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Heat-Wave–Related Mortality — Milwaukee, Wisconsin, July 1995

During July 12–15, 1995, a heat wave* occurred in major portions of the midwestern and eastern United States. Record-high temperatures were recorded at approximately 70 locations, ranging from the central and northern Great Plains to the Atlantic coast (*1*) and caused substantial numbers of heat-related illnesses and deaths in some locations (*2*). In Milwaukee, Wisconsin (1994 estimated population: 938,112), maximum daily temperatures ranged from 91 F (32.7 C) to 103 F (39.5 C), and average daily humidity was as high as 70%. This report summarizes the investigation by the Milwaukee County Medical Examiner's Office (MCMEO) and the Milwaukee Department of Health and Social Services of heat-related deaths in Milwaukee during the heat wave and presents four case reports.

Investigation of Deaths

During July 13–23, MCMEO received reports of and investigated 197 deaths. Of these, 91 (46%) were determined to be related to the heat wave. Deaths were considered heat-related if 1) the decedent's measured body temperature at the time of death was ≥105 F (≥40.4 C), or 2) there was evidence of high environmental temperature—usually ≥100 F (≥37.7 C)—at the scene of death.

Hyperthermia or excessive heat was cited as the underlying or direct cause for 34 (37%) of these 91 deaths and as an important contributing cause for 57 (63%). The 91 decedents ranged in age from 1 year to 97 years (median: 76 years), and 52 (57%) were male. Psychotropic medications were cited as contributing factors in 15 deaths, and alcohol consumption was cited as a contributing factor in five. Eighty-one (89%) of the deaths occurred during July 14–17, and 34 (42%) of these occurred on July 15 (Figure 1).

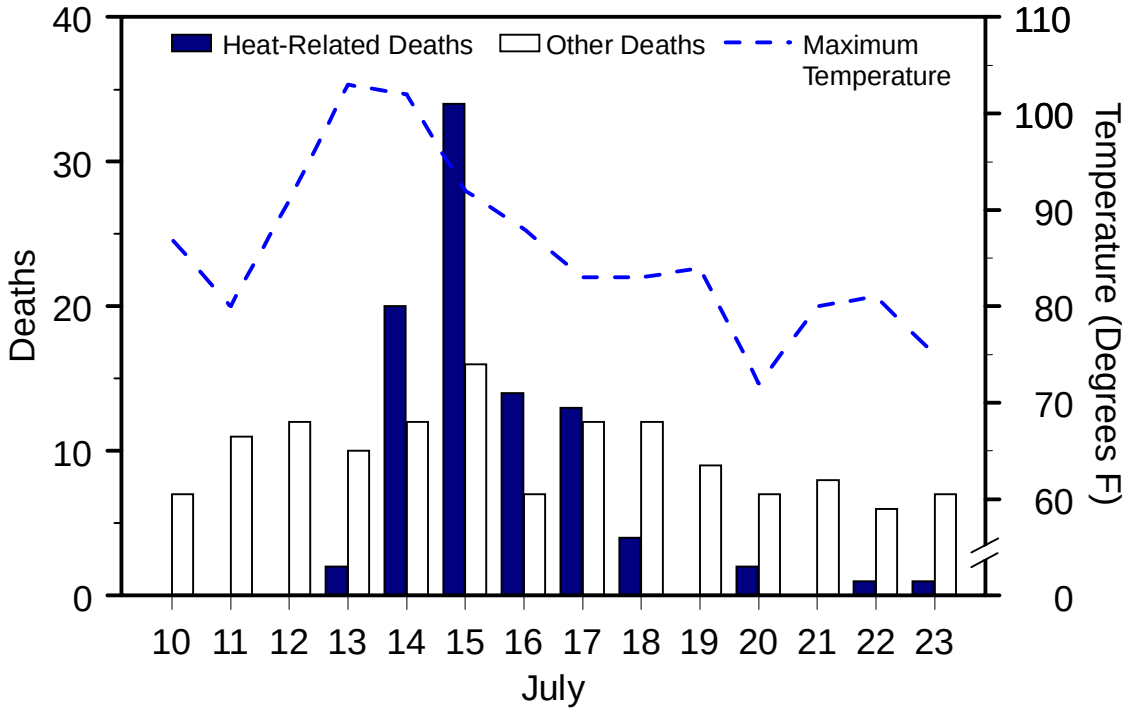
Case Reports

Case 1. On July 13, 1995, a 7-month-old girl was brought to an emergency department because of respiratory arrest but could not be resuscitated. The cause of death was listed by MCMEO as bronchopulmonary dysplasia associated with environmental hyperthermia. She had been receiving home nursing care for congenital respiratory impairment. A window air conditioner was being installed at the time of her death.

*Three or more consecutive days of air temperatures >90 F (>32.2 C).

Heat-Wave–Related Mortality — Continued

FIGURE 1. Deaths reported to the Milwaukee County Medical Examiner's Office and maximum daily temperatures — Milwaukee, Wisconsin, July 10–23, 1995



Case 2. On July 14, 1995, an 82-year-old woman was found dead in her two-story home. A neighbor reported that the decedent had had no health complaints the previous evening. Family members reported that the decedent had used a fan but kept all doors and windows closed because of safety concerns; the wall thermostat registered >90 F (>32.2 C) on the day before death. The immediate cause of death was listed by MCMEO as arteriosclerotic heart disease, with elevated environmental temperature as an important contributing factor.

Case 3. On July 15, 1995, a 24-year-old man with a history of schizophrenia, acute depression, and psychotropic drug use was found dead in the living room of his family residence. The previous day he had reported "not feeling well." The immediate cause of death was listed by MCMEO as environmental hyperthermia, with use of psychotropic medications as an important contributing factor.

Case 4. On July 17, 1995, a 79-year-old woman was found dead in her home. She had last been seen returning from a store on the previous day by a neighbor. The immediate cause of death was listed by MCMEO as arteriosclerotic heart disease, with elevated environmental temperature as an important contributing factor.

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Editorial Note: During periods of sustained environmental heat—particularly during the summer—the numbers of deaths classified as heat-related (e.g., heatstroke) and attributed to other causes (e.g., cardiovascular, cerebrovascular, and respiratory dis-

Heat-Wave–Related Mortality — Continued

ease) increase substantially (*3*). The epidemiology of the heat-related deaths in Milwaukee in 1995 is consistent with previous reports indicating increased risk for heat-related mortality among elderly persons, persons with chronic conditions (including obesity), patients taking medications that predispose them to heatstroke (e.g., neuroleptics or anticholinergics), and persons confined to bed or who otherwise are unable to care for themselves (*4,5*).

Adverse health outcomes associated with high environmental temperatures include heatstroke, heat exhaustion, heat syncope, and heat cramps (*6*). Heatstroke (i.e., core body temperature ≥105 F (≥40.4 C) is the most serious of these conditions and is characterized by rapid progression of lethargy, confusion, and unconsciousness; it is often fatal despite medical care directed at lowering body temperature. Heat exhaustion is a milder syndrome that occurs following sustained exposure to hot temperatures and results from dehydration and electrolyte imbalance; manifestations include dizziness, weakness, or fatigue, and treatment is supportive. Heat syncope and heat cramps usually are related to physical exertion during hot weather; persons with loss of consciousness resulting from heat syncope should be treated by placement in a recumbent position and replacement of electrolytes.

Basic behavioral and environmental measures are essential for preventing heat-related illness and death. Personal prevention strategies should include increases in time spent in air-conditioned environments, intake of nonalcoholic beverages, and incorporation of cool baths into a daily routine. When possible, activity requiring physical exertion should be conducted during cooler parts of the day. Sun exposure should be minimized, and light, loose, cotton clothing should be worn. The risk for heat-induced illness is greatest before persons become acclimatized to warm environments. Athletes and workers in occupations requiring exposure to either indoor or outdoor high temperatures should take special precautions, including allowing 10–14 days to acclimate to an environment of predictably high ambient temperature.

Public health agencies can assist in preventing heat-related illnesses and deaths by disseminating community prevention messages to persons at high risk (e.g., the elderly and persons with preexisting medical conditions) using a variety of communication techniques and establishing emergency plans that include provision of access to artificially cooled environments.

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National, State, and Urban Area Vaccination Coverage Levels Among Children Aged 19–35 Months — United States, July 1994–June 1995

The National Immunization Survey (NIS) is an ongoing survey to provide estimates of vaccination coverage levels among children aged 19–35 months in the United States, all 50 states, and selected urban areas. CDC implemented NIS in April 1994 as one element of the five-part Childhood Immunization Initiative (CII), a national strategy to achieve and maintain high vaccination levels among children during the first 2 years of life (*1*). NIS collects quarterly data from all 50 states, the District of Columbia, and 27 urban areas considered to be at high risk for undervaccination (*2,3*). This report provides NIS findings for July 1994–June 1995, which indicate that coverage levels for diphtheria and tetanus toxoids and pertussis vaccine (DTP), *Haemophilus influenzae* type b vaccine (Hib), poliovirus vaccine, and hepatitis B vaccine have met or exceeded the 1995 interim goals of the CII and that coverage for measles-mumps-rubella vaccine (MMR) is within 1 percentage point of the objective.

NIS uses a two-phase sample design: the first phase employs a quarterly random sample of telephone numbers for each survey area and includes administration of a screening questionnaire to respondents aged ≥18 years to locate households with one or more children aged 19–35 months*. Vaccination information is collected for all age-eligible children. All respondents are asked to refer to written records; however, reports from recall also are accepted. During July 1994–June 1995, approximately 1.6 million telephone numbers were called, and 35,440 interviews were completed (an average of 454 interviews per survey area). The overall response rate for eligible households was 71% (range: 57%–86% among the 78 survey sites).

In the second phase, vaccination information is requested from health-care providers for children in surveyed households. During 1994, households were excluded that used records indicating their children received all recommended doses of four specific vaccines.† All households identified in the first and second quarters of 1995 were included in the second phase. Based on exclusions, 30,543 (86%) children were eligible for the second phase; of these, vaccination information was obtained from providers for 13,755 (45%) children. The demographic characteristics and the reported vaccination histories were similar for children with and without provider information. Overall, for 59% of the children in the survey, either written records of having received all of the required doses for the four vaccines were available (29%) or vaccination information based on provider records was available (30%). As previously described, these provider data were used to adjust responses for the entire group of children surveyed (*2–5*). Data from four consecutive quarters yielded 12-month estimates for the United States, the 50 states, the District of Columbia, and the 27 urban areas.

Compared with the previous reporting period (April 1994–March 1995), there were statistically significant increases in national vaccination coverage with three or more doses of poliovirus vaccine (from 84% [95% confidence interval (CI)=±0.9%] to 86% [95% CI=±0.8%]) and with three or more doses of hepatitis b vaccine (from 42% [95%

*For this reporting period, included children born during August 1991–November 1993 (median: age 27 months).

†Four doses of DTP, three doses of poliovirus vaccine, one dose of MMR, and three doses of Hib.

Child Vaccination Levels — Continued

CI=±1.2%] to 51% [95% CI=±1.1%]) (Table 1)[§]. The series-complete coverage estimates for 4:3:1 (i.e., four doses of DTP, three doses of poliovirus vaccine, and one dose of MMR) and 4:3:1:3 (i.e., four doses of DTP, three doses of poliovirus vaccine, one dose of MMR, and three doses of Hib) remained stable.

For every vaccine or series of vaccines, estimated vaccination coverage for the most recent quarter (April–June 1995) was equal to or higher than that for the most recent 12 months. Coverage increased the most for hepatitis B vaccine (62% [95% CI=±1.5%] versus 51% [95% CI=±1.1%]) (Table 1).

During July 1994–June 1995, state-specific estimated coverage levels for the 4:3:1:3 series ranged from 61% to 87% (median: 75%), and for the 4:3:1 series ranged from 64% to 88% (median: 77%) (Table 2). Estimated coverage levels among selected urban areas ranged from 51% to 86% for the 4:3:1:3 series (median: 72%), and for the 4:3:1 series ranged from 55% to 86% (median: 76%) (Table 3). Compared with April 1994–March 1995 (*3*), changes for the 4:3:1:3 series were greatest in Illinois (from 64% [95%

[§]The overlap of three quarters between the current reporting period and the previous reporting period requires a special procedure for calculating the standard error of the difference. Taking the overlap into account leads to a smaller standard error than if the reporting periods were regarded as independent.

TABLE 1. Vaccination coverage levels among children aged 19–35 months, by selected vaccines — National Immunization Survey, United States, July 1994–June 1995

			National Immunization Survey					
			April 1994–March 1995		July 1994–June 1995		April 1995–June 1995[†]	
Vaccine/Dose	1995 Goal	1996 Goal	%	(95% CI*)	%	(95% CI)	%	(95% CI)
DTP/DT[§]								
≥3 Doses	87%	90%	94	(±0.6%)	94	(±0.5%)	95	(±0.8%)
≥4 Doses	–	–	77	(±1.0%)	78	(±1.0%)	78	(±1.3%)
Poliovirus								
≥3 Doses	85%	90%	84	(±0.9%)	86	(±0.8%)	88	(æ1.1%)
Hib[¶]								
≥3 Doses	85%	90%	90	(±0.7%)	91	(±0.7%)	92	(±0.9%)
MMR**								
≥1 Dose	90%	90%	89	(±0.8%)	89	(±0.7%)	89	(±1.0%)
Hepatitis B								
≥3 Doses	50%	70%	42	(±1.2%)	51	(±1.1%)	62	(±1.5%)
19–24 Months	–	–	58	(±1.4%)	64	(±1.3%)	70	(±2.4%)
25–30 Months	–	–	41	(±1.4%)	51	(±1.3%)	67	(±2.5%)
31–35 Months	–	–	24	(±1.3%)	34	(±1.3%)	49	(±2.6%)
Combined series								
4 DTP/3 Polio/1 MMR[††]	–	–	75	(±1.0%)	75	(±1.0%)	76	(±1.4%)
4 DTP/3 Polio/1 MMR/3 Hib[§§]	–	–	72	(±1.1%)	73	(±1.0%)	75	(±1.4%)

*Confidence interval.
[†]For this reporting period, included children born during May 1992–November 1993.
[§]Diphtheria and tetanus toxoids and pertussis vaccine/Diphtheria and tetanus toxoids.
[¶]*Haemophilus influenzae* type b vaccine.
**Measles-mumps-rubella vaccine.
[††] Four doses of DTP/DT, three doses of poliovirus vaccine, and one dose of MMR.
[§§]Four doses of DTP/DT, three doses of poliovirus vaccine, one dose of MMR, and three doses of Hib.

Child Vaccination Levels — Continued

TABLE 2. Estimated vaccination coverage levels with the 4:3:1 series* and the 4:3:1:3 series†, by coverage level and state — National Immunization Survey, United States, July 1994–June 1995

Coverage level/ State	4:3:1 Series coverage %	(95% CI§)	Coverage level/ State	4:3:1:3 Series coverage %	(95% CI)
≥85%			**≥85%**		
Connecticut¶	86	(±4.7%)	New Hampshire	85	(±4.3%)
Massachusetts¶	85	(±4.0%)	Vermont	87	(±3.8%)
New Hampshire¶	87	(±4.0%)	**75%–84%**		
Vermont**	88	(±3.7%)	Alabama	76	(±4.7%)
75%–84%			Connecticut	84	(±5.0%)
Alabama††	77	(±4.7%)	Delaware	77	(±5.7%)
Delaware¶	79	(±5.5%)	Florida	78	(±4.7%)
Florida¶	78	(±4.7%)	Hawaii	78	(±5.7%)
Georgia¶	75	(±5.1%)	Iowa	81	(±4.5%)
Hawaii¶	82	(±5.3%)	Kansas	75	(±5.0%)
Illinois††	75	(±4.4%)	Kentucky	83	(±4.8%)
Iowa††	82	(±4.4%)	Maine	82	(±4.5%)
Kansas††	78	(±4.8%)	Massachusetts	83	(±4.2%)
Kentucky**	84	(±4.7%)	Minnesota	78	(±5.2%)
Maine**	84	(±4.3%)	Mississippi	81	(±5.0%)
Maryland¶	78	(±4.6%)	New York	77	(±4.2%)
Minnesota**	79	(±5.2%)	North Carolina	79	(±5.2%)
Mississippi**	82	(±4.9%)	North Dakota	81	(±4.4%)
New Jersey¶	76	(±5.0%)	Ohio	75	(±4.2%)
New Mexico††	75	(±5.8%)	Pennsylvania	77	(±4.5%)
New York¶	78	(±4.1%)	Rhode Island	82	(±4.8%)
North Carolina**	82	(±5.0%)	South Carolina	80	(±5.1%)
North Dakota††	82	(±4.3%)	South Dakota	78	(±5.2%)
Ohio††	77	(±4.2%)	Virginia	78	(±5.4%)
Pennsylvania¶	80	(±4.2%)	Wisconsin	75	(±4.0%)
Rhode Island¶	83	(±4.7%)	Wyoming	77	(±5.2%)
South Carolina¶	81	(±5.0%)	**65%–74%**		
South Dakota††	79	(±5.1%)	Alaska	68	(±6.1%)
Virginia**	79	(±5.4%)	Arizona	71	(±4.3%)
Washington††	75	(±4.2%)	Arkansas	68	(±5.8%)
Wisconsin**	78	(±3.9%)	California	69	(±4.4%)
Wyoming**	79	(±5.1%)	Colorado	70	(±5.8%)
65%–74%			Georgia	74	(±5.2%)
Alaska§§	72	(±6.0%)	Idaho	67	(±6.0%)
Arizona††	74	(±4.2%)	Illinois	72	(±4.5%)
Arkansas††	71	(±5.8%)	Indiana	71	(±5.1%)
California§§	72	(±4.3%)	Louisiana	70	(±5.4%)
Colorado††	74	(±5.6%)	Maryland	74	(±4.8%)
Idaho††	68	(±6.0%)	Missouri	70	(±6.0%)
Indiana††	73	(±5.0%)	Montana	68	(±5.9%)
Louisiana§§	72	(±5.3%)	Nebraska	71	(±5.4%)
Missouri††	71	(±6.0%)	New Jersey	73	(±5.2%)
Montana††	70	(±5.8%)	New Mexico	71	(±6.0%)
Nebraska††	73	(±5.3%)	Oklahoma	69	(±6.5%)
Nevada§§	66	(±6.1%)	Oregon	68	(±5.9%)
Oklahoma††	72	(±6.4%)	Tennessee	72	(±4.0%)
Oregon§§	71	(±5.8%)	Texas	69	(±3.7%)
Tennessee§§	73	(±4.0%)	Utah	69	(±4.4%)
Texas††	71	(±3.6%)	Washington	73	(±4.3%)
Utah††	72	(±4.3%)	West Virginia	67	(±6.2%)
West Virginia††	68	(±6.2%)	**<65%**		
<65%			Michigan	61	(±5.3%)
Michigan††	64	(±5.2%)	Nevada	64	(±6.1%)
Total	**75**	**(±1.0%)**	**Total**	**73**	**(±1.0%)**

* Four doses of diphtheria and tetanus toxoids and pertussis vaccine/diphtheria and tetanus toxoids (DTP/DT), three doses of poliovirus vaccine, and one dose of measles-mumps-rubella vaccine (MMR).

† Four doses of DTP/DT, three doses of poliovirus vaccine, one dose of MMR, and three doses of *Haemophilus influenzae* type b vaccine (Hib).

§ Confidence interval.

¶ Met the 1995 Childhood Immunization Initiative (CII) goals for three or more doses of DTP, three or more doses of poliovirus, one or more dose of MMR, three or more doses of Hib, and three or more doses of hepatitis B vaccine.

** Met the 1995 CII goals for three or more doses of DTP, three or more doses of poliovirus, one or more dose of MMR, three or more doses of Hib, but not for three or more doses of hepatitis B vaccine.

†† Did not meet the 1995 CII goals for at least one of three or more doses of DTP, three or more doses of poliovirus, one or more dose of MMR, or three or more doses of Hib, or the 1995 goal for three or more doses of hepatitis B vaccine.

§§ Did not meet the 1995 CII goals for at least one of three or more doses of DTP, three or more doses of poliovirus, one or more dose of MMR, or three or more doses of Hib, but did meet the 1995 goal for three or more doses of hepatitis B vaccine.

Child Vaccination Levels — Continued

TABLE 3. Estimated vaccination coverage levels with the 4:3:1 series* and the 4:3:1:3 series†, by coverage level and selected urban area — National Immunization Survey, United States, July 1994–June 1995

Coverage level/ Area	4:3:1 Series coverage %	(95% CI§)	Coverage level/ Area	4:3:1:3 Series coverage %	(95% CI)
≥85%			**≥85%**		
Boston¶	86	(±5.1%)	Boston	86	(±5.1%)
75%–84%			**75%–84%**		
Baltimore**	79	(±6.0%)	Cuyahoga Co., Ohio	76	(±5.9%)
Cuyahoga Co., Ohio**	79	(±5.7%)	El Paso Co., Tex.	80	(±4.7%)
Dade Co., Fla.††	76	(±5.3%)	Fulton/DeKalb cos., Ga.	75	(±6.5%)
El Paso Co., Tex.¶	81	(±4.6%)	Jefferson Co., Ala.	79	(±5.7%)
Fulton/DeKalb cos., Ga.¶	78	(±6.3%)	King Co., Wash.	77	(±5.2%)
Jefferson Co., Ala.**	80	(±5.6%)	Marion Co., Ind.	77	(±5.9%)
King Co., Wash.¶	80	(±4.9%)	New York City	76	(±6.2%)
Maricopa Co., Ariz.§§	75	(±5.8%)	Santa Clara Co., Calif.	77	(±5.8%)
Marion Co., Ind.††	78	(±5.8%)	**65%–74%**		
Milwaukee Co., Wis.**	76	(±5.8%)	Baltimore	74	(±6.5%)
New York City¶	78	(±6.1%)	Chicago	65	(±7.4%)
San Diego Co., Calif.¶	76	(±5.5%)	Dallas Co., Tex.	67	(±6.6%)
Santa Clara Co., Calif.¶	81	(±5.3%)	Dade Co., Fla.	74	(±6.4%)
Shelby Co., Tenn.¶	76	(±6.4%)	Davidson Co., Tenn.	67	(±6.2%)
65%–74%			Duval Co., Fla.	70	(±6.0%)
Bexar Co., Tex.§§	68	(±6.4%)	Franklin Co., Ohio	71	(±6.5%)
Chicago§§	69	(±7.2%)	Los Angeles Co., Calif.	66	(±7.1%)
Dallas Co., Tex.††	67	(±6.6%)	Maricopa Co., Ariz.	71	(±6.0%)
Davidson Co., Tenn.††	69	(±6.1%)	Milwaukee Co., Wis.	73	(±6.0%)
District of Columbia§§	68	(±6.7%)	Philadelphia Co., Pa.	67	(±7.5%)
Duval Co., Fla.††	73	(±6.4%)	San Diego Co., Calif.	74	(±5.6%)
Franklin Co., Ohio§§	72	(±6.4%)	Shelby Co., Tenn.	74	(±6.4%)
Los Angeles Co., Calif.¶	68	(±7.0%)	**<65%**		
Orleans Parish, La.††	66	(±7.4%)	Bexar Co., Tex.	63	(±6.5%)
Philadelphia Co., Pa.††	69	(±7.4%)	Detroit	51	(±7.7%)
<65%			District of Columbia	62	(±6.9%)
Detroit§§	55	(±7.9%)	Houston	62	(±7.7%)
Houston§§	64	(±7.7%)	Newark, N.J.	57	(±9.1%)
Newark, N.J.§§	60	(±9.0%)	Orleans Parish, La.	64	(±7.5%)

*Four doses of diphtheria and tetanus toxoids and pertussis vaccine/diphtheria and tetanus toxoids (DTP/DT), three doses of poliovirus vaccine, and one dose of measles-mumps-rubella vaccine (MMR).

†Four doses of DTP/DT, three doses of poliovirus vaccine, one dose of MMR, and three doses of *Haemophilus influenzae* type b vaccine (Hib).

§Confidence interval.

¶Met the 1995 Childhood Immunization Initiative (CII) goals for three or more doses of DTP, three or more doses of poliovirus, one or more dose of MMR, three or more doses of Hib, and three or more doses of hepatitis B vaccine.

**Met the 1995 CII goals for three or more doses of DTP, three or more doses of poliovirus, one or more dose of MMR, three or more doses of Hib, but not for three or more doses of hepatitis B vaccine.

††Did not meet the 1995 CII goals for at least one of three or more doses of DTP, three or more doses of poliovirus, one or more dose of MMR, or three or more doses of Hib, but did meet the 1995 goal for three or more doses of hepatitis B vaccine.

§§Did not meet the 1995 CII goals for at least one of three or more doses of DTP, three or more doses of poliovirus, one or more dose of MMR, or three or more doses of Hib, or the 1995 goal for three or more doses of hepatitis B vaccine.

Child Vaccination Levels — Continued

CI=±5.2%] to 72% [95% CI=±4.5%]); coverage in Chicago increased from 55% (95% CI=±8.7%) to 65% (95% CI=±7.4%) (*3*).

The 1995 CII interim goal for coverage with three or more doses of DTP was achieved by all states, the District of Columbia, and by all except one of the 27 urban areas; the goal for coverage with three or more doses of Hib vaccine was achieved by 49 states and 24 urban areas. For coverage with three or more doses of poliovirus vaccine, the 1995 interim goal was achieved by 31 states and 16 urban areas; for coverage with one or more dose of MMR vaccine, by 25 states and 16 urban areas; and for coverage with three or more doses of hepatitis B vaccine, by 20 states and 16 urban areas.

Reported by: National Center for Health Statistics; Assessment Br, Data Management Div, National Immunization Program, CDC.

Editorial Note: The findings from the NIS indicate that the 1995 CII interim coverage goals have been met or exceeded for DTP, Hib, poliovirus vaccine, and hepatitis B vaccine (*1*); the coverage estimate for MMR is within 1 percentage point of the goal. This report presents for the first time national quarterly estimates. However, because these estimates reflect changes in coverage in a more timely manner than 12-month estimates, increased variability must be considered when interpreting these quarterly data.

Compared with the previous 12-month estimates, increases in vaccination coverage were greatest for hepatitis B vaccine, probably reflecting substantial progress in the implementation of the infant hepatitis B Advisory Committee on Immunization Practices (ACIP) recommendations (*6*). In addition, coverage for three doses of poliovirus vaccine exceeded the 1995 goal for the first time, and the results for the second quarter of 1995 suggest a continuation of this upward trend. This increase preceded recommendations by the ACIP to encourage administration of the third dose of oral polio vaccine at age 6 months rather than in the second year of life (*7*). National vaccination coverage for 4:3:1 series completion did not change for the 12-month period. Thus, approximately 1 million children still need one or more of the recommended doses of vaccine.

NIS enables identification of differences in coverage levels among states and urban areas and development of area-specific interventions (*3*). States and urban areas that did not meet the 1995 interim goals will need to intensify efforts to meet the 1995 and 1996 goals. Strategies for improving coverage include avoiding missed opportunities for vaccinations by increasing health care providers' awareness of the need to check the vaccination status of children evaluated for other reasons (*8,9*) and linking vaccination to the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (*10*). CDC and other public health agencies will continue to use NIS to monitor and target efforts to improve vaccination coverage levels.

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Child Vaccination Levels — Continued

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Epidemic Malaria — Tadjikistan, 1995

In June 1995, the Tadjikistan Ministry of Health (MOH) and CDC, with support of the U.S. Agency for International Development, began collaborative efforts to strengthen the health information and disease surveillance systems in Tadjikistan (1995 population: 5.7 million) (Figure 1). As part of an initial evaluation in Tadjikistan, the Republican Sanitary and Epidemiologic Service (RSES) and the Parasitology Laboratory of the Institute for Preventive Medicine in the MOH reported a substantial increase in the incidence of malaria since 1991. This report summarizes malaria surveillance data for 1995 in Tadjikistan and describes barriers to implementing effective measures for controlling and preventing malaria in Tadjikistan.

The MOH requires reporting of all malaria cases; reporting sources include physicians and feldshers (health-care workers similar to physician's assistants who often are the first contact patients may have with the medical system, especially in rural

FIGURE 1. Location of Tadjikistan

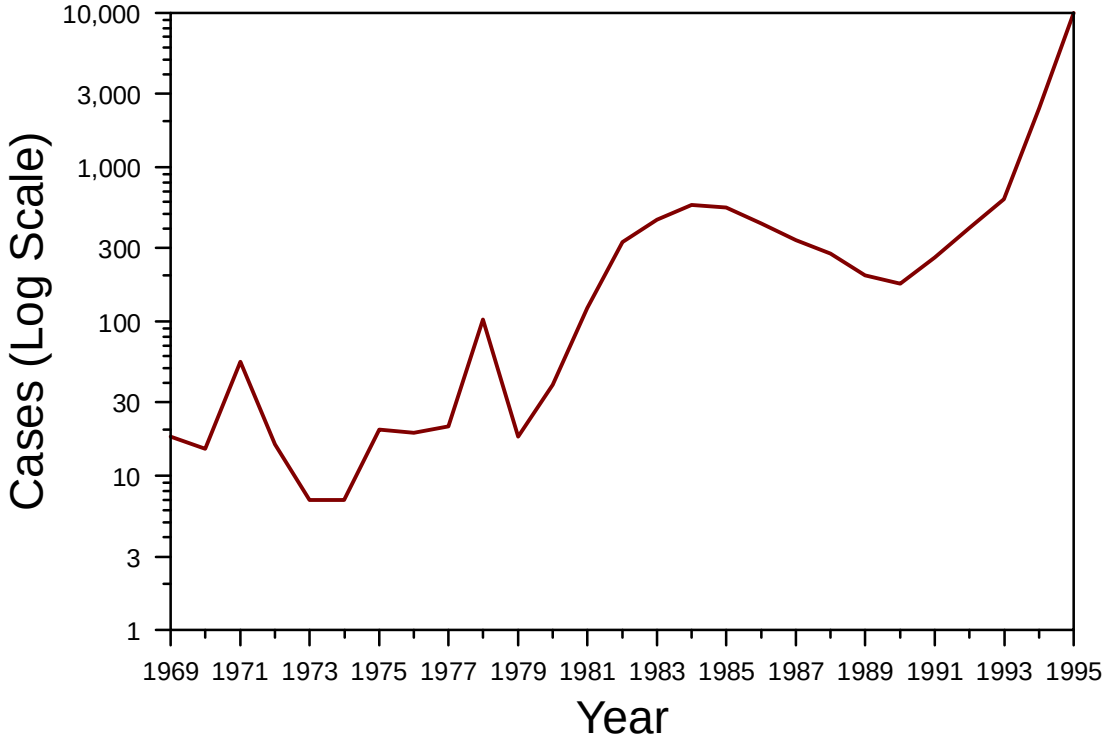
Epidemic Malaria — Continued

areas) who examine patients in hospitals, polyclinics, diagnostic centers, ambulatory clinics, or individual feldsher stations. All cases of malaria—whether confirmed or suspected—must be reported to the MOH within 12 hours. Each case is reviewed, and an investigation may be initiated to examine the diagnosis, exposure, and treatment. Cases enumerated in the surveillance system are those with a final diagnosis of malaria, based on the clinician's evaluation and/or results of the investigation, and may not require laboratory confirmation.

Historically, reported malaria data in Tadjikistan were assessed for validity through a systematic random-sample surveillance system requiring that a blood slide of every 10th smear-confirmed case be sent to the RSES for confirmation; the RSES then sent the slides to the Institute of Preventive Medicine for additional confirmation. The system also required that a blood slide of every 10th smear performed for initially suspected cases that were investigated but not confirmed be sent to the Sanitary and Epidemiologic Service at the oblast (state) level for examination. During the fourth quarter of 1995, this system was unreliable because of shortages of trained personnel.

During the 1960s and 1970s, sporadic cases of infection with *Plasmodium vivax* occurred in persons in Tadjikistan who resided in the area of the Amu Darya River basin that separates Tadjikistan from Afghanistan; from 1972 through 1978, annual case counts were consistently ≤21 (Figure 2). Malaria transmission in Tadjikistan was limited by mosquito-eradication efforts that included aerial spraying with insecticides. Following the start of the war in Afghanistan in 1979, the number of reported cases in Tadjikistan increased sharply, peaking at 571 cases (12.7 per 100,000 population) in 1984, reflecting in part disruption of intensive efforts for mosquito control in both Tad-

FIGURE 2. Reported cases of malaria* — Tadjikistan, 1969–1995



*Cases reported to the Tadjikistan Ministry of Health by physicians and feldshers.

Epidemic Malaria — Continued

jikistan and Afghanistan. Mosquito-control activities were resumed in the mid-1980s, and the total number of reported malaria cases in Tadjikistan had declined to 176 in 1990.

Mosquito-control operations were curtailed in 1991 because of financial constraints and discontinued in 1992. Beginning in 1991, the annual number of confirmed cases of malaria increased dramatically (Figure 2). The 619 cases of malaria reported in 1993 included the first reported cases of *P. malariae* and *P. falciparum*. In 1994, of the 2411 total cases of malaria, 54 (2.2%) were identified as *P. falciparum*; the remainder were identified as *P. vivax* or *P. malariae* infection. The overall incidence of malaria in 1994 was 43.4 per 100,000 population. Of the 2411 total cases, 1638 (70.7%) were reported from Hatlon Oblast (86.7 per 100,000), and 446 (18.5%) were reported from the Gorno-Badakhshan Autonomous Region (227.3 per 100,000). Of the cases reported from Hatlon Oblast, the incidence was highest in those districts bordering Afghanistan. In addition, in at least three administrative districts with populations of approximately 30,000 each, the incidence was ≥300 per 100,000.

During January–September 1995, a total of 4332 cases of malaria were reported, a 146% increase over the same period in 1994 (1764 cases). Although the final total number of new malaria cases in Tadjikistan in 1995 is unknown, an estimated 10,000 cases occurred, based on historical ratios of initial reports to confirmed cases; however, few of these new cases were slide-confirmed. In addition, during January–September 1995, 470 cases were reported in the capital city of Dushanbe (88.2 per 100,000). Although most of these cases occurred among persons who probably acquired infection in the southern oblasts bordering Afghanistan, approximately 24% did not have confirmed recent travel histories to a malaria-endemic area and may have acquired infection locally or these cases may represent relapses. More detailed epidemiologic description of cases (e.g., age and sex) and an accurate number of malaria-related deaths are not available. Chloroquine resistance has not been reported, although detailed drug-sensitivity studies have not been conducted.

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Editorial Note: An estimated 40% of the world's population is at risk for malaria infection; each year, 300–500 million clinical cases and 1.5–2.7 million malaria-associated deaths occur (*1*). Important components of the Global Malaria Control Strategy described by the World Health Organization (WHO) are recognition of areas at risk for outbreaks of malaria and epidemic preparedness (*2*).

Factors associated with the increased risk for epidemic malaria in Tadjikistan include the large population movements near the Afghanistan border, adverse economic conditions, breakdown of health-care services, shortages of trained public health personnel, and ongoing civil war that has constrained epidemiologic investigation and implementation of control activities (*3*). Systematic preventive measures—including mosquito control—have been suspended because of shortages of gasoline, equipment, and insecticides. Production of crops that require irrigation in an arid area (e.g., rice and corn) also is increasing, resulting in an increase in suitable anopheline breeding sites and possibly contributing to the increase in malaria transmission. Since the government of Tadjikistan declared independence in September 1991, political un-

Epidemic Malaria — Continued

rest and a decline in economic conditions have resulted in an exodus of trained epidemiologists and support personnel to other countries. Of 200 trained epidemiologists in the Tadjikistan RSES before independence, <25 remain. Underreporting also is increasing as persons are less likely to seek health-care services. In addition, although WHO has provided large quantities of antimalarials, only 50%–70% of cases have received optimal treatment with chloroquine and primaquine to treat the blood-stage parasites and to prevent relapses of *P. vivax* infection.

Infection with *P. falciparum* in a population with no prior exposure could cause severe illness with high case-fatality rates among both children and adults. Because many cases in Tadjikistan were imported among refugees returning from northern Afghanistan, an area with chloroquine-resistant *P. falciparum*, surveillance for drug resistance especially is important for development of treatment protocols.

Malaria transmission in Tadjikistan occurs primarily from the end of May through November. Because of the potential for intensification of the malaria epidemic, the surveillance system needs to be strengthened and include collection of travel and exposure history to help target control measures. Optimal case management will require rebuilding diagnostic capability, ensuring ample supplies of antimalarial drugs, and having standardized treatment protocols. Improving the ability to monitor anopheline populations will focus control measures and target the use of insecticides and aerial and house spraying. A needs assessment will be necessary to assist in developing enhanced surveillance, improved case management, and vector control, and to guide assistance from the international donor community.

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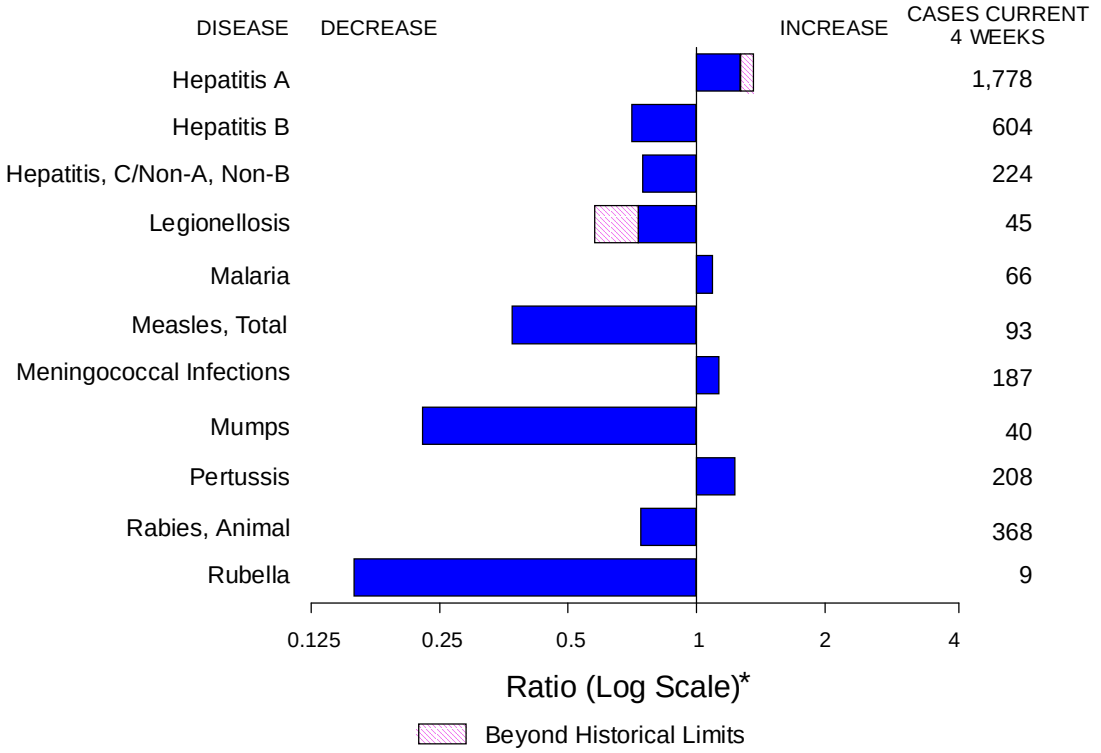
Erratum and Addendum: Vol. 45, No. 23

In the article "Outbreak of Postoperative Endophthalmitis Caused by Intrinsically Contaminated Ophthalmic Solutions—Thailand, 1992, and Canada, 1993" on page 492, in the second paragraph, the fourth line should read "... was recorded to have been *12* pounds per square inch (psi)...."

Additional information regarding the outbreak in Thailand is available in: Swaddiwudhipong W, Tangkitchot T, Silarug N. An outbreak of *Pseudomonas aeruginosa* postoperative endophthalmitis caused by contaminated intraocular irrigating solution. Trans R Soc Trop Med Hyg 1995;89:288.

FIGURE I. Selected notifiable disease reports, comparison of 4-week totals ending June 15, 1996, 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 — cases of selected notifiable diseases, United States, cumulative, week ending June 15, 1996 (24th Week)

	Cum. 1996		Cum. 1996
Anthrax	-	HIV infection, pediatric*§	122
Brucellosis	36	Plague	-
Cholera	2	Poliomyelitis, paralytic¶	-
Congenital rubella syndrome	1	Psittacosis	16
Cryptosporidiosis*	711	Rabies, human	-
Diphtheria	1	Rocky Mountain spotted fever (RMSF)	133
Encephalitis: California*	5	Streptococcal toxic-shock syndrome*	10
eastern equine*	1	Syphilis, congenital**	-
St. Louis*	-	Tetanus	9
western equine*	-	Toxic-shock syndrome	64
Hansen Disease	44	Trichinosis	11
Hantavirus pulmonary syndrome*†	-	Typhoid fever	150

-: 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 to the Division of HIV/AIDS Prevention, National Center for HIV, STD, and TB Prevention (NCHSTP) (proposed), last update May 28, 1996.
¶ One suspected case of polio with onset in 1996 has been reported to date.
**Updated quarterly from reports to the Division of STD Prevention, NCHSTP. First quarter 1996 is not yet available.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending June 15, 1996, and June 17, 1995 (24th Week)

Reporting Area	AIDS*		Chlamydia	*Escherichia coli* O157:H7		Gonorrhea		Hepatitis C/NA,NB		Legionellosis	
				NETSS†	PHLIS§						
	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995
UNITED STATES	28,480	32,078	133,551	483	208	125,444	177,102	1,645	1,821	324	535
NEW ENGLAND	1,123	1,696	8,058	44	17	3,453	2,291	54	56	18	10
Maine	16	26	-	3	-	21	34	-	-	1	3
N.H.	31	47	344	1	2	68	52	3	8	-	1
Vt.	9	14	-	6	5	27	20	22	6	2	-
Mass.	550	792	3,088	22	10	1,003	1,361	26	41	9	5
R.I.	73	121	938	5	-	241	235	3	1	6	1
Conn.	444	696	3,688	7	-	2,093	589	-	-	N	N
MID. ATLANTIC	7,891	8,351	18,121	51	23	13,821	20,826	168	178	64	71
Upstate N.Y.	1,000	978	N	33	12	2,697	4,167	143	88	17	22
N.Y. City	4,489	4,473	7,743	-	-	4,200	8,358	1	1	-	1
N.J.	1,511	1,770	2,053	18	5	2,328	1,702	-	78	7	14
Pa.	891	1,130	8,325	N	6	4,596	6,599	24	11	40	34
E.N. CENTRAL	2,298	2,543	22,366	130	64	22,871	36,133	215	150	95	176
Ohio	521	539	9,865	40	19	7,264	11,333	7	5	42	80
Ind.	347	255	4,751	20	11	3,252	3,950	7	-	23	40
Ill.	974	1,101	-	49	16	7,722	9,315	28	48	2	18
Mich.	323	494	4,101	21	18	2,911	8,500	173	97	22	18
Wis.	133	154	3,649	N	-	1,722	3,035	-	-	6	20
W.N. CENTRAL	691	689	11,282	81	41	5,302	9,202	108	30	22	40
Minn.	126	149	-	23	18	U	1,410	-	2	1	-
Iowa	51	43	1,878	14	10	488	674	80	3	5	12
Mo.	327	278	5,913	14	-	3,547	5,311	18	10	5	12
N. Dak.	6	1	2	1	5	1	14	-	3	-	2
S. Dak.	7	7	672	3	-	95	89	-	1	2	-
Nebr.	49	62	762	7	2	153	455	2	8	7	11
Kans.	125	149	2,055	19	6	1,018	1,249	8	3	2	3
S. ATLANTIC	7,305	7,937	24,412	29	4	45,146	49,894	116	133	50	88
Del.	142	162	-	-	-	661	912	1	-	-	-
Md.	853	1,123	2,881	N	1	5,771	5,778	-	6	7	15
D.C.	452	507	N	-	-	2,011	2,173	-	-	3	3
Va.	396	550	5,190	N	1	4,312	5,135	7	5	12	7
W. Va.	49	35	-	N	-	218	293	7	24	1	3
N.C.	355	405	-	7	2	8,628	11,190	21	27	3	17
S.C.	387	402	-	3	-	5,187	5,622	15	11	4	15
Ga.	1,096	1,093	5,822	7	-	10,118	9,305	-	15	1	11
Fla.	3,575	3,660	10,519	11	-	8,240	9,486	65	45	19	17
E.S. CENTRAL	953	982	13,631	17	13	14,272	18,044	296	568	25	24
Ky.	153	118	3,108	2	1	1,894	2,071	13	18	3	5
Tenn.	352	402	5,980	7	12	5,053	6,169	281	548	10	8
Ala.	278	261	3,878	4	-	6,056	7,513	2	2	1	3
Miss.	170	201	U	4	-	1,269	2,291	U	-	11	8
W.S. CENTRAL	2,656	2,490	6,040	25	4	8,514	23,429	202	105	2	11
Ark.	121	108	-	6	2	1,333	2,345	2	2	-	4
La.	656	360	3,148	4	2	3,565	5,477	82	64	-	2
Okla.	96	130	2,892	2	-	1,788	2,247	60	24	2	3
Tex.	1,783	1,892	-	13	-	1,828	13,360	58	15	-	2
MOUNTAIN	811	1,047	4,454	41	18	3,279	4,187	288	224	20	60
Mont.	10	8	-	4	-	13	38	9	9	1	4
Idaho	19	24	720	11	4	43	59	76	30	-	1
Wyo.	2	7	310	-	2	13	23	90	94	2	4
Colo.	248	340	-	14	5	825	1,382	25	32	6	26
N. Mex.	45	81	-	2	-	402	471	34	30	1	4
Ariz.	240	298	2,354	N	7	1,711	1,483	36	14	7	5
Utah	90	58	254	8	-	49	99	11	7	1	3
Nev.	157	231	816	2	-	223	632	7	8	2	13
PACIFIC	4,752	6,343	25,187	65	24	8,786	13,096	198	377	28	55
Wash.	366	458	4,557	15	5	1,006	1,107	29	102	1	7
Oreg.	223	208	2,578	21	14	246	202	4	24	-	-
Calif.	4,074	5,511	17,062	28	-	7,187	11,168	69	241	27	43
Alaska	11	45	432	1	-	193	331	2	1	-	-
Hawaii	78	121	558	N	5	154	288	94	9	-	5
Guam	3	-	114	N	-	26	58	1	3	-	1
P.R.	426	1,332	N	12	U	149	286	37	76	-	-
V.I.	9	19	N	-	U	-	21	-	-	-	-
Amer. Samoa	-	-	-	-	U	-	8	-	-	-	-
C.N.M.I.	-	-	N	-	U	11	13	-	-	-	-

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

*Updated monthly to the Division of HIV/AIDS Prevention, National Center for HIV, STD, and TB Prevention (proposed), last update May 28, 1996.

†National Electronic Telecommunications System for Surveillance.

§Public Health Laboratory Information System.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 15, 1996, and June 17, 1995 (24th Week)

Reporting Area	Lyme Disease		Malaria		Meningococcal Disease		Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal	
	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995
UNITED STATES	1,772	2,501	470	467	1,743	1,650	4,982	7,348	7,424	8,040	2,460	3,404
NEW ENGLAND	259	292	16	19	65	77	73	94	174	192	284	784
Maine	3	3	3	1	10	6	-	2	4	-	-	-
N.H.	3	12	1	1	2	14	1	1	6	5	38	88
Vt.	1	4	2	-	3	6	-	-	-	2	81	107
Mass.	35	22	7	6	24	24	34	37	75	109	52	281
R.I.	39	50	3	2	-	-	1	1	20	18	22	131
Conn.	178	201	-	9	26	27	37	53	69	58	91	177
MID. ATLANTIC	1,298	1,780	111	115	140	212	202	401	1,300	1,713	394	995
Upstate N.Y.	692	989	28	21	45	64	33	38	142	186	237	570
N.Y. City	159	167	50	57	22	26	65	177	703	925	-	-
N.J.	86	216	28	26	37	54	55	87	310	309	67	175
Pa.	361	408	5	11	36	68	49	99	145	293	90	250
E.N. CENTRAL	20	92	42	67	221	250	712	1,250	827	695	21	19
Ohio	16	9	7	3	85	69	251	423	139	134	4	2
Ind.	4	7	7	6	37	36	113	142	91	67	1	2
Ill.	-	6	8	41	47	70	234	463	511	467	1	3
Mich.	-	1	13	9	28	44	41	130	39	U	8	11
Wis.	U	69	7	8	24	31	73	92	47	27	7	1
W.N. CENTRAL	46	35	12	10	136	92	188	387	197	278	250	169
Minn.	3	-	3	3	15	16	27	26	38	66	14	11
Iowa	16	1	2	1	31	16	11	27	31	35	123	54
Mo.	7	16	5	4	60	35	141	318	83	102	13	18
N. Dak.	-	-	-	-	2	1	-	-	2	1	25	17
S. Dak.	-	-	-	-	3	4	-	-	13	10	59	44
Nebr.	-	3	-	2	10	8	5	7	7	17	3	1
Kans.	20	15	2	-	15	12	4	9	23	47	13	24
S. ATLANTIC	72	200	108	93	381	273	1,807	1,956	1,248	1,288	1,186	1,014
Del.	4	23	2	1	2	3	17	7	20	23	37	53
Md.	31	126	22	23	34	21	276	195	127	194	289	208
D.C.	1	1	4	9	6	2	86	60	68	49	2	9
Va.	3	13	13	17	32	32	216	305	118	105	252	191
W. Va.	4	12	1	1	8	5	1	1	27	45	48	46
N.C.	17	14	10	7	45	45	502	535	192	175	302	200
S.C.	2	5	3	-	37	36	211	303	40	144	37	63
Ga.	-	4	8	10	88	56	321	359	322	U	138	139
Fla.	10	2	45	25	129	73	177	191	334	553	81	105
E.S. CENTRAL	26	19	12	9	103	102	1,202	1,430	607	624	80	120
Ky.	8	3	2	-	19	26	65	96	115	137	20	9
Tenn.	7	9	5	4	10	32	467	392	179	207	30	48
Ala.	1	1	2	5	37	25	250	279	197	179	30	60
Miss.	10	6	3	-	37	19	420	663	116	101	-	3
W.S. CENTRAL	16	44	11	8	210	191	543	1,452	871	1,038	31	67
Ark.	7	2	-	1	27	21	140	218	39	90	9	22
La.	-	-	1	1	36	27	261	499	U	94	12	25
Okla.	2	19	-	-	19	22	68	76	34	-	10	20
Tex.	7	23	10	6	128	121	74	659	798	854	-	-
MOUNTAIN	2	2	29	28	107	127	57	114	248	261	53	57
Mont.	-	-	3	2	4	2	-	3	7	3	8	22
Idaho	-	-	-	1	12	5	1	-	4	6	-	-
Wyo.	2	1	2	-	3	5	1	-	3	1	14	17
Colo.	-	-	14	16	20	31	17	65	43	6	10	-
N. Mex.	-	-	1	3	20	26	-	4	39	40	1	3
Ariz.	-	-	3	3	29	42	35	19	106	143	15	13
Utah	-	-	4	2	11	8	-	4	10	10	2	1
Nev.	-	1	2	1	8	8	3	19	36	52	3	1
PACIFIC	33	37	129	118	380	326	198	264	1,952	1,951	161	179
Wash.	1	2	8	11	54	54	3	7	114	122	-	3
Oreg.	7	3	11	7	71	59	5	6	45	23	-	-
Calif.	24	32	104	92	251	206	190	250	1,689	1,690	153	169
Alaska	-	-	2	1	2	5	-	1	27	38	8	7
Hawaii	1	-	4	7	2	2	-	-	77	78	-	-
Guam	-	-	-	-	1	2	3	2	35	56	-	-
P.R.	-	-	-	1	3	13	71	154	58	86	25	29
V.I.	-	-	-	-	-	-	-	1	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	3	-	-
C.N.M.I.	-	-	-	1	-	-	1	3	-	13	-	-

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

TABLE III. Cases of selected notifiable diseases preventable by vaccination, United States, weeks ending June 15, 1996, and June 17, 1995 (24th Week)

Reporting Area	*H. influenzae*, invasive		Hepatitis (viral), by type				Measles (Rubeola)			
			A		B		Indigenous		Imported†	
	Cum. 1996*	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	1996	Cum. 1996	1996	Cum. 1996
UNITED STATES	587	612	12182	12,041	4,172	4,520	39	202	1	19
NEW ENGLAND	13	34	150	109	67	103	-	6	-	2
Maine	2	3	12	15	2	6	-	-	-	-
N.H.	7	7	6	5	5	11	-	-	-	-
Vt.	-	1	3	3	3	2	-	1	-	-
Mass.	4	7	76	44	24	33	-	4	-	2
R.I.	-	-	6	12	6	8	-	-	-	-
Conn.	-	16	47	30	27	43	-	1	-	-
MID. ATLANTIC	89	73	700	782	602	636	8	12	1	5
Upstate N.Y.	27	20	184	174	162	156	-	-	-	-
N.Y. City	14	18	302	392	287	216	-	4	-	3
N.J.	31	11	133	100	99	160	-	-	-	-
Pa.	17	24	81	116	54	104	8	8	1	2
E.N. CENTRAL	83	109	1,028	1,583	439	523	1	6	-	3
Ohio	50	51	448	902	58	60	-	2	-	-
Ind.	7	15	152	75	75	105	-	-	-	-
Ill.	16	27	185	307	89	138	1	2	-	1
Mich.	5	14	172	182	190	187	-	1	-	2
Wis.	5	2	71	117	27	33	-	1	-	-
W.N. CENTRAL	25	34	953	764	232	283	-	16	-	1
Minn.	10	14	50	86	19	25	-	13	-	1
Iowa	7	2	213	38	71	21	-	-	-	-
Mo.	5	14	439	540	111	201	-	2	-	-
N. Dak.	-	-	22	13	-	3	U	-	U	-
S. Dak.	1	-	36	18	-	2	-	-	-	-
Nebr.	1	2	106	21	8	15	-	-	-	-
Kans.	1	2	87	48	23	16	-	1	-	-
S. ATLANTIC	142	154	530	537	645	632	-	3	-	2
Del.	1	-	6	7	1	4	-	1	-	-
Md.	32	46	99	91	143	120	-	2	-	-
D.C.	5	-	15	7	15	10	-	-	-	-
Va.	4	16	75	92	68	42	-	-	-	2
W. Va.	4	6	10	11	14	29	-	-	-	-
N.C.	16	20	57	55	155	144	-	-	-	-
S.C.	3	-	29	19	40	27	-	-	-	-
Ga.	65	31	15	47	7	58	-	-	-	-
Fla.	12	35	224	208	202	198	-	-	-	-
E.S. CENTRAL	12	4	803	661	366	460	-	-	-	-
Ky.	3	1	15	30	28	46	-	-	-	-
Tenn.	3	-	562	546	229	359	-	-	-	-
Ala.	5	3	98	47	25	55	-	-	-	-
Miss.	1	-	128	38	84	-	U	-	U	-
W.S. CENTRAL	24	30	2,377	1,305	511	475	-	-	-	2
Ark.	-	4	241	113	35	21	-	-	-	-
La.	1	1	63	43	55	81	-	-	-	-
Okla.	22	16	924	321	53	71	-	-	-	-
Tex.	1	9	1,149	828	368	302	-	-	-	2
MOUNTAIN	64	61	1,929	1,863	514	377	16	37	-	1
Mont.	-	-	60	35	5	10	-	-	-	-
Idaho	1	2	128	190	60	44	-	1	-	-
Wyo.	32	3	18	64	15	10	-	-	-	-
Colo.	6	9	180	229	62	60	-	5	-	1
N. Mex.	8	10	232	368	172	152	-	-	-	-
Ariz.	9	17	770	515	124	48	-	8	-	-
Utah	6	6	435	400	59	37	15	18	-	-
Nev.	2	14	106	62	17	16	1	5	-	-
PACIFIC	135	113	3,712	4,437	796	1,031	14	122	-	3
Wash.	2	5	253	316	50	76	-	45	-	-
Oreg.	18	14	507	900	36	55	-	2	-	-
Calif.	112	92	2,882	3,113	702	885	14	16	-	2
Alaska	1	-	25	16	3	6	-	58	-	-
Hawaii	2	2	45	92	5	9	-	1	-	1
Guam	-	-	2	2	-	1	U	-	U	-
P.R.	1	3	59	37	235	169	-	1	-	-
V.I.	-	-	-	-	-	2	U	-	U	-
Amer. Samoa	-	-	-	5	-	-	U	-	U	-
C.N.M.I.	10	5	1	15	5	7	U	-	U	-

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

*Of 135 cases among children aged <5 years, serotype was reported for 32 and of those, 8 were type b.

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

TABLE III. (Cont'd.) Cases of selected notifiable diseases preventable by vaccination, United States, weeks ending June 15, 1996, and June 17, 1995 (24th Week)

Reporting Area	Measles (Rubeola), cont'd. Total		Mumps			Pertussis			Rubella		
	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995
UNITED STATES	221	223	7	302	471	22	1,317	1,222	5	82	61
NEW ENGLAND	8	4	-	-	8	4	207	187	-	11	14
Maine	-	-	-	-	4	-	8	18	-	-	1
N.H.	-	-	-	-	-	-	20	14	-	-	1
Vt.	1	-	-	-	-	-	7	9	-	2	-
Mass.	6	2	-	-	2	4	169	136	-	7	2
R.I.	-	2	-	-	-	-	-	-	-	-	-
Conn.	1	-	-	-	2	-	3	10	-	2	10
MID. ATLANTIC	17	4	2	45	70	2	102	113	-	4	8
Upstate N.Y.	-	-	1	12	16	1	57	60	-	3	1
N.Y. City	7	-	-	11	8	-	14	15	-	1	6
N.J.	-	4	-	-	9	-	-	6	-	-	1
Pa.	10	-	1	22	37	1	31	32	-	-	-
E.N. CENTRAL	9	8	-	68	77	3	158	133	-	3	-
Ohio	2	1	-	27	23	1	73	45	-	-	-
Ind.	-	-	-	5	5	2	14	15	-	-	-
Ill.	3	-	-	16	23	-	51	28	-	1	-
Mich.	3	5	-	20	26	-	15	33	-	2	-
Wis.	1	2	-	-	-	-	5	12	-	-	-
W.N. CENTRAL	17	1	-	4	28	-	62	76	-	1	-
Minn.	14	-	-	1	2	-	42	27	-	-	-
Iowa	-	-	-	-	8	-	2	2	-	1	-
Mo.	2	1	-	1	15	-	12	19	-	-	-
N. Dak.	-	-	U	2	-	U	-	6	U	-	-
S. Dak.	-	-	-	-	-	-	1	7	-	-	-
Nebr.	-	-	-	-	3	-	1	5	-	-	-
Kans.	1	-	-	-	-	-	4	10	-	-	-
S. ATLANTIC	5	5	3	43	68	5	151	107	2	14	16
Del.	1	-	-	-	-	-	9	5	-	-	-
Md.	2	-	1	13	23	1	54	16	-	-	-
D.C.	-	-	-	-	-	-	-	2	-	1	-
Va.	2	-	1	4	13	1	19	8	2	2	-
W. Va.	-	-	-	-	-	-	2	-	-	-	-
N.C.	-	-	1	9	16	-	29	50	-	-	-
S.C.	-	-	-	5	7	3	9	11	-	1	-
Ga.	-	2	-	2	1	-	7	-	-	-	-
Fla.	-	3	-	10	8	-	22	15	-	10	16
E.S. CENTRAL	-	-	-	15	6	-	44	36	2	2	-
Ky.	-	-	-	-	-	-	23	7	-	-	-
Tenn.	-	-	-	2	-	-	14	4	-	-	-
Ala.	-	-	-	3	4	-	4	25	2	2	-
Miss.	-	-	U	10	2	U	3	-	N	N	N
W.S. CENTRAL	2	15	-	14	33	3	30	69	-	2	2
Ark.	-	2	-	-	5	-	3	9	-	-	-
La.	-	13	-	10	7	-	4	4	-	1	-
Okla.	-	-	-	-	-	-	4	9	-	-	-
Tex.	2	-	-	4	21	3	19	47	-	1	2
MOUNTAIN	38	66	-	20	23	1	155	293	-	6	4
Mont.	-	-	-	-	1	-	4	3	-	-	-
Idaho	1	-	-	-	2	-	67	73	-	2	-
Wyo.	-	-	-	-	-	-	-	1	-	-	-
Colo.	6	26	-	2	-	1	21	45	-	2	-
N. Mex.	-	29	N	N	N	-	29	39	-	-	-
Ariz.	8	10	-	1	2	-	11	111	-	1	3
Utah	18	-	-	2	10	-	6	10	-	-	1
Nev.	5	1	-	15	8	-	17	11	-	1	-
PACIFIC	125	120	2	93	158	4	408	208	1	39	17
Wash.	45	17	1	10	10	4	161	37	-	1	-
Oreg.	2	1	N	N	N	-	27	15	-	1	1
Calif.	18	100	1	67	132	-	209	137	-	34	13
Alaska	58	-	-	2	12	-	2	-	-	-	-
Hawaii	2	2	-	14	4	-	9	19	1	3	3
Guam	-	-	U	3	3	U	-	2	U	-	1
P.R.	1	9	-	1	1	-	1	8	-	-	-
V.I.	-	-	U	-	2	U	-	-	U	-	-
Amer. Samoa	-	-	U	-	-	U	-	-	U	-	-
C.N.M.I.	-	-	U	-	-	U	-	-	U	-	-

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

TABLE IV. Deaths in 121 U.S. cities,* week ending June 15, 1996 (24th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	543	371	101	47	10	14	24
Boston, Mass.	153	94	32	18	3	6	1
Bridgeport, Conn.	35	19	9	5	2	-	3
Cambridge, Mass.	16	14	1	1	-	-	1
Fall River, Mass.	20	16	2	2	-	-	-
Hartford, Conn.	51	33	9	6	3	-	1
Lowell, Mass.	21	13	5	3	-	-	2
Lynn, Mass.	11	9	2	-	-	-	-
New Bedford, Mass.	21	18	1	2	-	-	1
New Haven, Conn.	41	24	13	1	-	3	1
Providence, R.I.	51	37	10	4	-	-	4
Somerville, Mass.	2	2	-	-	-	-	-
Springfield, Mass.	32	21	6	1	-	4	-
Waterbury, Conn.	28	21	5	1	1	-	4
Worcester, Mass.	61	50	6	3	1	1	6
MID. ATLANTIC	2,432	1,611	465	259	44	53	118
Albany, N.Y.	59	43	10	3	-	3	2
Allentown, Pa.	28	22	5	1	-	-	-
Buffalo, N.Y.	91	60	19	7	3	2	2
Camden, N.J.	29	14	9	6	-	-	3
Elizabeth, N.J.	23	19	-	3	-	1	-
Erie, Pa.§	44	36	6	2	-	-	3
Jersey City, N.J.	21	14	-	5	1	1	-
New York City, N.Y.	1,244	815	236	146	26	21	46
Newark, N.J.	49	17	16	11	2	3	7
Paterson, N.J.	26	13	8	5	-	-	-
Philadelphia, Pa.	400	245	89	41	11	14	23
Pittsburgh, Pa.§	47	29	10	5	-	3	2
Reading, Pa.	17	11	5	1	-	-	1
Rochester, N.Y.	125	100	13	11	-	1	12
Schenectady, N.Y.	17	15	2	-	-	-	1
Scranton, Pa.§	30	21	7	2	-	-	2
Syracuse, N.Y.	96	74	17	3	1	1	10
Trenton, N.J.	39	28	7	2	-	2	1
Utica, N.Y.	20	17	-	2	-	1	-
Yonkers, N.Y.	27	18	6	3	-	-	3
E.N. CENTRAL	1,965	1,315	401	163	41	42	101
Akron, Ohio	55	40	10	2	2	1	-
Canton, Ohio	43	34	8	1	-	-	3
Chicago, Ill.	313	176	75	45	10	4	20
Cincinnati, Ohio	158	113	29	9	4	3	11
Cleveland, Ohio	128	79	30	11	2	6	2
Columbus, Ohio	161	110	36	6	3	6	13
Dayton, Ohio	124	91	24	8	1	-	9
Detroit, Mich.	178	109	43	20	4	2	7
Evansville, Ind.	50	38	6	4	1	1	-
Fort Wayne, Ind.	58	39	6	9	3	1	2
Gary, Ind.	17	12	2	3	-	-	-
Grand Rapids, Mich.	58	46	7	4	-	1	4
Indianapolis, Ind.	201	128	41	18	4	10	9
Madison, Wis.	U	U	U	U	U	U	U
Milwaukee, Wis.	103	74	24	3	2	-	5
Peoria, Ill.	47	35	7	4	-	1	3
Rockford, Ill.	40	28	7	2	2	1	5
South Bend, Ind.	48	38	5	5	-	-	1
Toledo, Ohio	111	75	24	5	3	4	4
Youngstown, Ohio	72	50	17	4	-	1	3
W.N. CENTRAL	724	485	137	50	24	18	38
Des Moines, Iowa	82	54	16	7	-	5	8
Duluth, Minn.	34	26	5	1	2	-	2
Kansas City, Kans.	28	20	3	3	1	1	-
Kansas City, Mo.	94	57	21	2	3	1	3
Lincoln, Nebr.	21	15	2	1	3	-	1
Minneapolis, Minn.	142	94	27	14	3	4	9
Omaha, Nebr.	96	69	15	8	3	1	2
St. Louis, Mo.	121	79	22	10	5	5	9
St. Paul, Minn.	57	40	13	1	3	-	2
Wichita, Kans.	49	31	13	3	1	1	2

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,175	727	259	117	33	37	57
Atlanta, Ga.	211	128	46	24	5	8	6
Baltimore, Md.	237	140	63	25	7	2	26
Charlotte, N.C.	84	53	19	3	3	5	-
Jacksonville, Fla.	132	83	30	13	1	4	5
Miami, Fla.	110	62	23	15	7	3	-
Norfolk, Va.	41	24	8	5	-	4	2
Richmond, Va.	82	48	15	13	1	5	3
Savannah, Ga.	51	33	14	3	-	1	3
St. Petersburg, Fla.	47	36	4	6	-	1	1
Tampa, Fla.	166	111	37	5	9	4	11
Washington, D.C.	U	U	U	U	U	U	U
Wilmington, Del.	14	9	-	5	-	-	-
E.S. CENTRAL	800	537	172	56	22	11	51
Birmingham, Ala.	111	66	28	12	2	1	3
Chattanooga, Tenn.	84	58	19	4	1	2	2
Knoxville, Tenn.	75	48	18	2	4	3	8
Lexington, Ky.	83	57	19	5	2	-	9
Memphis, Tenn.	188	130	36	15	7	-	16
Mobile, Ala.	54	44	5	3	-	2	1
Montgomery, Ala.	66	48	8	5	4	1	5
Nashville, Tenn.	139	86	39	10	2	2	7
W.S. CENTRAL	1,400	878	291	138	52	40	73
Austin, Tex.	81	57	15	4	3	2	7
Baton Rouge, La.	50	29	12	6	1	2	1
Corpus Christi, Tex.	53	40	8	2	2	1	3
Dallas, Tex.	196	117	34	26	9	10	2
El Paso, Tex.	41	30	9	1	1	-	4
Ft. Worth, Tex.	94	65	19	6	2	2	3
Houston, Tex.	324	189	79	39	9	8	24
Little Rock, Ark.	77	47	15	7	6	2	3
New Orleans, La.	98	55	19	15	5	4	-
San Antonio, Tex.	228	145	44	22	11	5	13
Shreveport, La.	55	35	14	4	-	2	7
Tulsa, Okla.	103	69	23	6	3	2	6
MOUNTAIN	795	511	153	81	24	23	51
Albuquerque, N.M.	92	56	22	12	1	1	2
Colo. Springs, Colo.	50	39	6	4	-	1	4
Denver, Colo.	93	58	17	11	3	4	9
Las Vegas, Nev.	141	88	36	11	1	2	9
Ogden, Utah	39	28	5	3	2	1	2
Phoenix, Ariz.	150	85	32	14	12	7	13
Pueblo, Colo.	21	18	2	1	-	-	-
Salt Lake City, Utah	88	56	11	12	3	6	4
Tucson, Ariz.	121	83	22	13	2	1	8
PACIFIC	1,406	959	231	154	42	20	107
Berkeley, Calif.	16	12	3	1	-	-	-
Fresno, Calif.	81	53	14	6	4	4	4
Glendale, Calif.	U	U	U	U	U	U	U
Honolulu, Hawaii	75	55	8	7	4	1	6
Long Beach, Calif.	84	54	15	12	3	-	10
Los Angeles, Calif.	U	U	U	U	U	U	U
Pasadena, Calif.	27	17	7	2	-	1	4
Portland, Oreg.	140	99	20	13	6	2	3
Sacramento, Calif.	212	140	36	27	6	3	16
San Diego, Calif.	131	86	23	16	4	2	15
San Francisco, Calif.	142	87	26	28	1	-	11
San Jose, Calif.	192	129	40	17	3	3	23
Santa Cruz, Calif.	36	25	8	2	1	-	5
Seattle, Wash.	131	92	16	13	7	3	5
Spokane, Wash.	54	39	8	6	1	-	4
Tacoma, Wash.	85	71	7	4	2	1	1
TOTAL	11,240¶	7,394	2,210	1,065	292	258	620

U: Unavailable -: no reported cases

*Mortality data in this table are voluntarily reported from 121 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 these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶Total includes unknown ages.

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