Appalachia and United States, 1980–1993

Although heart disease-associated mortality has declined steadily since the 1960s, heart disease remains the leading cause of death for both men and women of all races/ethnicities in the United States (*1*). This report compares temporal trends in coronary heart disease (CHD) death rates for blacks and whites from 1980 to 1993 (the latest year for which data were available) in the Appalachian Region* with trends for the entire United States. The findings indicate that among whites aged ≥35 years the burden of CHD is greater in Appalachia than in the entire United States, with the disparity increasing over time, and among blacks, only slight differences in CHD rates between Appalachia and the United States were observed.

From 1980 through 1993, annual age-adjusted CHD death rates for persons aged ≥35 years were calculated using mortality data compiled by CDC and population estimates from the Bureau of the Census. For both Appalachia and the United States, CHD death rates were calculated separately for blacks and whites by sex and age group (i.e., ages 35–64 and ≥65 years). The 1980 U.S. population aged ≥35 years was the standard for age adjustment. CHD deaths were defined as deaths for which the underlying cause was listed on the death certificate as codes 410.0–414.0 and 429.2 of the *International Classification of Diseases, Ninth Revision* (ICD-9). The cause of death is reported by attending physicians, medical examiners, and coroners on death certificates and is subsequently coded according to the ICD-9. Linear regression models, with year as the independent variable and log-transformed annual CHD death rate as the dependent variable, were estimated separately for each group. Beta coefficients

*Appalachia is comprised of 399 counties, including all of West Virginia and parts of Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia (*2*).

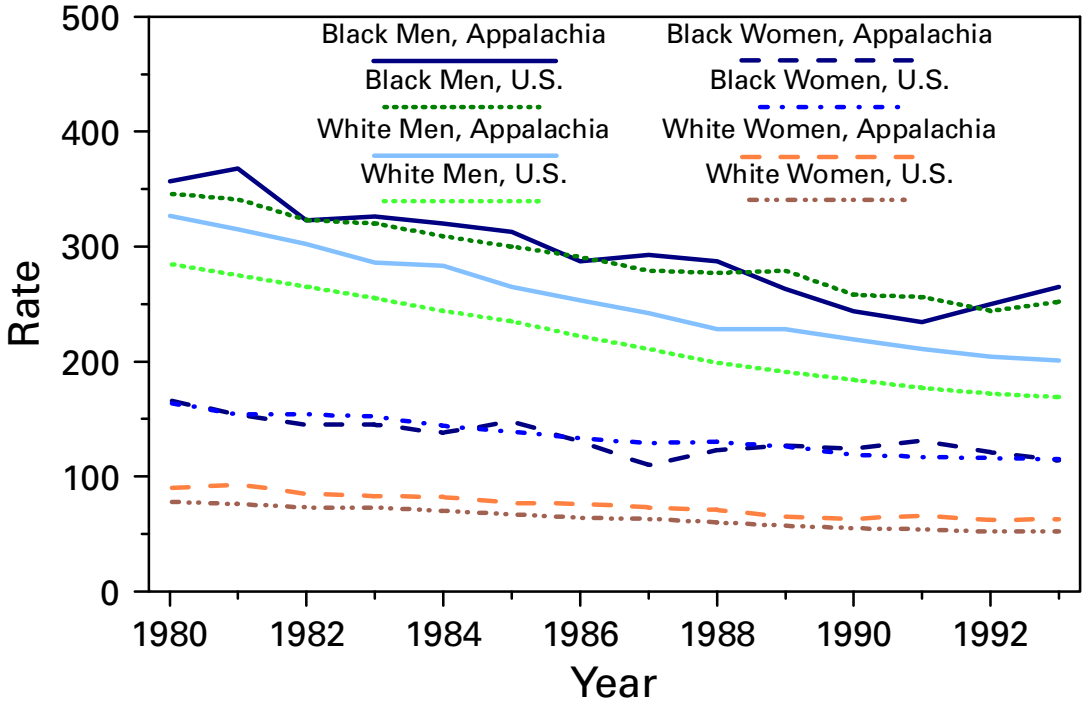
Coronary Heart Disease — Continued

from each model were used to calculate the average annual percentage change in CHD mortality.

CHD mortality declined from 1980 through 1993 for each of the demographic groups for both Appalachia and the United States; however, Appalachia and the United States differed in both the level of CHD mortality and the magnitude of decline for most demographic groups. Among persons aged 35–64 years, CHD death rates for whites in Appalachia were consistently higher than those for the entire United States (Figure 1). CHD death rates were 15% higher among white men aged 35–64 years in Appalachia than among white men in the United States in 1980; in 1993, rates were 19% higher for white men in Appalachia. Similarly, CHD death rates were 15% higher among white women aged 35–64 years in Appalachia than among white women in the United States in 1980; in 1993, rates were 21% higher for white women in Appalachia. In comparison, CHD death rates for blacks aged 35–64 years only differed slightly between Appalachia and the entire United States (Figure 1).

For Appalachian residents aged 35–64 years, the average annual declines in CHD mortality from 1980 through 1993 were 2.3% for black women, 3.1% for black men, 3.3% for white women, and 3.9% for white men. In the United States, average annual declines in the same age group were 2.7% for black men, 2.8% for black women, 3.4% for white women, and 4.3% for white men.

FIGURE 1. Rates* of coronary heart disease mortality among persons aged 35–64 years, by year, race/ethnicity†, and sex — Appalachia and United States, 1980–1993



*Per 100,000 population.

†Race-specific rates were limited to blacks and whites because numbers for other racial/ethnic groups were too small for meaningful analysis.

Coronary Heart Disease — Continued

Among persons aged ≥65 years, whites in Appalachia had slightly higher CHD death rates than whites in the same age group in the entire United States (6% higher in 1980 and 5% higher in 1993) (Figure 2). In comparison, blacks aged ≥65 years experienced slightly lower CHD death rates in Appalachia than blacks in the same age group in the entire United States (Figure 2).

From 1980 through 1993, average annual declines in CHD mortality for Appalachian residents aged ≥65 years were 1.8% for black men, 2.3% for black women, 3.2% for white men, and 3.3% for white women. In the United States, average annual declines for persons in the same age group were 1.6% for black men, 1.7% for black women, 3.1% for white women, and 3.3% for white men.

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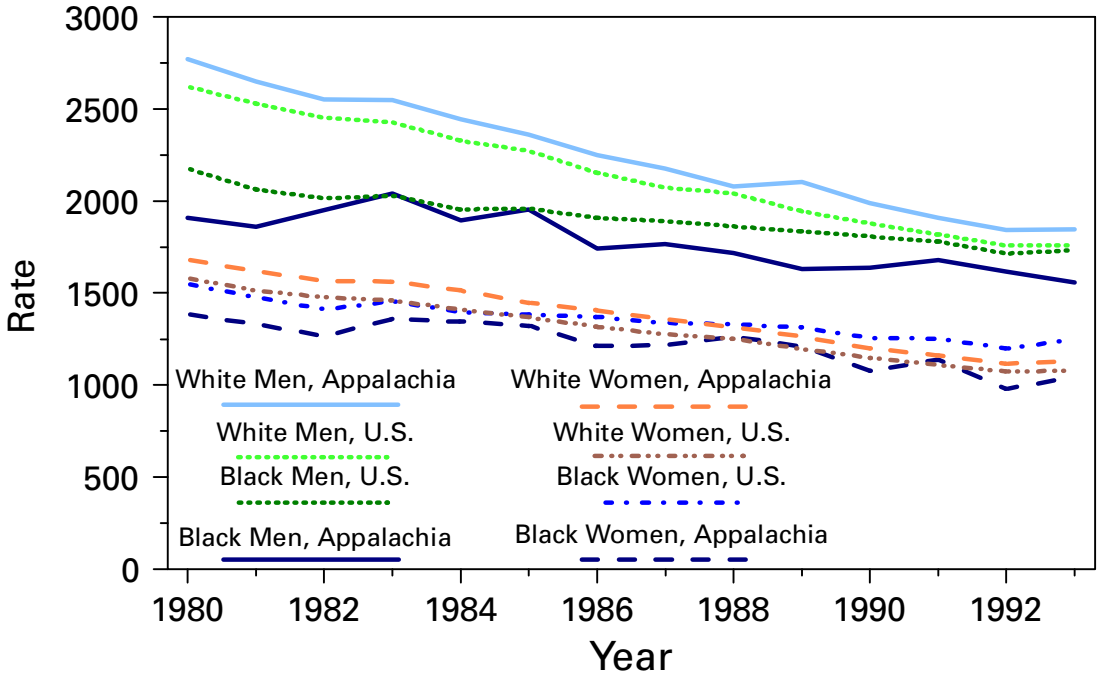
Editorial Note: The findings of this report corroborate recent reports showing important geographic and race/ethnicity variability in both levels and rates of decline in CHD mortality (*3–7*). The burden of CHD mortality observed among whites in Appalachia increased during 1980–1993. In both Appalachia and the entire United States, CHD death rates for blacks remained higher than rates for whites; however, among blacks there were only slight differences in CHD death rates between Appalachia and the entire United States.

FIGURE 2. Rates* of coronary heart disease mortality among persons aged ≥65 years, by year, race/ethnicity†, and sex — Appalachia and United States, 1980–1993



*Per 100,000 population.
†Race-specific rates were limited to blacks and whites because numbers for other racial/ethnic groups were too small for meaningful analysis.

Coronary Heart Disease — Continued

The findings in this report are subject to at least two limitations. First, data used to calculate CHD death rates in this study include census undercounts of black populations and variations in the accuracy of reporting underlying cause of death on death certificates. Second, examination of CHD death rates for a large region such as Appalachia obscures important geographic variation in risk for heart disease within the region. Rural and less affluent counties within Appalachia were at highest risk for CHD mortality and were least likely to have adequate economic and medical-care resources (*8*).

The findings in this report suggest that the social and environmental conditions and resources that influence CHD mortality for whites aged ≥35 years may differ between Appalachia and the United States. The Appalachian region is characterized by low levels of urbanization and lower standards of living than the nation (*9*). Life expectancy for both men and women is lower in Appalachian counties than the United States (*10*). In addition to low levels of economic resources, many Appalachian counties lack medical-care facilities (e.g., hospital coronary-care units and cardiac-rehabilitation units) for treatment of CHD (*8*). The population of Appalachia is predominantly white; however, blacks comprise 6% of the population, with several rural counties of southern Appalachia having black populations that are more than 20%. The similarity of CHD death rates for blacks in Appalachia with those in the nation overall suggests the need to examine the similarities in socioenvironmental conditions and resources for blacks in Appalachia compared with the United States. Increasing inequalities in CHD mortality trends for whites between Appalachia and the nation from 1980 through 1993 indicate the need for public health interventions focused on this disadvantaged region.

In Appalachia, policies and programs should be instituted that enhance both primary and secondary prevention of heart disease mortality. Secondary prevention of heart disease requires improved access to medical-care facilities and health-care professionals, especially for residents of isolated rural counties. In addition, persons with heart disease require social support from their families and communities, and access to facilities and programs for cardiac rehabilitation. Primary prevention of heart disease mortality requires communitywide improvements in the social environment, including full employment in healthy work environments, access to affordable healthy foods and recreational facilities, and opportunities for social interaction and participation in civic life.

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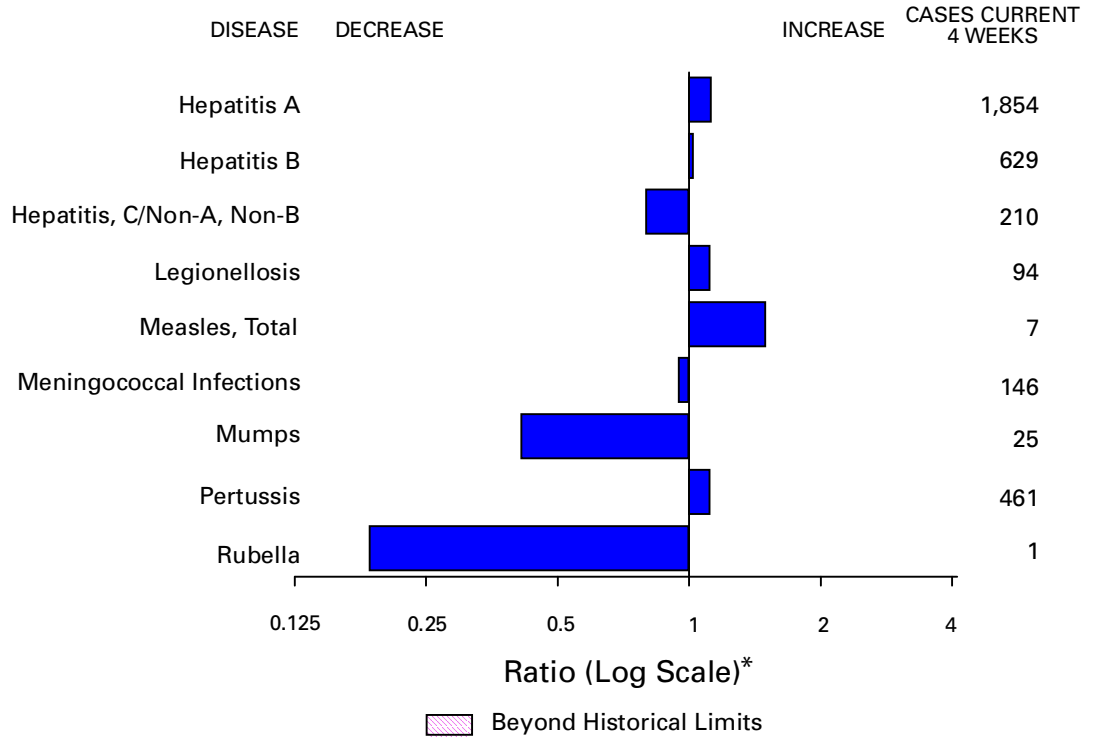
(Continued on page 1015)

FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending November 21, 1998, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — provisional cases of selected notifiable diseases, United States, cumulative, week ending November 21, 1998 (46th Week)

	Cum. 1998		Cum. 1998
Anthrax	-	Plague	8
Brucellosis	51	Poliomyelitis, paralytic	1
Cholera	12	Psittacosis	44
Congenital rubella syndrome	3	Rabies, human	-
Cryptosporidiosis*	2,902	Rocky Mountain spotted fever (RMSF)	302
Diphtheria	1	Streptococcal disease, invasive Group A	1,878
Encephalitis: California*	82	Streptococcal toxic-shock syndrome*	45
eastern equine*	3	Syphilis, congenital¶	361
St. Louis*	24	Tetanus	34
western equine*	-	Toxic-shock syndrome	120
Hansen Disease	98	Trichinosis	12
Hantavirus pulmonary syndrome*†	19	Typhoid fever	299
Hemolytic uremic syndrome, post-diarrheal*	78	Yellow fever	-
HIV infection, pediatric*§	230		

-:no reported cases
*Not notifiable in all states.
† Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases (NCID).
§ Updated monthly from reports to the Division of HIV/AIDS Prevention–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention (NCHSTP), last update October 25, 1998.
¶ Updated from reports to the Division of STD Prevention, NCHSTP.

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending November 21, 1998, and November 15, 1997 (46th Week)

Reporting Area	AIDS		Chlamydia		*Escherichia coli* O157:H7		Gonorrhea		Hepatitis C/NA,NB	
					NETSS†	PHLIS§				
	Cum. 1998*	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1998	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997
UNITED STATES	38,924	49,734	485,576	415,270	2,694	1,782	292,687	262,691	4,417	3,091
NEW ENGLAND	1,539	2,104	16,332	15,944	309	246	4,632	5,305	78	52
Maine	26	50	951	885	35	-	61	60	-	-
N.H.	28	34	854	723	43	43	79	86	-	-
Vt.	18	32	375	378	19	17	34	47	1	3
Mass.	785	729	7,459	6,481	142	142	2,024	1,876	74	42
R.I.	108	133	2,022	1,792	12	1	360	390	3	7
Conn.	574	1,126	4,671	5,685	58	43	2,074	2,846	-	-
MID. ATLANTIC	10,425	15,051	53,796	50,259	267	70	32,406	33,696	329	286
Upstate N.Y.	1,249	2,264	N	N	200	-	5,842	5,822	247	213
N.Y. City	5,885	8,005	30,919	24,116	7	12	13,775	12,669	-	-
N.J.	1,909	2,978	9,791	8,869	60	48	6,545	6,698	-	-
Pa.	1,382	1,804	13,086	17,274	N	10	6,244	8,507	82	73
E.N. CENTRAL	2,741	3,695	78,763	56,406	412	305	57,271	36,471	460	487
Ohio	562	766	22,629	19,986	111	61	14,760	13,056	8	17
Ind.	448	459	4,656	8,258	93	47	4,349	5,415	7	12
Ill.	1,044	1,515	24,217	U	105	58	20,172	U	32	83
Mich.	531	726	17,936	18,341	103	62	13,945	13,665	413	350
Wis.	156	229	9,325	9,821	N	77	4,045	4,335	-	25
W.N. CENTRAL	754	1,011	27,327	29,055	458	375	14,103	12,782	266	56
Minn.	146	175	5,498	5,924	191	197	2,124	2,092	10	4
Iowa	60	92	2,063	3,943	94	56	660	1,012	8	26
Mo.	367	506	10,774	10,751	45	60	8,018	6,569	241	10
N. Dak.	5	10	849	765	11	15	71	64	-	3
S. Dak.	15	8	1,389	1,213	32	34	205	146	-	-
Nebr.	59	84	2,354	2,356	54	-	960	1,039	4	2
Kans.	102	136	4,400	4,103	31	13	2,065	1,860	3	11
S. ATLANTIC	10,118	12,299	100,012	83,154	243	146	82,203	82,080	168	224
Del.	122	194	2,291	42	-	2	1,350	1,141	-	-
Md.	1,400	1,729	6,528	6,504	34	14	8,520	10,167	15	9
D.C.	751	956	N	N	1	-	3,163	3,930	-	-
Va.	771	1,010	11,750	10,488	N	42	8,168	7,787	11	25
W. Va.	72	108	2,298	2,587	12	7	740	830	6	16
N.C.	704	762	19,851	15,353	54	46	17,097	15,208	20	47
S.C.	640	688	14,761	11,080	16	9	9,335	10,277	9	37
Ga.	1,055	1,466	20,382	13,641	73	-	16,955	16,049	9	-
Fla.	4,603	5,386	22,151	23,459	53	26	16,875	16,691	98	90
E.S. CENTRAL	1,598	1,741	34,593	31,121	110	39	34,040	31,186	178	321
Ky.	249	321	5,705	5,545	32	-	3,315	3,584	19	12
Tenn.	591	677	11,846	11,312	52	33	10,302	9,874	152	216
Ala.	417	455	9,062	7,512	23	2	11,593	10,504	5	11
Miss.	341	288	7,980	6,752	3	4	8,830	7,224	2	82
W.S. CENTRAL	4,758	5,196	67,567	60,244	114	24	41,463	39,302	397	450
Ark.	177	193	3,500	2,507	11	10	3,516	4,250	10	14
La.	819	916	13,470	8,893	5	7	11,564	8,666	103	198
Okla.	256	256	8,387	6,551	22	7	4,634	4,248	14	7
Tex.	3,506	3,831	42,210	42,293	76	-	21,749	22,138	270	231
MOUNTAIN	1,360	1,424	28,571	26,431	332	217	8,061	7,178	329	283
Mont.	26	36	1,204	989	15	-	43	51	7	21
Idaho	27	48	1,765	1,470	38	23	147	133	87	63
Wyo.	3	13	616	531	53	55	29	46	63	70
Colo.	254	346	7,114	6,505	85	64	2,051	2,027	33	31
N. Mex.	189	146	3,280	3,392	19	13	795	764	89	54
Ariz.	549	343	10,137	9,452	21	26	3,665	3,170	8	25
Utah	114	125	1,925	1,552	79	21	204	248	23	5
Nev.	198	367	2,530	2,540	22	15	1,127	739	19	14
PACIFIC	5,631	7,213	78,615	62,656	449	360	18,508	14,691	2,212	932
Wash.	375	570	9,500	8,105	101	104	1,705	1,716	22	25
Oreg.	146	261	5,269	4,394	98	94	759	659	5	3
Calif.	4,949	6,256	60,138	47,215	243	147	15,350	11,528	2,130	745
Alaska	17	43	1,603	1,361	7	-	266	337	1	-
Hawaii	144	83	2,105	1,581	N	15	428	451	54	159
Guam	1	2	201	193	N	-	24	27	-	-
P.R.	1,499	1,715	U	U	6	U	333	496	-	-
V.I.	31	85	N	N	N	U	U	U	U	U
Amer. Samoa	-	-	U	U	N	U	U	U	U	U
C.N.M.I.	-	1	N	N	N	U	28	20	-	2

N: Not notifiable U: Unavailable -: no reported cases C.N.M.I.: Commonwealth of Northern Mariana Islands

*Updated monthly from reports to the Division of HIV/AIDS Prevention–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention, last update October 25, 1998.

†National Electronic Telecommunications System for Surveillance.

§Public Health Laboratory Information System.

TABLE II. (Cont'd.) Provisional cases of selected notifiable diseases, United States, weeks ending November 21, 1998, and November 15, 1997 (46th Week)

Reporting Area	Legionellosis		Lyme Disease		Malaria		Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal
	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998*	Cum. 1997	Cum. 1998
UNITED STATES	1,159	939	11,503	10,875	1,219	1,655	6,286	7,512	12,831	15,695	6,126
NEW ENGLAND	77	76	2,538	2,818	55	79	67	124	407	382	1,306
Maine	1	3	11	8	5	1	1	2	10	18	199
N.H.	7	7	44	34	5	8	2	-	12	15	74
Vt.	7	12	11	8	1	2	4	-	4	5	61
Mass.	30	26	704	282	16	30	41	62	230	212	466
R.I.	19	11	603	380	10	7	1	2	49	31	88
Conn.	13	17	1,165	2,106	18	31	18	58	102	101	418
MID. ATLANTIC	279	197	7,540	6,297	309	473	242	357	2,660	2,776	1,410
Upstate N.Y.	98	60	3,822	2,579	87	67	35	36	333	392	983
N.Y. City	27	20	28	167	145	293	71	79	1,330	1,391	U
N.J.	15	26	1,571	1,784	49	81	78	143	541	601	197
Pa.	139	91	2,119	1,767	28	32	58	99	456	392	230
E.N. CENTRAL	372	309	157	560	118	152	978	581	1,088	1,541	127
Ohio	122	110	80	37	15	18	124	193	87	235	55
Ind.	112	52	57	33	11	16	205	162	101	134	11
Ill.	32	33	8	13	36	60	420	U	553	818	16
Mich.	74	78	12	25	47	42	176	128	329	264	35
Wis.	32	36	U	452	9	16	53	98	18	90	10
W.N. CENTRAL	70	56	187	148	87	57	114	162	357	493	632
Minn.	7	3	153	110	52	28	8	16	132	130	111
Iowa	10	9	22	6	8	9	-	7	43	46	139
Mo.	24	20	2	25	15	11	86	106	92	206	25
N. Dak.	-	2	-	-	2	3	-	-	8	12	129
S. Dak.	3	2	-	1	-	1	1	1	17	10	143
Nebr.	19	15	3	2	1	1	6	3	26	20	7
Kans.	7	5	7	4	9	4	13	29	39	69	78
S. ATLANTIC	132	110	801	717	292	295	2,332	3,100	1,774	2,999	1,771
Del.	12	11	40	109	3	5	20	22	18	32	30
Md.	27	19	561	456	83	78	592	822	252	275	416
D.C.	7	4	4	9	18	19	73	102	93	88	-
Va.	19	25	64	59	52	64	137	216	250	275	515
W. Va.	N	N	12	10	2	1	3	3	38	48	70
N.C.	14	13	54	32	27	16	664	857	398	374	136
S.C.	10	7	7	2	6	17	305	333	214	295	136
Ga.	8	1	5	7	36	45	255	474	441	542	272
Fla.	33	30	54	33	65	50	283	271	70	1,070	196
E.S. CENTRAL	59	51	83	85	30	35	1,083	1,533	958	1,153	246
Ky.	25	11	23	15	6	12	94	122	149	167	31
Tenn.	22	29	41	39	16	8	506	665	341	400	126
Ala.	5	4	17	10	6	10	257	377	302	374	87
Miss.	7	7	2	21	2	5	226	369	166	212	2
W.S. CENTRAL	39	33	24	88	28	54	917	1,186	1,854	2,250	133
Ark.	-	2	6	25	1	5	100	149	136	171	31
La.	4	6	4	3	15	13	384	325	255	199	-
Okla.	12	2	2	25	4	8	108	110	141	182	102
Tex.	23	23	12	35	8	28	325	602	1,322	1,698	-
MOUNTAIN	71	62	22	11	61	62	203	162	389	495	209
Mont.	2	1	-	-	1	2	-	-	18	16	51
Idaho	2	2	5	3	8	-	2	1	12	10	-
Wyo.	1	1	1	2	-	2	1	-	4	2	62
Colo.	17	18	5	-	19	27	11	14	U	75	39
N. Mex.	2	3	4	1	12	8	22	8	62	58	6
Ariz.	19	12	1	2	8	11	152	124	180	207	19
Utah	22	18	-	1	1	3	4	5	48	28	26
Nev.	6	7	6	2	12	9	11	10	65	99	6
PACIFIC	60	45	151	151	239	448	350	307	3,344	3,606	292
Wash.	12	8	7	9	17	44	27	9	186	262	-
Oreg.	1	-	20	17	16	24	6	9	124	132	7
Calif.	45	36	123	123	200	367	315	287	2,845	2,995	262
Alaska	1	-	1	2	2	3	1	1	46	64	23
Hawaii	1	1	-	-	4	10	1	1	143	153	-
Guam	2	-	-	-	1	-	1	3	36	13	-
P.R.	-	-	-	-	-	5	166	224	68	164	49
V.I.	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	-	-	-	-	-	164	11	77	13	-

N: Not notifiable U: Unavailable -: no reported cases

TABLE III. Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending November 21, 1998, and November 15, 1997 (46th Week)

Reporting Area	*H. influenzae*, invasive		Hepatitis (Viral), by type				Measles (Rubeola)					
			A		B		Indigenous		Imported†		Total	
	Cum. 1998*	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997	1998	Cum. 1998	1998	Cum. 1998	Cum. 1998	Cum. 1997
UNITED STATES	912	957	19,662	25,233	7,718	8,405	-	60	2	25	85	128
NEW ENGLAND	61	55	247	599	169	161	-	1	-	2	3	19
Maine	3	5	19	58	4	6	-	-	-	-	-	1
N.H.	9	10	14	32	18	15	-	-	-	-	-	1
Vt.	7	3	15	13	5	11	-	-	-	1	1	-
Mass.	36	32	100	246	51	68	-	1	-	1	2	16
R.I.	5	3	16	126	66	14	-	-	-	-	-	-
Conn.	1	2	83	124	25	47	-	-	-	-	-	1
MID. ATLANTIC	133	150	1,317	1,898	985	1,208	-	8	-	6	14	26
Upstate N.Y.	57	49	324	330	268	275	-	1	-	1	2	5
N.Y. City	26	41	345	834	247	424	-	-	-	-	-	10
N.J.	45	42	307	279	176	218	U	7	U	1	8	3
Pa.	5	18	341	455	294	291	-	-	-	4	4	8
E.N. CENTRAL	151	149	3,237	2,632	1,407	1,324	-	11	-	3	14	10
Ohio	46	80	278	280	72	76	-	-	-	1	1	-
Ind.	39	14	306	285	713	93	-	2	-	1	3	-
Ill.	51	37	613	736	173	249	-	-	-	-	-	7
Mich.	8	17	1,882	1,163	409	386	-	9	-	1	10	2
Wis.	7	1	158	168	40	520	-	-	-	-	-	1
W.N. CENTRAL	83	56	1,237	1,963	366	427	-	1	-	-	1	17
Minn.	65	44	118	184	45	37	-	-	-	-	-	8
Iowa	2	5	392	419	59	38	-	1	-	-	1	-
Mo.	9	4	562	1,003	219	303	U	-	U	-	-	1
N. Dak.	-	-	3	10	4	5	-	-	-	-	-	-
S. Dak.	-	2	31	21	2	1	-	-	-	-	-	8
Nebr.	1	1	39	86	14	14	-	-	-	-	-	-
Kans.	6	-	92	240	23	29	U	-	U	-	-	-
S. ATLANTIC	176	142	1,796	1,807	1,032	1,095	-	3	-	5	8	14
Del.	-	-	3	29	3	6	-	-	-	1	1	-
Md.	50	52	297	177	144	148	-	-	-	1	1	2
D.C.	-	-	54	32	11	29	-	-	-	-	-	1
Va.	16	12	191	209	91	114	-	-	-	2	2	1
W. Va.	5	3	7	11	8	16	-	-	-	-	-	-
N.C.	23	21	115	185	214	235	-	-	-	-	-	2
S.C.	3	4	37	98	41	90	-	-	-	-	-	1
Ga.	45	29	589	554	128	126	-	1	-	1	2	1
Fla.	34	21	503	512	392	331	-	2	-	-	2	6
E.S. CENTRAL	50	54	339	553	362	634	-	-	-	2	2	1
Ky.	7	8	22	67	41	36	-	-	-	-	-	-
Tenn.	28	30	206	342	252	401	-	-	-	1	1	-
Ala.	13	14	68	76	67	71	-	-	-	1	1	1
Miss.	2	2	43	68	2	126	-	-	-	-	-	-
W.S. CENTRAL	52	47	3,727	5,209	1,128	1,156	-	1	-	-	1	8
Ark.	-	2	89	194	87	78	-	-	-	-	-	-
La.	23	12	108	213	153	150	-	1	-	-	1	-
Okla.	26	30	535	1,313	88	45	U	-	U	-	-	1
Tex.	3	3	2,995	3,489	800	883	-	-	-	-	-	7
MOUNTAIN	104	79	2,949	3,845	745	774	-	3	2	2	5	8
Mont.	-	-	92	68	5	11	-	-	-	-	-	-
Idaho	1	1	226	124	40	46	-	-	-	-	-	-
Wyo.	1	4	35	31	7	23	U	-	U	-	-	-
Colo.	18	18	309	373	104	132	-	-	-	-	-	-
N. Mex.	7	8	135	318	289	232	-	-	-	-	-	-
Ariz.	53	29	1,773	2,020	163	180	-	3	2	2	5	5
Utah	5	3	180	519	66	82	-	-	-	-	-	1
Nev.	19	16	199	392	71	68	U	-	U	-	-	2
PACIFIC	102	225	4,813	6,727	1,524	1,626	-	32	-	5	37	25
Wash.	10	5	879	591	108	72	-	-	-	1	1	2
Oreg.	37	31	348	335	111	105	-	-	-	-	-	-
Calif.	47	174	3,533	5,628	1,287	1,425	-	5	-	3	8	19
Alaska	1	8	17	32	12	14	-	27	-	1	28	-
Hawaii	7	7	36	141	6	10	-	-	-	-	-	4
Guam	-	-	-	-	2	3	U	-	U	-	-	-
P.R.	2	-	49	256	332	734	-	-	-	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	6	3	1	53	44	U	-	U	-	-	1

N: Not notifiable U: Unavailable -: no reported cases

*Of 212 cases among children aged <5 years, serotype was reported for 106 and of those, 42 were type b.

†For imported measles, cases include only those resulting from importation from other countries.

TABLE III. (Cont'd.) Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending November 21, 1998, and November 15, 1997 (46th Week)

Reporting Area	Meningococcal Disease		Mumps			Pertussis			Rubella		
	Cum. 1998	Cum. 1997	1998	Cum. 1998	Cum. 1997	1998	Cum. 1998	Cum. 1997	1998	Cum. 1998	Cum. 1997
UNITED STATES	2,335	2,849	4	427	568	149	5,449	4,839	1	328	158
NEW ENGLAND	100	180	-	7	11	9	842	886	-	38	1
Maine	6	17	-	-	-	-	5	18	-	-	-
N.H.	4	14	-	-	1	4	109	125	-	-	-
Vt.	5	4	-	-	-	1	69	226	-	-	-
Mass.	52	88	-	4	3	2	607	475	-	8	1
R.I.	8	20	-	1	6	-	9	16	-	1	-
Conn.	25	37	-	2	1	2	43	26	-	29	-
MID. ATLANTIC	220	305	-	29	52	6	518	355	-	130	34
Upstate N.Y.	65	78	-	6	11	6	282	144	-	111	6
N.Y. City	22	50	-	4	3	-	23	60	-	14	28
N.J.	54	64	U	2	7	U	5	13	U	4	-
Pa.	79	113	-	17	31	-	208	138	-	1	-
E.N. CENTRAL	347	433	1	70	78	18	583	531	-	-	6
Ohio	128	150	-	27	30	9	261	150	-	-	-
Ind.	63	49	-	6	12	3	140	54	-	-	-
Ill.	84	135	-	11	11	5	101	84	-	-	2
Mich.	40	62	1	26	21	1	64	53	-	-	-
Wis.	32	37	-	-	4	-	17	190	-	-	4
W.N. CENTRAL	196	209	-	30	17	11	504	442	-	33	-
Minn.	31	34	-	13	6	10	306	258	-	-	-
Iowa	40	44	-	11	9	1	71	79	-	-	-
Mo.	70	90	U	3	-	U	32	64	U	2	-
N. Dak.	5	2	-	2	-	-	3	1	-	-	-
S. Dak.	7	5	-	-	-	-	8	5	-	-	-
Nebr.	14	13	-	-	1	-	18	9	-	-	-
Kans.	29	21	U	1	1	U	66	26	U	31	-
S. ATLANTIC	411	485	2	48	62	22	306	389	1	19	78
Del.	2	5	-	-	-	-	5	1	-	-	-
Md.	28	42	-	-	1	2	52	111	-	1	-
D.C.	1	12	-	-	-	-	1	3	-	-	1
Va.	40	55	-	8	10	6	36	42	-	1	1
W. Va.	16	17	-	-	-	-	2	6	-	-	-
N.C.	56	85	-	11	10	2	98	112	-	13	59
S.C.	53	51	1	7	11	-	27	27	-	-	15
Ga.	91	93	-	1	10	3	27	13	-	-	-
Fla.	124	125	1	21	20	9	58	74	1	4	2
E.S. CENTRAL	220	215	-	14	29	1	116	130	-	2	1
Ky.	34	45	-	-	3	-	50	58	-	-	-
Tenn.	69	73	-	1	5	1	35	35	-	2	-
Ala.	93	73	-	8	9	-	28	26	-	-	1
Miss.	24	24	-	5	12	-	3	11	-	-	-
W.S. CENTRAL	271	273	-	59	81	3	350	248	-	87	4
Ark.	29	31	-	12	1	3	91	51	-	-	-
La.	58	48	-	10	14	-	9	18	-	-	-
Okla.	39	39	U	-	-	U	30	33	U	-	-
Tex.	145	155	-	37	66	-	220	146	-	87	4
MOUNTAIN	136	165	-	37	54	65	1,044	1,030	-	5	7
Mont.	4	8	-	-	-	3	12	18	-	-	-
Idaho	11	10	-	5	3	-	244	514	-	-	2
Wyo.	5	3	U	1	1	U	8	7	U	-	-
Colo.	28	44	-	6	3	11	216	316	-	-	-
N. Mex.	25	28	N	N	N	4	94	99	-	1	-
Ariz.	41	39	-	6	32	1	199	35	-	1	5
Utah	14	15	-	5	8	46	224	20	-	2	-
Nev.	8	18	U	14	7	U	47	21	U	1	-
PACIFIC	434	584	1	133	184	14	1,186	828	-	14	27
Wash.	58	83	-	10	19	8	305	344	-	9	5
Oreg.	78	114	N	N	N	-	86	46	-	-	-
Calif.	290	377	1	98	132	6	766	404	-	3	14
Alaska	3	3	-	2	8	-	14	16	-	-	-
Hawaii	5	7	-	23	25	-	15	18	-	2	8
Guam	1	1	U	2	1	U	-	-	U	-	-
P.R.	6	8	-	1	7	3	6	-	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	-	U	2	4	U	1	-	U	-	-

N: Not notifiable U: Unavailable -: no reported cases

TABLE IV. Deaths in 122 U.S. cities,* week ending November 21, 1998 (46th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	603	428	118	32	15	10	46
Boston, Mass.	176	111	43	11	6	5	17
Bridgeport, Conn.	25	19	3	-	3	-	1
Cambridge, Mass.	14	12	1	1	-	-	-
Fall River, Mass.	39	34	5	-	-	-	-
Hartford, Conn.	42	28	7	4	1	2	-
Lowell, Mass.	21	10	6	3	1	1	1
Lynn, Mass.	19	13	3	3	-	-	1
New Bedford, Mass.	34	25	6	1	2	-	-
New Haven, Conn.	34	23	10	1	-	-	5
Providence, R.I.	56	43	11	1	1	-	2
Somerville, Mass.	4	3	1	-	-	-	-
Springfield, Mass.	33	26	2	3	1	1	8
Waterbury, Conn.	32	23	7	2	-	-	6
Worcester, Mass.	74	58	13	2	-	1	5
MID. ATLANTIC	2,462	1,701	491	189	52	28	117
Albany, N.Y.	45	36	5	3	-	1	3
Allentown, Pa.	26	16	6	3	1	-	2
Buffalo, N.Y.	100	74	18	6	1	1	2
Camden, N.J.	40	25	11	2	2	-	4
Elizabeth, N.J.	10	8	2	-	-	-	-
Erie, Pa.	38	29	4	4	-	1	3
Jersey City, N.J.	28	20	4	3	1	-	-
New York City, N.Y.	1,277	863	272	105	21	16	48
Newark, N.J.	73	38	16	12	3	3	1
Paterson, N.J.	22	15	6	1	-	-	-
Philadelphia, Pa.	300	206	56	25	10	3	20
Pittsburgh, Pa.§	55	41	10	2	2	-	4
Reading, Pa.	31	23	2	4	2	-	1
Rochester, N.Y.	160	118	31	9	2	-	14
Schenectady, N.Y.	33	25	5	2	1	-	2
Scranton, Pa.	38	32	2	2	2	-	1
Syracuse, N.Y.	140	99	30	5	3	3	10
Trenton, N.J.	26	20	6	-	-	-	1
Utica, N.Y.	20	13	5	1	1	-	1
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	1,786	1,249	317	144	44	32	101
Akron, Ohio	60	45	12	2	-	1	-
Canton, Ohio	39	30	8	-	1	-	2
Chicago, Ill.	263	160	56	35	8	4	13
Cincinnati, Ohio	65	52	5	4	1	3	4
Cleveland, Ohio	141	97	24	16	3	1	4
Columbus, Ohio	189	139	32	15	3	-	14
Dayton, Ohio	115	84	23	6	1	1	5
Detroit, Mich.	217	121	47	24	15	10	7
Evansville, Ind.	53	46	5	1	-	1	4
Fort Wayne, Ind.	66	50	11	2	1	2	2
Gary, Ind.	15	8	4	1	2	-	-
Grand Rapids, Mich.	47	35	8	2	1	1	1
Indianapolis, Ind.	140	97	27	11	2	3	20
Lansing, Mich.	48	34	8	3	1	2	2
Milwaukee, Wis.	110	86	16	5	2	1	14
Peoria, Ill.	60	42	10	7	-	1	-
Rockford, Ill.	45	34	7	2	1	1	3
South Bend, Ind.	41	33	3	4	1	-	2
Toledo, Ohio	U	U	U	U	U	U	U
Youngstown, Ohio	72	56	11	4	1	-	4
W.N. CENTRAL	911	652	157	51	25	18	48
Des Moines, Iowa	57	43	6	3	4	1	4
Duluth, Minn.	32	28	2	2	-	-	3
Kansas City, Kans.	57	32	18	4	3	-	1
Kansas City, Mo.	109	79	16	4	1	1	5
Lincoln, Nebr.	46	42	4	-	-	-	2
Minneapolis, Minn.	230	181	32	10	2	5	17
Omaha, Nebr.	88	64	16	3	2	3	7
St. Louis, Mo.	114	57	28	16	9	4	-
St. Paul, Minn.	54	42	9	2	1	-	5
Wichita, Kans.	124	84	26	7	3	4	4

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,358	821	321	125	51	37	64
Atlanta, Ga.	175	105	42	18	6	4	5
Baltimore, Md.	247	126	67	34	9	8	24
Charlotte, N.C.	96	69	20	3	2	2	3
Jacksonville, Fla.	142	85	42	12	1	2	4
Miami, Fla.	104	61	21	18	3	1	-
Norfolk, Va.	45	28	11	3	-	3	-
Richmond, Va.	82	45	20	6	6	5	6
Savannah, Ga.	50	30	12	2	2	4	3
St. Petersburg, Fla.	95	75	10	3	4	3	11
Tampa, Fla.	158	108	30	9	7	4	7
Washington, D.C.	150	82	44	17	6	1	1
Wilmington, Del.	14	7	2	-	5	-	-
E.S. CENTRAL	783	527	173	44	20	18	40
Birmingham, Ala.	151	99	39	5	2	5	7
Chattanooga, Tenn.	87	57	21	6	1	2	8
Knoxville, Tenn.	79	54	17	4	3	1	3
Lexington, Ky.	82	54	16	7	3	2	8
Memphis, Tenn.	94	58	24	8	3	1	6
Mobile, Ala.	134	96	26	5	3	4	1
Montgomery, Ala.	36	25	8	-	1	2	3
Nashville, Tenn.	120	84	22	9	4	1	4
W.S. CENTRAL	1,355	864	270	132	39	50	68
Austin, Tex.	86	55	19	8	2	2	2
Baton Rouge, La.	38	26	7	5	-	-	5
Corpus Christi, Tex.	50	25	16	6	-	3	2
Dallas, Tex.	195	132	28	22	6	7	6
El Paso, Tex.	79	57	13	4	3	2	2
Ft. Worth, Tex.	127	93	25	4	3	2	11
Houston, Tex.	275	150	70	41	9	5	14
Little Rock, Ark.	75	49	16	3	1	6	5
New Orleans, La.	84	47	13	9	7	8	-
San Antonio, Tex.	213	139	45	16	8	5	15
Shreveport, La.	U	U	U	U	U	U	U
Tulsa, Okla.	133	91	18	14	-	10	6
MOUNTAIN	882	608	163	60	27	19	71
Albuquerque, N.M.	125	84	23	12	5	1	4
Boise, Idaho	44	28	14	-	1	1	2
Colo. Springs, Colo.	57	48	7	2	-	-	6
Denver, Colo.	123	76	23	10	7	7	11
Las Vegas, Nev.	186	127	39	13	4	2	11
Ogden, Utah	27	21	3	1	2	-	3
Phoenix, Ariz.	52	34	7	4	2	1	5
Pueblo, Colo.	33	29	2	2	-	-	3
Salt Lake City, Utah	107	65	27	8	2	5	10
Tucson, Ariz.	128	96	18	8	4	2	16
PACIFIC	1,659	1,192	289	112	35	30	137
Berkeley, Calif.	26	23	2	-	-	1	4
Fresno, Calif.	94	77	10	2	4	1	15
Glendale, Calif.	32	25	6	1	-	-	3
Honolulu, Hawaii	62	42	16	2	-	2	1
Long Beach, Calif.	66	44	15	4	3	-	15
Los Angeles, Calif.	453	315	77	42	11	8	19
Pasadena, Calif.	24	18	4	2	-	-	3
Portland, Oreg.	90	71	10	7	2	-	5
Sacramento, Calif.	U	U	U	U	U	U	U
San Diego, Calif.	165	120	29	10	1	5	20
San Francisco, Calif.	130	85	29	8	4	3	15
San Jose, Calif.	191	143	30	10	3	5	22
Santa Cruz, Calif.	30	25	2	2	1	-	3
Seattle, Wash.	151	96	31	17	5	2	3
Spokane, Wash.	51	41	7	2	-	1	2
Tacoma, Wash.	94	67	21	3	1	2	7
TOTAL	11,799¶	8,042	2,299	889	308	242	692

U: Unavailable -: no reported cases

*Mortality data in this table are voluntarily reported from 122 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

†Pneumonia and influenza.

§Because of changes in reporting methods in this Pennsylvania city, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶Total includes unknown ages.

Coronary Hearth Disease — Continued

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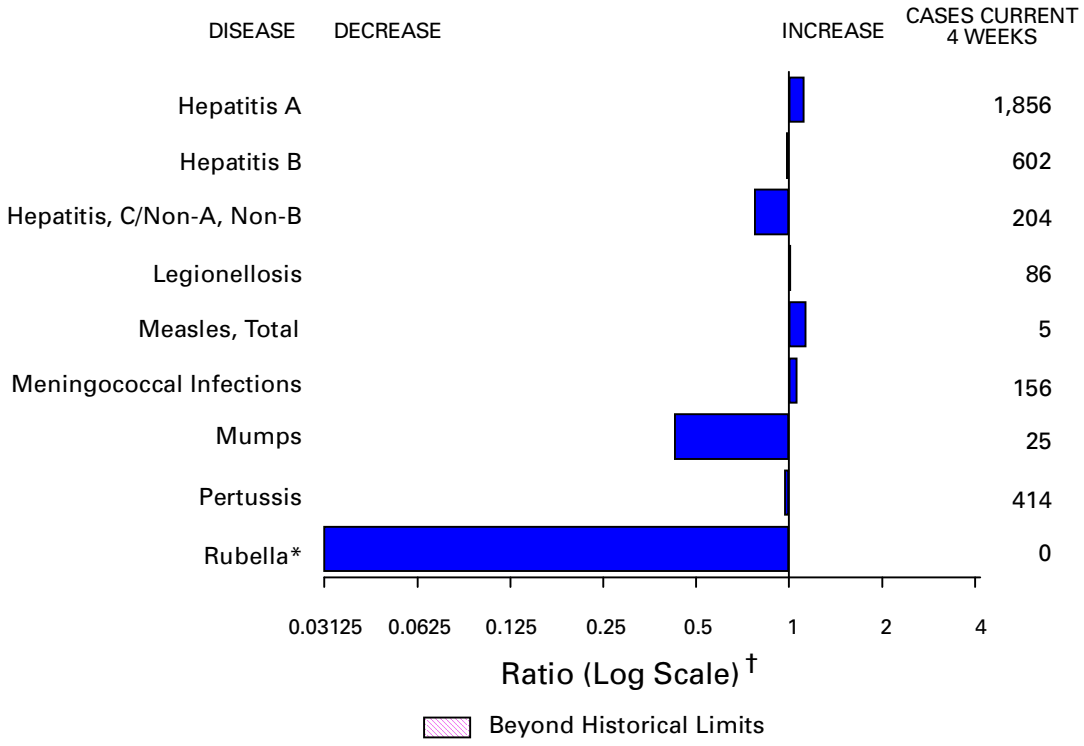
Erratum: Vol. 47, No. 45

On page 985 in "Figure I. Selected notifiable disease reports, comparison of provisional 4-week totals ending November 14, 1998, with historical data — United States," the display for Rubella is incorrect. The corrected figure for week 45 is below.

FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending November 14, 1998, with historical data — United States



*No rubella cases were reported for the current 4-week period, yielding a ratio for week 45 of zero (0).

†Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

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