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
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≤0.01; 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≤0.001; 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
### 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 | 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 | 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        | 72.8 (±2.8)                | 38.5 (±3.6)                              | 53.6 (±3.2)               | 64.0 (±2.8)                              |
| Hispanic    |                            |                                          |                           |                                          |
| 1991        | 53.1 (±3.5)                | 18.8 (±2.6)                              | 37.0 (±3.6)               | 37.4 (±6.2)                              |
| 1993        | 56.0 (±4.1)                | 18.8 (±3.1)                              | 39.4 (±3.7)               | 46.1 (±4.4)                              |
| 1995        | 57.6 (±5.6)                | 17.6 (±3.7)                              | 39.3 (±7.1)               | 44.4 (±11.1)                             |
| 1997        | 52.2 (±3.6)                | 15.5 (±2.4)                              | 38.4 (±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.
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
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 ciprofloxacin.

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
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
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
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 residences are served by the same staff. 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
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
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,
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 remaining 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).
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,
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 jmcl@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.
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

| DISEASE                                | DECREASE | INCREASE | CASES CURRENT 4 WEEKS |
|----------------------------------------|----------|----------|-----------------------|
| Hepatitis A                            |          |          | 1,178                 |
| Hepatitis B                            |          |          | 541                   |
| Hepatitis, C/Non-A, Non-B              |          |          | 176                   |
| Legionellosis                          |          |          | 72                    |
| Measles, Total                         |          |          | 3                     |
| Meningococcal Infections               |          |          | 160                   |
| Mumps                                  |          |          | 30                    |
| Pertussis                              |          |          | 432                   |
| Rubella                                |          |          | 10                    |

Ratio (Log Scale)*

*Beyond Historical Limits

*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)

| DISEASE                                      | Cum. 1998 | Cum. 1998 |
|----------------------------------------------|-----------|-----------|
| Anthrax                                      | -         | 6         |
| Brucellosis                                  | 35        | 1         |
| Cholera                                      | 6         | 29        |
| Congenital rubella syndrome                  | 3         | -         |
| Cryptosporidiosis*                           | 2,285     | 205       |
| Diphtheria                                   | 2         | 1,625     |
| Encephalitis: California*                    | 46        | 40        |
| eastern equine*                              | 3         | 288       |
| St. Louis*                                   | 2         | 29        |
| western equine*                              | -         | 88        |
| Hansen Disease                               | 77        | 9         |
| Hantavirus pulmonary syndrome*†              | 14        | 231       |
| Hemolytic uremic syndrome, post-diarrheal*   | 48        | -         |
| 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.
### 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/N.A./N.B. |
|----------------|------|-----------|--------------------------|-----------|---------------------|
| UNITED STATES  | 31,523 | 40,204 | 310,234 | 1,914 | 1,154 | 219,943 | 196,540 | 2,649 | 2,452 |
| NEW ENGLAND    | 1,194 | 1,732 | 13,375 | 245 | 191 | 3,852 | 4,040 | 37 | 46 |
| Maine          | 22 | 42 | 683 | 29 | - | 49 | 38 | - | - |
| N.H.           | 28 | 26 | 647 | 33 | 34 | 63 | 71 | - | - |
| Vt.            | 17 | 31 | 288 | 11 | 7 | 25 | 36 | - | 2 |
| Mass.          | 604 | 598 | 5,747 | 115 | 113 | 1,484 | 1,488 | 34 | 37 |
| R.I.           | 88 | 113 | 1,603 | 11 | 11 | 269 | 315 | 3 | 7 |
| Conn.          | 435 | 422 | 4,407 | 420 | 36 | 1,972 | 2,092 | - | - |
| MID. ATLANTIC   | 8,893 | 12,414 | 40,204 | 115 | 113 | 1,484 | 1,488 | 34 | 37 |
| N.Y. City      | 1,014 | 1,931 | 10,106 | 7 | 7 | 10,415 | 9,351 | - | - |
| N.J.           | 1,655 | 2,598 | 7,566 | 53 | 36 | 4,852 | 5,261 | 5 | 7 |
| Pa.            | 1,219 | 1,434 | 3,852 | 10 | 10 | 3,176 | 3,775 | 64 | 61 |
| Upstate N.Y.   | 1,014 | 1,931 | 10,106 | 7 | 7 | 10,415 | 9,351 | - | - |
| N.Y. City      | 1,014 | 1,931 | 10,106 | 7 | 7 | 10,415 | 9,351 | - | - |
| N.J.           | 1,655 | 2,598 | 7,566 | 53 | 36 | 4,852 | 5,261 | 5 | 7 |
| Pa.            | 1,219 | 1,434 | 3,852 | 10 | 10 | 3,176 | 3,775 | 64 | 61 |
| E.N. CENTRAL   | 2,276 | 3,016 | 21,209 | 294 | 217 | 10,618 | 22,470 | 22 | 7 |
| Ohio           | 485 | 683 | 17,261 | 70 | 35 | 2,945 | 4,185 | 4 | 12 |
| Ind.           | 379 | 409 | 4,573 | 10 | 10 | 1,552 | 1,569 | 8 | 3 |
| Ill.           | 898 | 1,176 | 18,045 | 72 | 14 | 14,861 | 14,961 | 24 | 69 |
| Mich.          | 390 | 581 | 14,106 | 75 | 47 | 10,761 | 9,944 | 33 | 303 |
| Wis.           | 134 | 188 | 6,845 | 58 | 58 | 2,931 | 3,188 | - | - |

**Notes:**
- **N:** Not notifiable
- **U:** Unavailable
- **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.
- **NETSS:** National Electronic Telecommunications System for Surveillance.
- **PHLIS:** Public Health Laboratory Information System.
# TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending September 12, 1998, and September 6, 1997 (36th Week)

| Reporting Area | Legionellosis | Malaria (Cumulative) | Syphilis (Primary & Secondary) | Tuberculosis (Cumulative) | Rabies, Animal |
|----------------|--------------|----------------------|-------------------------------|--------------------------|----------------|
|                | Cum. 1998    | Cum. 1997            | Cum. 1998                     | Cum. 1997                | Cum. 1998*      |
| UNITED STATES  | 833          | 623                  | 8,195                         | 5,886                    | 9,877          |
| NEW ENGLAND    | 53           | 54                   | 2,109                         | 2,060                    | 319            |
| Maine          | 1            | 2                    | 6                             | 8                        | 5              |
| N.H.           | 3            | 5                    | 28                            | 17                       | 3              |
| Vt.            | 4            | 10                   | 8                             | 6                        | 2              |
| Mass.          | 26           | 19                   | 579                           | 256                      | 180            |
| R.I.           | 10           | 5                    | 323                           | 219                      | 38             |
| Conn.          | 9            | 13                   | 1,165                         | 1,554                    | 277            |
| MID. ATLANTIC  | 205          | 119                  | 5,100                         | 4,223                    | 826            |
| Upstate N.Y.   | 68           | 32                   | 2,895                         | 1,744                    | 277            |
| N.Y. City      | 11           | 17                   | 808                           | 1,318                    | 149            |
| Pa.            | 103          | 57                   | 1,379                         | 1,021                    | 149            |
| E.N. CENTRAL   | 251          | 203                  | 553                           | 555                      | 266            |
| Ohio           | 96           | 79                   | 57                            | 27                       | 70             |
| Ind.           | 47           | 30                   | 17                            | 23                       | 7              |
| Ill.           | 23           | 16                   | 5                             | 11                       | 7              |
| Mich.          | 57           | 49                   | 1                             | 22                       | 11             |
| Wis.           | 28           | 29                   | U                             | 233                      | 3              |
| W.N. CENTRAL   | 58           | 36                   | 155                           | 82                       | 266            |
| Minn.          | 5            | 1                    | 127                           | 56                       | 102            |
| Iowa           | 7            | 9                    | 20                            | 5                        | 27             |
| Mo.            | 20           | 6                    | 1                             | 15                       | 8              |
| N. Dak.        | -            | 2                    | -                             | 2                        | 7              |
| S. Dak.        | 3            | 2                    | -                             | 1                        | 14             |
| Nebr.          | 16           | 12                   | 3                             | 2                        | 11             |
| Kans.          | 7            | 4                    | 4                             | 3                        | 18             |
| S. ATLANTIC    | 101          | 82                   | 553                           | 552                      | 266            |
| Del.           | 9            | 8                    | 12                            | 104                      | 22             |
| Md.            | 21           | 14                   | 403                           | 355                      | 197            |
| D.C.           | 6            | 3                    | 4                             | 7                        | 7              |
| Va.            | 16           | 18                   | 48                            | 37                       | 187            |
| W. Va.         | N            | N                    | 8                             | 3                        | 30             |
| N.C.           | 8            | 11                   | 41                            | 24                       | 381            |
| S.C.           | 7            | 3                    | 3                             | 2                        | 58             |
| Ga.            | 7            | -                    | 5                             | 1                        | 355            |
| Fla.           | 25           | 25                   | 29                            | 19                       | 187            |
| E.S. CENTRAL   | 49           | 41                   | 60                            | 65                       | 752            |
| Ky.            | 23           | 28                   | 13                            | 12                       | 116            |
| Tenn.          | 14           | 24                   | 32                            | 29                       | 227            |
| Ala.           | 5            | 2                    | 14                            | 5                        | 265            |
| Miss.          | 7            | 2                    | 1                             | 1                        | 188            |
| W.S. CENTRAL   | 19           | 12                   | 22                            | 56                       | 1,464          |
| Ark.           | -            | 1                    | 6                             | 15                       | 86             |
| Okla.          | 2            | 2                    | 3                             | 7                        | 73             |
| Tex.           | 9            | 8                    | 11                             | 27                       | 1,187          |
| MOUNTAIN       | 46           | 41                   | 12                            | 8                        | 285            |
| Mont.          | 2            | 1                    | -                             | 2                        | -               |
| Idaho          | 2            | 3                    | 3                             | 7                        | -               |
| Wyo.           | 1            | 1                    | -                             | 1                        | 8              |
| Colo.          | 12           | 15                   | 3                             | -                        | 4              |
| N. Mex.        | 2            | 2                    | 4                             | 1                        | 42             |
| Ariz.          | 10           | 9                    | -                             | 1                        | 138            |
| Utah           | 16           | 7                    | -                             | 3                        | 43             |
| Nev.           | 1            | 4                    | 2                             | 2                        | 45             |
| PACIFIC        | 51           | 35                   | 104                           | 116                      | 2,619          |
| Wash.          | 9            | 6                    | 6                             | 6                        | 152            |
| Ore.           | -            | 12                   | 16                            | 17                       | 50             |
| Calif.         | 40           | 28                   | 85                            | 94                       | 2,224          |
| Alaska         | 1            | -                    | 1                             | 1                        | 34             |
| Hawaii         | 1            | -                    | 1                             | 1                        | 113            |
| Guam           | 2            | -                    | -                             | 1                        | 36             |
| P.R.           | -            | -                    | -                             | -                        | 12             |
| V.I.           | U            | U                    | U                             | U                        | U              |
| Amer. Samoa    | U            | U                    | U                             | U                        | U              |
| C.N.M.I.       | -            | -                    | -                             | -                        | 158            |

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) |
|----------------|-------------------------|---------------------------|-------------------|
|                | Cum. 1998 | Cum. 1997 | A | B | Indigenous | Cum. 1998 | Cum. 1997 | Imported* | Total |
| 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 | 7 | 2 | 16 |
| R.I.           | 3       | 2        | 12    | 107   | 56   | 12    | - | - | - | - | - | 1 |
| Conn.          | 1       | 2        | 72    | 91    | 18   | 35    | - | - | - | - | - | 1 |
| MID. ATLANTIC   | 107     | 118      | 1,022 | 1,480 | 792  | 351   | - | 9 | 4 | 13 | 23 |
| Upstate N.Y.   | 44      | 35       | 248   | 227   | 212  | 196   | - | 2 | - | 2 | 5 |
| N.Y. City      | 21      | 31       | 241   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| N.J.           | 37      | 37       | 238   | 216   | 116  | 99    | - | 1 | 3 | 1 |
| Pa.            | 5       | 15       | 295   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| E.N. CENTRAL   | 128     | 129      | 2,227 | 1,966 | 596  | 1,041 | - | 9 | 4 | 13 | 23 |
| Upstate N.Y.   | 44      | 35       | 248   | 227   | 212  | 196   | - | 2 | - | 2 | 5 |
| New York City  | 21      | 31       | 241   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| N.J.           | 37      | 37       | 238   | 216   | 116  | 99    | - | 1 | 3 | 1 |
| Pa.            | 5       | 15       | 295   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| E.N. CENTRAL   | 128     | 129      | 2,227 | 1,966 | 596  | 1,041 | - | 9 | 4 | 13 | 23 |
| Upstate N.Y.   | 44      | 35       | 248   | 227   | 212  | 196   | - | 2 | - | 2 | 5 |
| New York City  | 21      | 31       | 241   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| N.J.           | 37      | 37       | 238   | 216   | 116  | 99    | - | 1 | 3 | 1 |
| Pa.            | 5       | 15       | 295   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| E.N. CENTRAL   | 128     | 129      | 2,227 | 1,966 | 596  | 1,041 | - | 9 | 4 | 13 | 23 |
| Upstate N.Y.   | 44      | 35       | 248   | 227   | 212  | 196   | - | 2 | - | 2 | 5 |
| New York City  | 21      | 31       | 241   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| N.J.           | 37      | 37       | 238   | 216   | 116  | 99    | - | 1 | 3 | 1 |
| Pa.            | 5       | 15       | 295   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| E.N. CENTRAL   | 128     | 129      | 2,227 | 1,966 | 596  | 1,041 | - | 9 | 4 | 13 | 23 |
| Upstate N.Y.   | 44      | 35       | 248   | 227   | 212  | 196   | - | 2 | - | 2 | 5 |
| New York City  | 21      | 31       | 241   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| N.J.           | 37      | 37       | 238   | 216   | 116  | 99    | - | 1 | 3 | 1 |
| Pa.            | 5       | 15       | 295   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| E.N. CENTRAL   | 128     | 129      | 2,227 | 1,966 | 596  | 1,041 | - | 9 | 4 | 13 | 23 |
| Upstate N.Y.   | 44      | 35       | 248   | 227   | 212  | 196   | - | 2 | - | 2 | 5 |
| New York City  | 21      | 31       | 241   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| N.J.           | 37      | 37       | 238   | 216   | 116  | 99    | - | 1 | 3 | 1 |
| Pa.            | 5       | 15       | 295   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| E.N. CENTRAL   | 128     | 129      | 2,227 | 1,966 | 596  | 1,041 | - | 9 | 4 | 13 | 23 |
| Upstate N.Y.   | 44      | 35       | 248   | 227   | 212  | 196   | - | 2 | - | 2 | 5 |
| New York City  | 21      | 31       | 241   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| N.J.           | 37      | 37       | 238   | 216   | 116  | 99    | - | 1 | 3 | 1 |
| Pa.            | 5       | 15       | 295   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| E.N. CENTRAL   | 128     | 129      | 2,227 | 1,966 | 596  | 1,041 | - | 9 | 4 | 13 | 23 |
| Upstate N.Y.   | 44      | 35       | 248   | 227   | 212  | 196   | - | 2 | - | 2 | 5 |
| New York City  | 21      | 31       | 241   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |
| N.J.           | 37      | 37       | 238   | 216   | 116  | 99    | - | 1 | 3 | 1 |
| Pa.            | 5       | 15       | 295   | 665   | 144  | 177   | - | 7 | 1 | 8 | 3 |

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 | Cum. 1998 | Cum. 1997 | Cum. 1998 | Cum. 1997 | Cum. 1998 | Cum. 1997 |
| UNITED STATES  | 1,939     | 2,389    | 4         | 344      | 422      | 93       | 3,629     | 3,680     |
| NEW ENGLAND    | 77        | 150      | 1         | 4        | 8        | 17       | 612       | 673       |
| Maine          | 5         | 17       | -         | -        | -        | -        | 5         | 7         |
| N.H.           | 4         | 12       | -         | -        | -        | -        | 7         | 60        |
| Vt.            | 1         | 4        | -         | -        | -        | -        | 4         | 63        |
| Mass.          | 39        | 74       | 2         | 2        | 2        | 3        | 443       | 367       |
| N.Ch.          | 3         | 15       | -         | -        | 5        | -        | 7         | 7         |
| Conn.          | 25        | 28       | 1         | 2        | 1        | 3        | 34        | 15        |
| MID. ATLANTIC  | 179       | 248      | -         | 19       | 46       | 14       | 382       | 273       |
| Upstate N.Y.   | 46        | 68       | -         | 4        | 10       | 2        | 203       | 107       |
| N.Y. City      | 20        | 42       | -         | 4        | 3        | -        | 9         | 58        |
| N.J.           | 47        | 46       | -         | 2        | 7        | 5        | 12        | 12        |
| Pa.            | 66        | 92       | -         | 9        | 26       | 12       | 165       | 96        |
| E.N. CENTRAL   | 291       | 352      | -         | 59       | 53       | 16       | 396       | 390       |
| Ohio           | 111       | 129      | -         | 23       | 19       | 6        | 189       | 109       |
| Ind.           | 51        | 38       | -         | 5        | 7        | 7        | 83        | 38        |
| Ill.           | 71        | 103      | -         | 10       | 8        | 4        | 47        | 53        |
| Mich.          | 33        | 52       | 21        | 16       | 3        | 50       | 47        | 53        |
| Wis.           | 25        | 30       | -         | -        | 3        | -        | 17        | 143       |
| W.N. CENTRAL   | 158       | 171      | -         | 25       | 13       | 9        | 294       | 252       |
| Minn.          | 28        | 29       | 12        | 5        | 9        | 171      | 160       | 110       |
| Iowa           | 31        | 39       | 9         | 6        | 8        | 53       | 17        | -         |
| Mo.            | 56        | 73       | 3         | -        | -        | 22       | 47        | -         |
| N. Dak.        | 3         | 2        | 1         | -        | -        | 2        | 1         | -         |
| S. Dak.        | 6         | 4        | -         | -        | 8        | 4        | 4         |
| Nebr.          | 8         | 8        | U        | 1        | U        | 10       | 5         | U         |
| Kans.          | 26        | 16       | -         | 1        | -        | 22       | 18        | -         |
| S. ATLANTIC    | 336       | 405      | 1         | 42       | 51       | 4        | 228       | 319       |
| Del.           | 1         | 5        | -         | -        | 3        | 1        | -         |
| Md.            | 24        | 37       | -         | -        | 1        | 2        | 40        | 98        |
| D.C.           | -         | 7        | -         | -        | -        | 1        | 3         | -         |
| Va.            | 27        | 40       | -         | 6        | 9        | -        | 19        | 34        |
| W. Va.         | 12        | 14       | 6         | -        | -        | 11       | 6         | -         |
| N.C.           | 47        | 77       | 10        | 9        | 1        | 75       | 89        | -         |
| S.C.           | 47        | 42       | 1         | 6        | 10       | -        | 22        | 20        |
| Ga.            | 72        | 77       | 1         | 1        | 6        | -        | 18        | 8         |
| Fla.           | 106       | 106      | -         | 19       | 16       | 1        | 49        | 60        |
| E.S. CENTRAL   | 175       | 182      | -         | 13       | 22       | 2        | 83        | 100       |
| Ky.            | 21        | 38       | -         | -        | 3        | -        | 25        | 42        |
| Tenn.          | 56        | 61       | 1         | 3        | 3        | -        | 31        | 29        |
| Ala.           | 76        | 60       | 7         | 6        | 2        | 24       | 19        | -         |
| Miss.          | 23        | 23       | -         | 5        | 10       | -        | 3         | 10        |
| W.S. CENTRAL   | 231       | 221      | 50        | 44       | 4        | 248      | 164       | -         |
| 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       | -         |
| MOUNTAIN       | 111       | 140      | -         | 28       | 51       | 16        | 668       | 873       |
| Mont.          | 4         | 7        | -         | -        | 4        | -        | 7         | 15        |
| Idaho          | 9         | 8        | 4         | 2        | 5        | 201      | 482       | -         |
| Wyo.           | 6         | 2        | 1         | -        | 1        | -        | 8         | 6         |
| Colo.          | 22        | 36       | -         | 7        | 3        | 3        | 144       | 242       |
| N. Mex.        | 19        | 24       | N         | 2        | 78       | 70       | -         |
| Ariz.          | 35        | 37       | U         | 5        | 31       | U        | 142       | 30        |
| Utah           | 11        | 11       | 4         | 7       | 6        | 62       | 14        | -         |
| Nev.           | 5         | 15       | U         | 7        | 7        | U        | 26        | 14        |
| PACIFIC        | 381       | 520      | 2         | 104      | 134      | 11       | 728       | 636       |
| Wash.          | 53        | 66       | -         | 7        | 14       | 8        | 231       | 265       |
| Oreg.          | 65        | 98       | N         | N        | 3        | 65       | 30        |
| Calif.         | 256       | 348      | 1         | 77       | 94       | -        | 413       | 309       |
| Alaska         | 3         | 2        | -         | 2        | 6        | -        | 13        | 16        |
| Hawaii         | 4         | 6        | 1         | 18       | 20       | -        | 6         | 16        |
| Guam           | 1         | 1        | U         | 2        | 1        | U        | -         | -         |
| P.R.           | 6         | 8        | -         | 1        | 7        | -        | 3         |
| V.I.           | U         | U        | U         | U        | U        | U        | U         |
| Amer. Samoa    | U         | U        | U         | U        | U        | U        | U         |
| C.N.M.I.       | -         | -        | U         | 2        | 4        | U        | 1         | -         |

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    | 1  |          |
| Bridgport, Conn. | 36 26     | 8   | 2   | -    | -    | 2 |          |
| Cambridge, Mass. | 12 9      | 3   | -   | -    | -    | 1 |          |
| Fall River, Mass. | 31 22     | 5   | 3   | -    | 1    |   |          |
| Hartford, Conn. | 49 36     | 6   | 5   | -    | 2    | 2 |          |
| Lowell, Mass.  | 20 15     | 4   | -   | -    | -    | 1 |          |
| Lynn, Mass.    | 16 13     | 2   | -   | -    | -    | 1 |          |
| New Bedford, Mass. | 17 16    | 1   | -   | -    | -    | 1 |          |
| New Haven, Conn. | 35 16    | 11  | 4   | 3    | -    | 1 |          |
| Providence, R.I. | U U U U U U U U U |          | | | | |          |
| Samenvael, 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    | - |          |
| M.D. ATLANTIC  | 1,991 1,387 | 387 138 | 45 43 | 94 |          |
| Albany, N.Y.   | 38 26     | 5   | 6   | -    | 3    | 2 |          |
| Allentown, Pa. | 29 25     | 3   | -   | -    | -    | 1 |          |
| Buffalo, N.Y.  | 89 59     | 18  | 10  | 1    | 2    |   |          |
| Camden, N.J.   | 41 26     | 5   | 4   | 1    | 5    | 4 |          |
| Elizabeth, N.J. | 15 9      | 3   | 9   | -    | 3    | 1 |          |
| Erie, Pa.      | 26 28     | 5   | -   | -    | 2    | 3 |          |
| Jersey City, N.J. | U U U U U U U U U |          | | | | |          |
| New York City, N.Y. | 1,071 745 | 212 78 | 21 15 | 39 |          |
| Newark, N.J.   | 26 15     | -   | 1   | 1    | 3    |   |          |
| Paterson, N.J. | 18 13     | 6   | -   | -    | -    | 1 |          |
| Philadelphia, Pa. | 300 182 | 68 26 | 18 6 12 | 6 12 |          |
| Pittsburgh, Pa. | 40 26     | 7   | 5   |   | 5    | - |          |
| Reading, Pa.   | 28 24     | 4   | -   | -    | -    | 1 |          |
| Rochester, N.Y. | 120 94    | 24 1   | 4    | 1    | 16   |   |          |
| Schenectady, N.Y. | 29 27     | 1   | -   | -    | -    | 2 |          |
| Scranton, Pa.  | 23 19     | 3   | -   | -    | -    | 1 |          |
| Syracuse, N.Y. | 50 40     | 6   | 2   | 7    | 2    | 2 |          |
| Trenton, N.J.  | 15 10     | 4   | 1   | -    | 1    | 3 |          |
| Utica, N.Y.    | 14 12     | 1   | 1   | -    | 1    | 7 |          |
| Yonkers, N.Y.  | U U U U U U U U U |          | | | | |          |
| E.N. CENTRAL   | 1,686 1,109 | 336 151 | 41 43 | 104 |          |
| Akron, Ohio    | 48 35     | 8   | 1   | 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 | 22  2 3 | 2 |          |
| Columbus, Ohio | 181 141   | 99 25 | 9   | 5    | 14   |   |          |
| Dayton, Ohio   | 91 71     | 8   | 11  | 1    | 1    | 7 |          |
| Detroit, Mich. | 161 94    | 48 15 | 1   | 3    | 1    | 3 |          |
| Evansville, Ind. | 31 24    | 6   | -   | -    | 1    | 1 |          |
| Fort Wayne, Ind. | 55 37    | 14 3 | 1   | 3    | -    | 3 |          |
| Gary, Ind.     | 10 4      | 4   | 1    | 1    | 1    | 3 |          |
| Grand Rapids, Mich. | 45 29    | 6   | 4   | 3    | 2    | 2 |          |
| Indianapolis, Ind. | 129 84    | 26 13 | 3   | 12   | 12 |          |
| Lansing, Mich. | 29 23     | 2   | 3   | 1    | 1    | 1 |          |
| Milwaukee, Wis. | 92 73     | 14 3 | -   | 2    | 9    | 2 |          |
| Peoria, Ill.   | 47 35     | 9   | 1    | 1    | 2    | 2 |          |
| Rockford, Ill. | 67 49     | 10 6 | 2   | -    | 8    | 2 |          |
| South Bend, Ind. | 24 19     | 4   | -   | -    | 1    | 7 |          |
| Toledo, Ohio   | 68 52     | 11 2 | 1    | 2    | 6    | 1 |          |
| Youngstown, Ohio | 28 19    | -   | 1   | -    | -    | 1 |          |
| W.N. CENTRAL   | 610 428   | 113 48 | 21  8 | 36 |          |
| Des Moines, Iowa | 85 65    | 18 4 | 10  | 2    | 1    | 2 |          |
| Duluth, Minn.  | 22 18     | 3   | 1    | -    | -    | 1 |          |
| Kansas City, Kan. | 18 13     | 2   | 3    | -    | 3    | 2 |          |
| Kansas City, Mo. | 107 93    | 16 8 | 3   | 5    | 5    | 7 |          |
| Lincoln, Nebr. | 31 21     | 9   | 1    | -    | -    | 2 |          |
| Minneapolis, Minn. | 100 76    | 15 5 | 6   | 2    | 3    | 1 |          |
| Omaha, Nebr.   | 54 34     | 13 1 | 5    | 1    | 4    | 1 |          |
| St. Louis, Mo. | 87 52     | 20 12 | 1   | 2    | 9    | 1 |          |
| St. Paul, Minn. | 62 47     | 10 3 | 2    | -    | 6    | 3 |          |
| Wichita, Kans. | 51 38     | 10 5 | -   | 3    | 8    | 1 |          |

**Note:**
- 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.
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