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MORBIDITY AND MORTALITY WEEKLY REPORT

Houseboat-Associated Carbon Monoxide Poisonings on Lake Powell — Arizona and Utah, 2000

During August 2000 at Lake Powell in the Glen Canyon National Recreation Area on the Arizona-Utah border, two brothers died of carbon monoxide (CO) poisoning as they swam near the stern of a houseboat while the onboard gasoline-powered generator was operating. As a result of these deaths, an investigation was initiated by the U.S. National Park Service (NPS) with assistance from the U.S. Department of the Interior, CDC's National Institute for Occupational Safety and Health, and the U.S. Coast Guard. In addition to investigating the deaths of the two brothers, the multiagency team evaluated visitor and worker boat-related CO exposures at Lake Powell. The study identified nine boat-related fatal CO poisonings since 1994 and approximately 100 nonfatal poisonings since 1990. This report describes the preliminary results of an ongoing investigation of watercraft-related CO poisonings on Lake Powell.

Incident Reports

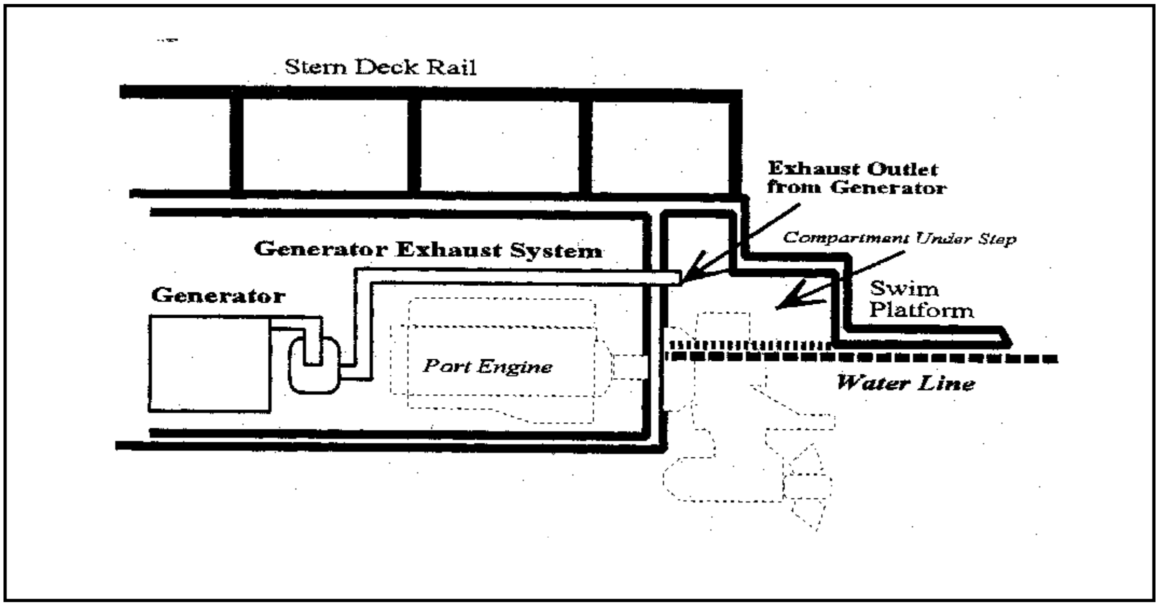
Incident 1. On August 2, 2000, two families vacationing on a houseboat on Lake Powell started the boat generator to cool the boat interior and operate the television. About 15 minutes later, two brothers (aged 8 and 11 years) swam into the airspace beneath the swim deck enclosed by the swim platform that was near water level (Figure 1) into which the exhaust of the generator was directed. Within an estimated 1–2 minutes, one boy lost consciousness and the other began to convulse before sinking underwater. The brothers' bodies were retrieved the next day. Autopsy results showed that the boys had been overcome by CO and subsequently drowned; autopsy carboxyhemoglobin (COHb) levels were 59% and 52%.

Incident 2. On August 18, 1994, three teenaged boys were swimming off the stern of a houseboat similar in design to that in incident one. The houseboat generator was operating. The boys were climbing up the back of the houseboat and sliding down a rear-mounted slide into the water. After several minutes, one of the boys developed a headache and went inside the boat cabin. While in the water, another boy commented that his legs felt numb and that he was dizzy. He climbed back onto the boat and is believed to have collapsed and fallen back into the water. Approximately 1 hour later, his body was recovered from the bottom of the lake. An autopsy revealed a COHb level of 53.9%.

Incidents 3, 4, and 5. During August 1998, three CO poisonings occurred on Lake Powell within the span of 12 days. All involved entry of the airspace beneath the swim deck for engine maintenance or clearing ropes from propellers, and all boats had designs similar to those in incidents one and two. Two of the incidents resulted in fatal CO

Houseboat-Associated Carbon Monoxide Poisonings — Continued

FIGURE 1. Diagram of standard configuration of stern of a houseboat



poisonings (COHb levels of 55% and 49%); the third incident involved a concessionaire employee who lost consciousness while in the water but who was retrieved and resuscitated.

Review of Medical Records

To further examine risk factors for such incidents, the team reviewed NPS emergency medical service (EMS) transport records for 1990–2000 to characterize the circumstances and number of boat-related CO poisonings. A total of 181 records was selected based on the notation of "CO poisoning" or symptoms consistent with CO poisoning and was reviewed for case classification. Of these, 111 definite cases of boat-related CO poisonings were identified.* COHb levels have been obtained for 25 cases.

Nine (8%) of the 111 CO poisonings were fatal, and five deaths occurred after the victim entered the cavity beneath the swim platform of the houseboat during operation of or immediately after deactivation of the generator or boat engines; two additional deaths occurred when the victims were overcome while standing on or swimming near a houseboat swim platform. The remaining two deaths occurred on pleasure crafts. Ages of the persons who died ranged from 8 to 66 years. Of the 111 CO poisonings, 74 (67%) occurred on houseboats and 30 (27%) occurred on pleasure crafts; seven records did not specify a boat type. Of the 74 CO-related poisonings on houseboats, 37 (50%) occurred outdoors, and half of those resulted in loss of conciousness.

*Signs and symptoms consistent with CO poisoning (i.e., death, loss of consciousness, seizures, headache, nausea, confusion, weakness, and altered state of consciousness) with a laboratory-confirmed elevated carboxyhemoglobin level (>2% in children or nonsmoking adults and >9% in smoking adults or adults for whom smoking status is unknown) or known exposure to engine or generator exhaust and one of the following: 1) loss of consciousness with no other cause; 2) symptoms of CO poisoning (other than loss of consciousness) and association with a person who also experienced symptoms of CO poisoning; or 3) symptoms of CO poisoning that improved on removal from exposure.

Environmental Sampling

Maximum CO concentrations measured in the cavity beneath the stern deck on houseboats on Lake Powell ranged from 6,000–30,000 parts of CO per million parts of air (ppm) while the generators were in operation. Oxygen concentrations as low as 12% also were measured. This oxygen deficient, CO-rich environment in a confined space is lethal within seconds to minutes. In addition, environmental measurements and case reports indicated that CO concentrations on and near the swim platform can reach life-threatening concentrations (measured as high as 7200 ppm). CO tends to accumulate above the water near the platform, and CO concentrations as high as 200 ppm were measured at water level 10 feet away from the platform.

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Editorial Note: CO poisoning associated with indoor exposure has long been recognized. However, the events described in this report illustrate a more rarely reported phenomenon—severe CO poisoning occurring outdoors.

The outdoor poisonings at Lake Powell and those reported elsewhere (*1,2* ; D. Lucas, Ohio Division of Watercraft, personal communication, 2000) probably represent a larger number of deaths not recognized as CO poisoning. Because symptoms of CO poisoning resemble those of other common conditions (e.g., alcohol consumption, motion sickness, heat stress, and nonspecific viral illness), poisonings often go unrecognized. In addition, associating illness with this exposure requires awareness of the problem among EMS staff, hospital emergency department personnel, and coroners.

The preliminary findings of this investigation indicate that houseboats with a rear swim deck and a water-level swim platform are an imminent danger to persons who enter the air space beneath the deck or spend time near the rear deck. The presence of features (e.g., engine propellers, water slides, and swim platform) that attract occupancy of that airspace enhances the risk for severe injury and death. To prevent CO poisonings and deaths, boat manufacturers should immediately devise engineering changes to new and existing boats to prevent the collection of CO in airspaces around the stern deck. Boat manufacturers should evaluate the effectiveness of such controls. Boat owners should contact the manufacturer of their boats to determine whether effective corrective measures have been identified. State and federal agencies that issue boat registrations or that regulate lakes and/or boats in their jurisdictions should assess their legal authority to determine what actions might be taken to prevent these deaths.

Workers also may be exposed to very high CO concentrations. According to the Occupational Safety and Health Administration, the area beneath the swim deck should be designated as a confined space, and confined space entry procedures[†] must be implemented before an employee enters the water to service engine components beneath the deck.

CO poisonings also occur inside houseboats (*3*); 36 of the nonfatal CO poisonings at Lake Powell occurred inside boat cabins, and eight of these were in boats on which CO detectors had been disabled because of repeated alarms. Federal, state, and local agencies and boat manufacturers should improve public awareness of the hazards of CO on

[†] 29 CFR 1910-146.

houseboats to ensure that boat occupants heed such alarms and act accordingly. All boats should be equipped with CO detectors, and boat occupants should never disable alarms.

The team has initiated an extensive effort to increase awareness of the problem by enlisting the help of state health departments, boat safety organizations, and other public health groups. The team also is developing plans to educate EMS and hospital emergency department staff to improve patient care through more rapid identification of CO poisoning symptoms. In August 2000, Lake Powell NPS officials initiated a public awareness program aimed at boat owners, renters, and occupants that included widespread posting and distribution of warning flyers, issuance of press releases, and contacting houseboat owners. However, the occurrence of another CO-poisoning at Lake Powell underscores the need for rapid intervention through modification of boat designs.

Finally, surveillance of CO poisonings must be improved. Definition of the hazard depends on improved recognition of boat-related CO poisonings and drownings by EMS personnel, emergency departments, and coroners and on more extensive environmental data collection. To assist with these efforts, the team is expanding the scope of this investigation to include other U.S. lakes. Lake Powell is one of many locations where similar conditions may exist.

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Unpowered Scooter-Related Injuries — United States, 1998–2000

Injuries associated with unpowered scooters have increased dramatically since May 2000 (*1*). These scooters are a new version of the foot-propelled scooters first popular during the 1950s. Most scooters are made of lightweight aluminum with small, low-friction wheels similar to those on in-line skates. They weigh <10 pounds and fold for easy portability and storage. Up to 5 million scooters are expected to be sold in 2000, an increase from virtually zero last year (Consumer Product Safety Commission [CPSC], unpublished data, 2000). This report summarizes the results of a descriptive analysis of scooter-related injuries during the past 34 months and provides recommendations to reduce these injuries.

CPSC and CDC analyzed preliminary data from CPSC's National Electronic Injury Surveillance System (NEISS) from January 1998 through October 2000 and the Injury and Potential Injury Incident File (IPII) during January–October 2000. NEISS is a probability sample of 100 U.S. hospitals with 24-hour emergency departments (EDs) and more than six beds. NEISS collects data from these hospitals on all persons seeking treatment for consumer product-related injury in the hospitals' EDs. Estimates of injuries in the United States associated with specific consumer products or activities can be made from NEISS data. Data were weighted according to the probability of hospital selection in the NEISS sample to provide estimates for the U.S. population (*2*). IPII consists of anecdotal information reported to CPSC from many sources (e.g., coroners and medical examiners; newspaper reports; consumer complaints through the CPSC hotline or CPSC's World-Wide Web site; and referrals from federal, state, and local officials). NEISS was used to estimate scooter-related injuries, and IPII was used to identify scooter-related deaths. Because the new scooters were introduced in large numbers into the United States market in 2000, the 1998 and 1999 data relate to the older versions of scooters.

During January–October 2000, an estimated 27,600* (95% confidence limits [CL]=22,190–33,010) persons sought ED care for scooter-related injuries. In August, September, and October 2000, the estimated number of injuries requiring ED care was 6,529 (95% CL=4,610–8,450), 8,628 (95% CL=6,090–11,170), and 7,359 (95% CL=5,200–9,520), respectively (Figure 1); October data are incomplete and may change slightly as additional injury reports are filed. The estimated number of injuries during August–October represents 80% of the estimated total number of injuries for all of 2000. Each of the preceding 3 months also exceeded the 12-month total for either 1998 or 1999. The estimated number of injuries seen in EDs in September 2000 was nearly 18 times higher than in May 2000.

Approximately 85% of persons treated in EDs were children aged <15 years, and 23% were aged <8 years; two thirds were male. The most common type of injury was a fracture or dislocation (29%), of which 70% were to the arm or hand. Other injuries included lacerations (24%), contusions/abrasions (22%), and strains/sprains (14%). Forty-two percent of all injuries occurred to the arm and hand, 27% to the head and face, and 24% to the leg and foot.

Two persons have died while using a scooter. An adult fell and struck his head while showing his daughter how to ride the scooter. A 6-year-old boy rode into traffic and was struck by a car.

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Editorial Note: The findings in this report demonstrate the rapid increase in injuries associated with riding the new lightweight, folding, unpowered scooters, which are a fast-growing activity in the United States. Because these scooters are a recent phenomenon, scientific data about the efficacy of safety equipment to protect against scooter-related injuries are not available. However, lessons learned from similar recreational activities (e.g., in-line skating) can guide users in adopting reasonable safety precautions, such as wearing protective gear.

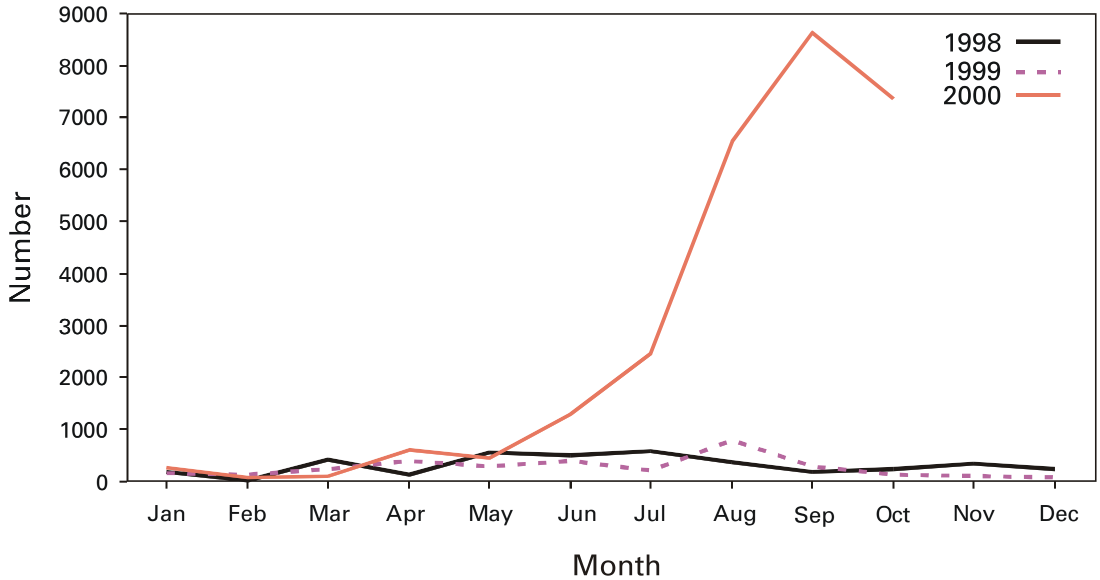
On the basis of data from in-line skating and bicycling, many of these injuries might have been prevented or reduced in severity had protective equipment been worn. Helmets can prevent 85% of head injuries (*3*), elbow pads can prevent 82% of elbow injuries, and knee pads can prevent 32% of knee injuries (*4*). Although wrist guards are effective in preventing injuries among in-line skaters, the protection they provide against injury for scooter riders is unknown because wrist guards may make it difficult to grip the scooter handle and steer it.

The public health community can be proactive and support efforts to decrease scooter-related injury in children by increasing awareness among parents and health-care providers of the injury potential and the need for safety measures when using scooters. Many children may not be prepared developmentally to handle the multitask challenges

*Estimates are based on the approximate range at the 95% confidence level of relative sampling error. For this analysis, the corresponding relative sampling error for the estimated number of injuries during January–October is 0.1.

Unpowered Scooter-Related Injuries — Continued

FIGURE 1. Estimated number of emergency department visits for unpowered scooter-related injuries, by month — United States, January 1998–October 2000



they may experience while riding a scooter. Changes in the product and rider behavior also may make riding scooters safer. The mechanisms and circumstances of scooter-related injury require further research.

On the basis of evidence of injury prevention effectiveness for other related activities, the following recommendations may help prevent scooter-related injuries:

- Wear a helmet that meets the standard established by CPSC;
- Use knee and elbow pads;
- Ride scooters on smooth, paved surfaces without traffic, and avoid streets and surfaces with water, sand, gravel or dirt;
- Do not ride scooters at night; and
- Young children should not use scooters without close supervision.

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Human Rabies — California, Georgia, Minnesota, New York, and Wisconsin, 2000

On September 20, October 9, 10, 25, and November 1, 2000, persons who resided in California, New York, Georgia, Minnesota, and Wisconsin, respectively, died of rabies. This report summarizes the case investigations.

California

On September 15, a 49-year-old man visited a neurologist with 2 days of increasing right arm pain and paresthesias. The neurologist diagnosed atypical neuropathy (Table 1). The symptoms increased and were accompanied by hand spasms and sweating on the right side of the face and trunk. The patient was discharged twice from an emergency department but symptoms worsened. After developing dysphagia, hypersalivation, agitation, and generalized muscle twitching, the patient was admitted to a local hospital on September 16. Vital signs and blood tests were normal, but within hours he became confused. The consulting neurologist suspected rabies. Rabies immune globulin, vaccine, and acyclovir were administered. On September 17, the patient was placed on mechanical ventilation and rabies tests returned positive. Renal failure developed and the patient died on September 20. The patient did not report contact with a bat, although his wife reported that in June or July a bat had flown into their house and the patient had removed it.

New York

On September 22, a 54-year-old man who had resided in Ghana arrived in the United States, and on September 26, reported discomfort in his right lower back. During the next few days, the pain intensified and alternated with abdominal discomfort. He developed restlessness and anxiety. On September 30, he was admitted to a local hospital for suspected bowel obstruction. On examination, the patient appeared anxious and had right flank tenderness, diaphoresis, spontaneous ejaculation, soft tissue swelling of the right lumbar area, vomiting, and a temperature of 99.3 F (37.4 C). Other symptoms appeared within hours, including dysphagia, dizziness, shortness of breath, and paranoia. The patient became delirious, with frothing and agitation. On October 1, the patient had a cardiac arrest, was resuscitated, and placed on mechanical ventilation. Rabies tests were positive on October 3. After a gradual decrease in respiration, heart rate, and blood pressure, the patient died on October 9. History from the patient's employer in Ghana revealed that the patient had been bitten in Ghana on his thumb and leg by his unvaccinated puppy in May.

Georgia

On October 3, a 26-year-old man developed intractable vomiting and hematemesis. At a local hospital, he was treated with antiemetic suppositories; that evening he became disoriented, combative, and had difficulty breathing. On October 5, he became hypotensive and hypoxic and was transferred to a referral hospital for ventilatory support. Examination revealed a temperature of 104 F (40 C), anisocoria, copious oral secretions, scattered bilateral pulmonary crackles, and a white blood cell count (WBC) of 46.6 cells x 10^9/L (normal: 5–10 x 10^9/L); a chest radiograph revealed bilateral diffuse alveolar densities. Broad spectrum antibiotics, including acyclovir, were initiated. On October 9, the patient developed cardiac arrhythmia, hypotension, and became combative, necessitating sedative and paralytic agent therapies. He developed respiratory and renal failure

TABLE 1. Presenting diagnoses, positive antemortem diagnostic tests, radiologic and cerebral spinal fluid studies, virus variants, and number receiving postexposure prophylaxis of persons with rabies, by state — California, Georgia, Minnesota, New York, and Wisconsin, 2000

State	Presenting diagnosis	Positive antemortem diagnostic tests	Radiologic and cerebral spinal fluid studies	Virus variant	Postexposure prophylaxis*
California	Atypical neuropathy	1. Direct fluorescent antibody test: cornea and skin biopsy 2. Reverse transcriptase-polymerase chain reaction: saliva	1. Head computed tomography scan: normal 2. Cerebral spinal fluid: increased glucose	*Tadarida brasiliensis* (Mexican free-tailed bat)	37 (89%)
Georgia	Encephalitis	None†	1. Head cerebral spinal fluid: mild sinusitis 2. Cerebral spinal fluid: normal	*Tadarida brasiliensis* (Mexican free-tailed bat)	71 (99%)
Minnesota	Carpal tunnel syndrome	1. Direct fluorescent antibody test: skin biopsy and saliva 2. Reverse transcriptase-polymerase chain reaction: skin biopsy and saliva	1. Head computed tomography scan: normal 2. Magnetic resonance imaging: increased signal in cervical and thoracic cord to the sixth thoracic vertebrae 3. Cerebral spinal fluid: increased cells, glucose, and protein	*Lasionycteris noctivagans* (Silver-haired bat) and *Pipistrellus subflavus* (Eastern pipistrelle bat)	20 (100%)
New York	Bowel obstruction	1. Direct fluorescent antibody test: skin biopsy 2. Reverse transcriptase-polymerase chain reaction: saliva	1. Head computed tomography scan: mild cerebral cortical and cerebellar atrophy	Dog, African	24 (96%)
Wisconsin	Myocardial ischemia	None†§	1. Head computed tomography scan: normal 2. Cerebral spinal fluid: normal	*Lasionycteris noctivagans* (Silver-haired bat) and *Pipistrellus subflavus* (Eastern pipistrelle bat)	27 (67%)

*Number of persons who received rabies postexposure prophylaxis for possible exposure to the patients' saliva and percentage who were health-care workers.
† Diagnosis made on postmortem examination and confirmed with direct fluorescent antibody test of brain tissue.
§ Rapid fluorescent focus inhibition test was negative.

Human Rabies — Continued

and died on October 10. Since July, the patient had been renting a room on the upper floor of an old house. He had reported to co-workers that bats from the attic had entered his living quarters and landed on him while he slept. Investigation of the house occupied by the patient since July revealed a colony of approximately 200 Mexican free-tailed bats in the attic and openings between the attic and the patient's bedroom, bathroom, closet, and kitchen.

Minnesota

On October 14, a 47-year-old man visited a local clinic with 6 days of worsening right arm pain and parasthesias. Two days later he developed decreased right finger movement. Nerve conduction studies were consistent with carpal tunnel syndrome. On October 19, while travelling in North Dakota, the patient was admitted to a North Dakota hospital with a temperature of 103 F (39.4 C), flaccid paralysis and sensory loss in the right upper extremity, sensory loss in the mid-thoracic area, hypoesthesia and hyporeflexia in the left upper extremity, and anisocoria. Laboratory findings were normal except a WBC count of 13.8 x 10^9/L. The patient was placed on broad spectrum antibiotics. On October 20, the patient developed acute respiratory failure and was intubated. Magnetic resonance imaging was consistent with myelitis and ganciclovir was added to antibiotic coverage. He died on October 25. Three days earlier, a friend told the family that during August 11–19, the patient had been awakened by a bat on his right hand. He killed the bat and was bitten in the process. The patient did not seek medical care. Investigation found in the patient's house multiple portals of entry for bats, openings between the attic and living areas, and extensive deposits of guano in the attic and living area.

Wisconsin

On October 14, a 69-year-old man with a 2-day history of chest discomfort and numbness, tingling, and tremors of the left arm was admitted to a local hospital for cardiac evaluation. On October 16, the patient had onset of progressive dysphagia, diaphoresis, delirium, and myoclonus. The patient was treated with intravenous antibiotics for possible sepsis and acyclovir for suspected herpes encephalitis. He developed renal insufficiency requiring hemodialysis and respiratory failure necessitating mechanical ventilation. A serum rapid fluorescent focus inhibition test for rabies antibodies was negative on October 18. The patient died on November 1, and postmortem examination of the brain revealed Negri bodies. Subsequent testing confirmed a diagnosis of rabies. The patient had told a friend that two or three times a year he had removed bats from his house with his bare hands; several other residences used by the patient also had potential portals for the entry of bats. He did not mention being bitten by an animal but had asked a friend a week before admission if rabies could be acquired from an insect bite.

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Editorial Note: These five cases of human rabies are the first diagnosed in the United States since December 1998, and underscore that rabies should be considered in any patient with progressive encephalitis. The initial presentations of rabies can be diverse and a history of animal contact is rarely obtained. Because the immune response to rabies may not occur until late in the disease, if rabies is suspected, an antemortem examination should include a nuchal skin biopsy, saliva, and cerebral spinal fluid or a postmortem examination of central nervous system tissue (*1*).

In the United States since 1990, infection with indigenous rabies virus variants associated with insectivorous bats and infection with foreign canine rabies virus variants have accounted for 30 of the 32 human cases. Although 24 (74%) of the 32 cases since 1990 have been attributed to bat-associated variants of the virus, a history of a bite was established in only two cases. Contact with bats occurred in approximately half of the other cases. These cases represent various bat-contact histories: a bat bite, direct contact with bats with multiple opportunities to be bitten, and possible direct contact with a bat. Canine rabies is prevalent in Africa, Asia, and Latin America. Worldwide estimates of human rabies deaths exceed 50,000 cases each year, and >95% of reported cases occur in regions where canine rabies is endemic (*2*).

Although rabies usually is transmitted by a bite, persons may minimize the medical implications of a bat bite. Unlike bites from larger animals, the trauma of a bat bite is unlikely to warrant seeking medical care. Unless the potential for rabies exposure is known to the patient, rabies postexposure prophylaxis (PEP) will not be received. Although bat rabies virus variants can be transmitted secondarily from terrestrial mammals, the lack of other animal-bite histories and the rarity of bat rabies virus variants found in terrestrial mammals suggest that this means of transmission is rare (*3*).

Persons who are bitten or scratched by any animal should wash wounds thoroughly and seek immediate medical attention to evaluate the need for PEP. In all cases where bat-human contact has occurred or is suspected, the bat should be collected and tested for rabies. If the bat is unavailable, the need for PEP should be assessed by public health officials. PEP should be considered after direct contact between a human and a bat, unless the exposed person can be certain a bite, scratch, or mucous membrane exposure did not occur. PEP may be considered for persons who were in the same room as a bat and who might be unaware that a bite or direct contact had occurred (e.g., when a sleeping person wakes to find a bat in the room or an adult witnesses a bat in the room with an unattended child, mentally disabled person, or intoxicated person). PEP is not warranted when direct contact between a human and a bat did not occur. Seeing a bat or being in the vicinity of bats does not constitute an exposure (*4*).

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Human Rabies — Continued

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Public Health Dispatch

Human Rabies — Québec, Canada, 2000

On September 22, 2000, a 9-year-old boy awoke with a fever and complained of pain in his upper left arm. The pain persisted, and he developed insomnia and tremors in his left arm and hand. He was admitted to a local hospital on September 27. That evening, he had mild dysphagia, pruritus of his upper chest and back, and a transient macular rash. On September 28, he developed tremors and myoclonic jerks in both arms, had become agitated, and had hydrophobia, aerophobia, dysarthria, and visual hallucinations. The next day hypersalivation was observed and the tremors and myoclonus had spread to his lower extremities. He became very anxious, indicated that he was suffocating, and underwent endotracheal intubation. A diagnosis of rabies was considered and he was transferred to a children's hospital. Laboratory findings were normal except a mildly elevated cerebral spinal fluid protein. An electroencephalogram indicated no epileptiform activity. Head magnetic resonance imaging was normal. On September 29, the results of the rabies tests were positive, and rabies immune globulin and vaccine were administered to the patient. His neurologic and hemodynamic status deteriorated, and he died on October 6.

A nuchal skin biopsy tested positive by direct fluorescent antibody test. Rabies virus was isolated from the saliva, and saliva, tears, and skin biopsy were positive for rabies by reverse transcriptase-polymerase chain reaction. Molecular analysis of the virus revealed a rabies variant associated with silver-haired (*Lasionycteris noctivagans*) and eastern pipistrelle (*Pipistrellus subflavus*) bats.

During August, the patient visited a zoo and went to a day camp where he observed bats that had been captive for many years. No history of substantial exposure to bats or other animals occurred in these places. On August 28, while the patient and his brother were sleeping in a rural cottage, his parents found a bat in the kitchen. The same evening, the patient's brother went into the bathroom and observed a bat that seemed to have difficulty flying. He alerted his father who removed it from the cottage with his bare hands. Approximately 3 days later, the patient showed his mother a 0.8-inch (2 cm) erythematous lesion with a small central laceration on his upper left arm. No action was taken. After the diagnosis was made, rabies postexposure prophylaxis was offered to the patient's parents and brother. Prophylaxis also was given to 44 health-care providers because of possible percutaneous or mucous membrane exposure to the patient's saliva and to 12 playmates possibly exposed to the patient's saliva. This human death from rabies was the first one reported in Canada since 1985.

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Human Rabies — Continued

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Notice to Readers

Recommendations From Meeting on Strategies for Improving Global Measles Control, May 11–12, 2000

During May 11–12, 2000, World Health Organization (WHO), United Nations Children's Fund (UNICEF), and CDC co-sponsored a technical working group meeting to review the status of global measles control and regional elimination efforts and to formulate recommendations to accelerate control activities, particularly in countries and regions with a high disease burden.

After reviewing the epidemiologic data by WHO region and by selected countries, participants concluded that vaccination coverage of >90% is required to achieve measles control and that a one-dose measles policy is insufficient to achieve and sustain measles control targets* (*1*). The average seroconversion rate of 85% following one dose at age 9 months, the recommended strategy for routine vaccination in developing countries, leaves many children susceptible (*2*). The routine delivery system in many countries also fails to reach many children with a dose at 9 months (*3*). Therefore, in addition to the first dose at age 9 months, meeting participants recommended that a second opportunity for measles immunization is essential to protect those children previously missed by routine services and for those children who failed to respond to their first dose of measles vaccine. The second opportunity can be provided through routine programs[†], supplemental campaigns, or a combination of both.

Meeting participants developed recommendations for accelerating measles control by improving routine and supplemental vaccination, measles surveillance, and vitamin A supplementation. Selected key recommendations follow. The full text of the recommendations is available at http://www.who.int/wer/75_27_52.html[§].

Action Plans for Accelerating Measles Control

- Action plans to reduce measles mortality through increasing vaccination coverage should be part of each country's comprehensive long-term vaccination strategy and should be incorporated into the 3–5 year Expanded Program on Immunization plans of action.
- Action plans should specify tasks and budgets for all recommended strategies for measles control such as improving vaccination (i.e., two opportunities for measles vaccination), intensifying surveillance, managing measles cases, and providing vitamin A supplements.

*The World Health Assembly in 1989 set targets for measles morbidity and mortality reduction of 90% and 95%, respectively, compared with prevaccine era levels.

[†] In countries with vaccination programs capable of achieving and sustaining measles vaccination coverage >90% through routine services, the second opportunity for measles vaccination also can be provided by implementing a routine two-dose vaccination schedule.

[§] References to sites of non-CDC organizations on the World-Wide Web are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of pages found at these sites.

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- Countries that qualify for support from the Global Alliance for Vaccines and Immunization (GAVI) (*4*) should be encouraged to use these resources for measles control activities.
- In collaboration with its partners, the GAVI board should support measles control and mortality reduction through strengthening vaccination services.

Routine and Supplemental Vaccination

- Countries and donor agencies should assess the reasons for low coverage and should improve routine coverage using appropriate strategies (i.e., fixed posts, outreach services, door-to-door canvassing, and regular pulse vaccination¶).
- Management of vaccination services should be strengthened at all levels. WHO should support the development of training courses and tools that cover such topics as reducing missed opportunities and dropout rates**, canvassing door-to-door, conducting outreach, and periodic supplementary campaigns.
- When well implemented, mass measles vaccination campaigns are an effective strategy to control measles. Depending on the coverage achieved during the campaign and routine coverage, mass campaigns will need to be repeated at regular intervals. Preliminary data suggest that targeted urban campaigns have limited impact on measles transmission either in cities or in neighboring rural areas (*5*). Campaigns should target large populations (entire nations or large regions) and should achieve ≥90% coverage using safe injection practices (*6*).
- The target age group for mass campaigns should be based on the susceptibility profile of the population, which can be determined from the history of measles vaccination coverage, age-specific disease incidence data, and seroprevalence studies.

Measles Surveillance

- Measles surveillance should include measles case counts by month and geographic area, age and vaccination status of case-patients and deaths by area, and timeliness and completeness of reporting.
- In countries and regions that have implemented elimination strategies, proposed methods for monitoring interruption of indigenous transmission of measles virus (e.g., percentage imported cases, average outbreak size, number of chains of transmission) should be applied to assess their usefulness (*7*).

Vitamin A

- In countries in which vitamin A deficiency is a significant public health problem, vaccination visits and measles campaigns should be used to provide vitamin A supplements (*8*).

¶ Periodic vaccination campaigns, usually conducted within a limited geographic area (e.g., a district), that target all children born since the last campaign.

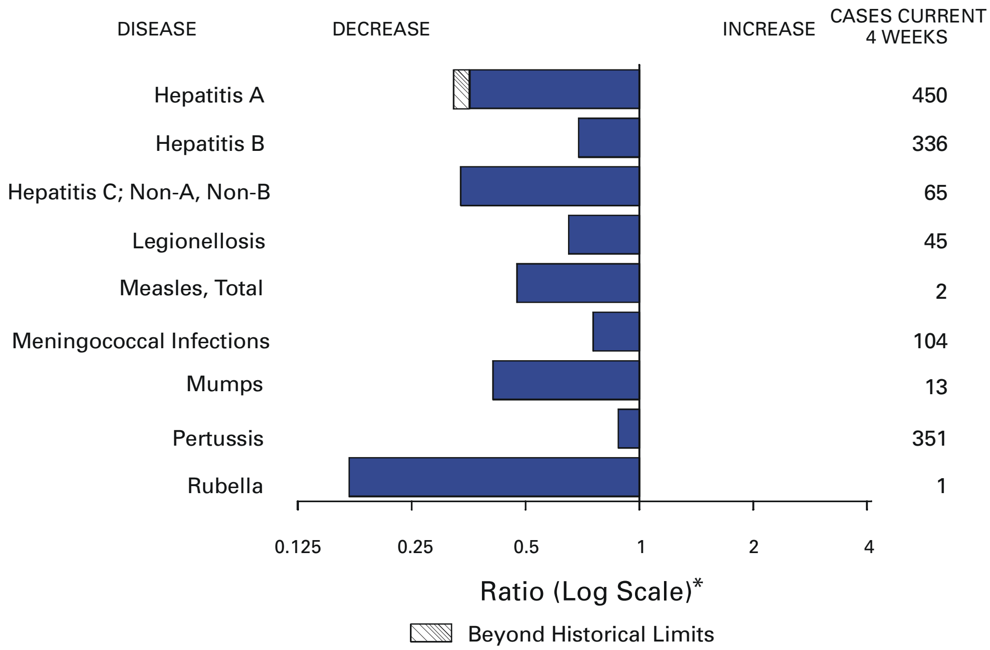
** Usually calculated as the difference in vaccination coverage between the first and third doses of combined diphtheria-tetanus-pertussis vaccine (*1*).

Notice to Readers — Continued

References

1. World Health Assembly. Executive summary: resolution of the 42nd World Health Assembly. Geneva, Switzerland: World Health Organization, 1989 (resolution WHA 42.32).
2. Cutts FT, Grabowsky M, Markowitz LE. The effect of dose and strain of live attenuated measles vaccines on serological responses in young infants. Biologicals 1995;23:95–106.
3. CDC. Global measles control and regional elimination, 1998–1999. MMWR 1999;48:1124–30.
4. Global Alliance for Vaccines and Immunization. Immunize every child—GAVI strategy for sustainable immunization services. Geneva, Switzerland: Global Alliance for Vaccines and Immunization, 2000. Available at http://www.vaccinealliance.org. Accessed December 2000.
5. World Health Organization Intercountry Office for Eastern Africa. Summary of presentations, reports, and recommendations of the East Africa measles strategy clarification meeting. Nairobi, Kenya: World Health Organization, October 11–13, 1999.
6. World Health Organization, United Nations Children's Fund. Policy statement on mass immunization campaigns. Geneva, Switzerland: World Health Organization, 1997 (WHO/EPI/LHIS/97.04).
7. De Serres G, Gay NJ, Farrington CP. Epidemiology of transmissible diseases after elimination. Am J Epidemiol 2000;151:1039–48.
8. World Health Organization, United Nations Children's Fund, and International Vitamin A Consultative Group Task Force. Vitamin A supplements: a guide to their use in the treatment and prevention of vitamin A deficiency and xeropthalmia. 2nd ed. Geneva, Switzerland: World Health Organization, 1997.

FIGURE I. Selected notifiable disease reports, United States, comparison of provisional 4-week totals ending December 9, 2000, with historical data



* 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 of provisional cases of selected notifiable diseases, United States, cumulative, week ending December 9, 2000 (49th Week)

	Cum. 2000		Cum. 2000
Anthrax	-	Poliomyelitis, paralytic	-
Brucellosis*	60	Psittacosis*	10
Cholera	2	Q fever*	21
Cyclosporiasis*	38	Rabies, human	2
Diphtheria	2	Rocky Mountain spotted fever (RMSF)	412
Ehrlichiosis: human granulocytic (HGE)*	173	Rubella, congenital syndrome	6
human monocytic (HME)*	96	Streptococcal disease, invasive, group A	2,592
Encephalitis: California serogroup viral*	109	Streptococcal toxic-shock syndrome*	68
eastern equine*	2	Syphilis, congenital¶	257
St. Louis*	3	Tetanus	25
western equine*	-	Toxic-shock syndrome	121
Hansen disease (leprosy)*	60	Trichinosis	15
Hantavirus pulmonary syndrome*†	30	Tularemia*	110
Hemolytic uremic syndrome, postdiarrheal*	183	Typhoid fever	305
HIV infection, pediatric*§	203	Yellow fever	-
Plague	6		

-: No reported cases.
*Not notifiable in all states.
† Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases (NCID).
§ Updated monthly from reports to the Division of HIV/AIDS Prevention — Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention (NCHSTP). Last update November 26, 2000.
¶ Updated from reports to the Division of STD Prevention, NCHSTP.

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending December 9, 2000, and December 11, 1999 (49th Week)

Reporting Area	AIDS		Chlamydia[†]		Cryptosporidiosis		*Escherichia coli* O157:H7* NETSS		*Escherichia coli* O157:H7* PHLIS	
	Cum. 2000[§]	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999
UNITED STATES	36,091	40,781	611,280	616,003	2,453	2,537	4,231	3,762	3,178	2,664
NEW ENGLAND	1,884	2,070	20,170	19,913	102	183	373	399	363	360
Maine	38	75	1,368	997	20	30	31	39	28	-
N.H.	31	46	978	920	23	19	36	35	35	33
Vt.	37	16	493	455	26	36	34	32	34	21
Mass.	1,137	1,319	8,400	8,442	30	70	158	175	165	185
R.I.	95	96	2,409	2,201	3	6	19	27	18	26
Conn.	546	518	6,522	6,898	-	22	95	91	83	95
MID. ATLANTIC	7,705	10,462	54,525	61,961	178	583	398	534	276	157
Upstate N.Y.	705	1,196	N	N	124	168	289	455	67	13
N.Y. City	3,929	5,574	23,206	25,335	11	250	12	17	13	17
N.J.	1,592	1,922	8,000	11,712	12	50	97	62	109	69
Pa.	1,479	1,770	23,319	24,914	31	115	N	N	87	58
E.N. CENTRAL	3,442	2,810	100,451	104,466	782	619	975	959	582	522
Ohio	546	462	23,713	27,685	259	66	269	243	220	218
Ind.	352	317	12,082	11,413	57	39	132	100	83	67
Ill.	1,693	1,345	26,715	30,691	7	87	187	494	14	89
Mich.	652	552	24,753	21,126	95	50	137	122	104	80
Wis.	199	134	13,188	13,551	364	377	250	N	161	68
W.N. CENTRAL	813	934	33,917	35,842	353	197	665	520	594	541
Minn.	160	177	6,920	7,090	131	75	216	166	211	186
Iowa	86	75	4,579	4,703	75	55	180	111	147	78
Mo.	368	449	10,975	12,636	30	25	103	45	96	68
N. Dak.	3	6	716	874	16	18	20	17	20	18
S. Dak.	7	15	1,726	1,483	15	7	56	47	58	62
Nebr.	68	62	3,343	3,349	77	15	63	102	45	113
Kans.	121	150	5,658	5,707	9	2	27	32	17	16
S. ATLANTIC	10,157	11,255	119,515	129,323	462	368	363	328	270	187
Del.	199	158	2,706	2,604	6	-	1	6	1	3
Md.	1,197	1,339	12,081	12,351	10	17	32	42	1	4
D.C.	785	636	3,021	N	20	7	1	1	U	U
Va.	764	777	14,797	13,269	17	27	75	74	61	61
W. Va.	60	64	1,442	1,699	3	3	15	16	13	11
N.C.	667	741	20,332	20,705	28	33	87	74	68	52
S.C.	755	917	9,023	17,698	-	-	21	19	14	14
Ga.	1,117	1,585	25,127	30,962	170	132	42	34	36	3
Fla.	4,613	5,038	30,986	30,035	208	149	89	62	76	39
E.S. CENTRAL	1,809	1,788	46,026	43,055	48	39	127	140	105	104
Ky.	186	256	7,616	7,012	7	7	40	48	32	35
Tenn.	771	704	14,081	13,304	11	12	56	55	45	44
Ala.	457	444	13,526	11,969	15	13	11	28	9	21
Miss.	395	384	10,803	10,770	15	7	20	9	19	4
W.S. CENTRAL	3,708	4,159	94,725	88,157	123	89	182	139	229	156
Ark.	172	186	5,355	5,674	14	2	57	15	38	14
La.	649	814	16,806	15,524	10	24	9	14	49	14
Okla.	320	125	8,610	7,773	17	13	19	37	17	30
Tex.	2,567	3,034	63,954	59,186	82	50	97	73	125	98
MOUNTAIN	1,322	1,605	34,300	31,308	173	98	433	324	283	241
Mont.	14	13	1,311	1,496	10	13	30	25	-	-
Idaho	20	22	1,728	1,671	23	8	74	66	35	43
Wyo.	9	11	751	740	5	1	20	15	10	17
Colo.	300	290	8,461	5,950	72	14	162	112	111	88
N. Mex.	140	82	4,279	4,739	21	41	23	13	16	7
Ariz.	427	816	11,991	11,748	11	12	58	36	41	23
Utah	137	141	2,084	2,021	27	N	52	35	70	48
Nev.	275	230	3,695	2,943	4	9	14	22	-	15
PACIFIC	5,251	5,698	107,651	101,978	232	361	715	419	476	396
Wash.	480	336	11,922	11,363	N	N	221	164	200	179
Oreg.	171	208	4,996	5,786	21	96	156	67	114	69
Calif.	4,479	5,047	85,579	80,021	211	265	293	173	150	136
Alaska	22	14	2,311	1,771	-	-	30	1	1	1
Hawaii	99	93	2,843	3,037	-	-	15	14	11	11
Guam	15	17	-	432	-	-	N	N	U	U
P.R.	1,245	1,180	3,068	U	-	-	7	8	U	U
V.I.	32	35	U	U	U	U	U	U	U	U
Amer. Samoa	-	-	U	U	U	U	U	U	U	U
C.N.M.I.	-	-	U	U	U	U	U	U	U	U

N: Not notifiable. U: Unavailable. -: No reported cases. C.N.M.I.: Commonwealth of Northern Mariana Islands.
* Individual cases can be reported through both the National Electronic Telecommunications System for Surveillance (NETSS) and the Public Health Laboratory Information System (PHLIS).
† Chlamydia refers to genital infections caused by *C. trachomatis*. Totals reported to the Division of STD Prevention, NCHSTP.
§ Updated monthly from reports to the Division of HIV/AIDS Prevention — Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention. Last update November 26, 2000.

TABLE II. (Cont'd) Provisional cases of selected notifiable diseases, United States, weeks ending December 9, 2000, and December 11, 1999 (49th Week)

Reporting Area	Gonorrhea		Hepatitis C; Non-A, Non-B		Legionellosis		Listeriosis	Lyme Disease	
	Cum. 2000§	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 2000	Cum. 1999
UNITED STATES	319,451	339,747	2,794	2,743	898	988	635	12,672	14,820
NEW ENGLAND	5,654	6,207	15	16	51	78	55	4,312	4,404
Maine	84	78	2	2	2	3	2	-	41
N.H.	98	109	-	-	3	8	4	62	22
Vt.	60	47	4	7	5	14	3	37	23
Mass.	2,286	2,337	4	4	16	27	26	1,098	772
R.I.	611	554	5	3	8	12	1	590	464
Conn.	2,515	3,082	-	-	17	14	19	2,525	3,082
MID. ATLANTIC	33,832	37,528	610	121	198	238	150	6,434	7,921
Upstate N.Y.	6,684	6,344	64	57	88	58	81	3,613	3,758
N.Y. City	10,090	11,542	-	-	-	43	29	102	134
N.J.	5,322	7,436	510	-	15	21	21	1,448	1,670
Pa.	11,736	12,206	36	64	95	116	19	1,271	2,359
E.N. CENTRAL	60,533	65,860	206	884	236	262	108	325	578
Ohio	14,311	17,108	12	4	110	79	55	88	43
Ind.	5,677	5,990	1	1	39	45	8	32	19
Ill.	17,764	21,825	19	47	9	31	11	11	17
Mich.	17,156	14,703	174	816	50	64	29	-	11
Wis.	5,625	6,234	-	16	28	43	5	194	488
W.N. CENTRAL	15,603	15,719	434	295	56	55	13	418	333
Minn.	2,716	2,682	7	10	7	13	5	322	219
Iowa	1,086	1,175	2	-	14	13	2	32	22
Mo.	7,584	7,746	408	281	24	18	5	43	64
N. Dak.	45	77	1	1	-	2	1	1	1
S. Dak.	265	188	-	-	2	3	-	-	-
Nebr.	1,320	1,394	6	3	4	6	-	4	11
Kans.	2,587	2,457	10	-	5	-	-	16	16
S. ATLANTIC	88,318	99,575	120	153	186	145	102	941	1,269
Del.	1,629	1,582	-	-	10	18	2	140	154
Md.	8,538	9,452	18	21	63	34	22	506	861
D.C.	2,606	3,428	3	1	6	4	-	11	6
Va.	9,772	9,017	3	11	33	39	8	144	118
W. Va.	465	538	15	17	N	N	5	32	18
N.C.	16,574	18,440	18	33	15	15	-	44	73
S.C.	11,013	14,192	3	22	6	11	9	14	6
Ga.	16,494	21,379	3	1	7	3	21	-	-
Fla.	21,227	21,547	57	47	46	21	35	50	33
E.S. CENTRAL	33,147	34,498	418	317	33	49	20	47	98
Ky.	3,329	3,192	34	24	18	21	3	12	17
Tenn.	11,220	10,730	95	114	10	22	13	28	57
Ala.	10,585	10,729	8	1	4	4	4	6	20
Miss.	8,013	9,847	281	178	1	2	-	1	4
W.S. CENTRAL	50,131	50,231	431	519	18	31	16	44	58
Ark.	2,920	3,115	9	28	-	1	1	4	5
La.	12,473	12,382	297	292	6	8	-	3	9
Okla.	3,881	3,798	10	16	5	4	7	1	8
Tex.	30,857	30,936	115	183	7	18	8	36	36
MOUNTAIN	9,432	9,123	390	208	47	47	36	30	16
Mont.	52	53	5	5	2	-	-	-	-
Idaho	84	82	3	7	5	3	-	3	3
Wyo.	48	33	302	70	2	-	1	9	3
Colo.	2,645	2,397	29	33	16	12	9	11	3
N. Mex.	958	930	13	34	1	1	2	-	1
Ariz.	3,978	4,172	20	45	8	7	15	-	2
Utah	219	216	2	6	12	18	4	3	2
Nev.	1,448	1,240	16	8	1	6	5	4	2
PACIFIC	22,801	21,006	170	230	73	83	135	121	143
Wash.	2,185	2,012	31	21	18	21	7	9	10
Oreg.	745	840	27	21	N	N	6	15	15
Calif.	19,166	17,448	110	188	55	60	119	95	118
Alaska	329	276	-	-	-	1	-	2	-
Hawaii	376	430	2	-	-	1	3	N	N
Guam	-	48	-	1	-	-	-	-	-
P.R.	567	312	1	-	1	-	-	N	N
V.I.	U	U	U	U	U	U	-	U	U
Amer. Samoa	U	U	U	U	U	U	-	U	U
C.N.M.I.	U	U	U	U	U	U	-	U	U

N: Not notifiable. U: Unavailable. - : No reported cases.

TABLE II. (Cont'd) Provisional cases of selected notifiable diseases, United States, weeks ending December 9, 2000, and December 11, 1999 (49th Week)

Reporting Area	Malaria		Rabies, Animal		Salmonellosis*			
					NETSS		PHLIS	
	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999
UNITED STATES	1,188	1,383	5,658	6,325	35,087	36,937	29,531	31,566
NEW ENGLAND	65	61	796	857	2,063	2,130	2,088	2,163
Maine	6	3	129	166	121	126	91	103
N.H.	1	2	21	45	139	137	135	135
Vt.	3	4	57	88	106	92	113	82
Mass.	27	22	264	219	1,150	1,153	1,166	1,175
R.I.	8	5	61	95	126	121	149	159
Conn.	20	25	264	244	421	501	434	509
MID. ATLANTIC	259	406	1,102	1,250	3,871	5,113	4,333	5,045
Upstate N.Y.	80	67	793	883	1,169	1,304	1,237	1,309
N.Y. City	113	242	U	U	925	1,406	852	1,446
N.J.	36	55	189	176	804	1,138	821	1,077
Pa.	30	42	120	191	973	1,265	1,423	1,213
E.N. CENTRAL	116	163	146	167	4,931	5,202	3,278	4,532
Ohio	21	18	51	36	1,512	1,247	1,350	1,054
Ind.	6	21	-	13	604	517	551	461
Ill.	46	74	22	10	1,357	1,546	129	1,512
Mich.	31	40	67	87	841	957	864	940
Wis.	12	10	6	21	617	935	384	565
W.N. CENTRAL	61	73	522	699	2,289	2,170	2,361	2,320
Minn.	27	41	88	105	540	547	626	684
Iowa	2	13	78	146	351	244	312	224
Mo.	15	13	50	31	672	726	865	845
N. Dak.	2	-	114	139	61	51	74	62
S. Dak.	1	-	90	175	99	93	105	117
Nebr.	7	1	2	4	215	184	94	165
Kans.	7	5	100	99	351	325	285	223
S. ATLANTIC	308	338	2,289	2,056	7,839	8,417	5,229	6,254
Del.	5	1	49	56	110	162	130	152
Md.	101	96	387	381	742	823	729	854
D.C.	16	18	-	-	63	72	U	U
Va.	49	71	545	554	970	1,204	839	1,004
W. Va.	4	4	110	107	164	168	143	148
N.C.	35	31	547	424	1,113	1,266	1,072	1,270
S.C.	2	15	153	133	736	643	540	497
Ga.	30	28	344	231	1,467	1,471	1,549	1,640
Fla.	66	74	154	170	2,474	2,608	227	689
E.S. CENTRAL	45	25	198	252	2,311	2,135	1,570	1,428
Ky.	18	7	21	35	365	400	249	284
Tenn.	12	8	101	93	645	556	679	573
Ala.	14	7	76	122	652	586	521	475
Miss.	1	3	-	2	649	593	121	96
W.S. CENTRAL	20	15	76	476	3,905	3,611	3,993	2,708
Ark.	3	3	20	14	704	642	587	248
La.	8	10	-	-	248	707	736	592
Okla.	9	2	56	91	386	442	265	341
Tex.	-	-	-	371	2,567	1,820	2,405	1,527
MOUNTAIN	52	43	242	215	2,746	2,869	2,142	2,490
Mont.	1	4	64	59	93	81	-	1
Idaho	4	3	9	5	125	125	97	97
Wyo.	-	1	55	44	67	69	44	58
Colo.	25	18	-	1	690	699	649	682
N. Mex.	-	3	21	9	227	356	182	284
Ariz.	9	6	74	81	814	855	719	789
Utah	6	4	10	8	481	494	451	530
Nev.	7	4	9	8	249	190	-	49
PACIFIC	262	259	287	353	5,132	5,290	4,537	4,626
Wash.	32	26	-	-	560	642	670	807
Oreg.	41	21	7	4	299	403	348	450
Calif.	178	199	257	342	3,988	3,871	3,270	3,069
Alaska	-	1	23	7	58	53	23	31
Hawaii	11	12	-	-	227	321	226	269
Guam	-	-	-	-	-	36	U	U
P.R.	5	-	80	70	617	612	U	U
V.I.	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U

N: Not notifiable. U: Unavailable. -: No reported cases.

* Individual cases can be reported through both the National Electronic Telecommunications System for Surveillance (NETSS) and the Public Health Laboratory Information System (PHLIS).

TABLE II. (Cont'd) Provisional cases of selected notifiable diseases, United States, weeks ending December 9, 2000, and December 11, 1999 (49th Week)

Reporting Area	Shigellosis*				Syphilis (Primary & Secondary)		Tuberculosis	
	NETSS		PHLIS					
	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999
UNITED STATES	19,670	15,752	10,197	9,539	5,557	6,311	11,861	14,582
NEW ENGLAND	369	847	365	827	71	58	398	409
Maine	10	5	12	-	1	-	12	18
N.H.	6	18	8	17	2	1	17	16
Vt.	4	6	-	4	-	3	4	3
Mass.	256	729	243	711	46	35	246	228
R.I.	26	23	36	28	4	3	30	39
Conn.	67	66	66	67	18	16	89	105
MID. ATLANTIC	1,920	1,048	1,325	717	249	282	2,174	2,436
Upstate N.Y.	730	264	211	74	14	19	264	303
N.Y. City	706	339	470	231	115	123	1,195	1,254
N.J.	296	251	384	232	42	65	521	502
Pa.	188	194	260	180	78	75	194	377
E.N. CENTRAL	3,702	3,101	1,153	1,704	1,058	1,178	1,258	1,534
Ohio	397	405	309	140	69	89	251	248
Ind.	1,485	326	145	111	331	421	105	129
Ill.	954	1,270	76	939	319	398	617	759
Mich.	638	489	564	442	295	230	209	304
Wis.	228	611	59	72	44	40	76	94
W.N. CENTRAL	2,337	1,160	1,875	772	59	125	458	500
Minn.	756	222	837	248	13	9	156	188
Iowa	522	66	316	55	11	9	35	50
Mo.	627	690	458	345	27	89	186	173
N. Dak.	51	3	49	2	-	-	5	6
S. Dak.	7	18	4	10	-	-	16	17
Nebr.	142	84	84	65	2	6	23	16
Kans.	232	77	127	47	6	12	37	50
S. ATLANTIC	2,882	2,338	1,102	525	1,865	2,018	2,456	3,014
Del.	23	15	23	10	8	8	14	26
Md.	191	158	115	58	275	336	228	251
D.C.	80	51	U	U	47	45	36	50
Va.	442	129	331	64	124	148	255	268
W. Va.	21	8	9	5	2	5	28	37
N.C.	378	200	265	92	453	446	321	447
S.C.	136	118	87	63	208	247	110	218
Ga.	257	226	167	83	364	428	528	560
Fla.	1,354	1,433	105	150	384	355	936	1,157
E.S. CENTRAL	1,106	1,151	505	669	821	1,095	845	966
Ky.	482	231	110	146	81	99	114	164
Tenn.	339	642	339	450	491	620	305	333
Ala.	92	112	49	62	119	199	289	291
Miss.	193	166	7	11	130	177	137	178
W.S. CENTRAL	2,848	2,546	2,597	1,131	798	990	935	1,748
Ark.	203	74	52	26	94	78	159	161
La.	134	215	183	132	204	291	74	238
Okla.	120	514	42	155	125	176	126	170
Tex.	2,391	1,743	2,320	818	375	445	576	1,179
MOUNTAIN	1,270	1,087	732	744	224	222	458	510
Mont.	7	9	-	-	-	1	17	13
Idaho	45	27	25	12	1	1	12	15
Wyo.	5	3	3	1	1	-	4	3
Colo.	265	196	196	155	11	2	70	72
N. Mex.	161	136	99	103	21	11	36	58
Ariz.	589	558	329	401	184	200	203	219
Utah	78	61	80	66	1	2	45	39
Nev.	120	97	-	6	5	5	71	91
PACIFIC	3,236	2,474	543	2,450	412	343	2,879	3,465
Wash.	436	120	405	108	60	64	227	234
Oreg.	163	92	105	86	6	7	25	103
Calif.	2,589	2,226	-	2,220	344	268	2,410	2,898
Alaska	8	3	3	4	-	1	95	58
Hawaii	40	33	30	32	2	3	122	172
Guam	-	17	U	U	-	-	-	62
P.R.	32	136	U	U	155	141	119	178
V.I.	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U

N: Not notifiable. U: Unavailable. -: No reported cases.

*Individual cases can be reported through both the National Electronic Telecommunications System for Surveillance (NETSS) and the Public Health Laboratory Information System (PHLIS).

TABLE III. Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending December 9, 2000, and December 11, 1999 (49th Week)

Reporting Area	*H. influenzae,* Invasive		Hepatitis (Viral), By Type A		Hepatitis (Viral), By Type B		Measles (Rubeola) Indigenous		Measles (Rubeola) Imported*		Measles (Rubeola) Total	
	Cum. 2000†	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	2000	Cum. 2000	2000	Cum. 2000	Cum. 2000	Cum. 1999
UNITED STATES	1,142	1,143	11,725	15,496	6,272	6,517	1	62	-	17	79	94
NEW ENGLAND	99	93	349	333	94	138	-	3	-	4	7	11
Maine	1	8	21	14	5	1	-	-	-	-	-	-
N.H.	12	18	18	17	17	16	-	2	-	1	3	1
Vt.	10	5	10	19	6	4	-	-	-	3	3	-
Mass.	38	38	120	133	17	43	-	1	-	-	1	8
R.I.	4	6	24	25	21	33	-	-	-	-	-	-
Conn.	34	18	156	125	28	41	-	-	-	-	-	2
MID. ATLANTIC	181	192	1,040	1,120	821	832	-	14	-	5	19	5
Upstate N.Y.	97	77	218	255	133	172	-	9	-	-	9	2
N.Y. City	42	57	353	379	422	252	-	5	-	4	9	3
N.J.	32	52	100	144	57	132	-	-	-	-	-	-
Pa.	10	6	369	342	209	276	-	-	-	1	1	-
E.N. CENTRAL	142	188	1,462	2,809	679	675	-	9	-	-	9	4
Ohio	53	57	257	625	98	88	-	2	-	-	2	-
Ind.	28	24	114	101	46	42	-	-	-	-	-	2
Ill.	48	81	618	791	110	52	-	4	-	-	4	1
Mich.	10	19	460	1,218	424	463	-	3	-	-	3	1
Wis.	3	7	13	74	1	30	-	-	-	-	-	-
W.N. CENTRAL	72	75	697	989	520	342	1	4	-	1	5	1
Minn.	42	47	183	95	39	52	-	-	-	1	1	1
Iowa	1	2	65	141	32	41	-	2	-	-	2	-
Mo.	17	11	301	638	378	210	-	-	-	-	-	-
N. Dak.	4	1	4	3	2	2	-	-	-	-	-	-
S. Dak.	1	2	3	9	1	1	-	-	-	-	-	-
Nebr.	3	4	34	48	44	20	-	-	-	-	-	-
Kans.	4	8	107	55	24	16	1	2	-	-	2	-
S. ATLANTIC	288	246	1,434	1,775	1,258	1,055	-	4	-	-	4	20
Del.	-	-	-	2	-	1	-	-	-	-	-	-
Md.	74	67	199	290	113	144	U	-	U	-	-	-
D.C.	-	5	25	58	29	25	-	-	-	-	-	-
Va.	37	20	150	170	156	97	-	2	-	-	2	18
W. Va.	9	7	55	40	19	23	-	-	-	-	-	-
N.C.	23	35	135	156	241	212	-	-	-	-	-	-
S.C.	15	6	83	46	23	63	-	-	-	-	-	-
Ga.	70	67	289	449	220	149	-	-	-	-	-	-
Fla.	60	39	498	564	457	341	-	2	-	-	2	2
E.S. CENTRAL	49	66	376	387	438	454	-	-	-	-	-	2
Ky.	12	8	47	66	73	46	-	-	-	-	-	2
Tenn.	24	37	138	147	206	207	-	-	-	-	-	-
Ala.	12	18	54	55	54	85	-	-	-	-	-	-
Miss.	1	3	137	119	105	116	-	-	-	-	-	-
W.S. CENTRAL	58	61	2,198	2,934	705	1,092	-	-	-	-	-	12
Ark.	2	2	112	71	78	83	-	-	-	-	-	5
La.	11	15	58	212	91	168	-	-	-	-	-	-
Okla.	43	40	253	487	155	145	-	-	-	-	-	-
Tex.	2	4	1,775	2,164	381	696	-	-	-	-	-	7
MOUNTAIN	114	104	978	1,194	550	545	-	12	-	1	13	2
Mont.	1	3	7	17	6	17	-	-	-	-	-	-
Idaho	4	1	40	43	8	29	-	-	-	-	-	-
Wyo.	1	1	45	8	38	14	-	-	-	-	-	-
Colo.	21	14	206	212	110	95	-	2	-	1	3	-
N. Mex.	23	18	70	50	110	174	-	-	-	-	-	-
Ariz.	47	54	470	663	203	130	-	-	-	-	-	1
Utah	11	9	62	60	27	34	-	3	-	-	3	-
Nev.	6	4	78	141	48	52	-	7	-	-	7	1
PACIFIC	139	118	3,191	3,955	1,207	1,384	-	16	-	6	22	37
Wash.	7	8	268	381	111	75	-	2	-	1	3	5
Oreg.	29	38	177	236	120	111	-	-	-	-	-	12
Calif.	33	53	2,722	3,302	955	1,167	-	13	-	2	15	17
Alaska	45	9	11	13	10	16	-	1	-	-	1	-
Hawaii	25	10	13	23	11	15	-	-	-	3	3	3
Guam	-	-	-	1	-	4	U	-	U	-	-	1
P.R.	4	2	228	340	257	239	-	-	-	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U	U	U	U	U

N: Not notifiable. U: Unavailable. - : No reported cases.

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

†Of 240 cases among children aged <5 years, serotype was reported for 103 and of those, 23 were type b.

TABLE III. (Cont'd) Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending December 9, 2000, and December 11, 1999 (49th Week)

	Meningococcal Disease		Mumps			Pertussis			Rubella		
Reporting Area	Cum. 2000	Cum. 1999	2000	Cum. 2000	Cum. 1999	2000	Cum. 2000	Cum. 1999	2000	Cum. 2000	Cum. 1999
UNITED STATES	1,921	2,202	3	303	352	88	6,210	6,223	1	151	247
NEW ENGLAND	121	106	-	4	9	6	1,502	828	-	13	7
Maine	8	5	-	-	-	-	45	-	-	-	-
N.H.	12	12	-	-	2	-	125	95	-	2	-
Vt.	3	5	-	-	1	3	238	76	-	-	-
Mass.	71	61	-	1	4	-	1,029	592	-	9	7
R.I.	9	7	-	1	2	3	20	33	-	1	-
Conn.	18	16	-	2	-	-	45	32	-	1	-
MID. ATLANTIC	182	216	1	24	44	17	614	979	-	9	35
Upstate N.Y.	64	67	1	11	12	10	311	723	-	2	21
N.Y. City	35	55	-	4	12	-	51	60	-	7	7
N.J.	41	50	-	3	2	7	42	27	-	-	4
Pa.	42	44	-	6	18	-	210	169	-	-	3
E.N. CENTRAL	334	389	-	30	47	11	714	615	-	1	2
Ohio	91	128	-	7	18	-	321	268	-	-	-
Ind.	44	61	-	1	5	-	111	75	-	-	1
Ill.	72	104	-	6	11	-	78	94	-	1	1
Mich.	101	60	-	16	9	11	122	65	-	-	-
Wis.	26	36	-	-	4	-	82	113	-	-	-
W.N. CENTRAL	157	216	-	18	13	5	567	480	-	3	130
Minn.	21	48	-	-	1	4	351	226	-	1	5
Iowa	34	37	-	7	7	-	55	92	-	-	30
Mo.	76	86	-	4	1	-	77	72	-	1	2
N. Dak.	2	4	-	-	1	1	7	18	-	-	-
S. Dak.	6	11	-	-	-	-	7	7	-	-	-
Nebr.	8	10	-	4	-	-	32	9	-	1	92
Kans.	10	20	-	3	3	-	38	56	-	-	1
S. ATLANTIC	301	375	-	46	49	10	483	418	1	95	35
Del.	1	10	-	-	-	-	9	5	-	1	-
Md.	26	53	U	10	6	U	106	118	U	-	1
D.C.	-	4	-	-	2	-	3	1	-	-	-
Va.	40	54	-	10	10	5	111	51	-	-	-
W. Va.	12	8	-	-	-	-	1	4	-	-	-
N.C.	36	46	-	7	8	2	110	96	-	82	34
S.C.	26	43	-	11	5	3	39	17	1	10	-
Ga.	47	59	-	2	4	-	40	40	-	-	-
Fla.	113	98	-	6	14	-	64	86	-	2	-
E.S. CENTRAL	124	152	-	7	14	1	105	108	-	5	2
Ky.	26	33	-	1	-	1	54	42	-	1	-
Tenn.	53	60	-	2	-	-	31	42	-	1	-
Ala.	32	36	-	2	10	-	19	21	-	3	2
Miss.	13	23	-	2	4	-	1	3	-	-	-
W.S. CENTRAL	129	205	1	31	45	5	335	214	-	6	15
Ark.	14	35	-	5	-	1	36	25	-	-	5
La.	35	65	-	4	11	-	12	9	-	1	-
Okla.	28	34	-	-	3	-	40	40	-	-	1
Tex.	52	71	1	22	31	4	247	140	-	5	9
MOUNTAIN	161	135	1	26	26	24	782	758	-	2	16
Mont.	6	4	-	1	-	-	35	2	-	-	-
Idaho	7	12	-	1	3	3	64	144	-	-	-
Wyo.	3	5	-	4	-	-	6	2	-	-	-
Colo.	34	35	-	2	6	7	457	281	-	1	1
N. Mex.	12	14	-	1	N	3	88	147	-	-	-
Ariz.	87	41	-	4	8	5	87	113	-	1	13
Utah	8	16	1	7	4	6	30	57	-	-	1
Nev.	4	8	-	6	5	-	15	12	-	-	1
PACIFIC	412	408	-	117	105	9	1,108	1,823	-	17	5
Wash.	59	63	-	11	2	-	395	638	-	7	-
Oreg.	75	76	N	N	N	-	113	59	-	-	-
Calif.	261	255	-	85	87	9	546	1,072	-	10	5
Alaska	9	7	-	7	3	-	22	5	-	-	-
Hawaii	8	7	-	14	13	-	32	49	-	-	-
Guam	-	1	U	-	3	U	-	2	U	-	-
P.R.	9	13	-	-	-	-	6	25	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U	U	U	U

N: Not notifiable. U: Unavailable. - : No reported cases.

TABLE IV. Deaths in 122 U.S. cities,* week ending December 9, 2000 (49th Week)

Reporting Area	All Causes, By Age (Years): All Ages	≥65	45-64	25-44	1-24	<1	P&I† Total
NEW ENGLAND	477	355	98	14	6	4	56
Boston, Mass.	160	111	37	6	4	2	15
Bridgeport, Conn.	24	15	6	2	-	1	3
Cambridge, Mass.	17	14	3	-	-	-	3
Fall River, Mass.	30	26	4	-	-	-	3
Hartford, Conn.	U	U	U	U	U	U	U
Lowell, Mass.	31	26	5	-	-	-	8
Lynn, Mass.	19	15	3	1	-	-	4
New Bedford, Mass.	40	31	7	2	-	-	3
New Haven, Conn.	38	26	12	-	-	-	3
Providence, R.I.	U	U	U	U	U	U	U
Somerville, Mass.	3	3	-	-	-	-	-
Springfield, Mass.	39	28	10	-	1	-	5
Waterbury, Conn.	29	23	4	1	-	1	6
Worcester, Mass.	47	37	7	2	1	-	3
MID. ATLANTIC	2,527	1,792	478	168	39	49	126
Albany, N.Y.	53	41	10	-	1	1	8
Allentown, Pa.	22	19	3	-	-	-	-
Buffalo, N.Y.	115	87	17	6	1	4	11
Camden, N.J.	41	24	12	3	1	1	2
Elizabeth, N.J.	27	20	5	-	1	1	-
Erie, Pa.§	67	51	10	4	1	1	4
Jersey City, N.J.	48	37	7	2	-	2	-
New York City, N.Y.	1,227	862	243	92	11	19	49
Newark, N.J.	64	33	16	7	3	4	-
Paterson, N.J.	23	15	6	2	-	-	1
Philadelphia, Pa.	413	278	79	37	11	8	19
Pittsburgh, Pa.§	47	32	8	4	1	2	1
Reading, Pa.	38	33	2	-	2	1	2
Rochester, N.Y.	148	105	32	5	3	3	12
Schenectady, N.Y.	28	23	4	-	1	-	2
Scranton, Pa.§	46	37	9	-	-	-	3
Syracuse, N.Y.	95	75	11	6	1	2	8
Trenton, N.J.	2	1	1	-	-	-	2
Utica, N.Y.	23	19	3	-	1	-	2
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,011	1,380	386	138	56	50	155
Akron, Ohio	53	39	12	2	-	-	4
Canton, Ohio	39	30	6	2	-	1	10
Chicago, Ill.	430	250	104	45	15	15	27
Cincinnati, Ohio	108	71	17	9	5	6	10
Cleveland, Ohio	147	108	27	7	3	2	9
Columbus, Ohio	209	151	46	7	3	2	16
Dayton, Ohio	139	102	23	9	3	2	8
Detroit, Mich.	202	122	44	23	9	4	15
Evansville, Ind.	52	44	4	2	1	1	4
Fort Wayne, Ind.	59	49	9	1	-	-	6
Gary, Ind.	26	17	4	2	1	2	1
Grand Rapids, Mich.	36	32	3	1	-	-	6
Indianapolis, Ind.	U	U	U	U	U	U	U
Lansing, Mich.	37	33	3	-	1	-	3
Milwaukee, Wis.	127	84	23	9	4	7	11
Peoria, Ill.	40	28	7	3	1	1	1
Rockford, Ill.	63	49	8	2	1	3	3
South Bend, Ind.	49	33	8	3	3	2	2
Toledo, Ohio	121	83	28	7	2	1	15
Youngstown, Ohio	74	55	10	4	4	1	4
W.N. CENTRAL	950	656	170	65	28	30	79
Des Moines, Iowa	66	49	13	2	1	1	8
Duluth, Minn.	31	26	3	-	-	2	3
Kansas City, Kans.	39	27	5	3	3	1	5
Kansas City, Mo.	87	53	16	11	4	3	2
Lincoln, Nebr.	35	28	4	1	-	2	3
Minneapolis, Minn.	257	183	42	17	8	6	27
Omaha, Nebr.	115	81	21	10	2	1	10
St. Louis, Mo.	120	67	30	11	3	9	7
St. Paul, Minn.	108	90	14	3	1	-	11
Wichita, Kans.	92	52	22	7	6	5	3
S. ATLANTIC	1,319	888	264	108	28	31	96
Atlanta, Ga.	129	90	22	10	4	3	6
Baltimore, Md.	284	169	69	33	7	6	18
Charlotte, N.C.	144	95	31	10	-	8	14
Jacksonville, Fla.	163	99	39	15	4	6	7
Miami, Fla.	102	70	19	8	3	2	12
Norfolk, Va.	48	36	8	1	3	-	2
Richmond, Va.	77	51	16	6	2	2	8
Savannah, Ga.	61	47	5	6	2	1	6
St. Petersburg, Fla.	62	49	10	3	-	-	3
Tampa, Fla.	222	155	45	16	3	3	20
Washington, D.C.	U	U	U	U	U	U	U
Wilmington, Del.	27	27	-	-	-	-	-
E.S. CENTRAL	717	491	138	54	20	14	55
Birmingham, Ala.	204	138	34	19	6	7	20
Chattanooga, Tenn.	93	64	21	4	3	1	3
Knoxville, Tenn.	U	U	U	U	U	U	U
Lexington, Ky.	66	47	10	5	2	2	5
Memphis, Tenn.	218	151	41	16	7	3	14
Mobile, Ala.	101	66	25	7	2	1	6
Montgomery, Ala.	35	25	7	3	-	-	7
Nashville, Tenn.	U	U	U	U	U	U	U
W.S. CENTRAL	1,769	1,165	336	181	56	31	107
Austin, Tex.	94	73	9	8	1	3	7
Baton Rouge, La.	132	81	28	16	6	1	3
Corpus Christi, Tex.	70	52	12	4	1	1	2
Dallas, Tex.	245	155	52	29	5	4	21
El Paso, Tex.	109	79	22	7	1	-	6
Ft. Worth, Tex.	116	87	20	7	1	1	1
Houston, Tex.	493	275	96	77	33	12	29
Little Rock, Ark.	75	49	18	7	-	1	5
New Orleans, La.	U	U	U	U	U	U	U
San Antonio, Tex.	266	191	49	14	7	5	19
Shreveport, La.	24	16	3	3	1	1	3
Tulsa, Okla.	145	107	27	9	-	2	11
MOUNTAIN	1,071	768	193	71	25	12	88
Albuquerque, N.M.	118	88	17	10	2	1	10
Boise, Idaho	38	32	4	1	1	-	5
Colo. Springs, Colo.	65	43	11	3	6	2	3
Denver, Colo.	106	78	17	7	3	1	8
Las Vegas, Nev.	200	142	42	12	2	1	16
Ogden, Utah	32	28	3	-	1	-	1
Phoenix, Ariz.	169	102	41	17	4	4	20
Pueblo, Colo.	32	28	3	1	-	-	1
Salt Lake City, Utah	137	101	19	9	5	3	17
Tucson, Ariz.	174	126	36	11	1	-	7
PACIFIC	1,542	1,116	274	89	30	28	134
Berkeley, Calif.	29	19	8	1	-	1	3
Fresno, Calif.	126	93	25	6	1	1	4
Glendale, Calif.	U	U	U	U	U	U	U
Honolulu, Hawaii	57	47	8	1	-	1	6
Long Beach, Calif.	73	59	11	3	-	-	8
Los Angeles, Calif.	U	U	U	U	U	U	U
Pasadena, Calif.	26	19	7	-	-	-	2
Portland, Oreg.	171	126	26	9	4	6	19
Sacramento, Calif.	198	137	37	18	5	1	16
San Diego, Calif.	182	138	27	7	4	4	14
San Francisco, Calif.	145	99	29	12	2	3	23
San Jose, Calif.	229	164	46	8	8	3	25
Santa Cruz, Calif.	U	U	U	U	U	U	U
Seattle, Wash.	128	84	24	11	3	6	8
Spokane, Wash.	64	47	11	2	2	2	3
Tacoma, Wash.	114	84	15	11	1	-	3
TOTAL	12,383¶	8,611	2,337	888	288	249	896

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. 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.

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