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Trends in Sexual Risk Behaviors Among High School Students — United States, 1991–1997

Each year, approximately three million cases of sexually transmitted diseases (STDs) occur among teenagers (*1*), and approximately one million become pregnant (*2*). Human immunodeficiency virus (HIV) infection is the sixth leading cause of death among persons aged 15–24 years in the United States (*3*). Unprotected sexual intercourse and multiple sex partners place young persons at risk for HIV infection, other STDs, and pregnancy. To determine trends in sexual risk behaviors among high school students, CDC analyzed data from the Youth Risk Behavior Survey (YRBS) for the years 1991, 1993, 1995, and 1997. This report summarizes the results of this analysis, which indicate that, from 1991 to 1997, the percentage of U.S. high school students who had ever had sexual intercourse decreased, and the prevalence of condom use among currently sexually active students increased.

The YRBS, a component of CDC's Youth Risk Behavior Surveillance System, measures the prevalence of health-risk behaviors among adolescents through representative national, state, and local surveys conducted biennially. The 1991, 1993, 1995, and 1997 national surveys used independent, three-stage cluster sampling to obtain representative cross-sectional samples of students in grades 9–12 in the 50 states and the District of Columbia. In 1991, 1993, 1995, and 1997, the sample sizes were 12,272, 16,296, 10,904, and 16,262, respectively; school response rates were 75%, 78%, 70%, and 79%, respectively; student response rates were 90%, 90%, 86%, and 87%, respectively; and overall response rates were 68%, 70%, 60%, and 69%, respectively.

For each of the four cross-sectional surveys, students completed a self-administered questionnaire that included questions about sexual intercourse, number of sex partners, and condom use. The wording of these questions was identical in each biennial survey. Sexual experience was defined as ever having had sexual intercourse, multiple sex partners as having had four or more sex partners during one's lifetime, current sexual activity as having had sexual intercourse during the 3 months preceding the survey, and condom use as having used a condom at last sexual intercourse among currently sexually active students. Data are presented only for non-Hispanic black, non-Hispanic white, and Hispanic students because the numbers of students from other racial/ethnic groups were too small for meaningful analysis.

Data were weighted to provide national estimates, and SUDAAN was used to calculate 95% confidence intervals and to conduct trend analyses. The relative percent

Sexual Risk Behaviors — Continued

change in behavior from 1991 to 1997 was calculated as the 1997 prevalence minus the 1991 prevalence divided by the 1991 prevalence and multiplied by 100. Secular trends were analyzed by using logistic regression analyses that controlled for sex, grade, and race/ethnicity and simultaneously assessed linear, higher order (i.e., quadratic and cubic), and overall time effects. Additional logistic regression models included significant time effects and their interactions with sex, grade, and race/ethnicity. For interactions that were significant ($p<0.05$), posthoc analyses were used to examine subgroup differences.

Compared with 1991, the prevalence of sexual experience in 1997 decreased 11%. Logistic regression analysis indicated a significant linear decrease overall and among male students and white and black students ($p\leq0.01$; Table 1). Among male students, sexual experience decreased 15% (from 57.4% to 48.8%); sexual experience among female students did not show a significant linear decrease. Sexual experience decreased 13% (from 50.0% to 43.6%) among white students and 11% (from 81.4% to 72.6%) among black students; sexual experience among Hispanic students did not show a significant linear decrease.

The prevalence of multiple sex partners decreased significantly overall (14%) (from 18.7% to 16.0%) and among male students ($p<0.01$; Table 1). The prevalence of multiple sex partners among male students decreased 25% (from 23.4% to 17.6%); multiple sex partners among female students did not show a significant linear decrease. The overall trend did not differ among grade or racial/ethnic subgroups.

The proportion of students who reported current sexual activity did not change significantly over time. Among currently sexually active students, condom use increased 23%, a significant linear increase ($p\leq0.001$; Table 1). The overall trend in condom use did not differ among sex, grade, or racial/ethnic subgroups.

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Editorial Note: The findings in this report indicate that fewer high school students are engaging in behaviors that place them at risk for HIV infection, other STDs, and pregnancy. The decrease in sexual experience represents a reversal of the increasing trend in sexual intercourse rates among adolescents that occurred during the 1970s and 1980s (*4*).

These survey findings are consistent with other national data that have shown stable rates of sexual experience and increasing use of condoms among adolescents during the 1990s (*4,5*). These behavioral changes also are consistent with recent reports describing national decreases in related health outcomes among adolescents. During 1993–1996, gonorrhea rates decreased 35% among males and 11% among females aged 15–19 years (*6*). During 1992–1995, pregnancy rates among females aged 15–19 years declined in all 43 states with available data (*7*). The decrease in sexual risk behaviors among high school students during 1991–1997 also corresponds to an increase in the percentage of high school students who received HIV/AIDS education in school (from 83.3% in 1991 to 91.5% in 1997) (CDC, unpublished data, 1998).

The findings in this report are subject to at least three limitations. First, these data apply only to adolescents who attend high school. In 1996, 5% of persons aged 14–17 years were not enrolled in school (*8*). These adolescents are more likely to be

Sexual Risk Behaviors — Continued

TABLE 1. Percentage of high school students who reported sexual risk behaviors, by sex, grade, race/ethnicity, and survey year — United States, Youth Risk Behavior Survey, 1991, 1993, 1995, 1997

	Survey year	Ever had sexual intercourse		Four or more sex partners during lifetime		Currently sexually active*		Condom use during last sexual intercourse†	
		%	(95% CI§)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Sex									
Male	1991	57.4	(±4.1)	23.4	(±3.0)	36.8	(±3.4)	54.5	(± 3.8)
	1993	55.6	(±3.5)	22.3	(±2.7)	37.5	(±3.0)	59.2	(± 3.8)
	1995	54.0	(±4.7)	20.9	(±2.6)	35.5	(±3.5)	60.5	(± 4.3)
	1997	48.8	(±3.4)	17.6	(±1.5)	33.4	(±2.6)	62.5	(± 2.8)
Female	1991	50.8	(±4.0)	13.8	(±1.8)	38.2	(±3.4)	38.0	(± 4.3)
	1993	50.2	(±2.5)	15.0	(±1.9)	37.5	(±1.8)	46.0	(± 2.8)
	1995	52.1	(±5.0)	14.4	(±3.5)	40.4	(±4.2)	48.6	(± 5.2)
	1997	47.7	(±3.7)	14.1	(±2.0)	36.5	(±2.7)	50.8	(± 3.0)
Grade									
9	1991	39.0	(±5.0)	12.5	(±2.9)	22.4	(±3.9)	53.3	(± 6.2)
	1993	37.7	(±4.2)	10.9	(±2.0)	24.8	(±3.2)	61.6	(± 5.7)
	1995	36.9	(±5.9)	12.9	(±3.0)	23.6	(±4.0)	62.9	(± 5.5)
	1997	38.0	(±3.8)	12.2	(±2.5)	24.2	(±3.3)	58.8	(± 5.6)
10	1991	48.2	(±5.7)	15.1	(±2.8)	33.2	(±4.6)	46.3	(± 4.7)
	1993	46.1	(±3.6)	15.9	(±2.0)	30.1	(±3.0)	54.7	(± 4.5)
	1995	48.0	(±5.1)	15.6	(±2.0)	33.7	(±3.1)	59.7	(± 4.6)
	1997	42.5	(±4.3)	13.8	(±2.7)	29.2	(±2.9)	58.9	(± 3.6)
11	1991	62.4	(±3.2)	22.1	(±3.6)	43.3	(±3.6)	48.7	(± 5.8)
	1993	57.5	(±3.5)	19.9	(±3.1)	40.0	(±3.6)	55.3	(± 3.0)
	1995	58.6	(±5.0)	19.0	(±3.7)	42.4	(±4.4)	52.3	(± 6.2)
	1997	49.7	(±5.2)	16.7	(±2.9)	37.8	(±4.8)	60.1	(± 5.2)
12	1991	66.7	(±4.4)	25.0	(±4.0)	50.6	(±4.5)	41.4	(± 3.6)
	1993	68.3	(±4.6)	27.0	(±3.6)	53.0	(±3.9)	46.5	(± 4.0)
	1995	66.4	(±4.0)	22.9	(±3.5)	49.7	(±3.9)	49.5	(± 4.4)
	1997	60.9	(±6.5)	20.6	(±3.5)	46.0	(±5.0)	52.4	(± 3.5)
Race/Ethnicity¶									
Non-Hispanic white	1991	50.0	(±3.2)	14.7	(±1.8)	33.9	(±2.8)	46.5	(± 4.6)
	1993	48.4	(±2.8)	14.3	(±2.1)	34.0	(±2.1)	52.3	(± 3.9)
	1995	48.9	(±5.0)	14.2	(±2.4)	34.8	(±3.9)	52.5	(± 4.0)
	1997	43.6	(±4.2)	11.6	(±1.5)	32.0	(±3.1)	55.8	(± 2.0)
Non-Hispanic black	1991	81.4	(±3.2)	43.1	(±3.5)	59.3	(±3.8)	48.0	(± 3.8)
	1993	79.7	(±3.2)	42.7	(±3.8)	59.1	(±4.4)	56.5	(± 3.8)
	1995	73.4	(±4.5)	35.6	(±4.4)	54.2	(±4.7)	66.1	(± 4.8)
	1997	72.6	(±2.8)	38.5	(±3.6)	53.6	(±3.2)	64.0	(± 2.8)
Hispanic	1991	53.1	(±3.5)	16.8	(±2.6)	37.0	(±3.6)	37.4	(± 6.2)
	1993	56.0	(±4.1)	18.6	(±3.1)	39.4	(±3.7)	46.1	(± 4.4)
	1995	57.6	(±8.6)	17.6	(±3.7)	39.3	(±7.1)	44.4	(±11.1)
	1997	52.2	(±3.6)	15.5	(±2.4)	35.4	(±3.9)	48.3	(± 5.6)
Total	**1991**	**54.1**	**(±3.5)**	**18.7**	**(±2.1)**	**37.4**	**(±3.1)**	**46.2**	**(± 3.3)**
	1993	**53.0**	**(±2.7)**	**18.7**	**(±2.0)**	**37.5**	**(±2.1)**	**52.8**	**(± 2.7)**
	1995	**53.1**	**(±4.5)**	**17.8**	**(±2.6)**	**37.9**	**(±3.4)**	**54.4**	**(± 3.5)**
	1997	**48.4**	**(±3.1)**	**16.0**	**(±1.4)**	**34.8**	**(±2.2)**	**56.8**	**(± 1.6)**

* Sexual intercourse during the 3 months preceding the survey.
† Among currently sexually active students.
§ Confidence interval.
¶ Numbers of students in other racial/ethnic groups were too small for meaningful analysis.

Sexual Risk Behaviors — Continued

sexually experienced and to have had multiple sex partners than those adolescents who are enrolled in school (*9*). Second, the extent of underreporting or overreporting cannot be determined, although the survey questions demonstrate good test-retest reliability (*10*). Finally, the survey provides no information on socioeconomic status and other variables that might explain subgroup differences.

The decreases in sexual risk behaviors and the corresponding improvements in reproductive health outcomes among adolescents are the result of broad efforts by parents and families; schools; community-based organizations; the religious community; the media; federal, state, and local government agencies; and adolescents. The dual approach of delaying first intercourse among all adolescents and increasing condom use among those who are sexually active has succeeded in reducing overall risk through improvements in both behaviors. Despite these findings, decreases in sexual experience and multiple sex partners were not found among all subgroups of students, and the percentage of currently sexually active students remained stable. Many adolescents remain at risk for HIV, other STDs, and unintended pregnancy. Expanded efforts are required of families, schools, and other social institutions that affect adolescents to achieve continued reductions in risk.

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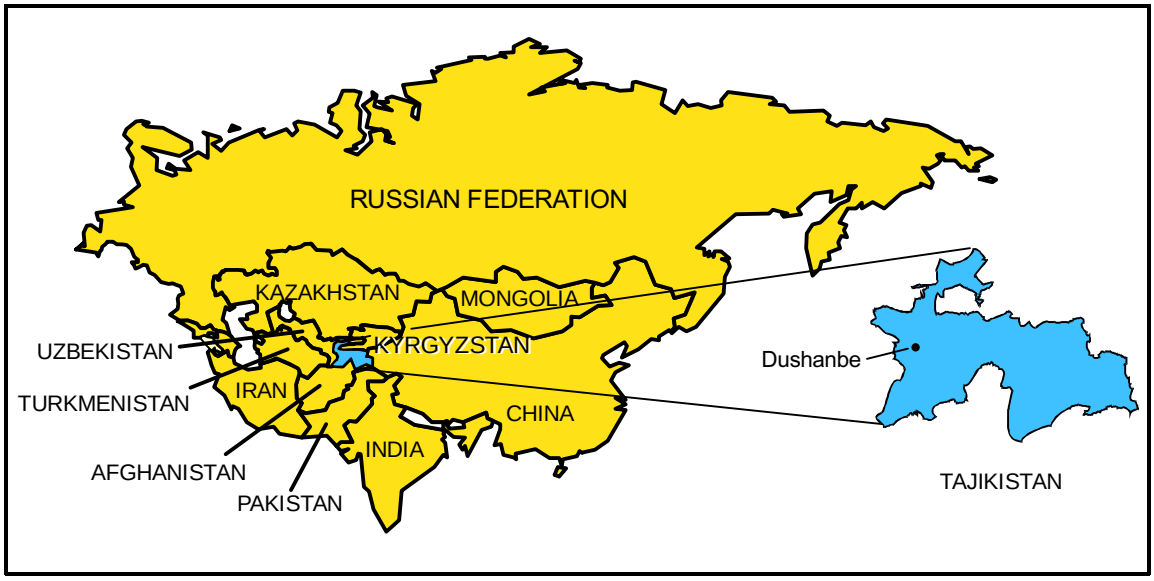
Epidemic Typhoid Fever — Dushanbe, Tajikistan, 1997

Typhoid fever, a severe systemic illness transmitted through food or water, is caused by the bacterium *Salmonella* serotype Typhi (*1*). This report describes a major epidemic of typhoid fever in Dushanbe, Tajikistan (Figure 1), that resulted from contamination of the municipal water system.

In Tajikistan, the Sanitary Epidemiologic Service (SES) maintains records for reportable diseases (*2*). Dushanbe (1997 population: 600,000) residents receive health care through assigned polyclinics; surveillance for reportable diseases is based

Typhoid Fever — Continued

FIGURE 1. Location of Tajikistan



on polyclinic records. A case of typhoid fever is defined as physician diagnosis or isolation of *S.* Typhi from stool, blood, or urine cultures. In February 1997, a sudden increase in the number of typhoid fever cases was identified by SES in Dushanbe, with approximately 2000 cases registered during a 2-week period. In March, the Ministry of Health of Tajikistan requested assistance from CDC. In collaboration with local authorities and nongovernmental partners, CDC reviewed epidemiologic and laboratory surveillance; conducted a case-control study to identify risk factors for infection; and evaluated municipal drinking water quality, water wastage, and health-education campaigns.

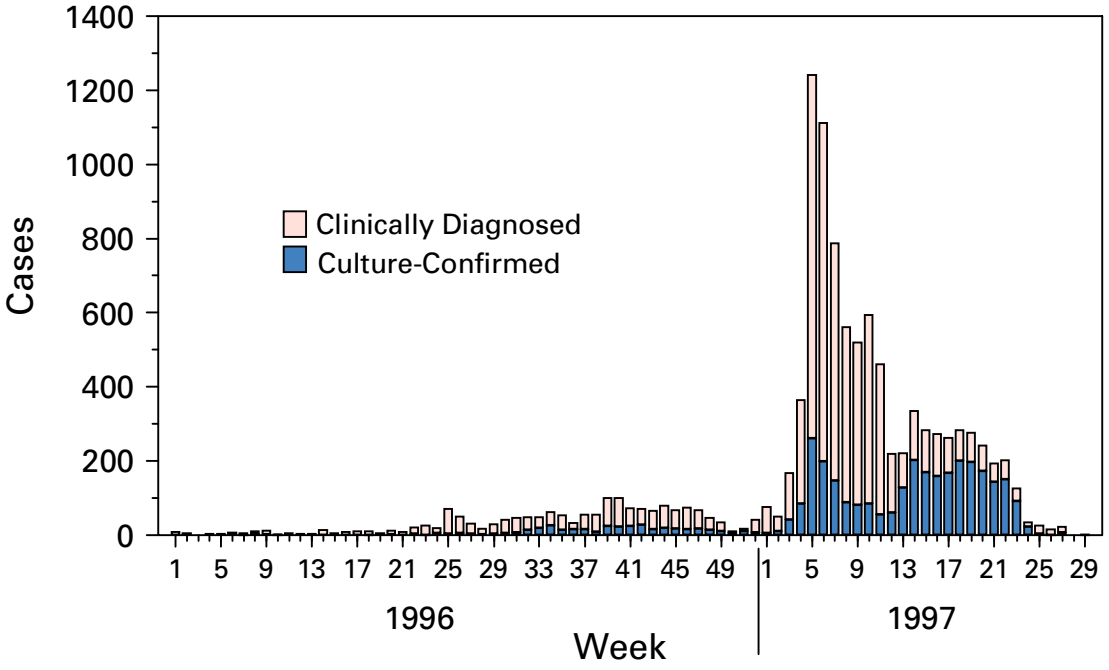
Of 10,766 cases of typhoid fever reported to SES during January 1996–July 1997, 8901 cases (2659 [30%] confirmed) and 95 deaths (case-fatality rate: 1.1%) occurred during January–June 1997 (Figure 2). The monthly typhoid fever incidence peaked at 570 per 100,000 population during February and decreased to 93 in June. Median patient age was 16 years (range <1–80 years); 50% were female.

The microbiology laboratory of City Hospital Number 2 monitored antimicrobial resistance during the epidemic. Of 56 isolates at that hospital from January through March 1997, 52 (93%) were resistant to chloramphenicol, ampicillin, and trimethoprim-sulfamethoxazole, antimicrobial agents used traditionally as first-line therapy for treatment of typhoid fever. On additional testing at CDC, 79% of the isolates also were resistant to nalidixic acid; none were resistant to ciporfloxacin.

CDC and SES conducted a case-control study to determine risk factors for developing typhoid fever. Using a written questionnaire, SES interviewed 43 culture-positive patients or their parents and 123 age-matched, neighborhood controls. Illness was associated with drinking unboiled water in the 30 days before onset (matched odds ratio [MOR]=6.5; 95% confidence interval [CI]=3.0–24.0), obtaining drinking water from a tap outside the home (MOR=9.1; 95% CI=1.6–82.0), and eating food from a street vendor (MOR=2.9; 95% CI=1.4–7.2). On multivariate conditional logistic regression

Typhoid Fever — Continued

FIGURE 2. Cases of typhoid fever*, by week of onset — Dushanbe, Tajikistan, January 1996–July 1997



* n=10,766.

analysis, drinking unboiled water (MOR=9.6; 95% CI=2.7–34.0) and obtaining water from an outside tap (MOR=16.7; 95% CI=2.0–138.0) were significantly associated with illness. Routinely boiling water in one's home for drinking was protective (MOR=0.2; 95% CI=0.05–0.5).

Municipal drinking water in Dushanbe is supplied by two surface water (Varzob River) and two ground water treatment plants. On inspection of the surface water treatment plants in March 1997, sedimentation basins and filters were full of silt, rendering them ineffective at removing solids and biological contaminants from river water. Finished water samples obtained before distribution from both surface treatment plants during March 22–April 7 revealed concentrations of 100–200 colony forming units (CFU) of fecal (thermotolerant) coliform bacteria per 100 mL. Water leaving the treatment plants entered an interconnected distribution system where surface and ground water blended. In the distribution system, the average concentration of fecal coliform bacteria in water, adjusted for the proportion of water supplied by each plant, was approximately 60 CFU per 100 mL. World Health Organization guidelines for potable water require <1 CFU per 100 mL (*3*).

To evaluate further municipal water quality, water samples were collected from taps in randomly selected 1 hectare areas in Dushanbe. Fecal coliform bacteria were detected in 26 of 27 household tap water samples tested (mean=175 CFU per 100 mL; range: 4–>400 CFU per 100 mL). Although water leaving the surface water treatment plants was fecally contaminated, higher colony counts at taps suggested that further contamination occurred within the distribution system. Water distribution pipes were frequently located in open storm channels that also contained wastewater runoff. Low

Typhoid Fever — Continued

water pressure in the distribution system contributed to cross-contamination of drinking water with wastewater. To determine how pressure in the municipal water system could be increased, investigators measured water wastage from open and broken taps and pipes in randomly selected Dushanbe neighborhoods. Average water wastage was estimated to be 1040 liters per person per day.

Chlorination of the municipal water supply ceased in December 1996, when chlorine supplies were exhausted, and resumed in April 1997, after international relief organizations provided chlorine to the water utility. After chlorination resumed, free chlorine residuals were monitored at the treatment plants and in tap water samples at 14 randomly selected sites during June 24–August 15, 1997. Free chlorine residuals in 30% of tap water samples tested remained below the targeted goal of 0.2 mg/L set by the water utility and international relief organizations. Follow-up testing in March 1998 revealed adequate chlorine residuals in tap water throughout the city.

To control the epidemic, local authorities and nongovernmental organizations initiated public information campaigns for water conservation and typhoid fever prevention in June 1997. In August, 200 randomly selected households in Dushanbe were surveyed to assess knowledge, attitudes, and practices regarding these issues. Ninety-one percent of respondents reported having heard or read the campaign messages and having altered some of their behaviors. However, 51% of those surveyed reported they still drank unboiled water because they perceived municipal water to be safe. Repeated surveys indicate that after water conservation campaigns were initiated, water wastage in Dushanbe decreased by approximately half. These savings have enabled Dushanbe's water utility to plan closure of its largest surface water treatment plant, thus providing a larger proportion of the population with water from cleaner and safer groundwater sources.

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Editorial Note: Epidemic typhoid fever emerged in Dushanbe because of contamination of the city's water treatment and distribution systems following the dissolution of the Soviet Union and an ensuing civil war. Through support from the U.S. Agency for International Development (USAID), the International Federation of Red Cross and Red Crescent Societies, and other partners, measures to improve chlorination, repair infrastructure, conserve water, and educate the public have contributed to controlling the epidemic.

During January–March 1998, the incidence of typhoid fever in Dushanbe decreased approximately 90% compared with January–March 1997; however, continued epidemiologic and laboratory surveillance are needed to guide resource allocation, monitor the effectiveness of prevention efforts, and determine appropriate antimicrobial therapy. The judicious use of fluoroquinolones is recommended to treat typhoid fever in Dushanbe. However, patients infected with nalidixic acid-resistant *S.* Typhi who receive short-course therapy with fluoroquinolones may not demonstrate clinical

Typhoid Fever — Continued

recovery and require repeated or alternative retreatment (*4*). In addition, the potential emergence of ciprofloxacin-resistant strains warrants close vigilance.

The control and prevention of typhoid fever and other waterborne epidemic diseases in Dushanbe depends on repairing the water treatment and distribution systems and achieving adequate chlorination of drinking water. Major infrastructure repairs may require years of investment and should be complemented by water conservation efforts and the eventual introduction of a fee-for-use schedule. Reducing water wastage will improve water pressure in the distribution system and decrease the volume of water that needs to be provided and the amount of resources required to treat water.

Until the municipal water supply reliably provides safe drinking water, public education campaigns stressing the importance of boiling all drinking water, conserving municipal water, and promoting basic hygiene measures to prevent the spread of typhoid fever will need to be strengthened. Other central Asian cities have similar economic and infrastructure problems and may be at risk for similar waterborne epidemics. To reduce the risk for similar epidemics in the region, CDC is working with USAID and the governments of the other central Asian republics to evaluate water treatment and distribution systems and enhance surveillance for diseases caused by waterborne pathogens.

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Influenza A — Florida and Tennessee, July–August 1998, and Virologic Surveillance of Influenza, May–August 1998

During July and August 1998, the state departments of health in Florida and Tennessee each reported an outbreak of influenza. The Florida outbreak occurred in July in two residential homes for children; the Tennessee outbreak occurred in August among members of a family that vacationed together. This report summarizes the investigation of these outbreaks, which were caused by influenza type A(H3N2) viruses, and presents information on influenza isolates received by CDC during May–August 1998, 81% of which were influenza A(H3N2).

Florida

In July, an outbreak of influenza occurred in two residential homes for children with cerebral palsy; the residences are served by the same staff. On July 10, a 7-year-old resident of one home developed fever and cough. During the following 2 weeks, in both residences combined influenza-like illness (defined as fever accompanied by cough and or sore throat) developed in 20 (91%) of 22 children and 10 (18%) of 56 staff

Influenza A — Continued

members. Eleven (55%) children were hospitalized; four had pneumonia, including one child who was in the hospital intensive-care unit for 5 days. The average length of hospitalization was 6 days (range: 2–13 days). All ill persons have recovered. Nasopharyngeal swabs were collected from three of the ill children, and all yielded influenza A virus. On analysis at CDC, the three viral isolates were similar antigenically to A/Sydney/05/97(H3N2), the strain that predominated during the 1997–98 influenza season and is included in the 1998–99 influenza vaccine.

During September and October 1997, 17 (85%) of the 20 ill children had received the 1997–98 influenza vaccine, which contained the A/Nanchang/933/94 strain as the H3N2 component (*1*). None of the ill staff or residents had traveled recently outside the 48 contiguous United States.

Tennessee

On August 13, a previously healthy 66-year-old man was admitted to a hospital in Tennessee after 5 days of progressive dyspnea, nonproductive cough, pharyngitis, fever, myalgias, and malaise. On admission, he was hypoxic, and a chest radiograph was suggestive of viral pneumonia. Influenza was considered among the initial diagnostic possibilities, but rapid-antigen test kits for influenza were not available in the hospital laboratory. A nasal washing was obtained on August 12, and influenza A virus was cultured from it on August 18. The isolate was characterized antigenically as A/Sydney/05/97(H3N2)-like at CDC.

On August 1, an 11-year old female relative of this patient returned to the United States after a 2-week visit to Panama. On August 3, she developed fever (104 F [40 C]), headache, myalgias, nonproductive cough, and nonexudative pharyngitis. From August 3 through August 9, she shared a beach house while on vacation with 12 family members; four of the 12, including the hospitalized man, developed similar febrile illnesses during that week. Only the man was hospitalized, and all ill persons have recovered. Two of the five ill persons had received the 1997–98 influenza vaccine.

In addition to this cluster of cases, two relatives who accompanied the 11-year-old on her return from Panama but who did not visit the beach house developed similar symptoms on August 3. None of the ill persons reported recent travel outside of the 48 contiguous United States except to Panama. Other than the two persons who accompanied the child on the plane, none of the family members in Panama visited by the 11-year-old reported any recent illness.

CDC Virologic Surveillance

During May–August 1998, CDC received 52 influenza isolates from U.S. laboratories; 44 were influenza type A viruses and eight were influenza type B viruses. Of the 42 influenza A viruses subtyped, all were influenza A(H3N2), and all were antigenically similar to A/Sydney/05/97. All eight influenza B viruses were antigenically similar to B/Beijing/184/93, which is contained in the 1998–99 influenza vaccine. Of the influenza A(H3N2) isolates, two were collected during a nursing home outbreak in Montana in May, four were collected from the outbreaks in Florida and Tennessee, and 32 were collected during an ongoing outbreak in Alaska and the Yukon Territory (*2,3*). Two influenza A isolates not yet subtyped also were collected during the Alaska and Yukon Territory outbreak. The eight influenza B and the four remaining influenza A(H3N2) viruses were collected from sporadic cases in seven states.

Influenza A — Continued

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Editorial Note: Although sporadic influenza infections occur in the United States throughout the year, outbreaks of influenza have been reported infrequently during the summer and early fall. However, during 1993–1997, nine summer outbreaks of influenza A have been reported to CDC (*1,4–6*).

Influenza must be considered as a potential cause of any outbreak of febrile respiratory illness, even during summer months. Tests for the rapid diagnosis of influenza A and influenza B infections aid in early detection and enable initiation of appropriate control measures and treatment. Although influenza vaccines usually are not available during the summer months, the antiviral medications rimantadine and amantadine are available. These drugs are effective for prophylaxis and for treatment of influenza type A when administered within 48 hours of illness; neither drug is effective against influenza type B viruses (*7*). Use of these drugs and implementation of other outbreak-control measures, such as cohorting of ill persons, should effectively decrease the morbidity associated with influenza outbreaks.

Influenza virus strains associated with summer outbreaks are important indicators of the strains likely to predominate during the fall and winter months. In 1997, a summer outbreak of influenza aboard a cruise ship traveling between New York and Montreal yielded early North American isolates that were A/Sydney/05/97(H3N2)-like. This strain became the predominant circulating influenza virus in the United States during the 1997–98 season, but was not well matched antigenically with the H3N2 component in that year's vaccine (*1,8*).

Summer outbreaks of influenza may become more common with increases in international travel. A 1997 outbreak aboard a cruise ship was associated with viruses from the southern hemisphere, where it was winter and influenza activity was elevated for that hemisphere. In addition, influenza can circulate year-round in the tropics. The investigation of the outbreak in Tennessee suggested that the three family members who traveled from Panama may have had a common exposure in Panama or during the return trip.

The Florida outbreak underscores that particular groups of persons aged <65 years are at high risk for severe complications of influenza, and annual influenza vaccination is recommended (*7*). Although 85% of the children in the Florida outbreak had been vaccinated during the previous year, vaccine coverage among high-risk groups aged <65 years typically is much lower (*9*). Persons aged <65 years and at increased risk for influenza-related complications include those who reside in nursing homes or chronic-care facilities; persons with chronic cardiovascular or pulmonary disorders (including asthma); persons who required medical follow-up or hospitalization during the previous year because of diabetes or other chronic metabolic diseases, renal dysfunction, hemoglobinopathies, or immunosuppression; children and teenagers (aged 6 months–18 years) who are receiving long-term aspirin therapy (and who therefore may be at risk for developing Reye syndrome after influenza); and women who will be in the second or third trimester of pregnancy during the influenza season. Because

Influenza A — Continued

persons who are clinically or subclinically infected can transmit influenza virus to high-risk persons, vaccination also is recommended for health-care workers and other persons, including household members in frequent contact with persons at high risk for influenza-related complications (*7*). Influenza vaccine is recommended annually because the protective antibody levels provided by vaccine wane during the year. In addition, continual antigenic drift among influenza viruses frequently results in the circulation of new strains that may not be adequately covered by older vaccine. Both of these factors probably contributed to the high attack rate in the Florida outbreak.

The optimal time for organized influenza vaccination campaigns is October through mid-November; however, beginning in September, health-care providers should offer influenza vaccine to persons at high risk who are seen for routine care or as a result of hospitalization. Because influenza viruses can circulate in the spring, health-care providers should continue to offer influenza vaccine to unvaccinated high-risk persons after influenza activity has been documented in the community (*7*).

Information about influenza surveillance is available through the CDC Voice Information System (recorded message), telephone (888) 232-3228 ([888] CDC-FACT), fax (888) 232-3299 ([888] CDC-FAXX) (document no. 361100), or the Internet at http://www.cdc.gov/ncidod/diseases/flu/weekly.htm. From October through May, the information is updated weekly.

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Acquired Multidrug-Resistant Tuberculosis — Buenaventura, Colombia, 1998

In 1996, the incidence of tuberculosis (TB) in Colombia was 26.5 per 100,000 population, and mortality was 3.4 per 100,000; in comparison, the incidence in Buenaventura, a port town on the Pacific coast, was 90.5 per 100,000, and mortality was 9.4 per 100,000 (*1*). The prevalence of multidrug-resistant tuberculosis (MDR-TB) (i.e., *Mycobacterium tuberculosis* isolates resistant to at least isoniazid [INH] and rifampin [RIF]) was not known because susceptibility testing is not performed routinely, and data on drug resistance for the country have not been collected systematically. During October–November 1997, at the request of the Secretary of Health in Cali, Colombia,

Multidrug-Resistant Tuberculosis — Continued

the International Center for Training and Medical Investigation in Cali performed sputum cultures for *M. tuberculosis* and drug-susceptibility testing on isolates from 18 (75%) of 24 TB patients in Buenaventura who were known to be clinically unresponsive to standard TB treatment. MDR-TB was identified in 12 (67%) of these patients, four of whom subsequently died. In March 1998, the International Center for Training and Medical Investigation and the Secretary of Health of Colombia invited CDC to participate in an investigation of these patients with MDR-TB. This report summarizes the findings of this investigation, which indicated that inconsistencies in treatment may have contributed to this outbreak, and provides recommendations for the prevention and control of MDR-TB in Buenaventura.

A case was defined as laboratory-confirmed MDR-TB in any of the 24 clinically unresponsive TB patients. The median age of the 12 MDR-TB case-patients was 30 years (range: 18–79 years); nine (75%) were men, and all were long-term residents of Buenaventura (median: 29 years; range: 17–80 years). Of the 12, 10 (83%) had no known epidemiologic link to another MDR-TB case. Of seven persons who were tested for human immunodeficiency virus infection, none were positive. Sputum specimens from five case-patients were smear-positive for acid-fast bacilli (AFB).

Clinical charts of all persons with MDR-TB were reviewed for possible factors associated with the development of MDR-TB. All case-patients had received a median of 3.5 years of TB treatment (range: 2–13 years); however, 11 (92%) had treatment interrupted and reinitiated several times. Of the 12 case-patients, 10 had a history of not taking the prescribed anti-TB medications for at least 1 month. One patient had been started on a suboptimal initial treatment regimen instead of the recommended regimen of 4 months of treatment with INH, RIF, pyrazinamide, and streptomycin, followed by 2 months of INH and RIF. Nine patients rema-ning AFB-smear–positive after 4 months had not received the recommended retreatment regimen. Eleven (92%) patients had TB medications improperly added and subtracted to their treatment regimen. Seven (58%) patients had a single drug added to a failing regimen. In addition, three of 10 case-patients with available data did not have sputum specimens obtained after failing to appear for treatment during at least 1 month, and six of nine case-patients with available data did not receive directly observed therapy (DOT). All 12 case-patients experienced at least two instances of incorrect treatment or management of their illness (median: 3.9; range: two–six) based on World Health Organization (WHO) and Colombian treatment protocols.

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Editorial Note: Each year, approximately 8 million new cases and 3 million deaths worldwide are attributable to TB (*2*). Most patients diagnosed with TB harbor drug-susceptible strains of *M. tuberculosis* that respond well to a short-course (6–8 months) multidrug chemotherapy regimen recommended by WHO (*3*). Although the cure rate is >80% in most countries where the regimen has been successfully applied and its administration appropriately supervised (*3*), the worldwide emergence of MDR-TB threatens global TB-control efforts (*4*).

Multidrug-Resistant Tuberculosis — Continued

Treatment history is the most significant factor associated with the appearance of drug-resistant TB (*5*). This report identified specific aspects of treatment and patient management that contributed to acquired drug resistance in Buenaventura. The most common factors in this study were failure to start the WHO-recommended retreatment regimen in patients who were unresponsive to the initial regimen and inappropriate additions or subtractions of medications during treatment. *M. tuberculosis* organisms also may have acquired drug resistance as a result of patient factors (e.g., nonadherence with treatment) and programmatic factors (e.g., lack of DOT) (*4*). Many patients had treatment interrupted and reinitiated in part because, in 1996, the TB-control program was decentralized from a hospital-based system to a health-post–based system.

The findings in this report are subject to at least three limitations. First, details of the initial TB diagnosis and treatment episode were not available for all patients. Second, clinical records and specimens were not available to ascertain whether a patient was originally infected with a drug-resistant strain or the strain acquired the drug resistance during therapy. Third, MDR-TB case-patients described in this report may not be representative of all MDR-TB patients in Buenaventura.

The findings from this investigation have led to improvements in TB-control efforts in Buenaventura in the context of a decentralized health system. Structural changes in the overall TB program have been implemented, including the designation of personnel to direct the program and the installation of mechanisms to monitor and evaluate TB services. Training for physicians and health-care workers in the management of TB and MDR-TB has been initiated. To improve patient adherence to TB treatment, the use of WHO-recommended DOT was initiated for both MDR-TB patients and other TB patients. Finally, new treatment regimens have been designed for each patient, based on drug-susceptibility testing performed by the International Center for Training and Medical Investigation.

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Notice to Readers

Report on Survey Regarding Collection and Use of Cause of Injury Data by States

In October 1997, the Injury Control and Emergency Health Services Section of the American Public Health Association (APHA) conducted a survey of all 50 states,

Notices to Readers — Continued

the District of Columbia (DC), and Puerto Rico to assess the availability of external cause-of-injury data in statewide hospital discharge data systems (HDDS), hospital emergency department data systems (HEDDS), and other ambulatory care data systems. The report on the findings of the analysis, *How States are Collecting and Using Cause of Injury Data* (*1*), includes recommendations for improving the quality and availability of statewide injury-related data for injury-prevention activities.

The findings in the survey indicated that 1) 36 states and DC routinely collect external cause-of-injury data in their HDDS, and 23 of the states have laws or mandates requiring external cause-of-injury coding; and 2) 11 states have developed the capacity to provide external cause-of-injury data on injury-related visits in their statewide HEDDS, and nine of those states have laws or mandates requiring external cause-of-injury coding. A coordinated effort among states is needed to develop standard methods for collecting, coding, analyzing, and presenting injury-related data from statewide data systems. Timely dissemination of uniform, population-based injury morbidity data to hospital administrators, public health professionals, and policy makers will enhance their usefulness for injury-prevention efforts.

This survey was funded by the APHA through a mini-grant to the Trauma Foundation at San Francisco General Hospital and was conducted in partnership with CDC's National Center for Injury Prevention and Control (NCIPC) and National Center for Health Statistics. A copy of the report is available from the Office of Statistics and Programming, NCIPC, telephone (770) 488-4656, e-mail jmc1@cdc.gov, or from the Trauma Foundation site on the World-Wide Web, http://www.traumafdn.org/injuries/apha4.html.

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Notice to Readers

Satellite Broadcast on HIV Prevention

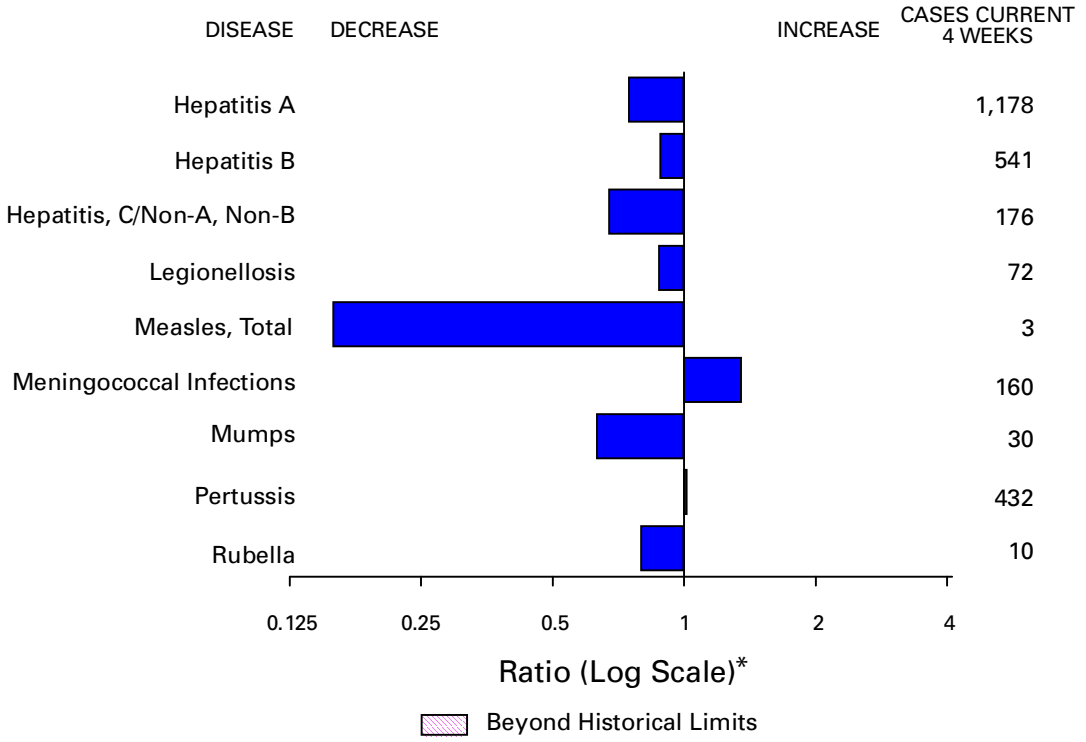
"HIV Prevention Update," a satellite broadcast, will be held Thursday, October 22, 1998, from 1 p.m. to 3:30 p.m. eastern daylight time. Cosponsors are CDC and the Public Health Training Network. This forum, the fourth in the "HIV Prevention Update" series, will focus on human immunodeficiency virus (HIV) prevention for persons who are HIV-infected. This broadcast is designed for staff and volunteers working in HIV and sexually transmitted disease prevention in health departments, community-based organizations, community-planning groups, education, and administration and for health-care providers in direct contact with persons who are HIV-infected or at risk for HIV infection.

Speakers will discuss the following topics related to persons who are HIV-infected: the need to focus on this population; the range of services that should be provided; the challenges of being HIV-infected; local, state, territorial, and federal activities; findings from behavioral research; and the cost-effectiveness of HIV prevention in this area.

Notices to Readers — Continued

Viewers are invited to submit questions before, during, or after the broadcast. Additional information is available through CDC's fax information system, telephone (888) 232-3299 (CDC-FAXX), by requesting document number 130021, and from the World-Wide Web site, http://www.cdcnpin.org/broadcast.

FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending September 12, 1998, with historical data — United States



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

TABLE I. Summary — provisional cases of selected notifiable diseases, United States, cumulative, week ending September 12, 1998 (36th Week)

	Cum. 1998		Cum. 1998
Anthrax	-	Plague	6
Brucellosis	35	Poliomyelitis, paralytic	1
Cholera	6	Psittacosis	29
Congenital rubella syndrome	3	Rabies, human	-
Cryptosporidiosis*	2,285	Rocky Mountain spotted fever (RMSF)	205
Diphtheria	2	Streptococcal disease, invasive Group A	1,625
Encephalitis: California*	46	Streptococcal toxic-shock syndrome*	40
eastern equine*	3	Syphilis, congenital¶	268
St. Louis*	2	Tetanus	29
western equine*	-	Toxic-shock syndrome	88
Hansen Disease	77	Trichinosis	9
Hantavirus pulmonary syndrome*†	14	Typhoid fever	231
Hemolytic uremic syndrome, post-diarrheal*	48	Yellow fever	-
HIV infection, pediatric*§	164		

-:no reported cases
*Not notifiable in all states.
† Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases (NCID).
§ Updated monthly to the Division of HIV/AIDS Prevention–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention (NCHSTP), last update August 30, 1998.
¶ Updated from reports to the Division of STD Prevention, NCHSTP.

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending September 12, 1998, and September 6, 1997 (36th Week)

Reporting Area	AIDS		Chlamydia		*Escherichia coli* O157:H7		Gonorrhea		Hepatitis C/NA,NB	
					NETSS†	PHLIS§				
	Cum. 1998*	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1998	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997
UNITED STATES	31,523	40,204	364,690	310,234	1,914	1,154	219,943	196,540	2,649	2,452
NEW ENGLAND	1,194	1,732	13,375	11,964	245	191	3,852	4,040	37	46
Maine	22	42	683	656	29	-	49	38	-	-
N.H.	28	26	647	541	33	34	63	71	-	-
Vt.	17	31	288	275	11	7	25	36	-	2
Mass.	604	598	5,747	4,925	115	113	1,484	1,488	34	37
R.I.	88	113	1,603	1,364	11	1	259	315	3	7
Conn.	435	922	4,407	4,203	46	36	1,972	2,092	-	-
MID. ATLANTIC	8,893	12,414	44,301	39,553	201	50	25,299	25,774	278	226
Upstate N.Y.	1,014	1,931	N	N	143	-	3,788	4,384	214	165
N.Y. City	5,005	6,451	23,649	18,608	5	7	10,415	9,351	-	-
N.J.	1,655	2,598	7,566	6,803	53	33	4,852	5,261	-	-
Pa.	1,219	1,434	13,086	14,142	N	10	6,244	6,778	64	61
E.N. CENTRAL	2,276	3,016	60,830	41,294	298	198	42,462	26,751	368	420
Ohio	485	663	17,261	14,849	81	44	10,964	9,734	7	13
Ind.	379	408	4,573	6,258	70	35	2,945	4,185	4	12
Ill.	888	1,176	18,045	U	72	14	14,861	U	24	69
Mich.	390	581	14,106	12,692	75	47	10,761	9,644	333	303
Wis.	134	188	6,845	7,495	N	58	2,931	3,188	-	23
W.N. CENTRAL	599	778	21,209	21,555	294	217	10,618	9,523	222	47
Minn.	119	136	4,230	4,475	120	91	1,552	1,569	8	3
Iowa	51	78	2,063	2,858	76	42	660	756	7	23
Mo.	282	377	8,180	8,177	27	43	6,051	5,074	201	8
N. Dak.	4	10	616	578	10	13	51	39	-	2
S. Dak.	13	7	1,077	850	21	21	172	92	-	-
Nebr.	56	71	1,416	1,495	21	-	502	574	2	2
Kans.	74	99	3,627	3,122	19	7	1,630	1,419	4	9
S. ATLANTIC	7,960	9,668	74,976	64,320	165	102	62,023	63,037	134	159
Del.	104	174	1,721	-	-	2	966	819	-	-
Md.	914	1,167	5,201	4,868	25	12	5,887	7,942	7	4
D.C.	635	717	N	N	1	-	2,518	3,004	-	-
Va.	650	769	8,725	8,039	N	28	5,748	5,313	11	20
W. Va.	60	77	1,832	2,002	7	5	541	639	5	13
N.C.	536	597	15,164	11,669	40	34	13,139	11,437	17	38
S.C.	507	535	12,412	8,579	8	5	7,820	8,075	3	30
Ga.	846	1,161	16,173	11,324	54	-	14,401	13,228	9	-
Fla.	3,708	4,471	13,748	17,839	30	16	11,003	12,580	82	54
E.S. CENTRAL	1,273	1,366	26,980	23,782	82	28	26,359	23,815	145	258
Ky.	195	237	4,374	4,481	22	-	2,511	2,852	16	11
Tenn.	434	570	9,107	8,731	37	24	7,982	7,451	122	172
Ala.	372	334	7,054	5,759	20	2	9,008	8,111	5	7
Miss.	272	225	6,445	4,811	3	2	6,858	5,401	2	68
W.S. CENTRAL	3,799	4,171	52,810	41,314	94	12	30,842	27,538	475	312
Ark.	136	159	2,515	2,030	7	6	1,245	3,303	8	10
La.	654	733	10,379	6,404	4	2	9,006	6,047	24	144
Okla.	224	216	6,853	5,171	12	4	3,748	3,409	8	7
Tex.	2,785	3,063	33,063	27,709	71	-	16,843	14,779	435	151
MOUNTAIN	1,052	1,127	14,637	20,029	252	172	5,592	5,370	294	204
Mont.	20	33	808	717	11	-	29	33	7	15
Idaho	19	37	1,217	1,061	29	7	119	87	87	41
Wyo.	1	13	399	398	51	53	18	40	70	49
Colo.	209	292	10	4,639	50	41	1,577	1,368	20	22
N. Mex.	166	112	2,453	2,628	17	13	607	602	72	37
Ariz.	385	269	7,537	7,369	21	23	2,724	2,437	3	24
Utah	91	93	1,471	1,152	63	21	157	175	21	3
Nev.	161	278	742	2,065	10	14	361	628	14	13
PACIFIC	4,477	5,932	55,572	46,423	283	184	12,896	10,692	696	780
Wash.	303	454	7,361	6,141	59	56	1,273	1,295	15	20
Oreg.	128	222	3,915	3,328	79	81	572	504	5	3
Calif.	3,919	5,170	41,489	34,753	141	35	10,513	8,280	621	639
Alaska	17	42	1,302	1,017	4	-	223	266	1	-
Hawaii	110	44	1,505	1,184	N	12	315	347	54	118
Guam	-	2	201	193	N	-	24	27	-	-
P.R.	1,246	1,381	U	U	6	U	263	415	-	-
V.I.	19	74	N	N	N	U	U	U	U	U
Amer. Samoa	-	-	U	U	N	U	U	U	U	U
C.N.M.I.	-	1	N	N	N	U	25	17	-	2

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

*Updated monthly to the Division of HIV/AIDS Prevention–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention, last update August 30, 1998.

†National Electronic Telecommunications System for Surveillance.

§Public Health Laboratory Information System.

TABLE II. (Cont'd.) Provisional cases of selected notifiable diseases, United States, weeks ending September 12, 1998, and September 6, 1997 (36th Week)

Reporting Area	Legionellosis		Lyme Disease		Malaria		Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal
	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998*	Cum. 1997	Cum. 1998
UNITED STATES	833	623	8,195	7,568	868	1,261	4,943	5,886	9,877	12,160	4,928
NEW ENGLAND	53	54	2,109	2,060	43	67	53	107	319	302	1,012
Maine	1	2	6	8	4	1	1	-	5	17	150
N.H.	3	5	28	17	3	8	1	-	9	10	47
Vt.	4	10	8	6	-	2	4	-	2	4	46
Mass.	26	19	579	256	14	25	34	52	180	166	365
R.I.	10	5	323	219	4	5	1	2	38	26	63
Conn.	9	13	1,165	1,554	18	26	12	53	85	79	341
MID. ATLANTIC	205	119	5,100	4,223	217	375	181	284	1,943	2,153	1,151
Upstate N.Y.	68	32	2,895	1,744	62	52	24	29	243	292	809
N.Y. City	23	13	18	140	97	231	44	63	1,001	1,097	U
N.J.	11	17	808	1,318	34	71	55	115	422	440	142
Pa.	103	57	1,379	1,021	24	21	58	77	277	324	200
E.N. CENTRAL	251	203	80	406	83	119	679	441	826	1,238	105
Ohio	96	79	57	27	9	15	90	152	78	199	47
Ind.	47	30	17	23	10	12	141	111	78	99	9
Ill.	23	16	5	11	22	50	262	U	422	651	11
Mich.	57	49	1	22	37	30	141	93	245	203	29
Wis.	28	29	U	323	5	12	45	85	3	86	9
W.N. CENTRAL	58	36	155	82	67	41	93	129	266	386	524
Minn.	5	1	127	56	39	19	6	15	102	104	95
Iowa	7	9	20	5	7	8	-	6	27	43	119
Mo.	20	6	1	15	10	7	71	81	87	152	19
N. Dak.	-	2	-	-	2	2	-	-	7	8	102
S. Dak.	3	2	-	1	-	-	1	-	14	9	109
Nebr.	16	12	3	2	1	1	4	2	11	14	6
Kans.	7	4	4	3	8	4	11	25	18	56	74
S. ATLANTIC	101	82	553	552	204	218	2,041	2,414	1,403	2,265	1,451
Del.	9	8	12	104	2	4	17	17	U	22	17
Md.	21	14	403	355	61	66	463	667	197	218	340
D.C.	6	3	4	7	14	12	53	82	72	73	-
Va.	16	18	48	37	39	51	109	170	187	220	418
W. Va.	N	N	8	3	1	-	2	3	30	44	61
N.C.	8	11	41	24	16	12	521	605	278	302	136
S.C.	7	3	3	2	5	11	195	269	196	230	104
Ga.	7	-	5	1	25	25	524	381	355	417	223
Fla.	25	25	29	19	41	37	157	220	70	739	152
E.S. CENTRAL	49	41	60	65	22	27	837	1,277	752	908	210
Ky.	23	8	13	12	4	8	77	100	116	122	28
Tenn.	14	24	32	29	11	6	397	544	227	322	109
Ala.	5	2	14	5	5	10	195	323	265	299	71
Miss.	7	7	1	19	2	3	168	310	144	165	2
W.S. CENTRAL	19	12	22	56	18	17	694	872	1,464	1,773	124
Ark.	-	1	6	15	1	4	80	117	86	134	29
La.	2	2	3	2	7	8	298	256	73	158	-
Okla.	8	1	2	12	3	5	62	83	118	151	95
Tex.	9	8	11	27	7	-	254	416	1,187	1,330	-
MOUNTAIN	46	41	12	8	42	58	154	120	285	394	144
Mont.	2	1	-	-	1	2	-	-	16	6	39
Idaho	2	2	3	3	7	-	1	-	8	7	-
Wyo.	1	1	-	1	-	2	1	-	4	2	52
Colo.	12	15	3	-	14	26	8	10	U	62	19
N. Mex.	2	2	4	1	11	8	19	5	42	41	5
Ariz.	10	9	-	1	8	8	119	91	138	175	12
Utah	16	7	-	-	1	3	3	5	43	25	16
Nev.	1	4	2	2	-	9	3	9	34	76	1
PACIFIC	51	35	104	116	172	339	211	242	2,619	2,741	207
Wash.	9	6	6	6	16	17	23	8	152	226	-
Oreg.	-	-	12	16	13	17	5	5	96	113	3
Calif.	40	28	85	94	139	296	181	227	2,224	2,208	182
Alaska	1	-	1	-	1	3	1	1	34	60	22
Hawaii	1	1	-	-	3	6	1	1	113	134	-
Guam	2	-	-	-	1	-	1	3	36	13	-
P.R.	-	-	-	-	-	5	148	169	68	129	39
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.	-	-	-	-	-	-	156	9	73	2	-

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

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

TABLE III. Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending September 12, 1998, and September 6, 1997 (36th Week)

Reporting Area	*H. influenzae*, invasive		Hepatitis (Viral), by type				Measles (Rubeola)					
			A		B		Indigenous		Imported†		Total	
	Cum. 1998*	Cum. 1997	Cum. 1998	Cum. 1997	Cum. 1998	Cum. 1997	1998	Cum. 1998	1998	Cum. 1998	Cum. 1998	Cum. 1997
UNITED STATES	760	771	14,995	18,954	5,656	6,444	1	31	-	19	50	110
NEW ENGLAND	50	44	183	474	122	120	-	1	-	2	3	19
Maine	2	4	16	47	2	6	-	-	-	-	-	1
N.H.	7	6	8	22	11	9	-	-	-	-	-	1
Vt.	5	3	13	9	3	6	-	-	-	1	1	-
Mass.	32	27	62	198	32	52	-	1	-	1	2	16
R.I.	3	2	12	107	56	12	-	-	-	-	-	-
Conn.	1	2	72	91	18	35	-	-	-	-	-	1
MID. ATLANTIC	107	118	1,022	1,480	792	948	-	9	-	4	13	23
Upstate N.Y.	44	35	248	227	212	198	-	2	-	-	2	5
N.Y. City	21	31	241	665	198	351	-	-	-	-	-	7
N.J.	37	37	238	216	144	177	-	7	-	1	8	3
Pa.	5	15	295	372	238	222	-	-	-	3	3	8
E.N. CENTRAL	128	129	2,227	1,966	596	1,041	-	11	-	3	14	10
Ohio	42	71	235	238	56	59	-	-	-	1	1	-
Ind.	35	13	112	211	72	76	-	2	-	1	3	-
Ill.	44	30	376	530	116	199	-	-	-	-	-	7
Mich.	3	15	1,380	846	326	305	-	9	-	1	10	2
Wis.	4	-	124	141	26	402	-	-	-	-	-	1
W.N. CENTRAL	71	39	1,021	1,495	289	339	1	1	-	-	1	13
Minn.	55	27	95	133	34	27	-	-	-	-	-	4
Iowa	2	5	378	308	48	26	1	1	-	-	1	-
Mo.	8	4	416	758	173	246	-	-	-	-	-	1
N. Dak.	-	-	3	10	4	4	-	-	-	-	-	-
S. Dak.	-	2	21	18	2	1	-	-	-	-	-	8
Nebr.	-	1	29	69	9	12	U	-	U	-	-	-
Kans.	6	-	79	199	19	23	-	-	-	-	-	-
S. ATLANTIC	153	118	1,276	1,166	819	844	-	3	-	5	8	11
Del.	-	-	3	23	-	4	-	-	-	1	1	-
Md.	43	44	220	141	116	115	-	-	-	1	1	2
D.C.	-	-	42	17	10	25	-	-	-	-	-	1
Va.	14	11	158	151	75	86	-	-	-	2	2	1
W. Va.	4	3	3	8	5	11	-	-	-	-	-	-
N.C.	23	17	81	138	159	180	-	-	-	-	-	2
S.C.	3	4	24	76	26	77	-	-	-	-	-	1
Ga.	33	23	365	265	124	94	-	1	-	1	2	1
Fla.	33	16	380	347	304	252	-	2	-	-	2	3
E.S. CENTRAL	41	40	281	450	275	498	-	-	-	2	2	1
Ky.	7	6	18	57	32	28	-	-	-	-	-	-
Tenn.	22	24	165	276	192	323	-	-	-	1	1	-
Ala.	10	8	55	65	50	49	-	-	-	1	1	1
Miss.	2	2	43	52	1	98	-	-	-	-	-	-
W.S. CENTRAL	46	36	2,934	3,809	968	789	-	1	-	-	1	7
Ark.	-	2	75	164	65	61	-	-	-	-	-	-
La.	22	8	53	147	68	95	-	1	-	-	1	-
Okla.	21	24	414	1,099	59	35	-	-	-	-	-	-
Tex.	3	2	2,392	2,399	776	598	-	-	-	-	-	7
MOUNTAIN	76	70	2,225	2,967	588	609	-	-	-	-	-	8
Mont.	-	-	73	58	5	7	-	-	-	-	-	-
Idaho	-	1	194	100	25	26	-	-	-	-	-	-
Wyo.	1	3	29	24	4	22	-	-	-	-	-	-
Colo.	17	13	208	304	84	113	-	-	-	-	-	-
N. Mex.	6	7	109	231	244	185	-	-	-	-	-	-
Ariz.	41	28	1,371	1,500	138	140	U	-	U	-	-	5
Utah	4	3	153	435	56	69	-	-	-	-	-	1
Nev.	7	15	88	315	32	47	U	-	U	-	-	2
PACIFIC	88	177	3,826	5,147	1,207	1,256	-	5	-	3	8	18
Wash.	7	3	752	373	77	52	-	-	-	1	1	2
Oreg.	34	29	265	260	77	82	-	-	-	-	-	-
Calif.	39	134	2,760	4,385	1,039	1,103	-	4	-	2	6	12
Alaska	1	4	15	25	9	11	-	1	-	-	1	-
Hawaii	7	7	34	104	5	8	-	-	-	-	-	4
Guam	-	-	-	-	2	3	U	-	U	-	-	-
P.R.	2	-	49	220	319	520	-	-	-	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	6	3	1	45	34	U	-	U	-	-	1

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

*Of 182 cases among children aged <5 years, serotype was reported for 102 and of those, 39 were type b.

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

TABLE III. (Cont'd.) Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending September 12, 1998, and September 6, 1997 (36th Week)

Reporting Area	Meningococcal Disease		Mumps			Pertussis			Rubella		
	Cum. 1998	Cum. 1997	1998	Cum. 1998	Cum. 1997	1998	Cum. 1998	Cum. 1997	1998	Cum. 1998	Cum. 1997
UNITED STATES	1,939	2,389	4	344	422	93	3,629	3,680	1	311	131
NEW ENGLAND	77	150	1	4	8	17	612	673	-	38	1
Maine	5	17	-	-	-	-	5	7	-	-	-
N.H.	4	12	-	-	-	7	60	85	-	-	-
Vt.	1	4	-	-	-	4	63	187	-	-	-
Mass.	39	74	-	2	2	3	443	367	-	8	1
R.I.	3	15	-	-	5	-	7	12	-	1	-
Conn.	25	28	1	2	1	3	34	15	-	29	-
MID. ATLANTIC	179	248	-	19	46	14	382	273	1	125	31
Upstate N.Y.	46	68	-	4	10	2	203	107	1	111	4
N.Y. City	20	42	-	4	3	-	9	58	-	9	27
N.J.	47	46	-	2	7	-	5	12	-	4	-
Pa.	66	92	-	9	26	12	165	96	-	1	-
E.N. CENTRAL	291	352	-	59	53	16	386	390	-	-	5
Ohio	111	129	-	23	19	6	189	109	-	-	-
Ind.	51	38	-	5	7	7	83	38	-	-	-
Ill.	71	103	-	10	8	-	47	53	-	-	1
Mich.	33	52	-	21	16	3	50	47	-	-	-
Wis.	25	30	-	-	3	-	17	143	-	-	4
W.N. CENTRAL	158	171	-	25	13	9	294	252	-	27	-
Minn.	28	29	-	12	5	9	177	160	-	-	-
Iowa	31	39	-	9	6	-	53	17	-	-	-
Mo.	56	73	-	3	-	-	22	47	-	2	-
N. Dak.	3	2	-	1	-	-	2	1	-	-	-
S. Dak.	6	4	-	-	-	-	8	4	-	-	-
Nebr.	8	8	U	-	1	U	10	5	U	-	-
Kans.	26	16	-	-	1	-	22	18	-	25	-
S. ATLANTIC	336	405	1	42	51	4	228	319	-	13	60
Del.	1	5	-	-	-	-	3	1	-	-	-
Md.	24	37	-	-	1	2	40	98	-	1	-
D.C.	-	7	-	-	-	-	1	3	-	-	-
Va.	27	40	-	6	9	-	19	34	-	-	1
W. Va.	12	14	-	-	-	-	1	6	-	-	-
N.C.	47	77	-	10	9	1	75	89	-	9	52
S.C.	47	42	1	6	10	-	22	20	-	-	6
Ga.	72	77	-	1	6	-	18	8	-	-	-
Fla.	106	106	-	19	16	1	49	60	-	3	1
E.S. CENTRAL	175	182	-	13	22	2	83	100	-	2	1
Ky.	21	38	-	-	3	-	25	42	-	-	-
Tenn.	55	61	-	1	3	-	31	29	-	1	-
Ala.	76	60	-	7	6	2	24	19	-	1	1
Miss.	23	23	-	5	10	-	3	10	-	-	-
W.S. CENTRAL	231	221	-	50	44	4	248	164	-	87	4
Ark.	26	26	-	7	1	-	52	16	-	-	-
La.	51	47	-	9	11	-	5	15	-	-	-
Okla.	32	26	-	-	-	-	18	24	-	-	-
Tex.	122	122	-	34	32	4	173	109	-	87	4
MOUNTAIN	111	140	-	28	51	16	668	873	-	5	6
Mont.	4	7	-	-	-	-	7	15	-	-	-
Idaho	9	8	-	4	2	5	201	482	-	-	2
Wyo.	6	2	-	1	1	-	8	6	-	-	-
Colo.	22	36	-	7	3	3	144	242	-	-	-
N. Mex.	19	24	N	N	N	2	78	70	-	1	-
Ariz.	35	37	U	5	31	U	142	30	U	1	4
Utah	11	11	-	4	7	6	62	14	-	2	-
Nev.	5	15	U	7	7	U	26	14	U	1	-
PACIFIC	381	520	2	104	134	11	728	636	-	14	23
Wash.	53	66	-	7	14	8	231	265	-	9	5
Oreg.	65	98	N	N	N	3	65	30	-	-	-
Calif.	256	348	1	77	94	-	413	309	-	3	10
Alaska	3	2	-	2	6	-	13	16	-	-	-
Hawaii	4	6	1	18	20	-	6	16	-	2	8
Guam	1	1	U	2	1	U	-	-	U	-	-
P.R.	6	8	-	1	7	-	3	-	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	-	U	2	4	U	1	-	U	-	-

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

TABLE IV. Deaths in 122 U.S. cities,* week ending September 12, 1998 (36th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	500	363	79	36	11	11	41
Boston, Mass.	141	109	19	7	5	1	14
Bridgeport, Conn.	36	26	8	2	-	-	5
Cambridge, Mass.	12	9	3	-	-	-	1
Fall River, Mass.	31	22	5	3	1	-	1
Hartford, Conn.	49	36	6	5	-	2	2
Lowell, Mass.	20	15	4	1	-	-	1
Lynn, Mass.	16	13	2	1	-	-	1
New Bedford, Mass.	17	16	1	-	-	-	-
New Haven, Conn.	35	16	11	4	3	1	-
Providence, R.I.	U	U	U	U	U	U	U
Somerville, Mass.	5	2	2	1	-	-	-
Springfield, Mass.	39	30	3	4	-	2	7
Waterbury, Conn.	32	24	2	4	2	-	1
Worcester, Mass.	67	45	13	4	-	5	8
MID. ATLANTIC	1,981	1,368	387	138	45	43	94
Albany, N.Y.	38	26	5	4	-	3	2
Allentown, Pa.	29	25	3	-	1	-	1
Buffalo, N.Y.	89	59	18	10	1	1	2
Camden, N.J.	41	26	5	4	1	5	4
Elizabeth, N.J.	15	9	3	3	-	-	1
Erie, Pa.	35	28	5	-	-	2	3
Jersey City, N.J.	U	U	U	U	U	U	U
New York City, N.Y.	1,071	745	212	78	21	15	39
Newark, N.J.	26	6	15	1	1	3	-
Paterson, N.J.	18	11	6	1	-	-	-
Philadelphia, Pa.	300	182	68	26	18	6	12
Pittsburgh, Pa.§	40	26	7	2	-	5	1
Reading, Pa.	28	23	4	1	-	-	3
Rochester, N.Y.	120	94	21	4	-	1	16
Schenectady, N.Y.	29	27	1	1	-	-	2
Scranton, Pa.	23	19	3	-	1	-	-
Syracuse, N.Y.	50	40	6	2	-	2	7
Trenton, N.J.	15	10	4	-	1	-	1
Utica, N.Y.	14	12	1	1	-	-	-
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	1,686	1,109	336	151	41	43	104
Akron, Ohio	46	35	8	1	1	1	-
Canton, Ohio	29	22	5	2	-	-	2
Chicago, Ill.	350	159	90	62	12	21	22
Cincinnati, Ohio	119	88	17	6	5	3	13
Cleveland, Ohio	124	89	24	7	2	2	3
Columbus, Ohio	141	99	25	9	5	3	14
Dayton, Ohio	91	71	8	11	1	-	1
Detroit, Mich.	161	94	48	15	3	1	3
Evansville, Ind.	31	24	6	1	-	-	1
Fort Wayne, Ind.	55	37	14	3	1	-	3
Gary, Ind.	10	4	4	1	-	1	1
Grand Rapids, Mich.	45	29	6	4	3	3	2
Indianapolis, Ind.	129	84	26	13	3	3	12
Lansing, Mich.	29	23	2	3	1	-	1
Milwaukee, Wis.	92	73	14	3	-	2	9
Peoria, Ill.	47	35	9	1	1	1	2
Rockford, Ill.	67	49	10	6	2	-	8
South Bend, Ind.	24	19	4	1	-	-	-
Toledo, Ohio	68	52	11	2	1	2	6
Youngstown, Ohio	28	23	5	-	-	-	1
W.N. CENTRAL	619	426	113	48	21	8	36
Des Moines, Iowa	85	54	18	10	2	1	2
Duluth, Minn.	22	18	3	1	-	-	2
Kansas City, Kans.	18	13	-	2	3	-	-
Kansas City, Mo.	109	73	16	8	5	5	7
Lincoln, Nebr.	31	21	9	1	-	-	2
Minneapolis, Minn.	100	76	16	5	2	-	3
Omaha, Nebr.	54	34	13	1	5	1	4
St. Louis, Mo.	87	52	20	12	2	1	9
St. Paul, Minn.	62	47	10	3	2	-	6
Wichita, Kans.	51	38	8	5	-	-	1
S. ATLANTIC	1,037	637	218	109	38	28	56
Atlanta, Ga.	119	73	25	15	5	1	2
Baltimore, Md.	176	110	39	20	4	3	11
Charlotte, N.C.	60	42	11	1	1	5	7
Jacksonville, Fla.	133	83	28	15	3	3	3
Miami, Fla.	96	46	22	17	6	-	1
Norfolk, Va.	36	22	6	3	2	3	3
Richmond, Va.	45	26	10	7	1	1	7
Savannah, Ga.	38	33	3	2	-	-	8
St. Petersburg, Fla.	37	27	4	4	1	1	1
Tampa, Fla.	142	94	31	11	5	-	13
Washington, D.C.	133	70	35	13	4	11	-
Wilmington, Del.	22	11	4	1	6	-	-
E.S. CENTRAL	717	490	147	52	12	14	36
Birmingham, Ala.	112	80	22	5	3	-	8
Chattanooga, Tenn.	69	42	19	3	2	3	2
Knoxville, Tenn.	82	58	13	7	3	1	4
Lexington, Ky.	50	36	9	4	1	-	3
Memphis, Tenn.	201	137	44	14	2	4	12
Mobile, Ala.	49	34	8	4	-	3	-
Montgomery, Ala.	35	21	9	5	-	-	5
Nashville, Tenn.	119	82	23	10	1	3	2
W.S. CENTRAL	1,098	729	226	86	34	23	56
Austin, Tex.	66	40	14	4	5	3	3
Baton Rouge, La.	34	24	2	6	2	-	2
Corpus Christi, Tex.	40	32	3	3	1	1	4
Dallas, Tex.	139	76	33	18	9	3	6
El Paso, Tex.	67	52	11	3	-	1	3
Ft. Worth, Tex.	73	51	15	4	2	1	3
Houston, Tex.	242	163	52	21	3	3	17
Little Rock, Ark.	37	24	8	3	2	-	4
New Orleans, La.	95	60	24	6	3	2	-
San Antonio, Tex.	152	107	30	7	5	3	6
Shreveport, La.	34	18	8	5	-	3	3
Tulsa, Okla.	119	82	26	6	2	3	5
MOUNTAIN	783	506	154	70	30	21	43
Albuquerque, N.M.	100	66	19	13	-	-	2
Boise, Idaho	43	31	8	-	1	3	3
Colo. Springs, Colo.	43	25	12	3	1	2	1
Denver, Colo.	73	38	15	9	8	3	7
Las Vegas, Nev.	148	95	35	14	2	2	5
Ogden, Utah	22	18	2	1	1	-	2
Phoenix, Ariz.	160	96	33	17	10	4	7
Pueblo, Colo.	22	17	1	3	1	-	4
Salt Lake City, Utah	89	58	15	6	5	5	5
Tucson, Ariz.	83	62	14	4	1	2	7
PACIFIC	1,500	1,060	253	120	43	24	117
Berkeley, Calif.	10	6	3	-	-	1	-
Fresno, Calif.	114	72	22	9	9	2	5
Glendale, Calif.	24	18	4	1	-	1	1
Honolulu, Hawaii	76	52	17	6	-	1	7
Long Beach, Calif.	42	31	6	4	-	1	4
Los Angeles, Calif.	409	299	62	30	13	5	32
Pasadena, Calif.	U	U	U	U	U	U	U
Portland, Oreg.	95	70	17	1	7	-	4
Sacramento, Calif.	114	73	21	16	3	1	10
San Diego, Calif.	125	85	22	12	2	4	13
San Francisco, Calif.	128	91	20	13	1	3	17
San Jose, Calif.	115	81	20	11	2	1	7
Santa Cruz, Calif.	21	15	4	1	-	1	3
Seattle, Wash.	98	70	17	8	2	1	4
Spokane, Wash.	48	39	6	2	1	-	2
Tacoma, Wash.	81	58	12	6	3	2	8
TOTAL	9,921¶	6,688	1,913	810	275	215	583

U: Unavailable -: no reported cases

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

†Pneumonia and influenza.

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

¶Total includes unknown ages.

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

Weekly Notifiable Disease Morbidity Data and 122 Cities Mortality Data

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