CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

May 22, 1998 / Vol. 47 / No. 19

MMWR™
MORBIDITY AND MORTALITY WEEKLY REPORT



## World No-Tobacco Day — May 31, 1998

Tobacco use is one of the most important determinants of human health trends worldwide (*1*). The annual rate of 3 million deaths attributed to tobacco use will reach approximately 10 million by 2025. Globally, if current trends continue, more than 200 million persons who are currently children and teenagers will die from tobacco-related illnesses (*1*).

In many countries, tobacco use is increasing among young persons, and the age of smoking initiation is declining. Most smokers begin smoking during their teenage years. If young persons do not use tobacco before age 20 years, they are unlikely to initiate use as adults (*2*).

The theme for this year's World No-Tobacco Day, to be held May 31, is "Growing up Without Tobacco." The World Health Organization (WHO) encourages governments, communities, organizations, schools, families, and persons to focus on the increasing epidemic of tobacco-related morbidity and mortality, to take strong actions to prevent nicotine addiction in young persons, to protect nonsmokers from the dangers of environmental tobacco smoke, and to provide effective youth-oriented smoking-cessation programs.

WHO will provide press releases, fact sheets, a poster, and an advisory kit on comprehensive measures to reduce tobacco use. Additional information about World No-Tobacco Day 1998 is available from WHO's World-Wide Web site http://www.who.ch/programmes/psa/toh.htm, from the WHO regional office of the Americas, telephone (202) 861-3200, or from CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, telephone (770) 488-5705; World-Wide Web site http://www.cdc.gov/tobacco.

*References*

1. Peto R, Lopez A, Boreham J, Thun M, Heath C Jr. Mortality from smoking in developed countries, 1950–2000: indirect estimates from national vital statistics. Oxford, England: Oxford University Press, 1994.
2. World Health Organization. World No-Tobacco Day, 31 May 1998 [Advisory kit]. Geneva, Switzerland: World Health Organization, 1998.

## Selected Cigarette Smoking Initiation and Quitting Behaviors Among High School Students — United States, 1997

The continuum of smoking behavior among children and adolescents can be described in stages of preparation, trying, experimentation, regular smoking, and nicotine dependence or addiction (*1*). Persons who have smoked can discontinue at any stage, but quitting becomes more difficult as smokers progress through the continuum and become increasingly dependent on nicotine (*1,2*). Nicotine addiction is characterized by a physiologic need for nicotine, including a tolerance for nicotine, withdrawal symptoms if an attempt is made to quit, and a high probability of relapse after quitting (*1*). To determine the prevalence of selected cigarette smoking initiation and quitting behaviors among youth, CDC analyzed data from the 1997 Youth Risk Behavior Survey (YRBS). Findings indicate that among U.S. high school students in 1997, 70.2% had tried cigarette smoking. Among students who had ever tried cigarette smoking, 35.8% went on to smoke daily. Among those who had ever smoked daily, 72.9% had ever tried to quit smoking and 13.5% were former smokers.

YRBS, a component of CDC's Youth Risk Behavior Surveillance System (*3*), biennially measures the prevalence of priority health risk behaviors among youth through representative national, state, and local surveys. The 1997 national YRBS used a three-stage cluster-sample design to obtain a representative sample of 16,262 students in grades 9–12 in the 50 states and the District of Columbia. The school response rate was 79%, the student response rate was 87%, and the overall response rate was 69%. Data were weighted to provide national estimates, and SUDAAN®* was used to calculate standard errors for determining 95% confidence intervals (CIs). Students completed a self-administered questionnaire that included questions about lifetime and current cigarette use, ever-daily cigarette use, and attempts to quit smoking. Lifetime smokers were defined as students who had ever tried smoking cigarettes, even one or two puffs. Current smokers were defined as students who smoked cigarettes on ≥1 of the 30 days preceding the survey. Ever-daily smokers were defined as students who reported that they had "ever smoked cigarettes regularly, that is, at least one cigarette every day for 30 days." Quit attempts were determined from the question "Have you ever tried to quit smoking cigarettes?" Former cigarette smokers were defined as ever-daily smokers who were not current smokers. The number of persons from racial/ethnic groups other than non-Hispanic black, non-Hispanic white, and Hispanic was too small for meaningful analysis.

The prevalence of lifetime smoking was 70.2% (95% CI=±1.9) overall and did not vary by sex, race/ethnicity, or grade in school (Table 1). More than one third of students (35.8%) who had tried cigarette smoking reported ever smoking daily (Table 1). Ever-daily smoking was highest among white students (41.7%), followed by Hispanic students (24.5%), and black students (14.9%).

Almost three fourths (72.9% [95% CI=±2.7]) of ever-daily smokers had tried to quit smoking (Table 1). Among ever-daily smokers, females (77.6%) were more likely than males (68.7%) and white students (76.0%) were more likely than Hispanic students (61.9%) to report ever having tried to quit. Among ever-daily smokers, 13.5% were former smokers (Table 1).

*Use of trade names and commercial sources is for identification only and does not imply endorsement by CDC or the U.S. Department of Health and Human Services.

*Smoking Initiation and Quitting Behaviors — Continued*

**TABLE 1. Percentage of high school students* who reported selected cigarette smoking initiation and quitting behaviors, by sex, race/ethnicity, and grade — United States, Youth Risk Behavior Survey, 1997**

| | Lifetime smokers† | | Lifetime smokers who have ever smoked daily§ | | Ever-daily smokers who have ever tried to quit smoking¶ | | Former smokers** | |
|---|---|---|---|---|---|---|---|---|
| **Category** | **%** | **(95% CI††)** | **%** | **(95% CI)** | **%** | **(95% CI)** | **%** | **(95% CI)** |
| **Sex** | | | | | | | | |
| Male | 70.9 | (±1.9) | 34.7 | (±2.6) | 68.7 | (± 5.5) | 13.0 | (±3.0) |
| Female | 69.3 | (±2.6) | 37.1 | (±4.1) | 77.6 | (± 2.6) | 14.0 | (±3.4) |
| **Race/Ethnicity§§** | | | | | | | | |
| White, non-Hispanic | 70.4 | (±2.3) | 41.7 | (±2.4) | 76.0 | (± 2.3) | 13.4 | (±3.4) |
| Black, non-Hispanic | 68.4 | (±4.4) | 14.9 | (±2.6) | 64.8 | (± 9.0) | 16.9 | (±6.0) |
| Hispanic | 75.0 | (±2.7) | 24.5 | (±3.5) | 61.9 | (± 8.3) | 14.3 | (±5.4) |
| **Grade** | | | | | | | | |
| 9 | 67.7 | (±5.1) | 35.7 | (±5.3) | 66.1 | (±11.5) | 17.8 | (±4.1) |
| 10 | 70.0 | (±3.9) | 34.9 | (±4.5) | 77.3 | (± 5.7) | 14.6 | (±5.6) |
| 11 | 68.8 | (±3.1) | 37.1 | (±4.4) | 73.2 | (± 6.2) | 10.0 | (±3.7) |
| 12 | 73.7 | (±4.1) | 35.5 | (±3.9) | 74.4 | (± 4.2) | 12.4 | (±2.9) |
| **Total** | **70.2** | **(±1.9)** | **35.8** | **(±2.6)** | **72.9** | **(± 2.7)** | **13.5** | **(±2.8)** |

* N=16,262.
† Ever tried cigarette smoking, even one or two puffs.
§ Ever tried cigarette smoking, even one or two puffs, and have ever smoked at least one cigarette every day for 30 days.
¶ Have ever smoked at least one cigarette every day for 30 days and have ever tried to quit smoking. Excludes data from 55 students who reported that they had never tried to quit, but did not smoke on any of the 30 days preceding the survey.
** Have ever smoked at least one cigarette every day for 30 days and did not smoke on any of the 30 days preceding the survey. Excludes data from 55 students who reported that they had never tried to quit, but did not smoke on any of the 30 days preceding the survey.
†† Confidence interval.
§§ Numbers for racial groups other than whites and blacks were too small for meaningful analysis.

*Reported by: Office on Smoking and Health, and Div of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.*

**Editorial Note:** As with other drug addictions, nicotine dependence is a progressive, chronic, and relapsing disorder (*1*). The optimal public health strategy is to prevent tobacco use completely or to intervene as early in the smoking behavior continuum as possible. Once adolescents have established a pattern of regular use, their behavior is usually compelled by nicotine dependence as well as social factors. Efforts are needed to help youth break the cycle of addiction and prevent the disability and death associated with tobacco use.

Initiation and quitting behaviors suggest areas for intervention and research. For example, the incidence of lifetime ever smoking among adolescents declined in the mid-1970s and early 1980s, but increased from 1991 to 1994 (*4*), suggesting that this

*Smoking Initiation and Quitting Behaviors — Continued*

behavior is modifiable. Cigarette advertising and promotion, smoking by adults and older siblings, access to cigarettes, price of cigarettes, peer pressure, and the degree of exposure to effective counteradvertising and school-based prevention programs can influence patterns of initiation (*1,2*).

The findings in this report are consistent with previous studies that indicate approximately 33%–50% of persons who try smoking cigarettes escalate to regular patterns of use (*1*). The 1990–1992 National Comorbidity Survey estimated that 23.6% of persons aged 15–24 years who ever used cigarettes progressed to the final stage in the smoking behavior continuum (i.e., nicotine dependence). This conversion rate (i.e., from any use to dependence) was similar to conversion rates for use of cocaine (24.5%) and heroin (20.1%) (*5*). Although indicators of dependence increase with the frequency of smoking among youth, many less-than-daily smokers experience symptoms of nicotine withdrawal when they attempt to quit (*6*).

Differences described in this report in the rate of conversion from trying a cigarette to daily use may explain some of the racial/ethnic differences in current smoking prevalence estimates among youth (*7,8*). Black adolescents who try cigarette smoking may experience greater social disapproval regarding their smoking behavior than white adolescents (*8*). Among ever-daily smokers, white students were more likely than Hispanics students and female students were more likely than male students to have attempted to quit smoking during high school. Investigation of the influence of early quit attempts on long-term success is needed.

The findings in this report are subject to at least three limitations. First, these data apply only to youth who attend high school and, therefore, are not representative of all persons in this age group. In 1996, 6% of persons aged 16–17 years were not enrolled in a high school program and had not completed high school (*7*). Second, more detailed measures of cessation (i.e., current interest in quitting, recent quit attempts, and longest time abstinent from cigarettes) could not be examined because they were not included in the survey. Third, a cross-sectional survey can measure only the prevalence of various stages in the smoking behavior continuum. Transitions through the stages of smoking behavior are best studied with a longitudinal research design.

Most young persons who smoke regularly are already addicted to nicotine, and the experience of addiction is similar to that among adults (*1*). Although approximately 70% of adolescent smokers regret ever starting (*9*), success rates have been low in the few cessation programs designed for young persons that have reported quit rates at follow-up (13%) (*10*). Adolescents are difficult to recruit for formal cessation programs and, when enrolled, are difficult to retain in the programs (*1*). In September 1997, CDC conducted the first Workgroup on Youth Tobacco Use Cessation to discuss strategies to stimulate research on tobacco-use cessation programs. Tobacco-use cessation programs are being evaluated in schools, health-maintenance organizations, and state health departments and feature adolescent team competitions, pharmacologic agents, telephone counseling, and cooperative learning. Evaluations of these efforts will assist in developing tobacco-use cessation programs for youth that can be used nationwide.

*References*

1. US Department of Health and Human Services. Preventing tobacco use among young people: a report of the Surgeon General. Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, CDC, 1994.

*Smoking Initiation and Quitting Behaviors — Continued*

2. National Cancer Institute. Strategies to control tobacco use in the United States: a blueprint for public health action in the 1990s. Bethesda, Maryland: US Department of Health and Human Services, National Institutes of Health, 1991; NIH publication no. 92-3316. (Smoking and tobacco control monograph no. 1).
3. Kolbe LJ, Kann L, Collins JL. Overview of the Youth Risk Behavior Surveillance System. Public Health Rep 1993;108(suppl 1):2–10.
4. Substance Abuse and Mental Health Services Administration. Preliminary results from the 1996 National Household Survey on Drug Abuse. Rockville, Maryland: US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 1997; DHHS publication no. (SMA)97-3149.
5. Anthony JC, Warner LA, Kessler RC. Comparative epidemiology of dependence on tobacco, alcohol, controlled substances and inhalants: basic findings from the National Comorbidity Survey. Exper and Clin Psychopharm 1994;2:244–68.
6. CDC. Reasons for tobacco use and symptoms of nicotine withdrawal among adolescent and young adult tobacco users—United States, 1993. MMWR 1994;43:745–50.
7. CDC. Tobacco use among high school students—United States, 1997. MMWR 1998;47:229–33.
8. US Department of Health and Human Services. Tobacco use among U.S. racial/ethnic minority groups—African Americans, American Indians and Alaska Natives, Asian Americans and Pacific Islanders, and Hispanics: a report of the Surgeon General. Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, CDC, 1998.
9. George H. Gallup International Institute. Teen-age attitudes and behaviors concerning tobacco: report of findings. Princeton, New Jersey: George H. Gallup International Institute, 1992.
10. Sussman DS, Lichtman K, Ritt A, Pallonen U. Effects of 34 adolescent tobacco use cessation and prevention trials on regular users of tobacco products. Substance Use and Misuse 1998 (in press).

## Cholera Outbreak among Rwandan Refugees — Democratic Republic of Congo, April 1997

In April 1997, a cholera outbreak occurred among 90,000 Rwandan refugees residing in three temporary camps between Kisangani and Ubundu, Democratic Republic of Congo (formerly Zaire). Médecins Sans Frontières (MSF) established two referral medical centers and a cholera treatment center in these camps. Personnel from MSF, Zairean nongovernmental organizations (NGOs), and the Office of the United Nations High Commissioner for Refugees (UNHCR) implemented morbidity and mortality surveillance to monitor refugee health status. This report presents the findings of the surveillance system and indicates this outbreak was characterized by a higher death rate than that observed in previous cholera outbreaks in refugee populations.

The daily number of deaths in the camps was obtained from Zairean Red Cross Society volunteers, who were responsible for burying bodies in mass graves. During March 30–April 20, 1997, a total of 1521 deaths were recorded, most of which occurred outside of health-care facilities. The daily crude mortality rate (CMR) ranged from seven to 14 per 10,000 population; the average daily CMR during this period was 9.9 per 10,000 population.

Active identification and referral for treatment of cholera cases was initiated by hiring Rwandan community health workers who were familiar with the refugees in their section of the camps. Cholera was defined as sudden onset of watery diarrhea resulting in dehydration. Clinical characteristics included vomiting (60% of patients), moderate to severe dehydration (50%–70%), and fever >99.5 F (>37.5 C) (<20%).

*Cholera — Continued*

During April 4–19, 1997, a total of 545 persons with cholera were admitted to the cholera treatment center (attack rate: 0.9%); 67 (12.3%) died. Most deaths in the treatment center occurred during the night when MSF health-care workers were absent. According to MSF personnel, most patients with cholera were severely malnourished and suffered from concurrent health problems (e.g., malaria or acute respiratory illnesses). Most (80%) persons with cholera were aged ≥5 years. Cholera cases also occurred among health-care workers at the cholera-treatment center. Three of seven stool specimens tested from patients with watery diarrhea were positive for *Vibrio cholerae* O1, biotype El Tor, serotypes Inaba or Ogawa.

Cholera-control interventions included filtration and chlorination of the camps' water systems, health education, and construction and maintenance of latrines. Treatment of cholera patients by intravenous and oral rehydration therapy was instituted by MSF (*1,2*). The overall evaluation of cholera control measures was not possible because of the dispersion of the refugees by unidentified armed forces on April 21, 1997.

*Reported by: F Matthys, Médecins Sans Frontières Belgium, Brussels, Belgium. S Malé, Z Labdi, Office of the United Nations High Commissioner for Refugees, Geneva, Switzerland. International Emergency and Refugee Health Program, National Center for Environmental Health; and an EIS Officer, CDC.*

**Editorial Note:** The findings in this report indicate that the implementation of a rapid surveillance system facilitated recognition of the need for increased health-care services and appropriate intervention strategies. Timely surveillance using simple case definitions is crucial to targeting interventions during the emergency phase of refugee situations.

During emergency situations, CMR (normally <0.5 per 10,000 population per day in developing countries) is the most specific indicator of health status in refugee populations (*3*). The CMR among refugees in this outbreak was 9.9. This rate was substantially higher than that in Tingi-Tingi (a temporary settlement of Rwandan refugees in the Democratic Republic of Congo) in 1997 (2.5 per 10,000 per day) (*4*); lower than in Goma in July 1994 (34–54 per 10,000 per day) (*5*); and similar to those in refugee camps in Thailand in 1979 (10.6 per 10,000 per day) and Somalia in 1980 (10.1 per 10,000 per day) (*3*).

The situation in the Democratic Republic of Congo demonstrates the importance of immediate and unrestricted access to displaced populations by the international community if local authorities do not have the means or the political will to assist in emergency situations. The case-fatality ratio for cholera in this outbreak was substantially higher than that observed in previous outbreaks of cholera in refugee camps (*3,4*). Case-fatality ratios of ≤1% are expected if adequate rehydration services are available (*1*).

Several factors accounted for the high mortality among the refugees in this outbreak. First, the refugees had been without adequate food, shelter, or access to health care during the preceding 5 months. In addition, the location of the camps assigned by local authorities was far from the nearest villages (4–50 miles [7–82 km] from Kisangani) and the only transport available for relief personnel and supplies was a railway line controlled by the military. As a result, relief workers were required to take a ferry across the Congo River, then travel to the camps by off-road vehicles; these transfers required up to 6 hours in both directions, leaving only 4 hours daily for building treat-

*Cholera — Continued*

ment facilities and for patient care. Finally, the camps were moved during the outbreak, requiring relocation of ill patients, rebuilding of cholera treatment facilities, and delaying the proper construction of water-treatment and sanitation facilities.

As in the refugee crisis in Goma (*5*), active identification of cholera cases with the assistance of Rwandan community health-care workers may have prevented the deaths of many refugees outside of treatment centers. Other intervention strategies included health education of refugees, provision of clean water, construction of latrines, and training health workers in aggressive rehydration therapy using a standardized treatment algorithm. Although these measures may have been effective in preventing the further spread of cholera, they abruptly stopped when the 90,000 refugees were dispersed by unidentified armed forces on April 21, 1997; only 37,000 were repatriated to Rwanda by May 1997.

*References*

1. World Health Organization. The management and prevention of diarrhoea: practical guidelines Geneva, Switzerland: World Health Organization, 1993
2. Médecins sans Frontières. Clinical guidelines—diagnostic and treatment manual. 3rd ed. Paris, France: Hatier, 1993.
3. CDC. Famine-affected refugee and displaced populations: recommendations for public health issues. MMWR 1992;41(no. RR-13).
4. Nabeth P, Vasset B, Guerin P, Doppler B, Tectonidis M. Health situation of refugees in eastern Zaire [Letter]. Lancet 1997;349:1031–2.
5. Goma Epidemiology Group. Public health impact of Rwandan refugee crisis: what happened in Goma, Zaire, in July, 1994? Lancet 1995;345:339–44.

## Lightning-Associated Deaths — United States, 1980–1995

A lightning strike can cause death or various injuries to one or several persons. The mechanism of injury is unique, and the manifestations differ from those of other electrical injuries. In the United States, lightning causes more deaths than do most other natural hazards (e.g., hurricanes and tornadoes) (*1*), although the incidence of lightning-related deaths has decreased since the 1950s (*1,2*). The cases described in this report illustrate diverse circumstances in which deaths attributable to lightning can occur. This report also summarizes data from the Compressed Mortality File of CDC's National Center for Health Statistics on lightning fatalities in the United States from 1980 through 1995, when 1318 deaths were attributed to lightning.

### Case Reports

**Case 1.** In April 1997, a 34-year-old woman in Florida was struck by lightning at approximately 12:30 p.m. after a severe thunderstorm had passed through the area. She had gone into her back yard to tend animals in a pen. As she walked toward the pen gate, lightning stuck her, throwing her several feet. A neighbor immediately administered cardiopulmonary resuscitation (CPR) but could not revive her and called the emergency medical service (EMS). EMS personnel were unable to resuscitate her, and she was pronounced dead at the scene. She had metal screws in her breast pocket and a cordless hand drill in her hand. The clothing of her upper torso was torn. Autopsy findings included arborization—erythematous marks in a branching pattern

*Lightning — Continued*

characteristic of lightning injury—on her left anterior torso but no other visible pathology related to the lightning strike.

**Case 2.** In July 1997, a 47-year-old man in Florida was struck by lightning while golfing at a driving range at approximately 5:30 p.m. The skies reportedly were clear but a storm may have been forming in the area. EMS personnel arrived at 5:40 p.m. and found him without a pulse or spontaneous respirations. He was intubated at the scene, but resuscitation efforts were unsuccessful. He was transported to an emergency department, where his pulse rate and blood pressure were obtained. However, his pupils were fixed and dilated, and he was unresponsive to stimuli. A computerized tomogram (CT) of his head showed cerebral edema but no hemorrhage. Bloody drainage was noted from his nose and right ear. He gradually became hypotensive, and his blood pressure failed to increase with intravenous fluid. He was pronounced dead at 1:25 p.m. the following day. Autopsy indicated burns on his left hand and a second-degree burn with vesicle formation on his right back. His heart had epicardial petechiae on the anterior and posterior surfaces. His brain was edematous and had hypoxic injury to the neurons.

**Case 3.** In September 1996, a 14-year-old boy in Washington was struck by lightning while riding his motorcycle during a thunderstorm. A bolt of lightning struck a tree near the motorcyclist, traveled along the trunk of the tree, then jumped from the tree to the motorcycle and the rider's feet and groin. Persons who saw the incident found him apneic and immediately began CPR. He was transported to the nearest hospital and was in cardiac arrest on arrival. Although he was successfully resuscitated and admitted to a hospital, he died 5 days later. Autopsy findings included a soft swollen brain with axial herniation and hypoxic injury to the neurons. The right side of his chest had singed hair, a healing burn injury, and damage to the underlying pectoralis muscles. His heart had multiple microscopic foci of myocardial necrosis, and his kidney had pink tubular casts consistent with myoglobinuria.

**Summary, 1980–1995**

Death attributed to lightning was defined as any recorded death for which the underlying cause of death, or at least one cause of death, was coded E907 (lightning, excluding injury from fall of a tree or object caused by lightning) according to the *International Classification of Diseases, Ninth Revision*. The 1940 census was used for age-adjusted rates.

In the United States from 1980 through 1995, a total of 1318 deaths were attributed to lightning, (average: 82 deaths per year [range: 53–100 deaths]). Of the 1318 persons who died, 1125 (85%) were male, and 896 (68%) were aged 15–44 years. The annual death rate from lightning was highest among persons aged 15–19 years (6 deaths per 10,000,000 population; crude rate: 3 per 10,000,000). The greatest number of deaths attributable to lightning occurred in Florida and Texas (145 and 91, respectively), but New Mexico, Arizona, Arkansas, and Mississippi had the highest rates (10.0, 9.0, 9.0, and 9.0, respectively).

*Reported by: S Nelson, MD, District Medical Examiner's Office, 10th Judicial Circuit of Florida, Lakeland; V Adams, MD, Hillsborough County Medical Examiner Dept, Tampa, Florida. D Selove, MD, Snohomish County Medical Examiner's Office, Everett, Washington. Health Studies Br, Div of Environmental Hazards and Health Effects, National Center for Environmental Health, CDC.*

**Editorial Note:** The National Weather Service estimates that 100,000 thunderstorms occur in the United States each year; lightning is present in all thunderstorms. A

*Lightning — Continued*

cloud-to-ground lightning strike, the most destructive form of lightning, occurs when the electrical difference between a thundercloud and the ground overcomes the insulating properties of the surrounding air. The danger may not be apparent; lightning has struck 10 miles away from the rain of a thunderstorm (*3*). In the United States, cloud-to-ground lightning strikes occur approximately 30 million times each year (*4*), most often in Florida and along the southeastern coast of the Gulf of Mexico (*5*).

Data from the National Oceanic and Atmospheric Administration compiled primarily from newspaper clippings for 1959–1990 identified an annual average of 93 deaths and 257 injuries attributable to lightning (*2*). A study based on national mortality statistics from death certificates for 1968–1985 identified an annual average of 107 deaths and an annual death rate of 6.1 per 10,000,000 (*2*). Differences in these averages may be explained by the general decrease in the number of lightning-related deaths since the 1950s (*1,2*). Possible explanations for the decrease include fewer persons living and working in rural areas, improved warning systems, increased public education about safety regarding lightning, and improved medical care (*2*).

Previous studies have identified patterns associated with lightning fatalities. For example, approximately 30% of persons struck by lightning die, and 74% of lightning strike survivors have permanent disabilities. In addition, persons with cranial burns or leg burns from lightning are at higher risk for death than others struck by lightning (*6*). Sixty-three percent of lightning-associated deaths occur within 1 hour of injury (*1*), 92% occur during May–September, and 73% occur during the afternoon and early evening. Of persons who died from lightning strikes, 52% were engaged in outdoor recreational activities, and 25% were engaged in work activities (*2*). Most lightning injuries and deaths can be prevented by taking precautions (see box) (*7*).

Neurologic and cardiopulmonary injuries associated with lightning strikes are the most life-threatening. A lightning strike may immediately cause asystole, ventricular fibrillation, or direct central nervous system injury to the respiratory center. A direct lightning strike (i.e., when the major pathway of current flow is through the victim) can result in cardiac injury that can manifest as life-threatening pericardial effusion or severe cardiac dysfunction (*8*). Because persons struck by lightning have a better

**Preventing Deaths and Injuries from Lightning Strikes**

- When participating in outdoor activities, be aware of weather forecasts during the thunderstorm season (generally May through September).
- Because lightning often precedes rain, preparations to avoid potential lightning strikes should begin before the rain begins.
- When thunder is heard, seek shelter inside the nearest building or an enclosed vehicle (e.g., a car or truck). If shelter is not available, avoid trees or tall objects because electricity may be conducted from that object to other nearby objects or persons.
- Avoid high ground, water, open spaces, and metal objects (e.g., golf clubs, umbrellas, fences, and tools).
- When indoors, turn off appliances and electronic devices and remain inside until the storm passes.

*Lightning — Continued*

chance of survival than persons suffering cardiopulmonary arrest from other causes, resuscitation of persons struck by lightning should be initiated immediately (*9*).

*References*
1. Duclos PJ, Sanderson LM. An epidemiological description of lightning-related deaths in the United States. Int J Epidemiol 1990;19:673–9.
2. Lopez RE, Holle RL. Demographics of lightning casualties. Semin Neurol 1995;15:286–95.
3. Holle RL, Lopez RE, Howard KW, Vavrek J, Allsopp J. Safety in the presence of lightning. Semin Neurol 1995;15:375–80.
4. Krider EP, Uman MA. Cloud-to-ground lightning: mechanisms of damage and methods of protection. Semin Neurol 1995:15:227–32.
5. MacGorman DR, Maier MW, Rust WD. Lightning strike density for the contiguous United States from thunderstorm duration records. Washington, DC: US Nuclear Regulatory Commission, 1984; report no. NUREG/CR-3759.
6. Cooper MA. Lightning injuries: prognostic signs for death. Ann Emerg Med 1980;9:134–8.
7. National Weather Service. Thunderstorms and lightning...the underrated killers!—a preparedness guide. Washington, DC: US Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, 1994.
8. Lichtenberg R, Dries D, Ward K, Marshall W, Scanlon P. Cardiovascular effects of lightning strikes. J Am Coll Cardiol 1993;21:531–6.
9. Lifschultz BD, Donoghue ER. Deaths caused by lightning. J Forensic Sci 1993;38:353–8.

## *Plesiomonas shigelloides* and *Salmonella* serotype Hartford Infections Associated with a Contaminated Water Supply — Livingston County, New York, 1996

On June 24, 1996, the Livingston County (New York) Department of Health (LCDOH) was notified of a cluster of diarrheal illness following a party on June 22, at which approximately 30 persons had become ill. This report summarizes the findings of the investigation, which implicated water contaminated with *Plesiomonas shigelloides* and *Salmonella* serotype Hartford as the cause of the outbreak.

The party was held at a private residence on June 22 and was attended by 189 persons. Food was provided by a local convenience store that sells gasoline, packaged goods, sandwiches, and pizza and prepares food for catered events. The convenience store had not catered any parties during the preceding 5 days but catered two parties on June 23. LCDOH contacted the organizers of these events and found no other reports of illness.

To determine the source and extent of the outbreak and mechanism of contamination, LCDOH conducted a cohort study, an environmental investigation, and microbiologic examinations of stool specimens, leftover food items, and water samples. A menu and guest list were obtained and guests were interviewed by telephone. A probable case was defined as diarrhea (>3 loose stools during a 24-hour period) in a person who attended the party and became ill within 72 hours. Persons with a confirmed case had either *Plesiomonas shigelloides* or *Salmonella* serotype Hartford or both isolated from stool. The caterer and facility employees were interviewed to obtain information on food preparation, and the water source was inspected.

Of the 189 attendees, 98 (52%) were interviewed. Sixty persons reported illness; 56 (57%) of 98 respondents had illnesses meeting the case definition. The mean age for case-patients was 41 years (range: 2–85 years), and 32 (57%) were male. Stool

Plesiomonal shigelloides *and* Salmonella *Infections — Continued*

specimens were obtained from 14 ill attendees: nine yielded only *P. shigelloides*, three only *Salmonella* serotype Hartford, and two had both organisms. One person with culture-confirmed *Salmonella* serotype Hartford was hospitalized. The clinical profiles of the culture-confirmed (n=14) and probable (n=42) cases were similar.

Twenty food and beverage items were served at the party. Three food items were associated with illness: macaroni salad, potato salad, and baked ziti. Of 56 attendees who ate macaroni salad, 43 (77%) became ill, compared with 17 (40%) of 42 who did not eat macaroni salad (relative risk [RR]=2.6; 95% confidence interval [CI]=1.5–4.4). Of 49 guests who ate potato salad, 36 (73%) became ill, compared with 20 (44%) of 45 who did not eat potato salad (RR=2.1; 95% CI=1.2–3.6). Of 46 attendees who ate baked ziti, 36 (78%) became ill, compared with 20 (42%) of 48 that did not eat baked ziti (RR=2.7; 95% CI=1.5–4.9).

Leftover food samples of these three items were collected on June 25 and sent for microbiologic examination. *Salmonella* serotype Hartford was isolated from the macaroni salad and baked ziti. Both *Salmonella* serotype Hartford and *P. shigelloides* were isolated from the potato salad. *Escherichia coli* was isolated from a water sample collected on June 27 from the tap in the store. Water samples collected on July 8 from the well that supplied water to the store contained both *Salmonella* serotype Hartford and *P. shigelloides*.

Preparation of the salads and the baked ziti began on June 21, and prepared food items were stored in a walk-in cooler overnight. On June 22, the ziti was prepared by heating the tomato sauce, pouring it over the meat and pasta, and heating in an oven for 50 minutes at an unknown temperature. The ziti remained in the oven with the heat off until it and the salads were transported to the party.

All foodhandlers denied gastrointestinal illness with onset before June 22. However, three foodhandlers reported illness beginning after June 22; all three reported having eaten foods prepared for the party. *P. shigelloides* was recovered from stool specimens from these three workers only.

The New York State Department of Agriculture and Markets found nine sanitary violations at the caterer's facilities. The water source, an unprotected dug well approximately 10 feet deep, served only the store. The well was fed by shallow ground water and may have received surface runoff from surrounding tilled and manured farm land and water from adjacent streams. A small poultry farm was located approximately 1600 feet upstream of the well. Farm field drainage systems discharged into the source water stream just above the well. A water sample collected at the store on June 27 showed no chlorine residual, indicating that the pellet chlorinator was off-line at the time of the event. The pellet chamber was empty and the system did not contain any filtration mechanism. Well water used for food preparation (i.e., rinsing pasta used in salads, mixing ingredients, cooking food items, and cleaning equipment) was probably contaminated as a result of rainfall on June 19 and June 20 that transported pathogens from the surrounding farmland. The improperly maintained chlorinator allowed these pathogens to reach the food preparation area. After the outbreak, the store was prohibited from preparing food until an adequate water-treatment system that met drinking water standards could be provided. Store employees and the public were instructed not to drink the water.

*Reported by: R Van Houten, D Farberman, J Norton, J Ellison, Livingston County Dept of Health, Mt. Morris; J Kiehlbauch, PhD, T Morris, MD, P Smith, MD, State Epidemiologist, New York*

Plesiomonal shigelloides *and* Salmonella *Infections — Continued*

*State Dept of Health. Foodborne and Diarrheal Diseases Br, Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, CDC.*

**Editorial Note:** The findings in this report implicated a deficient water supply system as the cause of an outbreak of diarrheal illness caused by *Salmonella* serotype Hartford and *P. shigelloide*s. Unfiltered, untreated surface water led to contamination of food during its preparation.

Most infections with *P. shigelloides* have been associated with drinking untreated water, eating uncooked shellfish, or with travel to developing countries (*1–3*). *P. shigelloides* (previously *Aeromonas shigelloides*) are ubiquitous, facultatively anaerobic, flagellated, gram-negative rods (*3*). Although they are widespread in the environment, few waterborne or foodborne outbreaks have been reported (*4*). *P. shigelloides* have been isolated from a variety of sources, including wild and domestic animals (*2*). Infection is characterized by self-limited diarrhea with blood or mucus, abdominal cramps, and vomiting or fever (*5*). Symptoms usually occur within 48 hours of exposure. Fecal leukocytes and erythrocytes have been found on stool smears (*1*); however, the exact mechanism of the diarrhea (secretory versus inflammatory) is unknown.

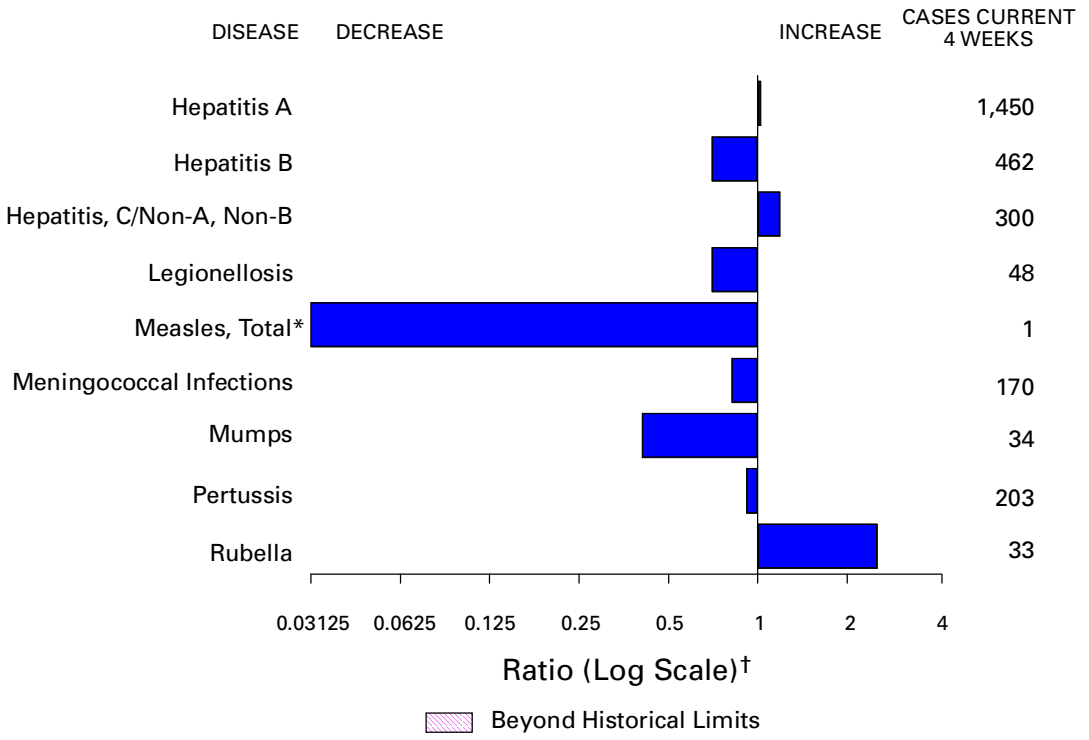
*Salmonella* serotype Hartford is a rare serotype that has been isolated from porcine and bovine sources. In May 1995, freshly squeezed, unpasteurized commercial orange juice was implicated as the cause of an outbreak (*6*). Contamination was thought to have originated from inadequate sanitization of the exterior surfaces of oranges.

In this outbreak, the well water most likely became contaminated with both *P. shigelloides* and *Salmonella* serotype Hartford through runoff from nearby farms. The outbreak could have been prevented if effective public health measures had been in place. Routine testing of well water for total fecal coliform bacteria, turbidity, and chlorine residual may enable early detection of fecal contamination and rapid decontamination. Filtration and chlorination of potable water systems have substantially reduced waterborne outbreaks and subsequent morbidity and mortality. Where possible, water sources subject to contamination from agricultural runoff should not be used for drinking or food preparation. Disinfection and filtration of water from any source can further reduce the risk for waterborne illness.

*References*

1. Soweid AM, Clarkston WK. *Plesiomonas shigelloides*: An unusual cause of diarrhea. Am J Gastroenterol 1995;90:2235–6.
2. Jeppesen C. Media for *Aeromonas* spp., *Plesiomonas shigelloides* and *Pseudomonas* spp. food and environment. Int J Food Microbiol 1995;26:25–41.
3. San Joaquin VH. *Aeromonas, Yersinia*, and miscellaneous bacterial enteropathogens. Pediatr Ann 1994;23:544–8.
4. Schofield GM. Emerging foodborne pathogens and their significance in chilled foods. J Appl Bacteriol 1992;72:267–73.
5. Holmberg SD, Wachsmuth IK, Hickman-Brenner FW, Blake PA, Farmer JJ. *Pleisiomonas* enteric infections in the United States. Ann Intern Med 1986;105:690–4.
6. Cook KA, Swerdlow D, Dobbs T, et al. Fresh-squeezed *Salmonella:* an outbreak of *Salmonella* Hartford associated with unpasteurized orange juice—Florida [Abstract]. EIS Conference Abstract 1996;38–9.

**FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending May 16, 1998, with historical data — United States**




*The large apparent decrease in the number of reported cases of measles (total) reflects dramatic fluctuations in the historical baseline. (Ratio [log scale] for week 19 measles [total] is .023256.)
†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 May 16, 1998 (19th Week)**

| | Cum. 1998 | | Cum. 1998 |
|---|---|---|---|
| Anthrax | - | Plague | - |
| Brucellosis | 8 | Poliomyelitis, paralytic¶ | - |
| Cholera | 3 | Psittacosis | 13 |
| Congenital rubella syndrome | 1 | Rabies, human | - |
| Cryptosporidiosis* | 634 | Rocky Mountain spotted fever (RMSF) | 27 |
| Diphtheria | - | Streptococcal disease, invasive Group A | 879 |
| Encephalitis: California* | - | Streptococcal toxic-shock syndrome* | 25 |
| eastern equine* | - | Syphilis, congenital** | 64 |
| St. Louis* | - | Tetanus | 7 |
| western equine* | - | Toxic-shock syndrome | 51 |
| Hansen Disease | 45 | Trichinosis | 4 |
| Hantavirus pulmonary syndrome*† | 2 | Typhoid fever | 104 |
| Hemolytic uremic syndrome, post-diarrheal* | 9 | Yellow fever | - |
| HIV infection, pediatric*§ | 88 | | |

-: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–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention (NCHSTP), last update April 26, 1998.
¶ One suspected case of polio with onset in 1998 has also been reported to date.
**Updated from reports to the Division of STD Prevention, NCHSTP.

## TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending May 16, 1998, and May 10, 1997 (19th 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 | 16,097 | 20,911 | 178,704 | 165,380 | 325 | 166 | 105,745 | 100,620 | 1,581 | 1,043 |
| NEW ENGLAND | 489 | 666 | 6,900 | 6,267 | 37 | 25 | 1,788 | 2,132 | 16 | 28 |
| Maine | 10 | 25 | 326 | 331 | 1 | - | 14 | 17 | - | - |
| N.H. | 14 | 8 | 328 | 283 | 6 | 5 | 31 | 52 | - | 3 |
| Vt. | 10 | 16 | 144 | 138 | - | - | 10 | 18 | - | 1 |
| Mass. | 211 | 279 | 3,135 | 2,580 | 17 | 15 | 759 | 813 | 16 | 22 |
| R.I. | 40 | 55 | 868 | 761 | 3 | 1 | 119 | 188 | - | 2 |
| Conn. | 204 | 283 | 2,099 | 2,174 | 10 | 4 | 855 | 1,044 | - | - |
| MID. ATLANTIC | 4,607 | 6,654 | 22,629 | 20,422 | 28 | 9 | 12,409 | 12,598 | 148 | 112 |
| Upstate N.Y. | 545 | 1,122 | N | N | 21 | - | 1,937 | 2,118 | 122 | 83 |
| N.Y. City | 2,631 | 3,292 | 12,578 | 11,167 | 2 | 4 | 5,382 | 5,086 | - | - |
| N.J. | 823 | 1,450 | 2,865 | 3,766 | 5 | 4 | 1,854 | 2,617 | - | - |
| Pa. | 608 | 790 | 7,186 | 5,489 | N | 1 | 3,236 | 2,777 | 26 | 29 |
| E.N. CENTRAL | 1,299 | 1,540 | 30,758 | 26,099 | 55 | 19 | 20,991 | 15,270 | 177 | 255 |
| Ohio | 242 | 305 | 9,040 | 8,153 | 16 | 3 | 5,453 | 4,977 | 5 | 5 |
| Ind. | 275 | 301 | 2,706 | 3,204 | 10 | 7 | 1,769 | 2,205 | 3 | 6 |
| Ill. | 495 | 504 | 8,172 | 4,128 | 15 | - | 6,710 | 2,051 | 7 | 38 |
| Mich. | 218 | 347 | 8,136 | 6,689 | 14 | 4 | 6,026 | 4,416 | 162 | 192 |
| Wis. | 69 | 83 | 2,704 | 3,925 | N | 5 | 1,033 | 1,621 | - | 14 |
| W.N. CENTRAL | 288 | 434 | 10,694 | 11,261 | 41 | 26 | 5,363 | 4,914 | 99 | 24 |
| Minn. | 50 | 79 | 1,830 | 2,470 | 17 | 12 | 650 | 854 | - | 1 |
| Iowa | 14 | 58 | 1,578 | 1,778 | 2 | - | 494 | 453 | 10 | 11 |
| Mo. | 139 | 208 | 4,250 | 4,163 | 8 | 12 | 3,204 | 2,736 | 85 | 3 |
| N. Dak. | 4 | 3 | 290 | 330 | 1 | 1 | 29 | 23 | - | 2 |
| S. Dak. | 7 | 2 | 616 | 418 | 1 | - | 104 | 40 | - | - |
| Nebr. | 32 | 34 | 894 | 709 | 6 | - | 328 | 261 | 2 | 1 |
| Kans. | 42 | 50 | 1,236 | 1,393 | 6 | 1 | 554 | 547 | 2 | 6 |
| S. ATLANTIC | 4,121 | 5,123 | 38,514 | 31,480 | 28 | 14 | 31,200 | 30,560 | 66 | 76 |
| Del. | 44 | 69 | 942 | 612 | - | 1 | 500 | 401 | - | - |
| Md. | 488 | 582 | 3,026 | 2,577 | 10 | 4 | 3,337 | 4,673 | 3 | 6 |
| D.C. | 343 | 343 | N | N | - | - | 1,320 | 1,475 | - | - |
| Va. | 284 | 420 | 3,307 | 4,022 | N | 7 | 2,252 | 2,985 | 1 | 8 |
| W. Va. | 36 | 27 | 1,102 | 1,169 | N | - | 305 | 359 | 3 | 3 |
| N.C. | 273 | 282 | 8,448 | 6,309 | 7 | 2 | 7,118 | 5,979 | 10 | 22 |
| S.C. | 283 | 264 | 6,937 | 4,498 | 1 | - | 4,454 | 3,991 | - | 17 |
| Ga. | 501 | 689 | 8,863 | 3,375 | 2 | - | 7,308 | 4,438 | 8 | - |
| Fla. | 1,869 | 2,447 | 5,889 | 8,918 | 7 | - | 4,606 | 6,259 | 41 | 20 |
| E.S. CENTRAL | 591 | 603 | 12,984 | 12,112 | 24 | 7 | 12,179 | 12,259 | 51 | 131 |
| Ky. | 87 | 60 | 2,280 | 2,388 | 5 | - | 1,268 | 1,628 | 9 | 6 |
| Tenn. | 184 | 278 | 4,512 | 4,565 | 15 | 7 | 3,750 | 3,885 | 39 | 78 |
| Ala. | 183 | 153 | 3,461 | 2,949 | 4 | - | 4,388 | 4,106 | 3 | 5 |
| Miss. | 137 | 112 | 2,731 | 2,210 | - | - | 2,773 | 2,640 | - | 42 |
| W.S. CENTRAL | 1,953 | 2,038 | 22,109 | 20,344 | 21 | 4 | 13,110 | 13,504 | 445 | 105 |
| Ark. | 71 | 83 | 1,148 | 989 | 1 | 1 | 1,094 | 1,657 | - | 2 |
| La. | 333 | 403 | 4,362 | 2,814 | - | - | 3,691 | 2,659 | 2 | 74 |
| Okla. | 106 | 116 | 3,857 | 2,800 | 3 | 3 | 2,081 | 1,766 | 1 | 4 |
| Tex. | 1,443 | 1,436 | 12,742 | 13,741 | 17 | - | 6,244 | 7,422 | 442 | 25 |
| MOUNTAIN | 526 | 621 | 6,946 | 9,354 | 26 | 17 | 2,587 | 2,809 | 285 | 129 |
| Mont. | 13 | 16 | 402 | 351 | 1 | - | 21 | 14 | 4 | 4 |
| Idaho | 12 | 18 | 705 | 569 | 2 | - | 60 | 43 | 80 | 18 |
| Wyo. | 2 | 11 | 262 | 184 | - | - | 11 | 20 | 128 | 42 |
| Colo. | 91 | 170 | - | 1,599 | 4 | 4 | 863 | 691 | 10 | 17 |
| N. Mex. | 76 | 59 | 1,359 | 1,278 | 7 | 4 | 267 | 491 | 34 | 26 |
| Ariz. | 200 | 157 | 3,315 | 3,696 | N | 5 | 1,213 | 1,171 | 1 | 15 |
| Utah | 45 | 46 | 650 | 609 | 8 | 1 | 60 | 77 | 16 | 2 |
| Nev. | 87 | 144 | 253 | 1,068 | 4 | 3 | 92 | 302 | 12 | 5 |
| PACIFIC | 2,223 | 3,232 | 27,170 | 28,041 | 65 | 45 | 6,118 | 6,574 | 294 | 183 |
| Wash. | 165 | 240 | 4,083 | 3,389 | 16 | 22 | 691 | 751 | 8 | 9 |
| Oreg. | 64 | 128 | 2,050 | 1,732 | 22 | 17 | 286 | 264 | 2 | 2 |
| Calif. | 1,947 | 2,822 | 19,574 | 21,803 | 27 | 3 | 4,872 | 5,225 | 242 | 112 |
| Alaska | 11 | 18 | 726 | 517 | - | - | 127 | 165 | 1 | - |
| Hawaii | 36 | 24 | 737 | 600 | N | 3 | 142 | 169 | 41 | 60 |
| Guam | - | 2 | 8 | 170 | N | - | 2 | 22 | - | - |
| P.R. | 666 | 517 | U | U | - | U | 150 | 243 | - | 34 |
| V.I. | 15 | 28 | N | N | N | U | - | - | - | - |
| Amer. Samoa | - | - | - | - | N | U | - | - | - | - |
| C.N.M.I. | - | - | N | N | N | U | 7 | 14 | - | 2 |

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–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention, last update April 26, 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 May 16, 1998, and May 10, 1997 (19th 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 | 371 | 306 | 1,344 | 1,140 | 377 | 474 | 2,410 | 3,221 | 2,103 | 5,689 | 2,479 |
| NEW ENGLAND | 22 | 26 | 261 | 235 | 17 | 20 | 28 | 63 | 104 | 135 | 484 |
| Maine | 1 | 1 | 1 | 3 | 1 | 1 | 1 | - | U | 11 | 80 |
| N.H. | 2 | 4 | 7 | 5 | 3 | 2 | 1 | - | 2 | 1 | 33 |
| Vt. | 1 | 3 | 2 | 2 | - | 1 | 2 | - | 1 | 2 | 26 |
| Mass. | 8 | 10 | 73 | 45 | 11 | 14 | 19 | 35 | 84 | 69 | 149 |
| R.I. | 4 | 4 | 25 | 33 | 2 | 2 | - | - | 17 | 7 | 32 |
| Conn. | 6 | 4 | 153 | 147 | - | - | 5 | 28 | U | 45 | 164 |
| MID. ATLANTIC | 80 | 52 | 861 | 716 | 102 | 127 | 82 | 158 | 198 | 1,055 | 561 |
| Upstate N.Y. | 25 | 12 | 492 | 91 | 28 | 20 | 9 | 17 | U | 135 | 390 |
| N.Y. City | 12 | 2 | 1 | 53 | 46 | 75 | 19 | 31 | U | 550 | U |
| N.J. | 3 | 6 | 55 | 173 | 16 | 22 | 18 | 72 | 198 | 221 | 71 |
| Pa. | 40 | 32 | 313 | 399 | 12 | 10 | 36 | 38 | U | 149 | 100 |
| E.N. CENTRAL | 117 | 121 | 23 | 18 | 24 | 47 | 356 | 289 | 157 | 572 | 15 |
| Ohio | 52 | 57 | 22 | 6 | 2 | 4 | 67 | 93 | 5 | 112 | 15 |
| Ind. | 17 | 16 | 1 | 8 | 1 | 4 | 65 | 63 | U | 48 | - |
| Ill. | 12 | 5 | - | 1 | 6 | 21 | 132 | 24 | 152 | 288 | - |
| Mich. | 23 | 31 | - | 3 | 14 | 15 | 72 | 45 | U | 82 | - |
| Wis. | 13 | 12 | U | U | 1 | 3 | 20 | 64 | U | 42 | - |
| W.N. CENTRAL | 28 | 23 | 11 | 11 | 20 | 11 | 61 | 65 | 70 | 165 | 232 |
| Minn. | 3 | 1 | 3 | 8 | 8 | 5 | 3 | 13 | U | 45 | 41 |
| Iowa | 2 | 4 | 7 | - | 2 | 3 | - | 3 | U | 20 | 50 |
| Mo. | 10 | 2 | - | 2 | 7 | 2 | 46 | 33 | 57 | 59 | 15 |
| N. Dak. | - | 2 | - | - | 1 | - | - | - | U | 4 | 45 |
| S. Dak. | - | 1 | - | - | - | - | 1 | - | 10 | 2 | 33 |
| Nebr. | 10 | 9 | - | 1 | - | 1 | 4 | - | 3 | 4 | 2 |
| Kans. | 3 | 4 | 1 | - | 2 | - | 7 | 16 | U | 31 | 46 |
| S. ATLANTIC | 51 | 36 | 126 | 111 | 98 | 87 | 1,033 | 1,294 | 382 | 975 | 809 |
| Del. | 6 | 5 | - | 21 | 1 | 2 | 11 | 11 | - | 10 | 17 |
| Md. | 10 | 11 | 96 | 74 | 33 | 29 | 232 | 367 | 94 | 100 | 199 |
| D.C. | 3 | 2 | 4 | 5 | 7 | 6 | 30 | 49 | 42 | 30 | - |
| Va. | 4 | 4 | 4 | - | 15 | 21 | 71 | 104 | 89 | 111 | 236 |
| W. Va. | N | N | 4 | - | - | - | 1 | 3 | 21 | 21 | 36 |
| N.C. | 6 | 5 | 1 | 3 | 7 | 6 | 293 | 252 | 136 | 123 | 136 |
| S.C. | 4 | 2 | 1 | 1 | 3 | 5 | 126 | 157 | U | 90 | 57 |
| Ga. | - | - | 2 | 1 | 13 | 12 | 191 | 237 | U | 171 | 45 |
| Fla. | 17 | 7 | 14 | 6 | 19 | 6 | 78 | 114 | U | 319 | 83 |
| E.S. CENTRAL | 12 | 10 | 16 | 24 | 10 | 13 | 394 | 706 | - | 428 | 99 |
| Ky. | 8 | - | 3 | 3 | 1 | 3 | 43 | 61 | U | 61 | 15 |
| Tenn. | 4 | 4 | 7 | 8 | 6 | 3 | 200 | 288 | U | 138 | 61 |
| Ala. | - | 2 | 6 | 2 | 3 | 4 | 90 | 177 | U | 148 | 23 |
| Miss. | - | 4 | - | 11 | - | 3 | 61 | 180 | U | 81 | - |
| W.S. CENTRAL | 8 | 5 | 5 | 2 | 10 | 7 | 258 | 452 | 38 | 846 | 68 |
| Ark. | - | - | 2 | - | - | 1 | 46 | 65 | 38 | 74 | 1 |
| La. | - | 1 | - | 1 | 4 | 4 | 106 | 142 | - | 58 | - |
| Okla. | 3 | 1 | - | - | 1 | 2 | 17 | 47 | U | 63 | 67 |
| Tex. | 5 | 3 | 3 | 1 | 5 | - | 89 | 198 | U | 651 | - |
| MOUNTAIN | 20 | 18 | 1 | 2 | 18 | 30 | 80 | 64 | 96 | 173 | 55 |
| Mont. | 1 | 1 | - | - | - | 2 | - | - | 2 | 2 | 18 |
| Idaho | - | 1 | - | - | 1 | - | - | - | 4 | 4 | - |
| Wyo. | 1 | 1 | - | - | - | 1 | - | - | 1 | 2 | 33 |
| Colo. | 4 | 4 | - | - | 6 | 15 | 4 | 2 | U | 35 | - |
| N. Mex. | 2 | 1 | - | - | 6 | 4 | 10 | - | 7 | 6 | - |
| Ariz. | 3 | 4 | - | 1 | 4 | 3 | 61 | 54 | 61 | 77 | 4 |
| Utah | 8 | 4 | - | - | 1 | 1 | 3 | 2 | 21 | 6 | - |
| Nev. | 1 | 2 | 1 | 1 | - | 4 | 2 | 6 | U | 41 | - |
| PACIFIC | 33 | 15 | 40 | 21 | 78 | 132 | 118 | 130 | 1,058 | 1,340 | 156 |
| Wash. | 3 | 3 | 1 | - | 6 | 6 | 6 | 6 | - | 108 | - |
| Oreg. | - | - | 4 | 8 | 8 | 7 | 2 | 3 | U | 50 | - |
| Calif. | 30 | 11 | 35 | 13 | 63 | 115 | 110 | 119 | 987 | 1,073 | 141 |
| Alaska | - | - | - | - | - | 2 | - | 1 | 16 | 33 | 15 |
| Hawaii | - | 1 | - | - | 1 | 2 | - | 1 | 55 | 76 | - |
| Guam | - | - | - | - | - | - | - | 3 | - | 13 | - |
| P.R. | - | - | - | - | - | 3 | 84 | 75 | 46 | - | 24 |
| V.I. | - | - | - | - | - | - | - | - | - | - | - |
| Amer. Samoa | - | - | - | - | - | - | - | - | - | - | - |
| C.N.M.I. | - | - | - | - | - | - | 1 | 5 | 8 | - | - |

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

*Additional information about areas displaying "U" for cumulative 1998 Tuberculosis cases can be found in Notice to Readers, *MMWR* Vol. 47, No. 2, p. 39.

## TABLE III. Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending May 16, 1998, and May 10, 1997 (19th 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 | 409 | 455 | 7,500 | 9,963 | 2,693 | 3,286 | - | 6 | - | 10 | 16 | 47 |
| NEW ENGLAND | 23 | 25 | 100 | 247 | 30 | 67 | - | - | - | 1 | 1 | 1 |
| Maine | 2 | 3 | 10 | 29 | - | 3 | - | - | - | - | - | - |
| N.H. | 1 | 3 | 6 | 13 | 7 | 5 | - | - | - | - | - | - |
| Vt. | 2 | - | 7 | 6 | - | 2 | - | - | - | - | - | - |
| Mass. | 16 | 16 | 25 | 125 | 12 | 34 | - | - | - | 1 | 1 | 1 |
| R.I. | 2 | 2 | 8 | 20 | 11 | 8 | - | - | - | - | - | - |
| Conn. | - | 1 | 44 | 54 | - | 15 | - | - | - | - | - | - |
| MID. ATLANTIC | 61 | 56 | 472 | 891 | 401 | 502 | - | 1 | - | 1 | 2 | 12 |
| Upstate N.Y. | 24 | 3 | 126 | 94 | 113 | 84 | - | - | - | - | - | 4 |
| N.Y. City | 10 | 19 | 130 | 415 | 104 | 206 | - | - | - | - | - | 5 |
| N.J. | 25 | 21 | 84 | 140 | 60 | 97 | - | 1 | - | - | 1 | 2 |
| Pa. | 2 | 13 | 132 | 242 | 124 | 115 | - | - | - | 1 | 1 | 1 |
| E.N. CENTRAL | 57 | 70 | 896 | 1,204 | 264 | 603 | - | 2 | - | 2 | 4 | 6 |
| Ohio | 27 | 37 | 122 | 164 | 26 | 35 | - | - | - | - | - | - |
| Ind. | 13 | 5 | 71 | 118 | 24 | 40 | - | 2 | - | 1 | 3 | - |
| Ill. | 16 | 19 | 123 | 308 | 38 | 121 | - | - | - | - | - | 5 |
| Mich. | - | 9 | 508 | 529 | 164 | 182 | - | - | - | 1 | 1 | 1 |
| Wis. | 1 | - | 72 | 85 | 12 | 225 | - | - | - | - | - | - |
| W.N. CENTRAL | 31 | 23 | 666 | 695 | 125 | 203 | - | - | - | - | - | 10 |
| Minn. | 17 | 14 | 28 | 59 | 11 | 13 | - | - | - | - | - | 1 |
| Iowa | 1 | 2 | 318 | 93 | 19 | 14 | - | - | - | - | - | - |
| Mo. | 9 | 3 | 253 | 392 | 75 | 153 | - | - | - | - | - | 1 |
| N. Dak. | - | - | 2 | 7 | 2 | 1 | - | - | - | - | - | - |
| S. Dak. | - | 2 | 8 | 6 | 1 | - | - | - | - | - | - | 8 |
| Nebr. | - | 1 | 13 | 22 | 6 | 8 | - | - | - | - | - | - |
| Kans. | 4 | 1 | 44 | 116 | 11 | 14 | - | - | - | - | - | - |
| S. ATLANTIC | 91 | 82 | 643 | 511 | 386 | 406 | - | 1 | - | 5 | 6 | 2 |
| Del. | - | - | 2 | 11 | - | 3 | - | - | - | 1 | 1 | - |
| Md. | 26 | 33 | 139 | 118 | 58 | 66 | - | - | - | 1 | 1 | 1 |
| D.C. | - | - | 24 | 13 | 6 | 18 | - | - | - | - | - | 1 |
| Va. | 10 | 6 | 103 | 67 | 37 | 44 | - | - | - | 2 | 2 | - |
| W. Va. | 3 | 3 | - | 5 | 3 | 6 | - | - | - | - | - | - |
| N.C. | 12 | 13 | 37 | 76 | 82 | 86 | - | - | - | - | - | - |
| S.C. | 2 | 3 | 12 | 54 | - | 41 | - | - | - | - | - | - |
| Ga. | 18 | 17 | 116 | 51 | 59 | 45 | - | - | - | 1 | 1 | - |
| Fla. | 20 | 7 | 210 | 116 | 141 | 97 | - | 1 | - | - | 1 | - |
| E.S. CENTRAL | 22 | 29 | 139 | 267 | 160 | 238 | - | - | - | - | - | 1 |
| Ky. | 3 | 4 | 8 | 29 | 16 | 15 | - | - | - | - | - | - |
| Tenn. | 13 | 17 | 97 | 163 | 118 | 148 | - | - | - | - | - | - |
| Ala. | 6 | 7 | 34 | 42 | 26 | 30 | - | - | - | - | - | 1 |
| Miss. | - | 1 | - | 33 | - | 45 | U | - | U | - | - | - |
| W.S. CENTRAL | 26 | 20 | 1,332 | 1,732 | 396 | 299 | - | - | - | - | - | 4 |
| Ark. | - | 1 | 19 | 95 | 22 | 21 | - | - | - | - | - | - |
| La. | 12 | 3 | 13 | 79 | 9 | 43 | - | - | - | - | - | - |
| Okla. | 12 | 14 | 208 | 626 | 26 | 11 | - | - | - | - | - | - |
| Tex. | 2 | 2 | 1,092 | 932 | 339 | 224 | - | - | - | - | - | 4 |
| MOUNTAIN | 57 | 49 | 1,218 | 1,529 | 310 | 325 | - | - | - | - | - | 1 |
| Mont. | - | - | 25 | 43 | 3 | 4 | - | - | - | - | - | - |
| Idaho | - | - | 88 | 66 | 15 | 8 | - | - | - | - | - | - |
| Wyo. | - | 1 | 25 | 17 | 7 | 8 | - | - | - | - | - | - |
| Colo. | 12 | 9 | 93 | 179 | 37 | 68 | - | - | - | - | - | - |
| N. Mex. | 4 | 3 | 69 | 106 | 118 | 111 | - | - | - | - | - | - |
| Ariz. | 31 | 12 | 776 | 707 | 83 | 70 | - | - | - | - | - | 1 |
| Utah | 4 | 3 | 79 | 281 | 25 | 36 | - | - | - | - | - | - |
| Nev. | 6 | 21 | 63 | 130 | 22 | 20 | U | - | U | - | - | - |
| PACIFIC | 41 | 101 | 2,034 | 2,887 | 621 | 643 | - | 2 | - | 1 | 3 | 10 |
| Wash. | 3 | 1 | 374 | 197 | 47 | 20 | - | - | - | - | - | - |
| Oreg. | 25 | 17 | 145 | 143 | 47 | 46 | - | - | - | - | - | - |
| Calif. | 10 | 79 | 1,486 | 2,472 | 518 | 561 | - | 2 | - | 1 | 3 | 7 |
| Alaska | 1 | 1 | 10 | 16 | 4 | 10 | - | - | - | - | - | - |
| Hawaii | 2 | 3 | 19 | 59 | 5 | 6 | - | - | - | - | - | 3 |
| Guam | - | - | - | - | - | 3 | U | - | U | - | - | - |
| P.R. | 2 | - | 16 | 140 | 233 | 480 | - | - | - | - | - | - |
| V.I. | - | - | - | - | - | - | U | - | U | - | - | - |
| Amer. Samoa | - | - | - | - | - | - | U | - | U | - | - | - |
| C.N.M.I. | - | 5 | - | 1 | 7 | 21 | U | - | U | - | - | 1 |

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

*Of 96 cases among children aged <5 years, serotype was reported for 50 and of those, 24 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 May 16, 1998, and May 10, 1997 (19th 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 | 1,147 | 1,572 | 8 | 175 | 240 | 77 | 1,380 | 1,971 | 2 | 197 | 33 |
| NEW ENGLAND | 62 | 96 | - | - | 7 | 2 | 237 | 464 | - | 30 | - |
| Maine | 4 | 8 | - | - | - | - | 5 | 6 | - | - | - |
| N.H. | 1 | 9 | - | - | - | - | 19 | 55 | - | - | - |
| Vt. | 1 | 2 | - | - | - | 1 | 24 | 153 | - | - | - |
| Mass. | 30 | 53 | - | - | 2 | 1 | 183 | 230 | - | 4 | - |
| R.I. | 3 | 6 | - | - | 4 | - | - | 12 | - | - | - |
| Conn. | 23 | 18 | - | - | 1 | - | 6 | 8 | - | 26 | - |
| MID. ATLANTIC | 123 | 154 | - | 10 | 29 | 4 | 165 | 173 | 2 | 93 | 11 |
| Upstate N.Y. | 30 | 34 | - | 3 | 4 | 4 | 99 | 59 | 1 | 89 | 1 |
| N.Y. City | 13 | 27 | - | 4 | 1 | - | 4 | 44 | 1 | 2 | 10 |
| N.J. | 35 | 31 | - | - | 4 | - | 5 | 10 | - | 2 | - |
| Pa. | 45 | 62 | - | 3 | 20 | - | 57 | 60 | - | - | - |
| E.N. CENTRAL | 149 | 230 | - | 25 | 31 | - | 141 | 200 | - | - | 3 |
| Ohio | 58 | 84 | - | 11 | 10 | - | 53 | 60 | - | - | - |
| Ind. | 25 | 27 | - | 2 | 4 | - | 42 | 20 | - | - | - |
| Ill. | 33 | 76 | - | 1 | 9 | - | 10 | 27 | - | - | - |
| Mich. | 16 | 21 | - | 11 | 7 | - | 19 | 28 | - | - | - |
| Wis. | 17 | 22 | - | - | 1 | - | 17 | 65 | - | - | 3 |
| W.N. CENTRAL | 98 | 115 | 1 | 18 | 7 | 19 | 125 | 111 | - | 2 | - |
| Minn. | 16 | 17 | 1 | 10 | 3 | 18 | 76 | 67 | - | - | - |
| Iowa | 14 | 23 | - | 5 | 3 | 1 | 26 | 7 | - | - | - |
| Mo. | 40 | 58 | - | 2 | - | - | 9 | 20 | - | 1 | - |
| N. Dak. | - | - | - | 1 | - | - | - | 2 | - | - | - |
| S. Dak. | 6 | 3 | - | - | - | - | 4 | 1 | - | - | - |
| Nebr. | 4 | 4 | - | - | 1 | - | 4 | 2 | - | - | - |
| Kans. | 18 | 10 | - | - | - | - | 6 | 12 | - | 1 | - |
| S. ATLANTIC | 195 | 264 | 1 | 30 | 37 | 4 | 101 | 170 | - | 5 | 1 |
| Del. | 1 | 4 | - | - | - | - | - | - | - | - | - |
| Md. | 18 | 27 | - | - | 4 | - | 19 | 69 | - | - | - |
| D.C. | - | 5 | - | - | - | - | 1 | 2 | - | - | - |
| Va. | 19 | 24 | - | 4 | 4 | - | 6 | 19 | - | - | 1 |
| W. Va. | 5 | 10 | - | - | - | - | 1 | 3 | - | - | - |
| N.C. | 25 | 47 | 1 | 7 | 6 | 2 | 42 | 35 | - | 3 | - |
| S.C. | 30 | 36 | - | 4 | 9 | 2 | 12 | 9 | - | 1 | - |
| Ga. | 40 | 49 | - | 1 | 5 | - | 1 | 5 | - | - | - |
| Fla. | 57 | 62 | - | 14 | 9 | - | 19 | 28 | - | 1 | - |
| E.S. CENTRAL | 80 | 109 | - | - | 15 | 1 | 35 | 39 | - | - | - |
| Ky. | 13 | 28 | - | - | 2 | 1 | 16 | 10 | - | - | - |
| Tenn. | 36 | 34 | - | - | 3 | - | 9 | 12 | - | - | - |
| Ala. | 31 | 30 | - | - | 5 | - | 10 | 10 | - | - | - |
| Miss. | - | 17 | U | - | 5 | U | - | 7 | U | - | - |
| W.S. CENTRAL | 128 | 150 | 3 | 25 | 27 | 7 | 78 | 40 | - | 52 | 3 |
| Ark. | 15 | 22 | - | - | - | - | 10 | 2 | - | - | - |
| La. | 25 | 29 | 1 | 2 | 7 | - | - | 7 | - | - | - |
| Okla. | 22 | 18 | - | - | - | - | 6 | 8 | - | - | - |
| Tex. | 66 | 81 | 2 | 23 | 20 | 7 | 62 | 23 | - | 52 | 3 |
| MOUNTAIN | 69 | 94 | 2 | 16 | 12 | 30 | 314 | 476 | - | 5 | 1 |
| Mont. | 2 | 6 | - | - | - | - | 1 | 2 | - | - | - |
| Idaho | 3 | 5 | - | 1 | 2 | 24 | 157 | 307 | - | - | - |
| Wyo. | 3 | - | - | 1 | 1 | - | 7 | 3 | - | - | - |
| Colo. | 16 | 30 | - | 2 | 3 | 4 | 50 | 127 | - | - | - |
| N. Mex. | 13 | 17 | N | N | N | - | 55 | 21 | - | 1 | - |
| Ariz. | 22 | 16 | - | 4 | - | 1 | 23 | 9 | - | 1 | 1 |
| Utah | 7 | 11 | 2 | 3 | 3 | 1 | 14 | 3 | - | 2 | - |
| Nev. | 3 | 9 | U | 5 | 3 | U | 7 | 4 | U | 1 | - |
| PACIFIC | 243 | 360 | 1 | 51 | 75 | 10 | 184 | 298 | - | 10 | 14 |
| Wash. | 28 | 43 | - | 4 | 5 | 10 | 111 | 137 | - | 8 | 1 |
| Oreg. | 46 | 72 | N | N | N | - | 8 | 17 | - | - | - |
| Calif. | 164 | 242 | 1 | 33 | 55 | - | 61 | 137 | - | 1 | 7 |
| Alaska | 1 | 1 | - | 2 | 5 | - | - | 2 | - | - | - |
| Hawaii | 4 | 2 | - | 12 | 10 | - | 4 | 5 | - | 1 | 6 |
| Guam | - | 1 | U | - | 1 | U | - | - | U | - | - |
| P.R. | 2 | 7 | - | 2 | 4 | - | 2 | - | - | - | - |
| V.I. | - | - | U | - | - | U | - | - | U | - | - |
| Amer. Samoa | - | - | U | - | - | U | - | - | U | - | - |
| C.N.M.I. | - | - | U | - | 1 | U | - | - | U | - | - |

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

# TABLE IV. Deaths in 122 U.S. cities,* week ending May 16, 1998 (19th Week)

| Reporting Area | All Causes, By Age (Years) | | | | | | P&I† Total |
|---|---|---|---|---|---|---|---|
| | All Ages | >65 | 45-64 | 25-44 | 1-24 | <1 | |
| NEW ENGLAND | 479 | 357 | 72 | 35 | 6 | 8 | 35 |
| Boston, Mass. | 121 | 84 | 25 | 6 | 5 | 1 | 14 |
| Bridgeport, Conn. | 38 | 33 | 2 | 2 | - | 1 | 3 |
| Cambridge, Mass. | 15 | 13 | 1 | 1 | - | - | - |
| Fall River, Mass. | 33 | 27 | 5 | 1 | - | - | - |
| Hartford, Conn. | U | U | U | U | U | U | U |
| Lowell, Mass. | 14 | 9 | 5 | - | - | - | - |
| Lynn, Mass. | 16 | 12 | 2 | 2 | - | - | 2 |
| New Bedford, Mass. | 23 | 19 | 2 | - | - | 1 | 1 |
| New Haven, Conn. | 28 | 18 | 3 | 5 | - | 2 | 2 |
| Providence, R.I. | 52 | 42 | 6 | 3 | - | 1 | 3 |
| Somerville, Mass. | 6 | 6 | - | - | - | - | - |
| Springfield, Mass. | 47 | 31 | 9 | 6 | - | 1 | 3 |
| Waterbury, Conn. | 24 | 17 | 2 | 4 | - | 1 | 2 |
| Worcester, Mass. | 62 | 46 | 10 | 5 | 1 | - | 5 |
| MID. ATLANTIC | 1,853 | 1,324 | 337 | 111 | 41 | 40 | 89 |
| Albany, N.Y. | 42 | 30 | 10 | - | 1 | 1 | 3 |
| Allentown, Pa. | 27 | 23 | 3 | 1 | - | - | - |
| Buffalo, N.Y. | 95 | 68 | 15 | 8 | 1 | 3 | 9 |
| Camden, N.J. | 36 | 25 | 4 | 6 | - | 1 | 3 |
| Elizabeth, N.J. | 28 | 16 | 9 | 3 | - | - | - |
| Erie, Pa. | 37 | 33 | 2 | - | - | 2 | 1 |
| Jersey City, N.J. | 37 | 24 | 8 | 4 | 1 | - | - |
| New York City, N.Y. | 1,067 | 758 | 204 | 58 | 25 | 22 | 37 |
| Newark, N.J. | 43 | 14 | 15 | 11 | 2 | 1 | 2 |
| Paterson, N.J. | 23 | 15 | 3 | 3 | 1 | 1 | - |
| Philadelphia, Pa. | U | U | U | U | U | U | U |
| Pittsburgh, Pa.§ | 56 | 43 | 9 | 3 | - | 1 | 7 |
| Reading, Pa. | 31 | 30 | - | - | 1 | - | 3 |
| Rochester, N.Y. | 121 | 89 | 21 | 4 | 3 | 4 | 10 |
| Schenectady, N.Y. | 21 | 17 | 2 | 2 | - | - | 1 |
| Scranton, Pa. | 30 | 23 | 6 | 1 | - | - | 3 |
| Syracuse, N.Y. | 112 | 82 | 17 | 5 | 4 | 4 | 10 |
| Trenton, N.J. | 23 | 14 | 5 | 2 | 2 | - | - |
| Utica, N.Y. | 24 | 20 | 4 | - | - | - | - |
| Yonkers, N.Y. | U | U | U | U | U | U | U |
| E.N. CENTRAL | 1,979 | 1,381 | 379 | 122 | 47 | 50 | 114 |
| Akron, Ohio | 53 | 40 | 8 | 1 | 1 | 3 | - |
| Canton, Ohio | 25 | 20 | 4 | 1 | - | - | 3 |
| Chicago, Ill. | 399 | 250 | 89 | 36 | 13 | 11 | 30 |
| Cincinnati, Ohio | 100 | 78 | 15 | 4 | - | 3 | 13 |
| Cleveland, Ohio | 134 | 91 | 27 | 11 | 4 | 1 | 2 |
| Columbus, Ohio | 218 | 161 | 33 | 14 | 3 | 7 | 18 |
| Dayton, Ohio | 119 | 79 | 29 | 5 | 4 | 2 | 8 |
| Detroit, Mich. | 198 | 111 | 54 | 17 | 8 | 8 | 5 |
| Evansville, Ind. | 38 | 31 | 4 | 2 | - | 1 | 1 |
| Fort Wayne, Ind. | 53 | 41 | 8 | 3 | - | 1 | 4 |
| Gary, Ind. | 14 | 6 | 3 | 4 | 1 | - | - |
| Grand Rapids, Mich. | 62 | 50 | 8 | - | 2 | 2 | 6 |
| Indianapolis, Ind. | 185 | 136 | 32 | 6 | 6 | 5 | - |
| Lansing, Mich. | 40 | 28 | 9 | 3 | - | - | 3 |
| Milwaukee, Wis. | 110 | 81 | 19 | 5 | 1 | 4 | 10 |
| Peoria, Ill. | 52 | 44 | 6 | 1 | 1 | - | 5 |
| Rockford, Ill. | 64 | 45 | 12 | 3 | 3 | 1 | 3 |
| South Bend, Ind. | 50 | 39 | 8 | 2 | - | 1 | 1 |
| Toledo, Ohio | U | U | U | U | U | U | U |
| Youngstown, Ohio | 65 | 50 | 11 | 4 | - | - | 2 |
| W.N. CENTRAL | 792 | 540 | 139 | 56 | 28 | 15 | 48 |
| Des Moines, Iowa | U | U | U | U | U | U | U |
| Duluth, Minn. | 26 | 19 | 5 | 1 | - | 1 | 1 |
| Kansas City, Kans. | 37 | 23 | 7 | 5 | 2 | - | - |
| Kansas City, Mo. | 107 | 70 | 13 | 8 | 2 | 1 | 5 |
| Lincoln, Nebr. | 24 | 20 | 3 | 1 | - | - | 3 |
| Minneapolis, Minn. | 215 | 148 | 40 | 13 | 8 | 5 | 26 |
| Omaha, Nebr. | 85 | 66 | 9 | 7 | 2 | 1 | 3 |
| St. Louis, Mo. | 109 | 65 | 25 | 8 | 8 | 3 | - |
| St. Paul, Minn. | 102 | 75 | 22 | 4 | 1 | - | 8 |
| Wichita, Kans. | 87 | 54 | 15 | 9 | 5 | 4 | 2 |

| Reporting Area | All Causes, By Age (Years) | | | | | | P&I† Total |
|---|---|---|---|---|---|---|---|
| | All Ages | >65 | 45-64 | 25-44 | 1-24 | <1 | |
| S. ATLANTIC | 1,171 | 730 | 265 | 107 | 38 | 26 | 48 |
| Atlanta, Ga. | U | U | U | U | U | U | U |
| Baltimore, Md. | 228 | 118 | 65 | 28 | 11 | 5 | 14 |
| Charlotte, N.C. | 58 | 39 | 14 | 3 | 1 | 1 | 2 |
| Jacksonville, Fla. | 155 | 96 | 41 | 11 | 6 | 1 | 3 |
| Miami, Fla. | 104 | 71 | 16 | 10 | 4 | 3 | 1 |
| Norfolk, Va. | 46 | 28 | 10 | 1 | - | 7 | 2 |
| Richmond, Va. | 85 | 59 | 13 | 8 | 4 | 1 | 3 |
| Savannah, Ga. | 63 | 45 | 12 | 6 | - | - | 5 |
| St. Petersburg, Fla. | 58 | 43 | 8 | 4 | 1 | 2 | 2 |
| Tampa, Fla. | 196 | 126 | 45 | 16 | 3 | 3 | 9 |
| Washington, D.C. | 157 | 86 | 39 | 20 | 8 | 3 | 7 |
| Wilmington, Del. | 21 | 19 | 2 | - | - | - | - |
| E.S. CENTRAL | 683 | 439 | 161 | 53 | 17 | 10 | 51 |
| Birmingham, Ala. | 195 | 131 | 42 | 10 | 7 | 2 | 14 |
| Chattanooga, Tenn. | 62 | 38 | 17 | 3 | 1 | 3 | 3 |
| Knoxville, Tenn. | 95 | 62 | 23 | 8 | 1 | 1 | 9 |
| Lexington, Ky. | 68 | 45 | 15 | 5 | 3 | - | 7 |
| Memphis, Tenn. | U | U | U | U | U | U | U |
| Mobile, Ala. | 83 | 53 | 19 | 10 | 1 | - | - |
| Montgomery, Ala. | 44 | 30 | 9 | 4 | - | 1 | 2 |
| Nashville, Tenn. | 136 | 80 | 36 | 13 | 4 | 3 | 16 |
| W.S. CENTRAL | 1,645 | 1,028 | 377 | 148 | 51 | 38 | 109 |
| Austin, Tex. | 91 | 60 | 20 | 7 | 2 | 2 | 4 |
| Baton Rouge, La. | 42 | 25 | 10 | 3 | 3 | 1 | - |
| Corpus Christi, Tex. | 53 | 31 | 17 | 3 | 1 | 1 | 4 |
| Dallas, Tex. | 208 | 124 | 53 | 17 | 9 | 5 | 6 |
| El Paso, Tex. | 109 | 66 | 27 | 11 | 3 | 2 | 4 |
| Ft. Worth, Tex. | 74 | 58 | 11 | 4 | - | 1 | 9 |
| Houston, Tex. | 551 | 314 | 135 | 68 | 17 | 15 | 57 |
| Little Rock, Ark. | 77 | 52 | 17 | 7 | 1 | - | 2 |
| New Orleans, La. | 96 | 63 | 19 | 6 | 5 | 3 | - |
| San Antonio, Tex. | 226 | 143 | 55 | 15 | 8 | 4 | 13 |
| Shreveport, La. | U | U | U | U | U | U | U |
| Tulsa, Okla. | 118 | 92 | 13 | 7 | 2 | 4 | 10 |
| MOUNTAIN | 689 | 498 | 101 | 50 | 17 | 14 | 49 |
| Albuquerque, N.M. | 97 | 66 | 16 | 9 | 4 | 1 | 2 |
| Boise, Idaho | 39 | 28 | 6 | 5 | - | - | 2 |
| Colo. Springs, Colo. | 44 | 29 | 10 | 2 | - | 3 | 7 |
| Denver, Colo. | 136 | 102 | 18 | 11 | 1 | 4 | 15 |
| Las Vegas, Nev. | U | U | U | U | U | U | U |
| Ogden, Utah | 36 | 28 | 5 | 1 | 2 | - | 1 |
| Phoenix, Ariz. | 76 | 45 | 13 | 3 | 5 | 2 | 8 |
| Pueblo, Colo. | 21 | 14 | 5 | 1 | 1 | - | 2 |
| Salt Lake City, Utah | 101 | 74 | 14 | 10 | - | 3 | 6 |
| Tucson, Ariz. | 139 | 112 | 14 | 8 | 4 | 1 | 6 |
| PACIFIC | 1,571 | 1,098 | 282 | 121 | 45 | 25 | 136 |
| Berkeley, Calif. | 16 | 13 | 3 | - | - | - | - |
| Fresno, Calif. | 176 | 125 | 19 | 17 | 11 | 4 | 18 |
| Glendale, Calif. | U | U | U | U | U | U | U |
| Honolulu, Hawaii | 49 | 37 | 9 | 3 | - | - | 4 |
| Long Beach, Calif. | 76 | 57 | 15 | 4 | - | - | 5 |
| Los Angeles, Calif. | 303 | 183 | 63 | 36 | 12 | 9 | 19 |
| Pasadena, Calif. | 21 | 14 | 4 | 2 | 1 | - | 3 |
| Portland, Oreg. | 28 | 22 | 3 | 2 | 1 | - | 1 |
| Sacramento, Calif. | 178 | 131 | 29 | 11 | 4 | 3 | 28 |
| San Diego, Calif. | 137 | 89 | 32 | 10 | 6 | - | 14 |
| San Francisco, Calif. | 128 | 93 | 16 | 13 | 3 | 3 | 8 |
| San Jose, Calif. | 165 | 117 | 37 | 7 | 3 | 1 | 17 |
| Santa Cruz, Calif. | 32 | 21 | 8 | 3 | - | - | 2 |
| Seattle, Wash. | 127 | 90 | 25 | 7 | 3 | 2 | 2 |
| Spokane, Wash. | 44 | 36 | 5 | 2 | 1 | - | 2 |
| Tacoma, Wash. | 91 | 70 | 14 | 4 | - | 3 | 13 |
| TOTAL | 10,862¶ | 7,395 | 2,113 | 803 | 290 | 226 | 679 |

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.

## Contributors to the Production of the *MMWR* (Weekly)

### Weekly Notifiable Disease Morbidity Data and 122 Cities Mortality Data

Samuel L. Groseclose, D.V.M., M.P.H.

***State Support Team***

Robert Fagan
Karl A. Brendel
Harry Holden
Gerald Jones
Felicia Perry
Carol A. Worsham

***CDC Operations Team***

Carol M. Knowles
Deborah A. Adams
Willie J. Anderson
Patsy A. Hall
Myra A. Montalbano
Angela Trosclair, M.S.

**The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format and on a paid subscription basis for paper copy. To receive an electronic copy on Friday of each week, send an e-mail message to *listserv@listserv.cdc.gov*. The body content should read *SUBscribe mmwr-toc*. Electronic copy also is available from CDC's World-Wide Web server at *http://www.cdc.gov/* or from CDC's file transfer protocol server at *ftp.cdc.gov*. To subscribe for paper copy, contact Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 512-1800.**

**Data in the weekly *MMWR* are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the following Friday. Address inquiries about the *MMWR* Series, including material to be considered for publication, to: Editor, *MMWR* Series, Mailstop C-08, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30333; telephone (888) 232-3228.**





☆**U.S. Government Printing Office: 1998-633-228/67079 Region IV**