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Tetrodotoxin Poisoning Associated With Eating Puffer Fish Transported from Japan — California, 1996

On April 29, 1996, three cases of tetrodotoxin poisoning occurred among chefs in California who shared contaminated fugu (puffer fish) brought from Japan by a co-worker as a prepackaged, ready-to-eat product. The quantity eaten by each person was minimal, ranging from approximately ¼ to 1½ oz. Onset of symptoms began approximately 3–20 minutes after ingestion, and all three persons were transported by ambulance to a local emergency department (ED). This report summarizes the investigation of these cases by the San Diego Department of Environmental Health (SDEH) and the Food and Drug Administration (FDA).

Case Reports

Case 1. A 23-year-old man ate a piece of fugu "the size of a quarter" (approximately ¼ oz). Approximately 10–15 minutes later, he had onset of tingling in his mouth and lips followed by dizziness, fatigue, headache, a constricting feeling in his throat, difficulty speaking, tightness in his upper chest, facial flushing, shaking, nausea, and vomiting. His legs weakened, and he collapsed. On examination in the ED, his blood pressure was 150/90 mmHg; heart rate, 117 beats per minute; respiratory rate, 22 per minute; temperature, 99.3 F (37.4 C); and oxygen saturation, 99% on room air.

Case 2. A 32-year-old man ate three bites of fugu (approximately 1½ oz) over 2–3 minutes. While eating his third bite, he noticed tingling in his tongue and right side of his mouth followed by a "light feeling," anxiety, and "thoughts of dying." He felt weak and collapsed. At the ED, his blood pressure was 167/125 mmHg; heart rate, 112 beats per minute; respiratory rate, 20 per minute; and oxygen saturation, 96% on room air.

Case 3. A 39-year-old man ate approximately ¼ oz of fugu after eating a full meal. Approximately 20 minutes after eating the fugu, he had onset of dizziness and mild chest tightness. At the ED, his blood pressure was 129/75 mmHg; heart rate, 84 beats per minute; respiratory rate, 22 per minute; temperature, 97.2 F (36.2 C); and oxygen saturation, 97% on room air.

Diagnosis and Treatment

A presumptive diagnosis of tetrodotoxin poisoning in all three men was based on clinical presentation in the ED and the history of recent consumption of fugu. All were

Tetrodotoxin Poisoning — Continued

treated with intravenous hydration, gastric lavage, and activated charcoal. Symptoms gradually resolved, and the men were discharged the following day with no residual symptoms.

Follow-Up Investigation

The chef who brought the fugu from Japan failed to declare this item through customs. The remaining fugu was obtained for toxin analysis at FDA. SDEH contacted health authorities in Japan and relayed the product label information for identification of the product manufacturer to assist in their local follow-up investigation.

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Editorial Note: The order Tetraodontoidea includes ocean sunfishes, porcupine fishes, and fugu, which are among the most poisonous of all marine life (*1*). These species inhabit the shallow waters of the temperate and tropical zones and can be exported from China, Japan, Mexico, the Philippines, and Taiwan. The liver, gonads, intestines, and skin of these fish contain tetrodotoxin, a powerful neurotoxin that can cause death in approximately 60% of persons who ingest it (*2*). Other animals (e.g., California newt and the eastern salamander) also possess tetrodotoxin in lethal quantities (*3*) (Table 1).

Tetrodotoxin is heat-stable and blocks sodium conductance and neuronal transmission in skeletal muscles. Paresthesias begin 10–45 minutes after ingestion, usually as tingling of the tongue and inner surface of the mouth. Other common symptoms include vomiting, lightheadedness, dizziness, feelings of doom, and weakness. An ascending paralysis develops, and death can occur within 6–24 hours, secondary to respiratory muscle paralysis. Other manifestations include salivation, muscle twitching, diaphoresis, pleuritic chest pain, dysphagia, aphonia, and convulsions. Severe poisoning is indicated by hypotension, bradycardia, depressed corneal reflexes, and fixed dilated pupils. Diagnosis is based on clinical symptoms and a history of ingestion. Treatment is supportive, and there is no specific antitoxin (*6*). Despite the high death rate associated with tetrodotoxin poisoning, the three persons described in this report survived probably because of the small amount of toxin ingested and rapid stomach evacuation by the ED.

Although personal importation of fugu into the United States is prohibited, FDA has permitted fugu to be imported and served in Japanese restaurants by certified fugu chefs on special occasions. A cooperative agreement with the Japanese Ministry of Health and Welfare ensures fugu is properly processed and certified safe for consumption before export by the government of Japan. If cleaned and dressed properly, the fugu flesh or musculature is edible and considered a delicacy by some persons in Japan, who may pay the equivalent of $400 U.S. for one meal. Despite careful preparation, fugu remains a common cause of fatal food poisoning in Japan, accounting for approximately 50 deaths annually (*7*).

Although arriving travelers are required to declare all food products brought into the United States, control measures rely primarily on the traveler. Other foodborne outbreaks in the United States have occurred after consumption of illegally imported

Tetrodotoxin Poisoning — Continued

TABLE 1. Types of food poisoning associated with naturally occurring toxins in seafoods, by selected characteristics*

Type of poisoning	Type of toxin	Source	Symptom onset	Clinical syndrome
Ciguatera	Ciguatoxin	Coral reef fish, barracuda, red snapper, and grouper	1 to 4 hours	Abdominal pain, diarrhea, vomiting, cold-to-hot sensory reversal, paresthesias, myalgias, and weakness
Amnesic shellfish	Domoic acid	Mussels, clams, crabs, and anchovies	15 minutes to 38 hours	Vomiting, diarrhea, headache, myoclonus, hemiparesis, seizures, coma, and permanent loss of short-term memory
Scombroid	Histidine	Tuna, mahi mahi, bonita, mackerel, bluefish, and skipjack	Minutes to 4 hours	Severe headache, dizziness, nausea, vomiting, flushed skin, urticaria, and wheezing
Neurotoxic shellfish	Neurotoxin	Mussels and most plankton feeders	Minutes to 3 hours	Diarrhea, vomiting, ataxia, and paresthesias
Paralytic shellfish	Saxitoxin	Mussels and clams	≤30 minutes	Vomiting, diarrhea, facial paresthesias, and respiratory paralysis

*Adapted from references *4* and *5*.

food products (*8*). Persons who travel to countries where fugu is served should be aware of the potential risk of eating this fish.

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AIDS Associated with Injecting-Drug Use — United States, 1995

Injecting-drug use is the second most frequently reported risk behavior for infection with human immunodeficiency virus (HIV) (*1*). As of December 31, 1995, of 513,486 cases of acquired immunodeficiency syndrome (AIDS) reported to CDC, 184,359 (36%) were directly or indirectly associated with injecting-drug use. Injecting-drug-user (IDU)–associated AIDS cases include persons who are IDUs* (n=161,891), their heterosexual sex partners (n=18,710), and children (n=3,758) whose mothers were IDUs or sex partners of IDUs (*1*). This report characterizes persons with and trends in IDU-associated AIDS reported to CDC through 1995 from the 50 states, the District of Columbia, and the U.S. territories.

IDU-associated AIDS cases reported in 1995 were analyzed by sex, race/ethnicity, state, and region†. Trends in IDU-associated AIDS among adolescents and adults (aged ≥13 years) were evaluated using the estimated incidence of AIDS-defining opportunistic illness (AIDS-OI), which adjusts for the 1993 expansion of the AIDS surveillance case definition and for reporting delays and anticipated reclassification of cases initially reported with no identified risk (*1,2*). Trends in estimated AIDS-OI incidence were analyzed by quarter for January 1990–June 1995 (the most recent date for which AIDS-OI incidence can be reliably estimated). For inter-area and intergroup comparisons, estimated IDU-associated AIDS-OI incidence rates (per 100,000 population) among adolescents and adults for July 1994–June 1995 were calculated using 1994 Bureau of the Census population estimates by race/ethnicity and region.

IDU-Associated AIDS Cases Reported in 1995

Of 74,180 AIDS cases reported in 1995, a total of 25,860 (35%) were associated with injecting-drug use. Among persons with IDU-associated AIDS, 14,057 (54%) were heterosexual males, 5204 (20%) were female, 3425 (13%) were men who have sex with men (MSM), 2849 (11%) were male and female heterosexual sex partners of IDUs, and 325 (1%) were children whose mothers were either IDUs or sex partners of IDUs. Among persons with IDU-associated AIDS, 50% (12,832) were black, 25% (6509) white, and 24% (6319) Hispanic; Asians/Pacific Islanders (74) and American Indians/Alaskan Natives (88) each accounted for <1% of cases.

When analyzed by sex and sexual orientation, 66% (7125 of 10,777) of AIDS cases reported among women and 85% (14,985 of 17,686) among heterosexual men with an identified exposure category were IDU-associated. In comparison, 10% (3425 of 34,096) of AIDS cases among MSM had a history of injecting-drug use.

IDU-associated AIDS accounted for >50% of cases reported from Delaware (204 [65%] of 314 cases), Puerto Rico (1647 [63%] of 2604), Connecticut (1018 [61%] of 1676), Maryland (1382 [52%] of 2680), and Rhode Island (121 [52%] of 232) and

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*Defined as any person who injected drugs at least once after 1977.

†Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin); South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming; U.S. territories=Guam, Puerto Rico, U.S. Pacific Islands, and U.S. Virgin Islands.

Injecting-Drug Use — Continued

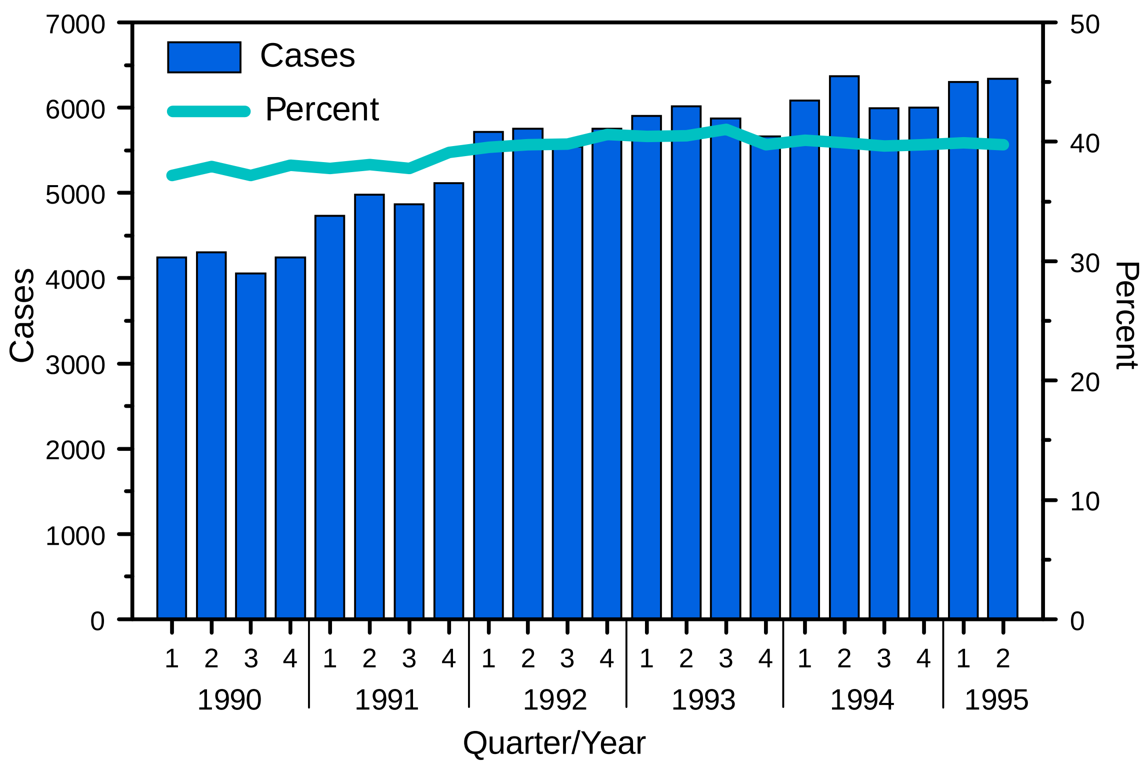
accounted for 49% from New York (6130 of 12,394) and New Jersey (2155 of 4364). By region, the Northeast accounted for 44% (11,284) of IDU-associated AIDS cases, followed by the South (29%, 7481), West (13%, 3351), Midwest (8%, 2091), and U.S. territories (6%, 1653).

Trends in IDU-Associated AIDS-OI Cases Among Adolescents and Adults, 1990–1995

During January 1990–June 1995, the quarterly number of estimated IDU-associated AIDS-OI cases among adolescents and adults increased 48%, from approximately 4200 cases to approximately 6300 cases (Figure 1). However, most of this increase occurred during the early 1990s (annual increases of 17% during 1990–1991 compared with 4% during 1993–1994). Among female and heterosexual male IDUs, increases in annual AIDS-OI cases were substantial in the early 1990s and smaller in subsequent years (Figure 2). In comparison, the number of cases among MSM IDUs peaked in 1992 (approximately 1000 per quarter) and subsequently declined (Figure 2). Among heterosexual sex partners of IDUs, the number of cases increased steadily throughout the 1990s: cases among heterosexual sex partners of IDUs during 1990–1991 increased 23% among women and 19% among men; during January–June 1994 and January–June 1995, increases were 9% among women and 17% among men.

Among non-Hispanic black IDUs, cases increased from January–June 1990 to January–June 1995 by 59% (from approximately 1800 cases to 2800 cases). During

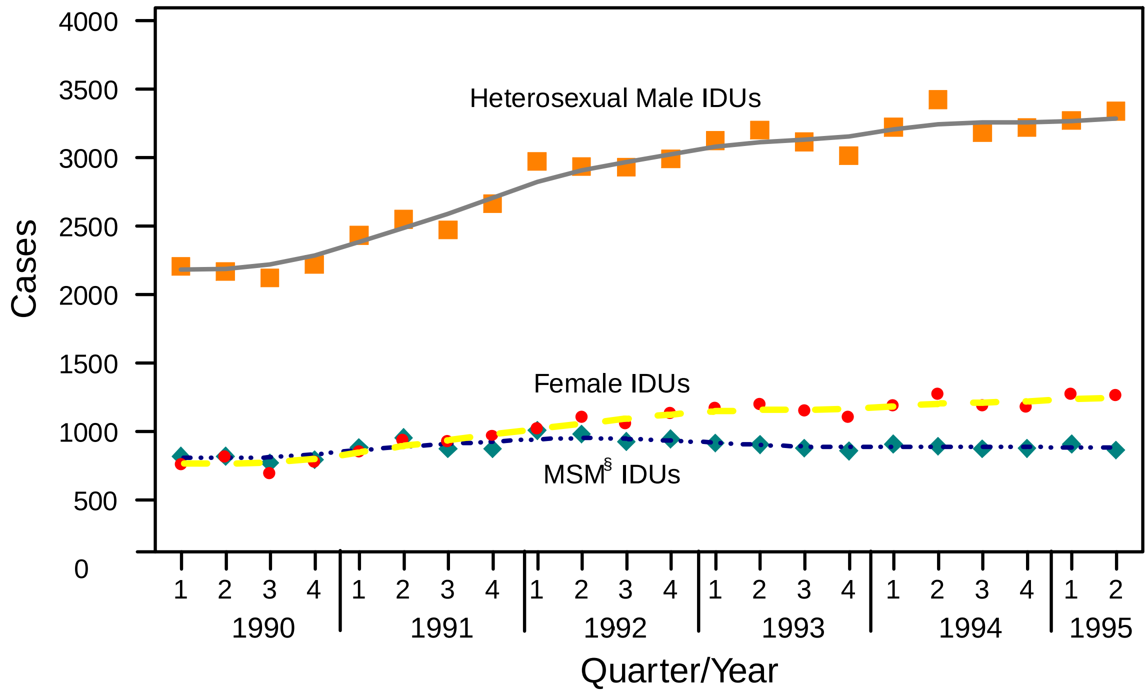
FIGURE 1. Estimated number of incident cases* of injecting-drug-user–associated AIDS-defining opportunistic illness (AIDS-OI) and percentage of total AIDS-OI, by quarter year of diagnosis — United States, January 1990–June 1995



*Estimates are adjusted for delays in reporting and reclassification of cases initially reported without risk (*1*).

Injecting-Drug Use — Continued

FIGURE 2. Estimated number of incident cases* of AIDS-defining opportunistic illness among injecting-drug users (IDUs), by risk-exposure group and quarter year of diagnosis — United States, January 1990–June 1995†



*Estimates are adjusted for delays in reporting and reclassification of cases initially reported without risk (*1*).
†Points represent quarterly incidence; line represents "smoothed" incidence (*2*).
§Men who have sex with men.

January–June 1995, the estimated quarterly number of cases among non-Hispanic blacks (approximately 2800 cases) was more than twice that among non-Hispanic whites (approximately 1300 cases) and Hispanics (approximately 1200 cases) (Figure 3)§. From January–June 1990 through January–June 1995, the estimated number of cases in the South increased 62% (from 1000 to 1700 per quarter) and in the West by 56% (from approximately 460 to 700 cases per quarter). In comparison, during 1990–1993, AIDS-OI cases increased approximately 37% (from 1700 to 2400 per quarter) in the Northeast and 68% (from 240 to 400 per quarter) in the Midwest and have remained stable.

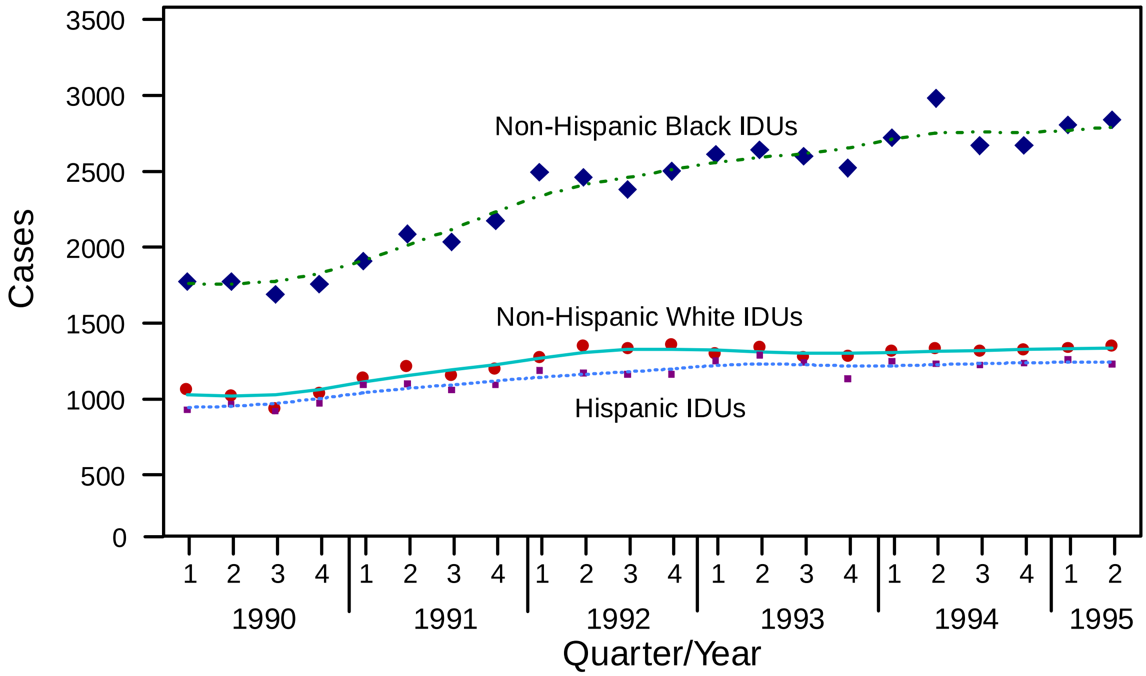
Estimated IDU-Associated AIDS-OI Rates Among Adolescents and Adults, July 1994–June 1995

During July 1994–June 1995, the estimated annual incidence rate of IDU-associated AIDS-OI among adolescents and adults was 11.1 cases per 100,000 population. In all regions, estimated IDU-associated AIDS-OI rates were higher for non-Hispanic blacks and Hispanics than non-Hispanic whites (Table 1). Rates were nearly 14-fold higher for non-Hispanic black men (78.7 cases per 100,000 population) and nearly 17-fold higher for non-Hispanic black women (31.8) than for non-Hispanic white men (5.8) and non-

§Numbers for other racial/ethnic groups were too small for meaningful analysis.

Injecting-Drug Use — Continued

FIGURE 3. Estimated number of incident cases* of AIDS-defining opportunistic illness among injecting-drug users (IDUs), by race/ethnicity† and quarter year of diagnosis — United States, January 1990–June 1995§



*Estimates are adjusted for delays in reporting and reclassification of cases initially reported without risk (*1*).
†Numbers for other racial/ethnic groups were too small for meaningful analysis.
§Points represent quarterly incidence; line represents "smoothed" incidence (*2*).

Hispanic white women (1.9). Rates for Hispanic men (44.7) and Hispanic women (15.0) were eightfold higher than rates among non-Hispanic whites.

Rates varied substantially by region and were highest in the Northeast (Table 1): of the 13 states with rates ≥10 cases per 100,000 population, six were located in the Northeast (New York [39.4 cases per 100,000 population], New Jersey [32.3], Connecticut [24.7], Massachusetts [12.5], Rhode Island [12.4], and Pennsylvania [10.1]), six in the South (Delaware [27.8], Maryland [26.2], Florida [19.3], Georgia [12.2], South Carolina [10.6], and Louisiana [10.5]), and one in the West (Nevada [10.6]). Rates also were high in the District of Columbia (91.9) and Puerto Rico (46.4).

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Editorial Note: The findings in this report underscore three important trends in the AIDS epidemic. First, although annual increases in the number of cases associated with IDUs continue to occur, these increases have been progressively smaller while AIDS incidence among heterosexual partners of IDUs has continued to increase steadily. Second, IDU-associated AIDS has disproportionately increased among heterosexual minorities, particularly among blacks. Finally, although the highest rates of IDU-associated AIDS-OI continued to occur in the Northeast, the numbers of cases in the South and West continued to increase while increases in the Northeast have slowed.

TABLE 1. Estimated annual number and rate* of injecting-drug-use–associated AIDS-defining opportunistic illness among persons aged ≥13 years, by race/ethnicity† and region§ — United States, July 1994–June 1995¶

	Northeast		Midwest		South		West		Total	
Race/Ethnicity	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**
White, non-Hispanic	1,900	(5.8)	550	(1.4)	1,700	(3.2)	1,400	(4.7)	**5,600**	**(3.5)**
Black, non-Hispanic	4,900	(117.3)	1,100	(23.4)	5,300	(41.0)	850	(38.7)	**12,100**	**(50.9)**
Hispanic	2,800	(87.6)	180	(12.1)	600	(12.0)	550	(6.6)	**4,200**	**(21.9)**
Total	**10,400**	**(24.6)**	**2,000**	**(4.0)**	**7,900**	**(10.7)**	**3,100**	**(6.8)**	**23,300**	**(11.1)**

*Per 100,000 population.
†Numbers for other racial/ethnic groups were too small for meaningful analysis.
§Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin; South=Alabama, Arkansas, Delaware , District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
¶Estimates are adjusted for delays in reporting of AIDS cases and anticipated redistribution of cases initially reported with no identified risk.

Injecting-Drug Use — Continued

Rates of IDU-associated AIDS in this report were calculated using the total adolescent and adult population. Because the number of IDUs in the United States is unknown, rates of AIDS among IDUs could not be calculated. However, findings of HIV seroprevalence studies among IDUs entering drug-treatment centers are consistent with the results of this report: HIV seroprevalence has been consistently highest among IDUs in the Northeast (27%), intermediate in the South (12%), and lowest in the Midwest (7%) and West (3%) (*3*). In addition, HIV seroprevalence has been consistently higher among non-Hispanic black and Hispanic IDUs than among non-Hispanic white IDUs (*3*). Racial differences in the number and rate of IDU-associated AIDS cases probably reflect socioeconomic, behavioral, and other risk factors related to injecting-drug use.

Because IDU-associated risk for AIDS is probably underreported, the findings in this report represent minimum estimates. Multiple overlapping risk behaviors are associated with HIV/AIDS and account for variations in the epidemiology of this disease. For example, through 1995, 17% of the 128,696 heterosexual men and women IDUs with AIDS also reported having heterosexual contact with an HIV-positive person or a person with other risks for HIV (*1,4*), emphasizing the strong links between heterosexually acquired AIDS and injecting-drug use. In addition, preliminary findings of a study at six sites to verify exposure risk indicated that 21% (120 of 569) of men and 15% (136 of 877) of women initially reported as having heterosexual contact with an HIV-positive partner or a partner at high risk for HIV infection had an additional risk; of these, most (56% of 120 men and 88% of 136 women) had injected drugs (*5*).

Measures for reducing the occurrence of IDU-associated AIDS include preventing the initiation of injecting-drug use, increasing the number of IDUs in drug treatment, encouraging safer injecting practices among IDUs, and promoting safer sexual behaviors among IDUs and their sex partners (*6,7*). For example, in Connecticut, partial repeal of needle prescription and drug paraphernalia laws in 1992 allowing purchase of needles and syringes by IDUs without a prescription and possession of this equipment without medical need decreased the sharing of syringes by IDUs (*8*). In addition, some jurisdictions have implemented needle and syringe exchange programs to provide IDUs with sterile injection equipment and access to drug-abuse treatment and some services (*9*). Persons who continue to inject drugs should be screened periodically for HIV infection and advised of measures that may reduce risks for infection (*10*).

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Mosquito-Transmitted Malaria — Michigan, 1995

During the 19th and early 20th centuries, malaria was endemic in many areas of the United States. Although indigenous transmission was interrupted by the 1940s (*1*), recent outbreaks in New Jersey, New York, and Texas have underscored the potential for reintroduction of mosquitoborne transmission of malaria in the United States (*2–4*). This report summarizes the investigation of a case of *Plasmodium vivax* malaria diagnosed during September 1995 in a resident of Michigan with no history of international travel; the findings of the investigation indicated that the route of transmission was probably through the bite of a locally infected *Anopheles* spp. mosquito.

Case Investigation

On September 3, 1995, a 31-year-old man was hospitalized because of a 5-day history of fever, chills, sweats, and headache. On physical examination, the only abnormality identified was a temperature of 103 F (39.4 C). A complete blood count on admission identified neutropenia (white blood cell count: 3100/mm^3 [normal: 4000–10,000/mm^3]) and thrombocytopenia (platelet count: 69,000/mm^3 [normal: 150,000–450,000/mm^3]). On September 6, examination of the patient's peripheral blood smear identified intracellular red blood cell parasites consistent with *Plasmodium* spp. The diagnosis of *P. vivax* infection was confirmed by slide examination, serologic tests, and DNA amplification using polymerase chain reaction. The patient responded to treatment with chloroquine and primaquine and was discharged on September 9.

The patient had no history of travel outside the United States, receipt of blood transfusions, injecting-drug use, or previous malaria infection. He lived in a suburban area, approximately 5 miles from the Detroit Metropolitan-Wayne County Airport. The patient cited three locations where he had been outdoors at night and could have been exposed to anopheline mosquitoes: a rural campground in southeast Michigan where he slept outdoors on August 18–19, a suburban golf course south of Detroit where he played golf regularly in the evening, and his backyard.

On September 19, adult female *A. quadrimaculatus* and *A. punctipennis*, both competent vectors for malaria, were recovered from dry ice-baited CDC light traps placed overnight at the campground. In addition, anopheline larvae were identified in a small swamp 10–15 meters from the site where the patient had camped. No adult or larval anophelines were recovered from the golf course or the yard. Weather data for three cities in the area indicated that the average evening temperature in August 1995 was 75.6 F (24.2 C), exceeding the 30-year average by 5.9 F (3.3 C).

Malaria — Continued

Active Case Detection and Investigation

A survey of laboratories, infection-control practitioners, infectious disease physicians, and local health departments was conducted to identify all cases of malaria diagnosed by physicians in residents of the area during June 1, 1995–September 19, 1995. Because the patient's campsite was adjacent to an automobile racetrack visited by persons from states in the surrounding region, the survey included 16 counties in southern Michigan, three in northwestern Ohio, and three in northeastern Indiana. The survey identified 10 additional cases of malaria that had been diagnosed in persons living in Michigan and two in Indiana; all 12 of those persons had histories of recent travel to malaria-endemic countries. The species identified were *P. vivax* (six cases), *P. falciparum* (five), and *P. malariae* (one). Only two of the 10 additional cases in Michigan had been reported to public health authorities by September 19.

Possible sources of infection for the case described in this report also included infected anopheline mosquitoes inadvertently transported to Michigan on aircraft ("airport malaria") (*5*) and unrecognized or unreported malaria infections among recent immigrants, migrant workers, and travelers from malaria-endemic countries. Follow-up investigation of the diagnosed malaria cases in the survey area did not establish epidemiologic links with the case in this report. Authorities at the Detroit airport reported that no direct flights into Detroit originate from known malaria-endemic areas. Based on information provided by the U.S. Immigration and Naturalization Service, of the 8736 immigrants to the Detroit metropolitan statistical area in 1994, 42% had arrived from countries with areas of endemic malaria transmission. In addition, an estimated 26,000 migrant farm workers enter Michigan each summer, including some who may have arrived from malaria-endemic areas of Mexico and Central America.

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Editorial Note: The findings of this investigation indicate that the patient probably acquired his malaria infection in Michigan, most likely at the campground. This conclusion is based on at least five factors. First, the patient had no history of foreign travel or other possible exposures identified. Second, he had camped within a few meters of an *Anopheles* spp. breeding site 11 days before the onset of illness—a period consistent with the 8–14-day incubation period of *P. vivax* malaria. Third, the above-average temperatures in southeastern Michigan during August 1995 may have facilitated malaria transmission because warmer external temperatures shorten the reproductive (sporogonic) cycle of the parasite and prolong *Anopheles* spp. survival (*1*). Fourth, potential sources of mosquito infection include an average of 30 cases of imported malaria reported annually in Michigan and unrecognized or unreported cases among immigrants, migrant workers, and travelers from malaria-endemic countries. Fifth, because no airline flights arriving at the Detroit airport originated in areas where malaria is known to be endemic, transmission was unlikely to have occurred from infected anophelines inadvertently transported to Michigan on aircraft (*5*).

In the United States, mosquitoborne malaria has not occurred this far north since 1972. From 1957 through 1994, a total of 76 cases of locally acquired malaria were reported in the United States; of these, *P. vivax* was the species identified most frequently (59 [80%]) (*1*). Since 1986, local outbreaks of malaria have been identified in

Malaria — Continued

California, Florida, New Jersey, New York, and Texas (*2–4,6–8*). The outbreaks in California and Florida were associated with rural exposure, while those in New Jersey, New York, and Texas occurred in suburban or urban environments.

Although the investigation in Michigan did not identify any additional locally acquired cases, only 20% of the imported cases identified by active detection efforts had been reported through passive surveillance by the time of the investigation. The detection of local outbreaks—which could indicate endemic mosquitoborne transmission of malaria—requires sensitive and timely surveillance. The findings of this investigation underscore the need for enhanced surveillance systems for malaria and the role of laboratory-based case reporting to ensure the prompt identification, reporting, and investigation of all malaria cases. The Michigan Department of Community Health is planning a system of laboratory-based electronic disease reporting for laboratory-confirmed notifiable diseases.

The increasing number of persons in the United States who travel to or immigrate from malaria-endemic areas increases the likelihood of imported cases and locally acquired malaria. Therefore, health-care providers should consider malaria in the differential diagnosis of persons with unexplained fever, particularly during the summer months, initiate appropriate treatment on diagnosis, and promptly report cases to public health officials. Persons can protect themselves from the bites of mosquitoes that transmit malaria and other infectious diseases by using insect repellents containing N,N diethylmethyltoluamide (DEET), wearing long-sleeved clothing, and sleeping in a screened enclosure or under an insecticide-impregnated mosquito net.

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Mercury Poisoning Associated with Beauty Cream — Texas, New Mexico, and California, 1995–1996

The Texas Department of Health (TDH), New Mexico Department of Health (NMDH), and San Diego County Health Department (SDCHD) recently investigated three cases of mercury poisoning among persons who had used a beauty cream produced in Mexico. The investigations implicated the beauty cream as the source of the mercury. The cream, marketed as "Crema de Belleza—Manning," lists "calomel" (mercurous

Mercury Poisoning — Continued

chloride) as an ingredient and was found to contain 6%–8% mercury by weight. This report summarizes the ongoing investigation of these and other possible cases.

Case 1

In September 1995, a previously healthy 15-year-old boy who resided in Texas near the Mexico border had onset of fatigue, weakness, insomnia, myalgias of his extremities, severe headache, sore throat, cough, constipation, and paresthesias of his feet and hands. On September 16, a physician in Piedras Negras, Mexico, prescribed symptomatic treatment for the paresthesia and cough. Subsequent problems included loss of taste, weight loss of approximately 15 pounds, and progressive weakness in his arms and legs. A neurologist in Piedras Negras performed an electromyogram and measured nerve-conduction velocities that were consistent with a demyelinating polyneuropathy.

In early November 1995, the patient was evaluated at a hospital in San Antonio, Texas, where a magnetic resonance imaging (MRI) scan of his brain was normal. Findings on examination by a pediatric neurologist included intact cranial nerve function, diffusely decreased deep tendon reflexes, and mild weakness of the lower extremities. On November 3, his blood lead and urine arsenic levels were normal; however, a urine mercury level was 178 µg/L (normal range: 0–20 µg/L), and chelation therapy was initiated on December 7.

TDH conducted an environmental assessment of the patient's home in mid-December and did not detect mercury in indoor air, indoor paint, or soil. Family members reported that they ate fish from Mexico once or twice per year and denied hobbies at home or school known to be associated with mercury exposure. However, a container of cream ("Crema de Belleza—Manning") that was used regularly by the patient for treatment of acne had "calomel" listed as an ingredient. Elevated mercury levels (approximately 6% by weight) were confirmed in that container and in a second previously unopened container of the cream. The patient had been using the cream daily since June and was advised to discontinue use.

Case 2

In April 1996, a neurologist in El Paso, Texas, diagnosed mercury poisoning in a 35-year-old woman who resided in New Mexico; urinary mercury levels were 355 µg/g creatinine (normal: 0–25 µg/g creatinine). Beginning in September 1995, the patient had onset of symptoms progressing to paresthesias (left forearm, right leg, and ear), irritability, and insomnia by March 1996. A collaborative investigation by the NMDH and TDH indicated that the woman had used "Crema de Belleza—Manning" for approximately 10 years and had no other known exposures to mercury. She was immediately advised to discontinue use of the cream.

Case 3

On May 7, 1996, SDCHD identified mercury poisoning in a 33-year-old woman who resided in San Diego, California; urinary mercury levels were 143 µg/g creatinine. During 1992–1996, the woman had had weekly severe migraine headaches of 3–4 days' duration, irritability, fatigue, short-term memory loss, night blindness, and inability to eat products from tin cans because of overt metal taste. Since 1990, the patient had been using "Creme de Belleza—Manning" daily on her face, hands, and chest and had

Mercury Poisoning — Continued

no other known exposures to mercury. She was immediately advised to discontinue use of the cream.

Follow-Up Investigation and Control Measures

TDH and the California Department of Health Services (CDHS) are investigating additional cases of possible mercury poisoning related to the use of "Crema de Belleza—Manning." On April 19, TDH issued press releases recommending that persons discontinue use of "Crema de Belleza—Manning" and that persons with potential manifestations of mercury poisoning or who were exposed to the product consult their physicians. Physicians were advised to contact local poison-control centers regarding the medical management of patients exposed to mercury. In addition, because the cream is considered hazardous waste, TDH recommends that cream be disposed of in a manner consistent with the proper disposal of hazardous household waste such as batteries or paint. CDHS will issue similar recommendations. For disposal instructions, commercial retailers with remaining stock can contact Paul Thomas, U.S. Environmental Protection Agency, telephone (214) 665-6707.

During April 22–30, 1996, the Mexican Secretary of Health seized 35,000 containers of "Crema de Belleza—Manning" in the State of Tampaulipas, Mexico, for testing at the National Public Health Laboratory. Laboratory analyses confirmed high levels of mercury (approximately 8% by weight) in the cream. As a result, the Mexican Secretary of Health issued an epidemiologic alert to all northern border states of Mexico to enhance surveillance for cases of acute or chronic mercury intoxication.

Reported by: JF Villanacci, PhD, R Beauchamp, MD, DM Perrotta, PhD, Bur of Epidemiology; K Hendricks, MD, Bur of Communicable Disease Control; M Rodriguez, MD, Office of Border Health; RJ Dutton, PhD, Environmental and Consumer Health; K Sutton, MS, Public Health Region 8; J Duran, Public Health Region 9/10; DM Simpson, MD, State Epidemiologist, Texas Dept of Health. K Richards, Office of Border Health; D Nelson, Div of Epidemiology, Evaluation, and Planning; F Crespin, MD, Public Health Div; CM Sewell, DrPh, State Epidemiologist, New Mexico Dept of Health. M Bartzen, M Ginsberg, MD, San Diego County Health Dept, San Diego; L Senini, Office of Border Health, F Nava, S Richardson, S Waterman, MD, State Epidemiologist, California Dept of Health Svcs. MG Lombera, MD, MA Ruíz, MD, P Cravioto, MS, Director General of Epidemiology, Ministry of Health; O Saldate, National Laboratory of Public Health, Ministry of Health; G Flores, MD, Health Svcs of Tampaulipas, Mexico. Environmental Hazards Epidemiology Section, Health Studies Br, Div of Environmental Hazards and Health Effects, National Center for Environmental Health; Div of Field Epidemiology, Epidemiology Program Office, CDC.

Editorial Note: Although the product associated with these three reported cases of mercury poisoning is sold primarily in Mexico, the ongoing investigation also is assessing reports that the product may be sold in the United States in some border-area shops. Furthermore, some U.S. residents residing in the border-area frequently travel to Mexico to purchase pharmaceuticals for use in the United States.

The product label is printed in Spanish and lists "calomel" (i.e., mercurous chloride) as an ingredient, but does not indicate the concentration. Because mercury compounds are readily absorbed through the skin, Food and Drug Administration regulations restrict the use of these compounds as cosmetic ingredients: specifically, mercury can be used only as a preservative in eye-area cosmetics at concentrations not exceeding 65 ppm (0.0065%); no effective and safe nonmercurial substitute preservative is available for use in such cosmetics.*

*21 CFR 700.13.

Mercury Poisoning — Continued

Urinary mercury concentrations >20 µg/L or >25 µg/g creatinine have been associated with signs and symptoms of mercury poisoning. Chronic exposure to mercury salts can result in central nervous system toxicity, including personality changes; nervousness; irritability; tremors; weakness; fatigue; loss of memory; changes in or loss of hearing, vision, or taste (*1*); gingivitis; stomatitis; and excessive salivation. In children, mercury poisoning can result in the syndrome of acrodynia, which is characterized by severe leg cramps, irritability, paresthesias, excessive perspiration, pruritus, and painful redness and peeling of the palms of the hands and soles of the feet. Acute poisoning with mercury salts can result in a metallic taste, nausea, vomiting, bloody diarrhea, severe abdominal pain, and tenesmus. Renal damage may include acute tubular necrosis and excessive protein, casts, and red blood cells in the urine. Additional information about mercury poisoning is available from local poison-control centers.

Reference

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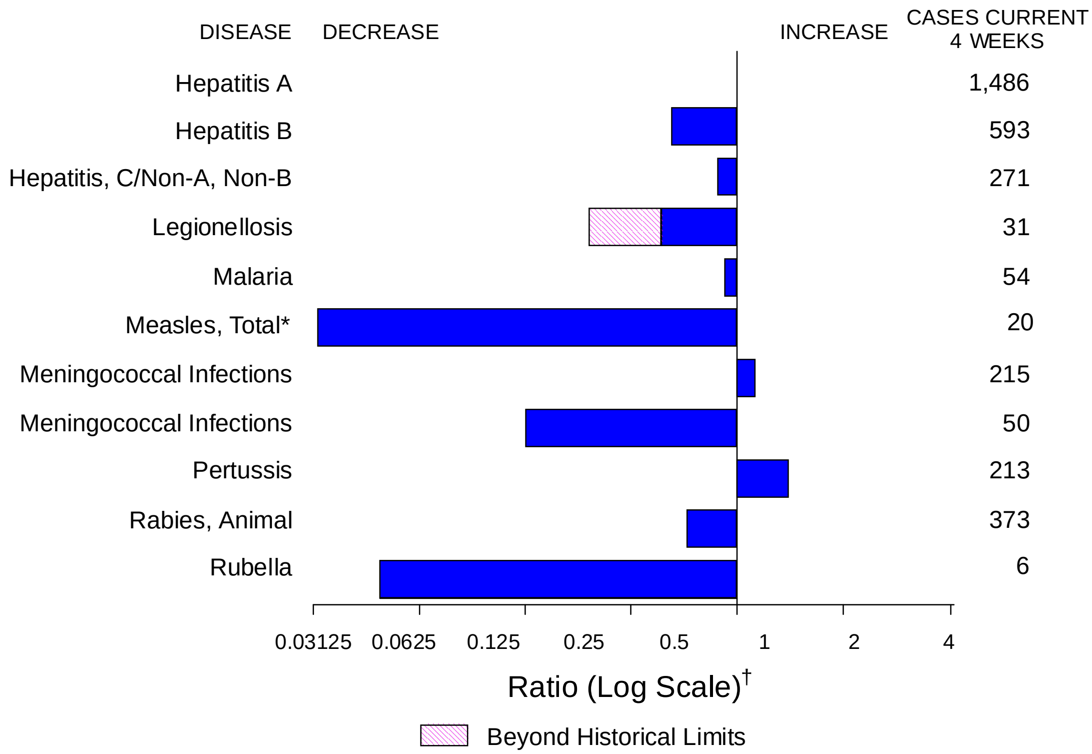
FIGURE I. Selected notifiable disease reports, comparison of 4-week totals ending May 11, 1996, with historical data — United States



*The large apparent decrease in the number of reported cases of measles (total) reflects dramatic fluctuations in the historical baseline.

†Ratio 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 May 11, 1996 (19th Week)

	Cum. 1996		Cum. 1996
Anthrax	-	HIV infection, pediatric*§	92
Brucellosis	25	Plague	-
Cholera	1	Poliomyelitis, paralytic¶	-
Congenital rubella syndrome	1	Psittacosis	9
Cryptosporidiosis*	502	Rabies, human	-
Diphtheria	1	Rocky Mountain spotted fever (RMSF)	48
Encephalitis: California*	-	Streptococcal toxic-shock syndrome*	9
eastern equine*	1	Syphilis, congenital**	-
St. Louis*	-	Tetanus	5
western equine*	-	Toxic-shock syndrome	55
Hansen Disease	33	Trichinosis	10
Hantavirus pulmonary syndrome*†	5	Typhoid fever	102

*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 April 30, 1996.
¶No suspected cases of polio reported for 1996.
**Updated quarterly from reports to the Division of STD Prevention, NCHSTP. First quarter 1996 is not yet available.
-: no reported cases

TABLE II. Cases of selected notifiable diseases, United States, weeks ending May 11, 1996, and May 13, 1995 (19th Week)

Reporting Area	AIDS*		Chlamydia	*Escherichia coli* O157:H7 NETSS†	*Escherichia coli* O157:H7 PHLIS§	Gonorrhea		Hepatitis C/NA,NB		Legionellosis	
	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995
UNITED STATES	21,920	25,977	81,890	295	121	97,047	136,487	1,274	1,457	239	440
NEW ENGLAND	878	1,402	3,438	27	16	2,791	1,919	45	41	13	4
Maine	15	23	-	3	-	18	30	-	-	1	-
N.H.	25	43	224	1	1	41	36	1	5	-	-
Vt.	8	13	-	5	5	23	17	19	4	1	-
Mass.	490	635	2,437	11	10	812	1,082	22	31	6	3
R.I.	61	89	777	2	-	202	198	3	1	5	1
Conn.	279	599	-	5	-	1,695	556	-	-	N	N
MID. ATLANTIC	5,707	6,454	12,836	40	22	10,658	15,701	126	130	50	55
Upstate N.Y.	568	803	N	21	11	2,212	3,439	107	63	10	12
N.Y. City	3,281	3,079	4,121	-	-	2,608	5,788	1	1	-	1
N.J.	1,143	1,607	1,902	12	5	2,157	1,310	-	56	7	13
Pa.	715	965	6,813	N	6	3,681	5,164	18	10	33	29
E.N. CENTRAL	1,874	2,207	13,776	65	26	14,898	28,995	161	123	73	150
Ohio	438	496	3,526	24	8	2,222	9,233	4	5	34	67
Ind.	309	195	3,812	14	6	2,685	3,009	6	-	18	36
Ill.	758	888	-	17	2	5,922	7,530	22	42	2	17
Mich.	257	492	4,101	10	10	2,911	6,837	129	76	16	14
Wis.	112	136	2,337	N	-	1,158	2,386	-	-	3	16
W.N. CENTRAL	548	604	8,811	42	22	5,309	7,479	90	25	15	27
Minn.	109	119	-	6	13	U	1,104	-	1	1	-
Iowa	44	32	1,343	7	4	392	565	71	3	3	8
Mo.	237	273	4,950	7	-	2,920	4,306	14	10	1	8
N. Dak.	4	1	2	1	1	1	11	-	1	-	2
S. Dak.	7	7	482	2	-	74	78	-	1	2	-
Nebr.	40	51	388	4	-	57	356	1	6	6	7
Kans.	107	121	1,646	15	4	866	1,059	4	3	2	2
S. ATLANTIC	5,803	7,218	19,065	18	3	36,425	40,057	60	98	34	71
Del.	114	133	-	-	-	532	726	1	-	-	-
Md.	658	1,118	2,253	N	1	4,825	4,597	-	2	6	14
D.C.	373	441	N	-	-	1,571	1,776	-	-	1	3
Va.	317	545	4,440	N	1	3,564	4,194	5	3	9	4
W. Va.	31	35	-	N	-	160	223	6	20	1	3
N.C.	266	310	-	5	1	7,139	9,067	18	25	3	14
S.C.	283	324	-	1	-	4,163	4,236	13	4	3	13
Ga.	871	888	4,256	4	-	8,017	7,594	-	11	-	9
Fla.	2,890	3,424	8,116	5	-	6,454	7,644	17	33	11	11
E.S. CENTRAL	776	816	9,668	9	4	10,687	15,815	250	494	20	13
Ky.	120	81	2,407	-	-	1,482	1,667	10	11	2	3
Tenn.	283	347	3,862	N	4	3,656	4,921	215	481	9	6
Ala.	244	231	3,201	2	-	4,938	6,194	1	2	-	3
Miss.	129	157	198	3	-	U	3,033	24	-	9	1
W.S. CENTRAL	2,096	2,459	4,562	11	4	6,957	11,763	150	78	2	7
Ark.	97	108	-	5	2	1,017	1,756	1	1	-	1
La.	559	360	2,502	N	2	2,813	4,330	60	45	-	2
Okla.	55	100	2,060	1	-	1,299	10	55	20	2	3
Tex.	1,385	1,891	-	1	-	1,828	5,667	34	12	-	1
MOUNTAIN	648	820	5,343	35	15	2,507	3,435	246	172	10	51
Mont.	8	8	-	3	-	12	30	9	7	1	2
Idaho	10	22	600	11	4	34	49	65	22	-	1
Wyo.	2	5	268	-	-	10	18	80	69	2	2
Colo.	181	268	-	12	5	626	1,101	23	30	4	23
N. Mex.	43	71	-	2	-	313	388	31	26	-	4
Ariz.	197	202	3,549	N	6	1,278	1,231	27	7	2	5
Utah	79	52	254	5	-	49	83	7	6	-	4
Nev.	128	192	672	2	-	185	535	4	5	1	10
PACIFIC	3,590	3,997	4,391	48	9	6,815	11,323	146	296	22	62
Wash.	313	416	3,653	10	5	850	927	26	73	1	5
Oreg.	189	158	-	12	-	150	165	3	20	-	-
Calif.	3,025	3,282	-	22	-	5,497	9,682	48	193	21	52
Alaska	10	39	N	-	-	196	299	2	1	-	-
Hawaii	53	102	430	N	4	122	250	67	9	-	5
Guam	3	-	90	N	-	22	36	-	-	-	-
P.R.	423	952	N	N	U	105	221	16	59	-	-
V.I.	6	19	N	N	U	-	14	-	-	-	-
Amer. Samoa	-	-	-	N	U	-	8	-	-	-	-
C.N.M.I.	-	-	N	N	U	11	11	-	-	-	-

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 April 30, 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 May 11, 1996, and May 13, 1995 (19th 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	1,149	1,781	333	360	1,392	1,327	3,917	6,035	5,470	5,959	1,788	2,451
NEW ENGLAND	49	152	11	15	52	60	61	80	135	131	202	650
Maine	-	1	3	1	9	3	-	2	4	-	-	-
N.H.	1	10	1	1	1	12	1	1	3	4	23	78
Vt.	-	2	1	-	3	6	-	-	-	1	60	86
Mass.	22	15	4	3	19	19	27	30	56	68	36	249
R.I.	21	34	2	2	-	-	-	1	18	16	21	92
Conn.	5	90	-	8	20	20	33	46	54	42	62	145
MID. ATLANTIC	956	1,380	81	89	111	152	161	361	924	1,294	258	552
Upstate N.Y.	468	729	19	19	35	45	20	34	107	130	135	205
N.Y. City	155	124	36	40	18	19	53	185	457	716	-	-
N.J.	72	148	22	20	31	37	48	73	238	233	53	135
Pa.	261	379	4	10	27	51	40	69	122	215	70	212
E.N. CENTRAL	15	16	29	49	198	197	589	1,002	652	526	15	3
Ohio	13	5	6	2	76	55	222	343	105	102	3	1
Ind.	2	7	4	3	33	31	88	99	66	47	1	-
Ill.	-	3	7	33	46	52	178	367	415	358	-	2
Mich.	-	1	8	6	25	33	41	116	39	-	6	-
Wis.	U	U	4	5	18	26	60	77	27	19	5	-
W.N. CENTRAL	36	27	9	8	116	75	162	301	137	211	171	121
Minn.	1	-	3	3	10	14	27	17	24	40	11	6
Iowa	16	1	1	-	25	15	9	25	19	31	88	40
Mo.	2	12	4	4	53	27	119	243	55	83	10	12
N. Dak.	-	-	-	-	2	-	-	-	2	1	15	12
S. Dak.	-	-	-	-	3	3	-	-	11	8	37	28
Nebr.	-	1	-	1	10	6	3	7	7	8	2	-
Kans.	17	13	1	-	13	10	4	9	19	40	8	23
S. ATLANTIC	47	142	68	77	263	219	1,296	1,588	922	910	907	800
Del.	1	19	2	1	2	2	16	7	-	19	23	39
Md.	24	87	19	19	24	15	220	150	103	158	219	161
D.C.	1	1	3	8	4	2	68	46	49	38	2	5
Va.	-	8	7	15	26	26	181	265	82	62	204	144
W. Va.	3	7	1	1	6	4	1	1	22	38	35	35
N.C.	10	10	7	6	33	41	398	427	123	99	232	156
S.C.	2	5	3	-	29	30	165	258	40	109	20	47
Ga.	-	4	8	10	74	51	114	276	231	10	114	114
Fla.	6	1	18	17	65	48	133	158	272	377	58	99
E.S. CENTRAL	15	9	7	8	90	80	987	1,537	406	493	64	101
Ky.	2	1	-	-	16	23	54	83	88	103	17	8
Tenn.	5	5	5	3	7	23	372	305	74	165	23	41
Ala.	1	1	1	5	35	18	208	221	158	149	24	51
Miss.	7	2	1	-	32	16	353	928	86	76	-	1
W.S. CENTRAL	7	27	10	5	170	146	471	812	591	692	21	45
Ark.	4	2	-	1	22	18	130	176	20	77	3	22
La.	-	-	-	1	33	20	208	406	-	12	10	9
Okla.	2	13	-	-	14	16	59	-	30	-	8	14
Tex.	1	12	10	3	101	92	74	230	541	603	-	-
MOUNTAIN	-	1	22	23	86	106	44	100	194	216	32	41
Mont.	-	-	1	2	1	2	-	3	7	3	5	17
Idaho	-	-	-	1	10	5	1	-	3	6	-	-
Wyo.	-	-	2	-	3	5	1	-	1	1	11	14
Colo.	-	-	12	12	14	22	15	59	25	5	1	-
N. Mex.	-	-	1	3	18	22	-	1	29	22	1	-
Ariz.	-	-	3	2	26	38	24	16	87	87	12	9
Utah	-	-	2	2	8	5	-	3	10	10	-	-
Nev.	-	1	1	1	6	7	3	18	32	82	2	1
PACIFIC	24	27	96	86	306	292	146	254	1,509	1,486	118	138
Wash.	1	1	6	8	43	49	2	6	83	91	-	-
Oreg.	7	1	8	6	59	52	3	6	35	21	-	-
Calif.	15	25	78	64	198	186	141	241	1,306	1,283	110	132
Alaska	-	-	1	1	4	3	-	1	24	29	8	6
Hawaii	1	-	3	7	2	2	-	-	61	62	-	-
Guam	-	-	-	-	1	2	2	1	28	5	-	-
P.R.	-	-	-	-	2	12	48	123	20	53	10	27
V.I.	-	-	-	-	-	-	-	1	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	2	-	-
C.N.M.I.	-	-	-	-	-	-	1	-	-	13	-	-

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

TABLE III. Cases of selected notifiable diseases preventable by vaccination, United States, weeks ending May 11, 1996, and May 13, 1995 (19th 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	497	512	9,205	9,312	3,063	3,539	4	95	2	14
NEW ENGLAND	12	28	110	70	54	80	-	5	-	1
Maine	2	1	10	13	2	2	-	-	-	-
N.H.	7	6	3	4	2	9	U	-	U	-
Vt.	-	1	2	3	2	1	-	1	-	-
Mass.	3	7	60	23	17	26	-	3	-	1
R.I.	-	-	3	10	4	7	-	-	-	-
Conn.	-	13	32	17	27	35	-	1	-	-
MID. ATLANTIC	73	54	596	574	473	480	1	4	-	4
Upstate N.Y.	21	14	151	117	117	117	-	-	-	-
N.Y. City	10	14	258	279	225	165	1	4	-	3
N.J.	25	8	123	82	88	126	-	-	-	-
Pa.	17	18	64	96	43	72	-	-	-	1
E.N. CENTRAL	71	93	798	1,251	330	421	-	3	1	3
Ohio	47	48	372	698	46	35	-	2	-	-
Ind.	2	14	130	57	52	93	-	-	-	-
Ill.	14	24	122	256	56	115	-	-	1	1
Mich.	3	7	131	146	152	150	-	-	-	2
Wis.	5	-	43	94	24	28	-	1	-	-
W.N. CENTRAL	20	29	684	524	183	236	-	4	-	1
Minn.	7	11	27	52	10	17	-	4	-	1
Iowa	6	2	168	26	68	15	-	-	-	-
Mo.	5	13	311	378	82	171	-	-	-	-
N. Dak.	-	-	17	10	-	2	-	-	-	-
S. Dak.	1	-	34	11	-	1	-	-	-	-
Nebr.	1	1	77	12	6	14	-	-	-	-
Kans.	-	2	50	35	17	16	-	-	-	-
S. ATLANTIC	121	137	301	393	405	482	-	2	-	-
Del.	1	-	5	6	1	3	-	1	-	-
Md.	29	39	77	75	111	105	-	1	-	-
D.C.	3	-	15	3	14	9	-	-	-	-
Va.	4	13	54	71	52	34	-	-	-	-
W. Va.	4	6	10	10	11	21	-	-	-	-
N.C.	14	18	42	49	129	116	-	-	-	-
S.C.	3	-	29	13	38	19	-	-	-	-
Ga.	58	29	7	41	5	49	-	-	-	-
Fla.	5	32	62	125	44	126	-	-	-	-
E.S. CENTRAL	8	4	726	493	291	375	-	-	-	-
Ky.	2	1	9	24	21	42	-	-	-	-
Tenn.	-	-	519	394	189	287	-	-	-	-
Ala.	5	3	84	44	20	46	-	-	-	-
Miss.	1	-	114	31	61	-	U	-	U	-
W.S. CENTRAL	16	23	1,629	972	319	370	-	-	-	2
Ark.	-	4	220	67	31	12	-	-	-	-
La.	-	1	47	32	40	64	-	-	-	-
Okla.	15	15	673	198	46	44	-	-	-	-
Tex.	1	3	689	675	202	250	-	-	-	2
MOUNTAIN	59	44	1,327	1,602	389	287	2	9	-	1
Mont.	-	-	50	24	4	9	-	-	-	-
Idaho	1	2	118	166	50	36	-	-	-	-
Wyo.	30	2	17	58	14	8	-	-	-	-
Colo.	5	7	146	202	54	49	1	2	-	1
N. Mex.	7	6	193	300	142	118	-	-	-	-
Ariz.	9	13	393	442	64	33	1	3	-	-
Utah	5	5	344	360	47	23	-	-	-	-
Nev.	2	9	66	50	14	11	-	4	-	-
PACIFIC	117	100	3,034	3,433	619	808	1	68	1	2
Wash.	1	4	214	215	44	60	-	4	-	-
Oreg.	17	12	437	708	31	43	1	1	-	-
Calif.	97	82	2,322	2,432	540	694	-	1	1	1
Alaska	-	-	26	14	2	5	-	62	-	-
Hawaii	2	2	35	64	2	6	-	-	-	1
Guam	-	-	2	2	-	-	U	-	U	-
P.R.	1	3	33	19	137	119	-	1	-	-
V.I.	-	-	-	-	-	1	U	-	U	-
Amer. Samoa	-	-	-	5	-	-	U	-	U	-
C.N.M.I.	10	2	1	14	5	6	U	-	U	-

*Of 106 cases among children aged <5 years, serotype was reported for 26 and of those, 5 were type b.

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

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

TABLE III. (Cont'd.) Cases of selected notifiable diseases preventable by vaccination, United States, weeks ending May 11, 1996, and May 13, 1995 (19th 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	109	191	14	230	327	59	968	977	2	66	32
NEW ENGLAND	6	4	-	-	4	1	169	151	1	8	6
Maine	-	-	-	-	2	-	8	17	-	-	-
N.H.	-	-	U	-	-	U	17	9	U	-	1
Vt.	1	-	-	-	-	-	7	3	1	2	-
Mass.	4	2	-	-	1	1	134	115	-	4	2
R.I.	-	2	-	-	-	-	-	-	-	-	-
Conn.	1	-	-	-	1	-	3	7	-	2	3
MID. ATLANTIC	8	3	1	27	49	6	87	87	-	4	3
Upstate N.Y.	-	-	1	8	14	6	48	50	-	3	-
N.Y. City	7	-	-	4	7	-	14	14	-	1	2
N.J.	-	3	-	-	7	-	-	6	-	-	1
Pa.	1	-	-	15	21	-	25	17	-	-	-
E.N. CENTRAL	6	9	5	62	57	1	129	107	-	3	-
Ohio	2	-	3	26	18	1	55	36	-	-	-
Ind.	-	-	-	5	5	-	10	8	-	-	-
Ill.	1	-	2	13	16	-	47	23	-	1	-
Mich.	2	7	-	18	18	-	12	28	-	2	-
Wis.	1	2	-	-	-	-	5	12	-	-	-
W.N. CENTRAL	5	1	1	3	22	1	41	65	-	1	-
Minn.	5	-	1	1	2	1	31	24	-	-	-
Iowa	-	-	-	-	4	-	2	1	-	1	-
Mo.	-	1	-	-	13	-	4	15	-	-	-
N. Dak.	-	-	-	2	-	-	-	5	-	-	-
S. Dak.	-	-	-	-	-	-	1	7	-	-	-
Nebr.	-	-	-	-	3	-	-	3	-	-	-
Kans.	-	-	-	-	-	-	3	10	-	-	-
S. ATLANTIC	2	1	1	24	54	5	110	96	1	12	5
Del.	1	-	-	-	-	-	7	5	-	-	-
Md.	1	-	-	9	13	2	45	10	-	-	-
D.C.	-	-	-	-	-	-	-	2	1	1	-
Va.	-	-	-	3	13	-	5	7	-	-	-
W. Va.	-	-	-	-	-	-	2	-	-	-	-
N.C.	-	-	-	-	16	-	25	49	-	-	-
S.C.	-	-	-	3	5	-	5	10	-	1	-
Ga.	-	-	1	2	-	2	4	-	-	-	-
Fla.	-	1	-	7	7	1	17	13	-	10	5
E.S. CENTRAL	-	-	-	10	10	1	36	26	-	2	-
Ky.	-	-	-	-	-	-	23	2	-	-	-
Tenn.	-	-	-	1	-	1	8	4	-	-	-
Ala.	-	-	-	4	4	-	1	20	-	-	-
Miss.	-	-	U	5	6	U	4	-	N	N	N
W.S. CENTRAL	2	2	2	11	21	-	19	48	-	1	2
Ark.	-	2	-	-	5	-	2	6	-	-	-
La.	-	-	-	8	6	-	3	1	-	1	-
Okla.	-	-	-	-	-	-	4	7	-	-	-
Tex.	2	-	2	3	10	-	10	34	-	-	2
MOUNTAIN	10	57	1	19	12	7	120	232	-	2	3
Mont.	-	-	-	-	1	1	4	3	-	-	-
Idaho	-	-	-	-	2	4	48	70	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-
Colo.	3	17	-	1	-	1	18	33	-	-	-
N. Mex.	-	29	N	N	N	1	26	23	-	-	-
Ariz.	3	10	-	1	1	-	4	94	-	1	3
Utah	-	-	1	2	1	-	3	7	-	-	-
Nev.	4	1	-	15	7	-	17	2	-	1	-
PACIFIC	70	114	3	74	98	37	257	165	-	33	13
Wash.	4	15	-	8	6	15	87	30	-	1	-
Oreg.	1	1	N	N	N	-	25	11	-	-	1
Calif.	2	97	2	50	80	22	137	115	-	30	11
Alaska	62	-	-	2	11	-	-	-	-	-	-
Hawaii	1	1	1	14	1	-	8	9	-	2	1
Guam	-	-	U	2	3	U	-	-	U	-	-
P.R.	1	3	-	1	1	-	-	7	-	-	-
V.I.	-	-	U	-	1	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 May 11, 1996 (19th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	516	371	93	35	10	7	22
Boston, Mass.	154	96	37	11	4	6	7
Bridgeport, Conn.	35	26	5	4	-	-	4
Cambridge, Mass.	14	8	5	1	-	-	-
Fall River, Mass.	28	26	2	-	-	-	-
Hartford, Conn.	37	26	7	3	1	-	-
Lowell, Mass.	15	12	1	2	-	-	1
Lynn, Mass.	9	9	-	-	-	-	-
New Bedford, Mass.	23	20	1	2	-	-	-
New Haven, Conn.	32	22	7	2	-	1	4
Providence, R.I.	60	47	7	3	3	-	4
Somerville, Mass.	2	1	1	-	-	-	-
Springfield, Mass.	39	27	8	4	-	-	-
Waterbury, Conn.	21	16	4	-	1	-	1
Worcester, Mass.	47	35	8	3	1	-	1
MID. ATLANTIC	2,545	1,683	522	259	39	42	131
Albany, N.Y.	44	32	5	2	2	3	1
Allentown, Pa.	17	12	5	-	-	-	1
Buffalo, N.Y.	U	U	U	U	U	U	U
Camden, N.J.	35	23	6	2	1	3	1
Elizabeth, N.J.	22	14	4	4	-	-	-
Erie, Pa.§	39	26	8	4	-	1	1
Jersey City, N.J.	53	33	10	6	1	3	1
New York City, N.Y.	1,269	803	287	142	20	17	43
Newark, N.J.	80	36	21	23	-	-	6
Paterson, N.J.	21	16	2	2	1	-	3
Philadelphia, Pa.	500	335	94	53	10	8	32
Pittsburgh, Pa.§	101	70	23	5	2	1	4
Reading, Pa.	14	13	-	1	-	-	2
Rochester, N.Y.	137	108	19	7	1	2	15
Schenectady, N.Y.	33	27	6	-	-	-	4
Scranton, Pa.§	29	23	6	-	-	-	2
Syracuse, N.Y.	98	71	20	3	1	3	8
Trenton, N.J.	35	25	4	5	-	1	6
Utica, N.Y.	18	16	2	-	-	-	1
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,022	1,370	382	175	50	44	131
Akron, Ohio	47	31	9	5	-	2	-
Canton, Ohio	37	32	3	2	-	-	4
Chicago, Ill.	424	244	92	55	15	17	31
Cincinnati, Ohio	148	108	22	14	2	2	17
Cleveland, Ohio	146	96	27	16	5	2	-
Columbus, Ohio	148	94	26	20	4	4	11
Dayton, Ohio	149	107	34	6	1	1	6
Detroit, Mich.	197	120	48	23	4	2	5
Evansville, Ind.	40	31	7	1	-	1	2
Fort Wayne, Ind.	37	28	4	2	1	2	2
Gary, Ind.	9	8	-	1	-	-	-
Grand Rapids, Mich.	39	32	6	-	-	1	5
Indianapolis, Ind.	206	139	46	10	6	5	14
Madison, Wis.	U	U	U	U	U	U	U
Milwaukee, Wis.	108	85	15	7	-	1	11
Peoria, Ill.	40	25	10	1	2	2	4
Rockford, Ill.	50	34	10	3	2	1	6
South Bend, Ind.	38	31	3	1	2	1	2
Toledo, Ohio	99	77	12	5	5	-	7
Youngstown, Ohio	60	48	8	3	1	-	4
W.N. CENTRAL	760	549	119	49	17	15	42
Des Moines, Iowa	99	77	10	9	1	2	8
Duluth, Minn.	30	28	1	-	1	-	5
Kansas City, Kans.	25	13	8	4	-	-	-
Kansas City, Mo.	85	58	11	3	1	1	9
Lincoln, Nebr.	29	21	4	3	1	-	-
Minneapolis, Minn.	170	125	27	9	5	4	11
Omaha, Nebr.	82	60	14	4	2	2	4
St. Louis, Mo.	107	73	24	7	-	3	-
St. Paul, Minn.	53	34	11	3	3	2	3
Wichita, Kans.	80	60	9	7	3	1	2

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,321	807	274	166	34	40	64
Atlanta, Ga.	197	114	39	25	5	14	5
Baltimore, Md.	230	128	57	37	7	1	18
Charlotte, N.C.	77	45	26	4	2	-	5
Jacksonville, Fla.	123	79	23	16	2	3	1
Miami, Fla.	115	64	26	20	2	3	1
Norfolk, Va.	58	34	8	8	4	4	3
Richmond, Va.	71	50	13	4	2	2	4
Savannah, Ga.	69	44	13	8	1	3	6
St. Petersburg, Fla.	44	33	7	2	2	-	1
Tampa, Fla.	189	135	32	14	3	5	16
Washington, D.C.	129	67	27	28	2	5	4
Wilmington, Del.	19	14	3	-	2	-	-
E.S. CENTRAL	761	516	146	65	17	16	64
Birmingham, Ala.	113	76	20	7	5	4	4
Chattanooga, Tenn.	67	48	9	6	3	1	3
Knoxville, Tenn.	85	54	20	7	3	1	13
Lexington, Ky.	32	23	5	3	-	1	3
Memphis, Tenn.	186	125	37	18	1	5	25
Mobile, Ala.	76	53	17	3	2	1	4
Montgomery, Ala.	64	48	10	4	1	1	3
Nashville, Tenn.	138	89	28	17	2	2	9
W.S. CENTRAL	1,445	940	275	143	43	44	106
Austin, Tex.	56	36	10	9	1	-	4
Baton Rouge, La.	30	23	3	2	1	1	-
Corpus Christi, Tex.	70	54	11	3	1	1	8
Dallas, Tex.	175	102	37	21	6	9	4
El Paso, Tex.	92	66	14	8	1	3	4
Ft. Worth, Tex.	95	57	19	12	4	3	4
Houston, Tex.	381	233	80	39	14	15	34
Little Rock, Ark.	55	35	9	3	4	4	5
New Orleans, La.	112	61	28	18	3	2	-
San Antonio, Tex.	189	126	39	15	6	3	21
Shreveport, La.	64	45	14	5	-	-	10
Tulsa, Okla.	126	102	11	8	2	3	12
MOUNTAIN	981	672	197	66	30	16	78
Albuquerque, N.M.	109	85	16	6	2	-	4
Colo. Springs, Colo.	47	32	8	5	1	1	5
Denver, Colo.	120	85	20	6	2	7	16
Las Vegas, Nev.	232	145	56	18	12	1	17
Ogden, Utah	30	26	3	1	-	-	1
Phoenix, Ariz.	179	110	41	12	10	6	19
Pueblo, Colo.	22	15	5	2	-	-	1
Salt Lake City, Utah	106	71	28	5	1	1	10
Tucson, Ariz.	136	103	20	11	2	-	5
PACIFIC	1,892	1,295	336	164	53	44	125
Berkeley, Calif.	13	9	3	1	-	-	1
Fresno, Calif.	85	63	13	6	1	2	8
Glendale, Calif.	30	23	5	-	1	1	1
Honolulu, Hawaii	68	49	15	4	-	-	4
Long Beach, Calif.	62	39	7	12	1	3	8
Los Angeles, Calif.	545	366	103	43	19	14	16
Pasadena, Calif.	30	23	-	4	2	1	2
Portland, Oreg.	127	86	27	10	4	-	6
Sacramento, Calif.	135	98	24	4	3	6	10
San Diego, Calif.	133	88	23	15	2	5	19
San Francisco, Calif.	152	95	30	20	6	1	11
San Jose, Calif.	192	128	41	16	2	5	18
Santa Cruz, Calif.	25	19	2	3	-	1	7
Seattle, Wash.	135	92	23	11	8	1	4
Spokane, Wash.	46	31	4	6	3	2	3
Tacoma, Wash.	114	86	16	9	1	2	7
TOTAL	12,243¶	8,203	2,344	1,122	293	268	763

*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.

U: Unavailable -: no reported cases

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