CDC

MMWR

Morbidity and Mortality Weekly Report

www.cdc.gov/mmwr

Weekly June 20, 2008 / Vol. 57 / No. 24

Heat-Related Deaths Among Crop Workers — United States, 1992–2006

Workers employed in outdoor occupations such as farming are exposed to hot and humid environments that put them at risk for heat-related illness or death. This report describes one such death and summarizes heat-related fatalities among crop production workers in the United States during 1992–2006. During this 15-year period, 423 workers in agricultural and nonagricultural industries were reported to have died from exposure to environmental heat; 68 (16%) of these workers were engaged in crop production or support activities for crop production. The heat-related average annual death rate for these crop workers was 0.39 per 100,000 workers, compared with 0.02 for all U.S. civilian workers. Data aggregated into 5-year periods indicated that heat-related death rates among crop workers might be increasing; however, trend analysis did not indicate a statistically significant increase. Prevention of heat-related deaths among crop workers requires educating employers and workers on the hazards of working in hot environments, including recognition of heat-related illness symptoms, and implementing appropriate heat stress management measures.

Information for the illustrative case described in this report was collected by the Agricultural Safety and Health Bureau of the North Carolina Department of Labor. For the nationwide analysis, fatality data were obtained from the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) (*1*).* A heat-related death was identified in CFOI as an exposure to environmental heat (BLS Occupational Injury and Illness Classification System [OIICS] event/exposure code 321), with the nature of injury attributed to effects of heat and light (OIICS nature code 072). A crop worker death was indicated where the industry in which the decedent worked was crop production or support activities for crop production.[†] Fatality rates were calculated as an average annualized rate per 100,000 workers during the 15-year study period for civilian noninstitutionalized workers aged ≥15 years. The numerator was the total of all fatalities during the 15-year period; the denominator was the total of the annual average worker population during the same period. Estimates of the number of workers employed were derived from the U.S. Current Population Survey (CPS) (*2*).[§] To examine trends in fatality rates during the study period, data were aggregated in 5-year periods because the numbers of fatalities for several individual years in the study period were too low to

* For this report, CDC used a CFOI research file provided by BLS, which excluded deaths in New York City. Because of confidentiality restrictions, individual case information from the CFOI data cannot be reported; information for the case described in this report was obtained solely from the North Carolina Department of Labor field investigation.

[†] Because of changes to the industry classification system in 2003, two comparable, though not identical, classification systems were used: the Standard Industrial Classification (major group 01 and 07, excluding industry group 078) for 1992–2002 and the North American Industry Classification System (NAICS) (industry codes 111 and 11511) for 2003–2006.

[§] CPS labor counts included workers in crop production industries (NAICS code 111) and support activities for agriculture and forestry (code 115). The latter industry category includes some workers who do not specifically support crop production activities. However, the inclusion of a small number of animal production and forestry support workers in the denominator value should have little influence on the crop worker fatality rate.

INSIDE

DEPARTMENT OF HEALTH AND HUMAN SERVICES

CENTERS FOR DISEASE CONTROL AND PREVENTION

meet BLS publishing criteria. Poisson regression was used to estimate confidence intervals for these aggregate rates.

Case Report

In mid-July 2005, a male Hispanic worker with an H-2A work visa (i.e., a temporary, nonimmigrant foreign worker hired under contract to perform farm work) aged 56 years was hand-harvesting ripe tobacco leaves on a North Carolina farm. He had arrived from Mexico 4 days earlier and was on his third day on the job. The man began work at approximately 6:00 a.m. and took a short mid-morning break and a 90-minute lunch break. At approximately 2:45 p.m., the employer's son observed the man working slowly and reportedly instructed him to rest, but the man continued working. Shortly thereafter, the man's coworkers noticed that he appeared confused. Although the man was combative, his coworkers carried him to the shade and tried unsuccessfully to get him to drink water. At approximately 3:50 p.m., coworkers notified the employer of the man's condition. At 4:25 p.m., the man was taken by ambulance to an emergency department, where his core body temperature was recorded at 108°F (42°C) and, despite treatment, he died. The cause of death was heat stroke. On the day of the incident, the local high temperature was approximately 93°F (34°C) with 44% relative humidity and clear skies. The heat index was in the range of 86°–101°F (30°–38°C) at mid-morning and 97°–112°F (36°–44°C) at mid-afternoon.[¶] Similar conditions had occurred during the preceding 2 days.

The man had been given safety and health training on pesticides but nothing that addressed the hazards and prevention of heat-related stress. He reportedly only spoke Spanish. Fluids, such as water and soda, were always available to the workers in the field; however, whether the man drank any of these fluids is unknown.

Heat-Related Fatalities, 1992–2006

During 1992–2006, a total of 423 worker deaths from exposure to environmental heat were reported in the United States, resulting in an average annual fatality rate of 0.02 deaths per 100,000 workers. Of these 423 deaths, 102 (24%) occurred in workers employed in the agriculture, forestry, fishing, and hunting industries (rate: 0.16 per

¶ The heat index, an indicator of the combined physiologic effect of air temperature and relative humidity, is presented in this report as a range, which is estimated by using the temperature and humidity to calculate the minimum value and then adding 15°F. This method better reflects exposure conditions in the field under clear skies. Additional information available at http://www.nws.noaa.gov/om/heat/heat_wave.shtml.

The *MMWR* series of publications is published by the Coordinating Center for Health Information and Service, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

Suggested Citation: Centers for Disease Control and Prevention. [Article title]. MMWR 2008;57:[inclusive page numbers].

100,000 workers), and of these, 68 (67%) occurred in workers employed in the crop production or support activities for crop production sectors, resulting in an average annual fatality rate of 0.39 deaths per 100,000 crop workers (Table). Analysis of fatality rates by 5-year periods suggests an increase in rates over time; however, those rates were based on small numbers of deaths, and the increase over time was not statistically significant (Figure).

During 1992–2006, nearly all deceased crop workers were male,** and 78% were aged 20–54 years (Table). During 1992–2006, the birth country was unknown for 46% of the decedents; however, during 2003–2006, approximately 20 (71%) of the 28 deceased crop workers were from Mexico or Central and South America. Nearly 60% of all heat-related deaths among crop workers occurred in July, and most deaths occurred in the afternoon. Although 21 states reported heat-related deaths among crop workers, California, Florida, and North Carolina accounted for 57% of all deaths, with North Carolina having the highest annualized rate.

Reported by: *RC Luginbuhl, MS, North Carolina Dept of Labor. LL Jackson, PhD, DN Castillo, MPH, Div of Safety Research, National Institute for Occupational Safety and Health; KA Loringer, ND, EIS Officer, CDC.*

Editorial Note: During 1992–2006, a total of 68 crop workers died from heat stroke, representing a rate nearly 20 times greater than for all U.S. civilian workers. The majority of these deaths were in adults aged 20–54 years, a population not typically considered to be at high risk for heat illnesses (*3*). In addition, the majority of these deaths were among foreign-born workers.

Persons who work outside in hot and humid conditions are at risk for heat-related mortality and morbidity. Heat-related illnesses range from minor heat cramps or rash to heat exhaustion, which is more serious and can lead to heat stroke, which can result in death if medical attention is not provided immediately. Heat stroke is characterized by a body temperature of >103°F (>39°C); red, hot, and dry skin (with no sweating); rapid, strong pulse; throbbing headache; dizziness; nausea; confusion; and unconsciousness. Crop workers might be at increased risk for heat stroke because they often wear extra clothing and personal protective equipment to protect against pesticide poisoning or green tobacco illness (transdermal nicotine poisoning). Employers and workers must be aware that heat-related illness, which can have symptoms similar to pesticide poisoning and green tobacco illness, requires immediate attention. The high proportion of heat-related deaths among foreign-born workers indicates that training and communications regarding the risk for heat-related illnesses should be provided in the workers' native language.

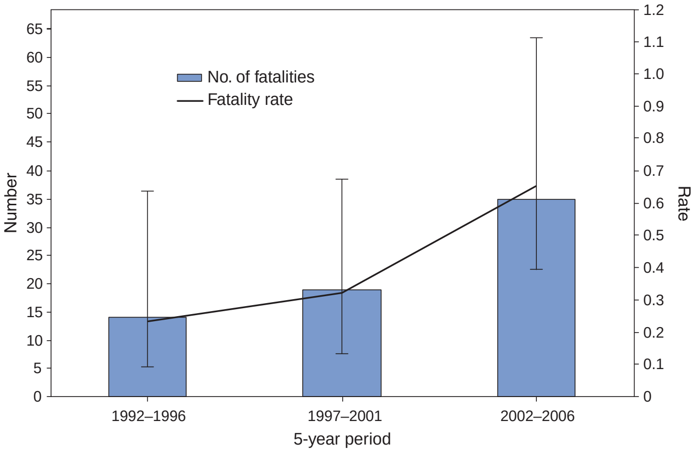
** Data are not reported by sex because they do not meet BLS publication criteria.

TABLE. Number, percentage, and estimated average annualized rate* of occupational heat-related deaths among crop workers, by selected characteristics — United States, 1992–2006

Characteristic	No.	(%)[†]	Total no. of workers[§]	Rate
Total	**68**	**(100)**	**17,227,000**	**0.39**
Industry category				
Crop production	52	(76)	14,454,000	0.36
Vegetable and melon farming	15	(22)	—[¶]	—
Fruit and tree nut farming	11	(16)	—	—
Other crops**	19	(28)	—	—
Other/Unspecified	7	(10)	—	—
Support activities	16	(24)	2,716,000	0.59
Age group (yrs)				
20–34	16	(24)	4,616,000	0.35
35–54	37	(54)	6,907,000	0.54
≥55	15	(22)	4,589,000	0.33
Region of birth				
Mexico/Central and South America	27	(40)	—	—
Other regions outside United States	10	(15)	—	—
Unknown	31	(46)	—	—
Month of injury				
June	11	(16)	19,487,000	0.06
July	40	(59)	20,143,000	0.20
August	12	(18)	19,964,000	0.06
Other months	5	(7)	—	—
Time of incident				
Before 1:00 p.m.	13	(19)	17,227,000	0.08
After 1:00 p.m.	46	(68)	17,227,000	0.27
Unknown	9	(13)	—	—
State of injury				
California	20	(29)	4,041,000	0.49
Florida	6	(9)	809,000	0.74
North Carolina	13	(19)	551,000	2.36
Other states	29	(43)	—	—

* Per 100,000 workers.
† Percentages for certain characteristics might not add to 100 because of rounding.
§ Annual national average estimates (totaled for 15 years) of employed civilians aged ≥15 years, based on the Current Population Survey. Monthly total number of workers are monthly national average estimates. State total number of workers are annual state average estimates. Numbers are rounded to thousands.
¶ Labor force data not available.
** Includes crops such as cotton, tobacco, sugarcane, and hay; excludes oilseeds and grains.

FIGURE. Number and rate* of heat-related deaths among crop workers, by 5-year period — United States, 1992–2006



* Per 100,000 workers. Rates calculated using annual national average estimates of employed civilians aged ≥15 years based on the Current Population Survey.

† 95% confidence interval for fatality rate.

Guidance to help agricultural employers establish a heat-illness prevention program is available from CDC and the U.S. Environmental Protection Agency (*4,5*). In addition, the Department of the Army and Air Force has published a technical bulletin that provides strategies for employers to control heat stress (*6*). Heat-related safety materials in English and Spanish are available from several other sources, including the California Division of Occupational Safety and Health[††] and the North Carolina Department of Labor.[§§] California and Washington state have recently enacted regulations requiring that employers take action to prevent heat-related illnesses and deaths among their workers, including providing training to supervisors and workers and ensuring the availability of fluids (*7,8*). These regulations were prompted by deaths and illnesses in both states in recent years.

The findings in this report are subject to at least four limitations. First, certain fatality rates had to be calculated as average annualized rates for the entire 15-year study period because small numbers prevented publication according to BLS publishing criteria. This aggregation obscured variability between years. Second, CPS estimates likely underestimated the number of crop workers because of the seasonal nature of the work and because the CPS relies on stable residences for sequential interviews. An underestimate of the worker population would have resulted in an overestimation of the fatality rates. Third, heat-related deaths were likely underreported because heat stroke was not recognized at the time of death, was not indicated as a contributing factor on the death certificate (*3*), or was not recognized by the state agencies as meeting the case definition for an injury-related death in CFOI. Finally, the fatality rates for 5-year periods were based on small numbers with large confidence intervals, and the data do not allow an assessment of whether increased numbers over time might be a reflection of increased awareness and reporting.

The illustrative case described in this report and another case previously reported by CDC (*9*) suggest that some employers might not have heat stress management programs in place. Agricultural employers should develop and implement heat stress management measures that include 1) training for field supervisors and employees to prevent, recognize, and treat heat illness, 2) implementing a heat acclimatization program, 3) encouraging proper hydration with proper amounts and types of fluids, 4) establishing work/rest schedules appropriate for the current heat indices, 5) ensuring access to shade or cooling areas, 6) monitoring the environment and workers during hot conditions, and 7) providing prompt medical attention to workers who show signs of heat illness (*5,6,10*). Employers and workers should be vigilant for signs of heat illness, not only in themselves but in their coworkers, and be prepared to provide and seek medical assistance.

Acknowledgments

The findings in this report are based, in part, on contributions by J Myers, MS, National Institute for Occupational Safety and Health, CDC.

References

1. Bureau of Labor Statistics. Bureau of Labor Statistics handbook of methods. Washington, DC: US Department of Labor, Bureau of Labor Statistics; 2007. Available at http://www.bls.gov/opub/hom/homch9_a1.htm.
2. Bureau of Labor Statistics. Current Population Survey, 1992–2006 (microdata files) and labor force data from the Current Population Survey. In: BLS handbook of methods. Washington, DC: US Department of Labor, Bureau of Labor Statistics; 2003. Available at http://www.bls.gov/cps/home.htm.
3. CDC. Heat-related deaths—United States, 1999–2003. MMWR 2006;55:796–8.
4. CDC. Working in hot environments. Cincinnati, OH: US Department of Health and Human Services, CDC, National Institute for Occupational Safety and Health; 1986. DHHS (NIOSH) publication 86-112. Available at http://www.cdc.gov/niosh/hotenvt.html.
5. US Environmental Protection Agency. A guide to heat stress in agriculture. Washington, DC: US Environmental Protection Agency; 1993. EPA-750-b-92-001. Available at http://www.epa.gov/oecaagct/awor.html.
6. Department of the Army and Air Force. Heat stress control and heat casualty management. Washington, DC: Department of the Army and Air Force; 2003. Available at http://chppm-www.apgea.army.mil/documents/tbmeds/tbmed507.pdf.

[††] Available at http://www.dir.ca.gov/dosh/heatillnessinfo.html.
[§§] Available at http://www.nclabor.com/pubs.htm.

7. California Division of Occupational Safety and Health. Heat-related illness prevention. Oakland, CA: California Division of Occupational Safety and Health; 2007. Available at http://www.dir.ca.gov/dosh/heatillnessinfo.html.
8. Washington State Department of Labor and Industries. Outdoor heat-related illness (heat stress). Olympia, WA: Washington State Department of Labor and Industries; 2008. Available at http://www.lni.wa.gov/safety/topics/atoz/heatstress/default.asp.
9. CDC. Migrant farm worker dies from heat stroke while working on a tobacco farm—North Carolina. Morgantown, WV: US Department of Health and Human Services, CDC, National Institute for Occupational Safety and Health; 2007. FACE report 2006-04. Available at http://www.cdc.gov/niosh/face/in-house/full200604.html.
10. CDC. Criteria for a recommended standard: occupational exposure to hot environments (revised criteria 1986). Cincinnati, OH: US Department of Health and Human Services, CDC, National Institute for Occupational Safety and Health; 1986. DHHS (NIOSH) publication no. 86-113. Available at http://www.cdc.gov/niosh/86-113.html.

Influenza Vaccination Coverage Among Persons with Asthma — United States, 2005–06 Influenza Season

During 2006, approximately 6.8 million (9.3%) U.S. children and 16.1 million (7.3%) U.S. adults were reported to have asthma (*1,2*). Since 1964, the Advisory Committee on Immunization Practices (ACIP) has recommended influenza vaccination of all persons with asthma because of the higher risk for medical complications from influenza for those persons (*3,4*). Influenza vaccination coverage of persons with asthma varies by age group and remains below *Healthy People 2010* targets of 60% coverage of persons aged 18–64 years with high-risk conditions (14-29c) and 90% of all persons aged ≥65 years (14-29a) (*5–7*). Influenza vaccination rates of children and older adults with asthma have not been well studied. Using 2006 National Health Interview Survey (NHIS) data, this report provides the first examination of influenza vaccination rates and related factors across a national sample of persons with asthma aged ≥2 years. The results indicated that 36.2% received influenza vaccination during the 2005–06 influenza season. Vaccination rates remained below target levels among all subgroups examined, including those reporting the greatest number of health-care visits in the past 12 months. The results of this study indicate that influenza vaccination coverage of all persons with asthma can be improved by increasing access to health care and using opportunities for vaccination during health-care visits.

NHIS is an ongoing, nationally representative, in-person household interview survey of the civilian, noninstitutionalized population of the United States. Beginning with the 2004–05 influenza season, influenza vaccination questions were included in the child questionnaire portion of the NHIS. Because of an influenza vaccine shortage during the 2004–05 season, 2005–06 was the first influenza season for which the NHIS was able to provide an estimate of influenza vaccination rates among children with asthma in a nonshortage season. This report examines NHIS data on influenza vaccination among all persons with asthma aged ≥2 years during the 2004–05 and 2005–06 influenza seasons and identifies characteristics associated with vaccination coverage. Age subgroups were chosen for convenient comparison with previously published Behavioral Risk Factor Surveillance System and NHIS results (*5*). Because diagnoses of asthma in children aged <2 years are considered unreliable, and to be consistent with other reports, the <2 years age group was excluded from this report (*6*).

To ensure that included respondents had equal opportunity for vaccination, only responses for persons who were within the stated age range for the entire influenza season (September 2005–February 2006) were included; furthermore, only responses from interviews that occurred following the influenza season (i.e., interviews conducted during March–August 2006) were included in the analysis to ensure that only vaccinations given for the 2005–06 season were counted. In addition, only persons who reported the month of their most recent vaccination to be in the period September 2005–February 2006 were considered vaccinated for the 2005–06 season. The same inclusion criteria were applied to 2004–05 influenza season data.

For the 2004–05 and 2005–06 seasons, influenza vaccination status was stratified by characteristics reported to influence likelihood of vaccination, including age group, race/ethnicity, income, health insurance coverage, number of health-care visits, and possession of a usual place of health care (*5,6*). Differences in coverage were compared by chi-square test for within-year comparisons and z-test for comparisons in coverage across influenza seasons, with statistical significance defined as $p<0.05$.

Of the 15,295 survey participants aged ≥2 years for the entire 2005–06 influenza season, 1,277 (8.3%) reported current asthma, of whom 29 (2.2%) were excluded from further analysis because of incomplete answers regarding vaccination. Of the remaining 1,248 participants with asthma, 455 reported receiving influenza vaccinations, but 24 (5.3%) had received their vaccination before September 2005 or after February 2006 and were counted as unvaccinated for the 2005–06 season. Influenza vaccination coverage of persons aged ≥2 years with asthma in the 2005–06 influenza season was 36.2%, compared with

23.9% among those without current asthma (p<0.001) (Table 1) . Both coverage rates represent significant increases from the 2004–05 season, in which respective rates were 31.5% (95% confidence interval [CI] = 28.9–34.3, p<0.05) and 16.7% (CI = 16.4–17.4, p<0.001). Among persons with asthma, those aged 50–64 years and ≥65 years had the highest influenza vaccination coverage in 2005–06 (48.6% and 75.7%, respectively). Among all age subgroups, persons with asthma were more likely to receive influenza vaccination than those without asthma (Table 1).

Persons without a usual place for health care were more likely to remain unvaccinated during the 2005–06 season (89.6%, CI = 79.3–95.1) than those with at least one usual place for health care (61.3%, CI = 57.5–65.0; p<0.001); this difference persisted when limited to the insured (81.8%, CI = 58.6–93.5; and 59.2%, CI = 55.1–63.2, respectively; p<0.03). Influenza vaccination coverage was higher among participants with health insurance coverage (39.9%) than among the uninsured (14.5%, p<0.001) (Table 2). Vaccination coverage increased from 33.8% to 39.9% (p<0.02) among insured persons with asthma from the vaccine shortage season of 2004–05 to the season of regular supply in 2005–06, but coverage did not increase among those without insurance (13.5% to 14.5%, p=0.8). From the 2004–05 to the 2005–06 influenza seasons, vaccination rates increased significantly only among persons in families earning annual incomes >4.5 times the federal poverty level (Table 2).

The likelihood of receiving an influenza vaccination increased with increasing numbers of health-care visits, defined as a visit to a doctor's office, clinic, or other place of health care, but not counting hospitalizations, emergency department visits, dental or home visits, or telephone calls (Table 3). Coverage ranged from 17.6% in persons with asthma reporting one visit or less to 50.8% in those reporting 10 or more visits. Stratified by number of health-care visits, influenza vaccination coverage was significantly higher among persons with asthma than among those without for each stratum, except for the 6–9 health-care visits stratum. Stratified by available measures of asthma

TABLE 1. Influenza vaccination coverage* levels, by asthma status† and age group — National Health Interview Survey (NHIS),§ United States, 2005–06 influenza season (September 2005–February 2006)

Age group	All persons			Without current asthma			With current asthma		
(yrs)	No.¶	(%)	(95% CI**)	No.	(%)	(95% CI)	No.	(%)	(95% CI)
2–17	3,743	(15.9)††	(14.3–17.5)	3,332	(14.3)††	(12.8–16.0)	411	(29.3)††	(23.8–35.4)
18–49	6,431	(15.2)	(14.1–16.3)	5,982	(14.6)	(13.5–15.7)	449	(23.6)	(19.0–28.8)
50–64	2,470	(33.2)	(30.9–35.6)	2,247	(31.8)	(29.4–34.2)	223	(48.6)	(40.0–57.4)
≥65	2,090	(65.3)	(62.9–67.6)	1,955	(64.5)	(62.0–67.0)	135	(75.7)	(66.4–83.1)
Total§§	**14,991**	**(24.9)**	**(23.9–25.9)**	**13,743**	**(23.9)**	**(22.9–25.0)**	**1,248**	**(36.2)**	**(32.7–39.9)**

TABLE 1. (*Continued*) Influenza vaccination coverage* levels, by asthma status† and age group — National Health Interview Survey (NHIS),§ United States, 2005–06 influenza season (September 2005–February 2006)

Age group	With asthma and attack in past 12 mos			With asthma and ED or urgent care visit in past 12 mos		
(yrs)	No.	(%)	(95% CI)	No.	(%)	(95% CI)
2–17	222	(29.3)††	(22.0–37.9)	61	(24.7)††	(14.7–38.5)
18–49	233	(27.9)	(21.2–35.8)	64	(30.8)	(18.5–46.7)
50–64	127	(49.6)	(39.1–60.2)	35	(60.9)	(37.8–79.9)
≥65	54	(80.9)	(67.4–89.7)	18	(88.1)	(66.4–96.5)
Total§§	**652**	**(37.5)**	**(32.4–42.9)**	**180**	**(41.8)**	**(33.2–50.9)**

* Based on a "yes" response to either or both survey questions: "During the past 12 months, has [person] had a flu shot? A flu shot is usually given in the fall and protects against influenza for the flu season," "During the past 12 months, has [person] had a flu vaccine sprayed in his/her nose by a doctor or other health professional? This vaccine is usually given in the fall and protects against influenza for the flu season."

† *Current asthma*: "Yes" responses to the survey questions "Has a doctor or other health professional ever told you that [person] had asthma?" and "Does [person] still have asthma?" *Without current asthma*: "No" response to the survey question, "Has a doctor or other health-care professional ever told you that [person] had asthma?" or "Does [person] still have asthma?" *Asthma attack or episode*: "Yes" response to the survey question, "During the past 12 months, has [person] had an episode of asthma or an asthma attack?" *Emergency department* (*ED*) *or urgent care visit*: "Yes" response to "During the past 12 months, has [person] had to visit an emergency room or urgent care center because of asthma?"

§ Only responses in the subset of NHIS interviews that occurred during March–August 2006 were included to isolate responses to the 2005–06 influenza season; only persons within the stated age range for the entire influenza season (September 2005–February 2006) are included. Persons who reported receiving vaccine before September 2005 or after February 2006 were not counted as vaccinated for the 2005–06 influenza season.

¶ Unweighted sample size; percentages and confidence intervals are weighted proportions.

** Confidence interval.

†† Within-column difference in vaccination coverage across age groups is statistically significant (p<0.001).

§§ Totals are larger than the sum of rows because each age category row contains only persons within the stated age group for the entire influenza season (September 2005–February 2006). The broader age category of persons aged ≥2 years thereby includes persons who transitioned between age subgroups during the influenza season and are correspondingly not included within any one row.

TABLE 2. Influenza vaccination coverage* levels among persons with current asthma† aged ≥2 years, by insurance status,§ usual place of care,¶ and poverty level — National Health Interview Survey (NHIS), United States, 2004–05 and 2005–06 influenza seasons††**

Characteristic	2004–05 No.§§	2004–05 (%)	2004–05 (95% CI¶¶)	2005–06 No.	2005–06 (%)	2005–06 (95% CI)
Health insurance coverage						
Covered	1,510	(33.8)***†††	(30.9–36.8)	1,069	(39.9)†††	(36.0–44.0)
Not covered	174	(13.5)	(8.9–20.1)	176	(14.5)	(9.6–21.3)
Usual place for health care						
Yes	1,578	(32.8)***†††	(30.0–35.8)	1,146	(38.7)†††	(35.0–42.5)
No	108	(15.5)	(9.3–24.8)	102	(10.4)§§§	(4.9–20.7)
Ratio of family annual income to poverty threshold¶¶¶						
0–0.99	262	(27.1)	(20.8–34.4)	255	(25.0)†††	(19.0–32.2)
1.0–2.49	456	(33.1)	(28.2–38.3)	329	(34.9)	(28.2–42.4)
2.5–4.49	348	(28.8)	(23.8–34.4)	230	(34.5)	(26.8–43.0)
≥4.5	314	(28.6)***	(23.1–34.8)	206	(44.5)	(36.9–52.4)

* Based on “yes” responses to either or both survey questions: “During the past 12 months, has [person] had a flu shot? A flu shot is usually given in the fall and protects against influenza for the flu season,” “During the past 12 months, has [person] had a flu vaccine sprayed in his/her nose by a doctor or other health professional? This vaccine is usually given in the fall and protects against influenza for the flu season.”

† *Current asthma*: “Yes” responses to the survey questions, “Has a doctor or other health professional ever told you that [person] had asthma?” and “Does [person] still have asthma?”

§ Persons aged <65 years who are not covered by private insurance, Medicaid, State Children’s Health Insurance Program (SCHIP), public assistance (through 1996), state-sponsored or other government-sponsored health plans (starting in 1997), Medicare, or military plans are considered to have no health insurance coverage. Persons with only Indian Health Service coverage are considered uninsured. (CDC. Health, United States, 2006. Available at http://www.ncbi.nlm.nih.gov/books/bookres.fcgi/healthus06/healthus06.pdf.) This pertains to overall insurance coverage and does not address whether vaccinations specifically are included in insurance.

¶ *Yes*: “Yes” or “There is more than one place” response to the question: “Is there a place that you usually go to when you are sick or need advice about your health?” *No*: “There is no place” response to the same question.

** Only responses in the subset of NHIS interviews that occurred during March–August 2006 were included to isolate responses to the 2005–06 influenza season; only persons within the stated age range for the entire influenza season (September 2005–February 2006) are included. Persons who reported receiving vaccine before September 2005 or after February 2006 were not counted as vaccinated for the 2005–06 influenza season. The same criteria were applied to the 2004–05 season.

†† Respectively, September 2004–February 2005 September 2005–February 2006.

§§ Unweighted sample size; percentages and confidence intervals are weighted proportions.

¶¶ Confidence interval.

*** Difference in across-year comparison within stratification is statistically significant (p<0.05).

††† Difference among within-year stratification is statistically significant (p<0.05).

§§§ Estimate is considered unreliable and should be interpreted with caution: relative standard error = 0.3–0.5.

¶¶¶ Missing income responses were not imputed or included.

TABLE 3. Influenza vaccination coverage* levels among persons aged ≥2 years by current asthma status† and number of health-care visits,§ National Health Interview Survey (NHIS)¶ — United States, 2005–06 influenza season**

No. health-care visits	All persons No.††	All persons (%)	All persons (95% CI§§)	Without asthma No.	Without asthma (%)	Without asthma (95% CI)	With asthma No.	With asthma (%)	With asthma (95% CI)
0–1	5,608	(12.3)¶¶	(11.3–13.4)	5,346	(12.0)¶¶***	(11.0–13.1)	262	(17.6)¶¶***	(13.0–23.4)
2–5	6,036	(28.6)	(27.0–30.2)	5,522	(27.9)***	(26.3–29.6)	514	(36.1)***	(30.8–41.7)
6–9	1,409	(38.5)	(35.4–41.8)	1,240	(38.1)	(34.8–41.4)	169	(41.9)	(32.8–51.5)
≥10	1,850	(40.7)	(38.1–43.5)	1,562	(39.0)***	(36.0–42.1)	288	(50.8)***	(43.2–58.3)

* Based on “yes” responses to either or both survey questions: “During the past 12 months, has [person] had a flu shot? A flu shot is usually given in the fall and protects against influenza for the flu season,” “During the past 12 months, has [person] had a flu vaccine sprayed in his/her nose by a doctor or other health professional? This vaccine is usually given in the fall and protects against influenza for the flu season.”

† *Current asthma*: “Yes” responses to the survey questions, “Has a doctor or other health professional ever told you that [person] had asthma?” and “Yes” response to the survey question, “Does [person] still have asthma?” *Without current asthma*: “No” response to the survey question, “Has a doctor or other health-care professional ever told you that [person] had asthma?” or “Does [person] still have asthma?”

§ Based on response to the question: “During the past 12 months, how many times have you seen a doctor or other health-care professional about your own health at a doctor’s office, a clinic, or some other place? Do not include times you were hospitalized overnight, visits to hospital emergency rooms, home visits, dental visits, or telephone calls.”

¶ Only responses in the subset of NHIS interviews that occurred during March–August 2006 were included to isolate responses to the 2005–06 influenza season; only persons within the stated age range for the entire influenza season are included. Persons who reported receiving vaccine outside of September 2005–February 2006 were not counted as vaccinated for the 2005–06 influenza season.

** September 2005–February 2006.

†† Unweighted sample size; percentages and confidence intervals are weighted proportions.

§§ Confidence interval.

¶¶ Difference in vaccination coverage among health-care visits subgroups was statistically significant (p<0.05).

*** Pairwise difference between “with asthma” and “without asthma” within the given health-care visits subgroup was statistically significant (p<0.05).

severity, coverage was not different among those with acute exacerbations. Vaccination coverage was 41.8% among persons with at least one emergency department or urgent care visit for asthma within the preceding 12 months and 35.4% with no such visits (p=0.2). Influenza vaccination coverage did not differ significantly between persons with asthma who had an exacerbation in the past 12 months and those who did not (37.5% versus 34.8%, p=0.5). Vaccination coverage also did not differ significantly by race/ethnicity, ranging from 30.8% of Hispanics (CI = 24.4–38.1) to 37.9% (CI = 33.4–42.5) of non-Hispanic whites (p=0.09).

Reported by: *CB Ligon, RA Rudd, MSPH, DB Callahan, MD, Div of Environmental Hazards and Health Effects, National Center for Environmental Health; GL Euler, DrPH, Immunization Svcs Div, National Center for Immunization and Respiratory Diseases, CDC*

Editorial Note: This report presents the first estimates of influenza vaccination coverage in the United States among the civilian, noninstitutionalized population of persons with asthma and reinforces the need to increase vaccination throughout this at-risk population. Health-care visits provide an opportunity for vaccination, but even among persons with the highest number of visits, nearly half remained unvaccinated in the 2005–06 influenza season. Even so, access to health care is an important factor associated with receiving influenza vaccination. Persons with asthma who had health insurance had a greater rate of influenza vaccination than did those who lacked insurance. Likewise, the vaccination rate for persons with asthma who had a usual place for health care was significantly greater than the rate for those who did not have a regular place for health care. After the vaccine shortage of the 2004–05 influenza season, vaccination coverage of persons with asthma in 2005–06 failed to improve among households with the lowest incomes, among persons without health insurance, and among persons without a regular place for medical care, emphasizing the need for interventions that include the medically underserved.

During the 2005–06 influenza season, the oldest age groups (50–64 years and ≥65 years) had the highest vaccination coverage. Influenza vaccination is recommended for both age groups, regardless of asthma status, because the influenza-related death rate increases sharply among older adults (*3*). In February 2006, ACIP recommended that all children aged 24–59 months be vaccinated against influenza, regardless of risk status. Examination of the 2007 NHIS data could determine whether the expanded recommendation affected coverage among the subset of children with asthma, who already had been recommended for vaccination under previous guidelines. Because ACIP voted in February 2008 to recommend influenza vaccination for all children, data soon will be available to also study the effects on coverage for older children.*

The findings in this report are subject to at least three limitations. First, the sample size of the survey (34,112 adults and children, 2,700 of whom reported having current asthma) limits reliable identification of patterns among subgroups of persons with asthma potentially of interest but smaller in number than the subgroups examined here. Second, determination of vaccination status in NHIS is made by self-report, which introduces recall bias and likely overestimation of vaccination rates (*8*). Finally, NHIS does not ascertain whether a child received a second vaccine dose, as is recommended by ACIP for children aged 6 months to 8 years who previously have not received the influenza vaccination; therefore, NHIS overestimates full coverage for this age group (*3*).

The findings in this report emphasize the need for measures to uniformly increase influenza vaccination rates among persons with asthma. Interventions that target patients, health-care access, and health-care providers have demonstrated benefits in similar settings and should be implemented to improve influenza vaccination coverage. Such interventions include automated reminders, standing orders, multicomponent educational programs, reduction of travel distances or out-of-pocket vaccine costs, and provider performance feedback (*9*). Persons with inadequate access to health care and those treated at multiple facilities would be less likely to miss opportunities for vaccination if they consistently sought care at a single medical facility. That continuity of care could reduce the diffusion of responsibility that occurs when patients are treated at multiple health-care facilities (*10*). Providing vaccination through at least January and February of the influenza season can further reduce missed opportunities for effective vaccination of persons in this group at high risk.

References

1. Bloom B, Cohen RA. Summary health statistics for U.S. children: National Health Interview Survey, 2006. Vital Health Stat 2007;10(234).
2. Pleis JR, Lethbridge-Çejku M. Summary health statistics for U.S. adults: National Health Interview Survey, 2006. Vital Health Stat 2007;10(235).
3. CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2007. MMWR 2007;56(No. RR-6).
4. CDC. Advisory Committee on Immunization Practices: recommendations for influenza immunization and control in the civilian population. Influenza Surveillance Report 1964;80:8–11.

* Available at http://www.cdc.gov/vaccines/recs/provisional/downloads/flu-3-21-08-508.pdf.

5. CDC. Self-reported influenza vaccination coverage trends 1989–2006 among adults by age group, risk group, race/ethnicity, health-care worker status, and pregnancy status, United States, National Health Interview Survey (NHIS). Available at http://www.cdc.gov/flu/professionals/vaccination/pdf/vaccinetrend.pdf.
6. CDC. Influenza vaccination coverage among children with asthma—United States, 2004–05 influenza season. MMWR 2007;56:193–6.
7. US Department of Health and Human Services. Healthy people 2010 (conference ed, in 2 vols). Washington, DC: US Department of Health and Human Services; 2000. Available at http://www.healthypeople.gov.
8. Mangtani P, Shah A, Roberts JA. Validation of influenza and pneumococcal vaccine status in adults based on self-report. Epidemiol Infect 2007;135:139–43.
9. Task Force on Community Preventive Services. Recommendations regarding interventions to improve vaccination coverage in children, adolescents, and adults. Am J Prev Med 2000;18(1 Suppl):92–6.
10. Smith PJ, Santoli JM, Chu SY, Ochoa DQ, Rodewald LE. The association between having a medical home and vaccination coverage among children eligible for the Vaccines for Children program. Pediatrics 2005;116:130–9.

Recommendations from an Ad Hoc Meeting of the WHO Measles and Rubella Laboratory Network (LabNet) on Use of Alternative Diagnostic Samples for Measles and Rubella Surveillance

Laboratory confirmation of measles and rubella is an important component of disease surveillance in all settings. Because the use of clinical diagnosis for surveillance is unreliable, case-based laboratory confirmation of disease is critically important in settings with measles or rubella elimination goals. The World Health Organization (WHO) Measles and Rubella Laboratory Network (LabNet) was established in 2000 to provide a standardized testing and reporting structure and a comprehensive, external quality-assurance program (*1*). LabNet currently consists of 679 laboratories serving 166 countries. However, measles and rubella surveillance remains incomplete in certain areas because of difficulties with the collection and transport of serum specimens. Recently, LabNet evaluated two alternative sampling approaches to serum samples, the use of dried blood spots (DBS) and oral fluid (OF) samples. Both of these approaches have potential to be useful tools for measles and rubella control programs. In June 2007, WHO convened an ad hoc meeting in Geneva, Switzerland, to review available data and provide recommendations on use of DBS and OF samples for measles and rubella diagnostics. Attendees included LabNet staff members and scientists who had been conducting studies to evaluate use of these alternative diagnostic samples. The attendees concluded that 1) although serum-based diagnostics remain the "gold standard," the use of these two alternative sampling techniques would not adversely affect routine measles and rubella surveillance and might enhance surveillance; 2) regions in the elimination phase* that already have established serum-based testing for rash illness surveillance would not likely benefit from converting to DBS or OF sampling methods, except in special circumstances; and 3) DBS or OF sampling are viable options for measles and rubella surveillance in all regions, especially where patients might resist venipuncture for blood collection, or where special challenges exist with transport or refrigeration of diagnostic samples.

Background on Use of Alternative Diagnostic Samples

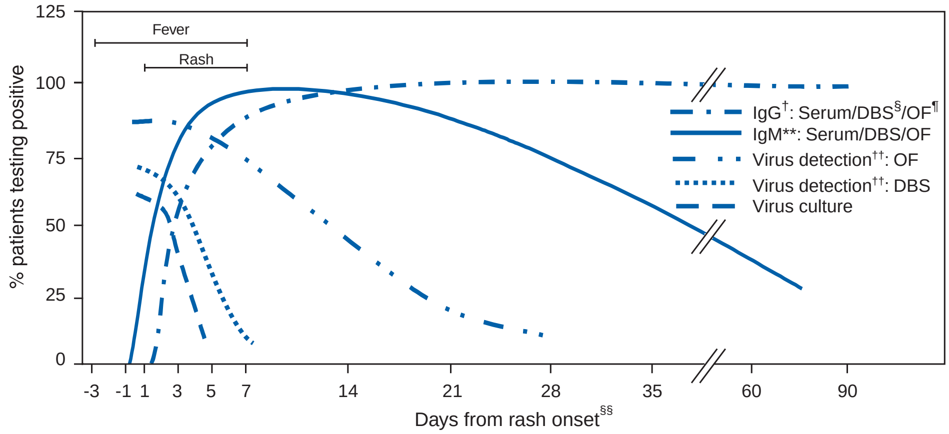
Conventional laboratory confirmation of suspected cases of measles and rubella is based on the detection of virus-specific immunoglobulin M (IgM) in a single serum sample collected soon after the onset of symptoms (*2*). In addition, detection of viral RNA by reverse transcription–polymerase chain reaction (RT-PCR), usually in a throat swab or urine sample, and subsequent genotyping of strains is valuable for diagnosis and molecular epidemiology (*2*). Accurate laboratory results for detection of IgM and viral RNA are dependent on proper collection, processing, shipment, and storage of clinical samples and use of accurate tests performed by a proficient laboratory. However, collection of blood samples by venipuncture, particularly from children, can be a challenge, and the sustained refrigeration required for diagnostic samples during transport is not always achievable. In these situations, alternatives to serum collection can be useful.

DBS has been used for various epidemiologic studies for the detection of measles- and rubella-specific IgG and IgM antibodies and viral RNA (*3–5*). Antibody and viral RNA are sufficiently stable on DBS at ≤98.6°F (≤37.0°C) to allow this sample collection method to be used for case confirmation or molecular epidemiology in areas where sample refrigeration is not feasible. OF has been used in similar studies and for the national measles, mumps, and rubella (MMR) surveillance program in the United Kingdom (UK) for approximately 10 years (*6,7*). OF is easy to

*As of 2008, four out of six World Health Organization regions have measles elimination goals: the Region of the Americas (by 2000; measles declared eliminated since late 2002), the European Region (by 2010), the Eastern Mediterranean Region (by 2010), and the Western Pacific Region (by 2012). In addition, two regions have rubella elimination goals: the Region of the Americas and the European Region (both by 2010).

collect, and collection is more acceptable to the population (*6*), thereby enabling health-care workers to obtain more complete sampling for suspected cases.

FIGURE 1. Pattern of test results among patients with wild measles virus infection, by day from rash onset and type of sampling method used — WHO Measles and Rubella Laboratory Network*



* Illustrative schematic based on data presented at the Measles and Rubella Alternative Sampling Techniques Review Meeting, convened in Geneva, Switzerland, in June 2007.
† Immunoglobulin G.
§ Dried blood spots.
¶ Oral fluid.
** Immunoglobulin M.
†† Virus RNA detection by conventional, nested, or real-time reverse transcription–polymerase chain reaction.
§§ Incubation period: approximately 14 days.

Evaluations Comparing Alternative Diagnostic Samples with Serum-Based Diagnostics

Since 2001, LabNet reference laboratories in Australia, Cote d'Ivoire, Netherlands, Turkey, Uganda, the UK, and the United States have been working to 1) determine IgM and RNA stability in DBS and OF samples and 2) optimize the methods for IgM antibody assay and protocols for RNA detection in DBS and OF samples (*8–10*). This work has provided data on sensitivity and specificity of OF and DBS samples compared with serum and also has identified logistic challenges in implementing alternative sampling techniques. Three different types of data were available for review during the ad hoc meeting. First, beginning in 2001, LabNet laboratories conducted studies that collected OF, DBS, and corresponding serum samples from persons with suspected measles or rubella during outbreaks and tested the samples for the presence of measles- or rubella-specific IgM antibodies. Second, LabNet reviewed data from the MMR surveillance program in the UK, where 1,000–3,000 OF samples have been collected annually during the past decade. Third, LabNet reviewed data from seven countries in the WHO African Region that used DBS sampling methods for routine measles and rubella surveillance during 2005–2007. DBS was either the only sample collected (Sierra Leone) or was collected in conjunction with routine serum collection (Burkina Faso, the Democratic Republic of Congo, Ethiopia, Ghana, Senegal, and Zambia). Standard protocols for sample collection and laboratory testing recommended by LabNet were used (*2*).

Data from all three sources indicated that the sensitivity and specificity of DBS and OF for detecting measles and rubella virus–specific IgM parallels that of serum; however, a moderate decline in sensitivity for detecting rubella virus–specific IgM in OF during the first 4–5 days after disease onset was observed (Figures 1 and 2; Table). Detection of RNA in serum and DBS was shown to be possible with nested or real-time RT-PCR (but not conventional RT-PCR) if samples are collected within 5–7 days after rash onset. This procedure has proven invaluable for collecting viral sequence information where urine or throat swabs were not available. In the MMR surveillance program in the UK, using OF, the rate of measles RNA detection by nested RT-PCR ranged from 80% to 90% when collected during the first week after rash onset, and reached 50% at 3–4 weeks after rash onset. Conventional RT-PCR was sensitive for up to 2 weeks after rash onset, but was still considered useful. For rubella, testing for both IgM and RNA in OF samples substantially increased the sensitivity of surveillance for confirming cases during the first 4–5 days after rash onset, when many rubella cases are not yet IgM positive. Results of evaluations comparing OF and DBS with serum sampling indicated that OF and DBS sampling have a potential role in improving measles and rubella surveillance. Compared with serum collection, these sampling procedures provide:

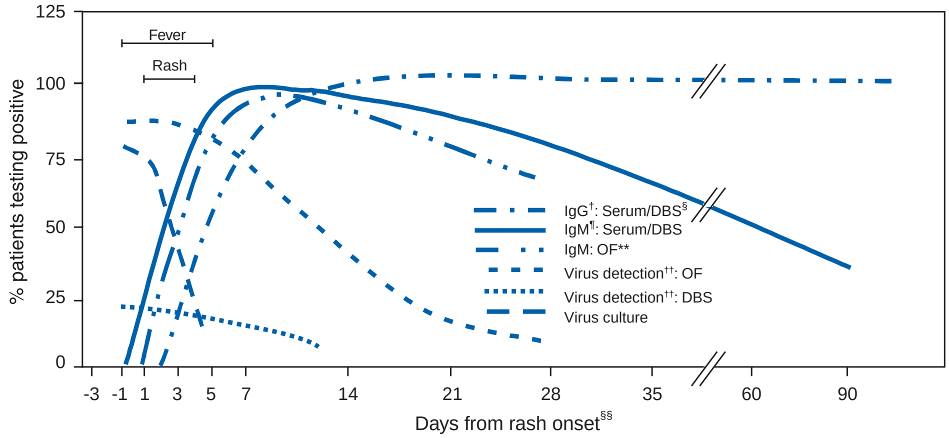
- Equivalent sensitivity and specificity for specific IgM detection, although moderately reduced sensitivity for detecting rubella virus–specific IgM in OF samples.
- Simplified sample collection, although training is required.

- Good acceptance by patients, because DBS avoids venipuncture and OF is noninvasive.
- Stability without refrigeration for periods of up to 7 days (OF) or longer (DBS).
- Equivalent cost for collection, extraction, and testing.
- Potential to substantially reduce transport costs through avoiding refrigeration.
- Ability to detect both specific IgM and RNA in the same sample. OF can extend the opportunity for RNA detection after rash onset.
- Equivalent sensitivity and specificity for IgG detection and consequent versatility for use in seroepidemiology studies.

However, use of OF and DBS sampling also has some disadvantages compared with serum collection, in particular:

- Collection devices are not commonly available and would need to be provided to health-care facilities by the surveillance program.
- Volume of DBS might be inadequate unless staff are fully trained in sample collection.
- Extraction procedures for DBS and OF require more time of technicians.
- External quality-assurance programs, such as those currently required for testing of serum, have yet to be established for OF and DBS.

FIGURE 2. Pattern of test results among patients with wild rubella virus infection, by day from rash onset and type of sampling method used — WHO Measles and Rubella Laboratory Network*



* Illustrative schematic based on data presented at the Measles and Rubella Alternative Sampling Techniques Review Meeting, convened in Geneva, Switzerland, in June 2007.
† Immunoglobulin G.
§ Dried blood spots.
¶ Immunoglobulin M.
** Oral fluid.
†† Virus RNA detection by conventional, nested, or real-time reverse transcription–polymerase chain reaction.
§§ Incubation period: 14–17 days.

TABLE. Percentage of patients testing positive for wild measles and rubella virus infection, by time of specimen collection, type of specimen, and type of sampling method used — WHO Measles and Rubella Laboratory Network*

	Time of collection	Serum (%)	Dried blood spots (%)	Oral fluid (%)
Measles				
IgM†	Early (day 0–3)	60–70	60–70	60–70
	Intermediate (day 4–14)	90–100	90–100	90–100
	Late (day 15–28)	100	100	100
Virus detection (RT-PCR§)	Early (day 0–3)	<10	<25	>80
	Intermediate (day 4–14)	<1	<1	50
	Late (day 15–28)	0	0	<20
Rubella				
IgM	Early (day 0–3)	50	50	40
	Intermediate (day 4–14)	60–90	60–90	50–90
	Late (day 15–28)	100	100	100
Virus detection (RT-PCR)	Early (day 0–3)	—¶	20	60–70
	Intermediate (day 4–14)	—¶	—¶	50
	Late (day 15–28)	—¶	—¶	—¶

* Based on data presented at the Meeting on the Use of Alternative Sampling Techniques for Measles and Rubella Surveillance, convened in Geneva, Switzerland, in June 2007.
† Immunoglobulin M.
§ Virus RNA detection by conventional, nested, or real-time reverse transcription–polymerase chain reaction.
¶ Data are insufficient for meaningful analysis.

Recommendations

Having considered the evidence described in this report, participants in the ad hoc meeting made the following recommendations.

No single alternative sampling technique has been shown to be optimal for surveillance under every circumstance, and serum should still be considered the "gold standard" for IgM detection. However, DBS and OF sampling techniques are viable options for measles and rubella surveillance (*5–10*), especially where challenges with specimen transport or refrigeration exist or where patients might resist venipuncture. Alternative sampling techniques would not adversely affect routine measles and rubella surveillance (provided adequate training and resources are provided) and might enhance surveillance through:

- More acceptable noninvasive methods (OF).
- Reduced transport costs (DBS and OF).
- Enhanced ability to conduct molecular surveillance (OF and DBS RNA).
- Enhanced sensitivity of rubella case confirmation during the first 4–5 days after rash onset (OF RNA).
- Offering a confirmatory option for questionable serum IgM results during the early stage of disease for both measles and rubella (OF RNA).

Regions in the elimination phase that already have established a serum-based rash illness surveillance system would not likely benefit from changing to DBS or OF sampling methods except in special circumstances, such as in settings where:

- Timely specimen transport from remote or difficult-to-access areas to the laboratory conducting the serologic analysis is especially difficult.
- Collection of OF in addition to serum might improve efficiency of case identification and virologic surveillance by enabling detection of viral RNA from disease onset.

Implications for Measles and Rubella Surveillance in the United States

Elimination of indigenous measles and rubella virus was declared in the United States in 2000 and 2004, respectively.[†] High-quality measles and rubella surveillance including timely collection of diagnostic samples for laboratory confirmation, along with sustained high coverage with a combined MMR vaccine, have been critical in achieving that public health success. At present, routine measles and rubella surveillance in the United States will continue to rely upon already established diagnostic methods, including serum-based assays for detection of virus-specific antibodies and on nasopharyngeal swab or urine samples for virus detection.

[†] Additional information available at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5718a5.htm and http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5411a5.htm.

References

1. World Health Organization. Global measles and rubella laboratory network—update. Wkly Epidemiol Rec 2005;80:384–8.
2. World Health Organization. Manual for the laboratory diagnosis of measles and rubella infection, 2nd ed. Geneva, Switzerland: World Health Organization; 2007. WHO/IVB/07.01. Available at http://www.who.int/immunization_monitoring/LabManualFinal.pdf.
3. Ibrahim SA, Abdallah A, Saleh EA, Osterhaus ADM, De Swart RL. Measles virus-specific antibody levels in Sudanese infants: a prospective study using filter paper blood samples. Epidemiol Infect 2006;134:79–85.
4. Riddell MA, Byrnes GB, Leydon JA, Kelly HA. Dried venous blood samples for the detection and quantification of measles IgG using a commercial enzyme immunoassay. Bull World Health Organ 2003;81:10.
5. El Mubarak HS, Yüksel S, Mustafa OM, Ibrahim SA, Osterhaus AD, de Swart RL. Surveillance of measles in the Sudan using filter paper blood samples. J Med Virol 2004;73:624–30.
6. Vyse AJ, Gay NJ, White JM, et al. Evolution of surveillance of measles, mumps, and rubella in England and Wales: providing the platform for evidence-based vaccination policy. Epidemiol Rev 2002;24:125–36.
7. Vyse AJ, Jin L. An RT-PCR assay using oral fluid samples to detect rubella virus genome for epidemiological surveillance. Mol Cell Probes 2002;16:93–7.
8. De Swart RL, Nur Y, Abdallah A, et al. Combination of reverse transcriptase PCR analysis and immunoglobulin M detection on filter paper blood samples allows diagnostic and epidemiological studies of measles. J Clin Microbiol 2001;39:270–3.
9. Riddell MA, Leydon JA, Catton MG, et al. Detection of measles virus-specific immunoglobulin M in dried venous blood samples by using a commercial enzyme immunoassay. J Clin Microbiol 2002;40:5–9.
10. Helfand RF, Cabezas C, Abernathy E, et al. Dried blood spots versus sera for detection of rubella virus-specific immunoglobulin M (IgM) and IgG in samples collected during a rubella outbreak in Peru. Clin Vaccine Immunol 2007;14:1522–5.

False-Positive Oral Fluid Rapid HIV Tests — New York City, 2005–2008

On June 18, this report was posted as an MMWR Early Release *on the* MMWR *website* (http://www.cdc.gov/mmwr).

The New York City Department of Health and Mental Hygiene (NYC DOHMH) operates 10 sexually transmitted disease (STD) walk-in clinics offering various free services, including confidential or anonymous testing for human immunodeficiency virus (HIV). In January 2004, the STD clinics introduced on-site rapid HIV testing of finger-stick whole-blood specimens using the OraQuick® brand test (OraSure Technologies, Bethlehem, Pennsylvania). In March 2005, the clinics replaced finger-stick whole-blood testing with oral fluid testing with the OraQuick Advance Rapid HIV-1/2 Antibody Test.* The clinics use Western blot confirmatory tests on serum to confirm all whole-blood or oral fluid reactive (i.e., preliminary positive) rapid tests. In late 2005, an unexpected increase in the number of false-positive oral fluid tests occurred, but the increase subsided after several months. In December 2005, while the cluster of false-positive oral fluid test results was being investigated, the NYC DOHMH Bureau of STD Control suspended oral fluid testing in the clinics for 3 weeks and replaced it with finger-stick whole-blood rapid testing, which produced no false-positive test results. On December 21, 2005, NYC DOHMH resumed oral fluid rapid testing but also introduced the use of immediate follow-up finger-stick whole-blood testing, using a second OraQuick test, after any reactive oral fluid test result. In late 2007, another larger increase in the incidence of false-positive oral fluid rapid test results was observed. The cause for the episodic increases in false-positive oral fluid tests has not yet been determined. NYC DOHMH has again suspended the use of oral fluid testing in STD clinics, and finger-stick whole-blood testing is the only rapid HIV test being used in this setting. These findings underscore the importance of confirming all reactive HIV tests, both from oral fluid and whole-blood specimens. In addition, the results suggest that the NYC DOHMH strategy of following up reactive oral fluid test results with an immediate finger-stick whole-blood test reduced the number of apparent false-positive oral fluid test results and might be a useful strategy in other settings and locations.

The NYC DOHMH Bureau of STD Control routinely offers STD and HIV screening to all patients during the approximately 115,000 annual visits to the 10 STD clinics operated by the city. In 2003, 33,375 conventional (i.e., not rapid) HIV tests were performed. A total of 552 (1.6%) were positive; 79% of all patients tested received their test results. In 2004, after on-site finger-stick whole-blood rapid HIV testing was initiated with the OraQuick test, HIV testing at the clinics increased 14% to 38,092 tests, and receipt of results increased to 88% for HIV-positive and 86% for HIV-negative patients. On average, during January 2004–February 2005, fewer than one false-positive finger-stick whole-blood rapid test occurred monthly. After oral fluid rapid HIV testing began in March 2005, overall test volume increased an additional 24%, to 47,204 tests in 2005. This upward trend in testing has continued (Figure 1); in 2007, the STD clinics performed 60,281 HIV tests, of which 607 (1.0%) were confirmed positive.

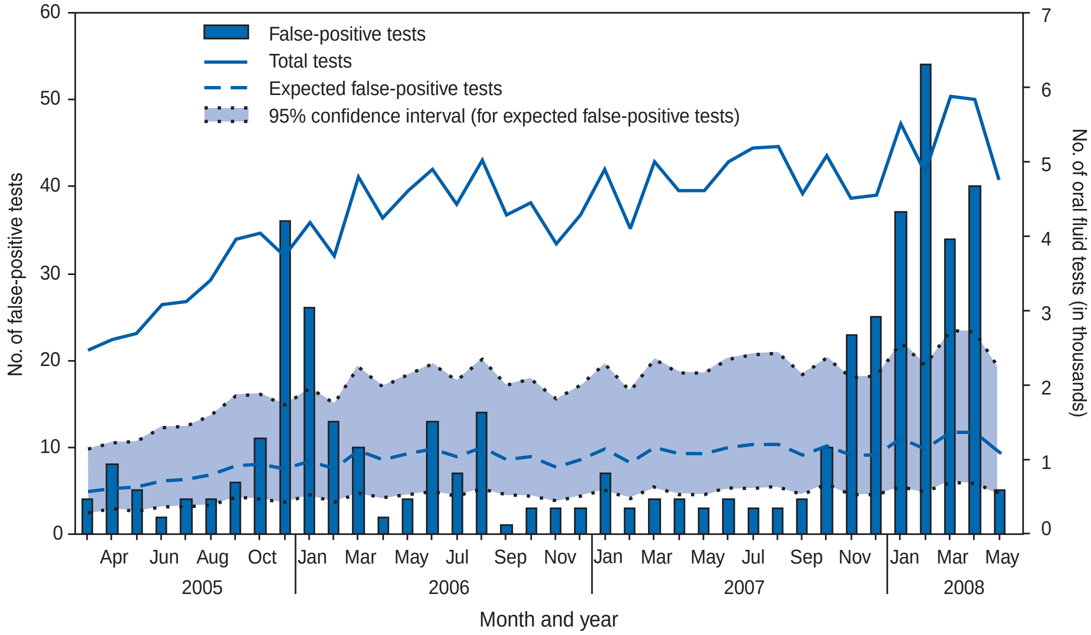
In the first 7 months after oral fluid testing was introduced, 35 (0.16%) of 21,722 tests were false positive by Western blot, consistent with the 99.8% (95% confidence interval [CI] = 99.6%–99.9%) specificity claim by the manufacturer in the product package insert (*1*). However, in October 2005, staff members at the clinics noticed an increase in the number of false-positive oral fluid test results each month. From an average of five false-positive tests per month, the monthly number of false-positive tests increased to 11 (0.27% of 4,024 tests) in October 2005 and to 36 (0.97% of 3,735 tests) in November 2005 (with a specificity of 99.03%, lower than the lower limit of the manufacturer's CI specifications) (Figure 1). An investigation detected no consistent relation between false-positive results and test-kit handling, storage conditions, or lot numbers or between false-positive results and clinic sites, test operators, or patient characteristics.

Despite the increased number of false-positive results, testing with the noninvasive oral fluid specimens was popular with clinic patients and more convenient for staff members; therefore, the NYC DOHMH continued offering oral fluid rapid HIV testing while attempting to minimize the adverse effects of false-positive test results. In late December 2005, a revised strategy was implemented at the clinics by continuing to offer oral fluid rapid tests but immediately following reactive oral fluid tests with a second OraQuick test on finger-stick whole-blood specimens. Both test results were documented in the medical record. Counselors continued to explain to patients that any reactive rapid tests required Western blot confirmation but also emphasized that discordant oral fluid and whole-blood test results were likely to be false positive. By February 2006, an oral fluid test specificity of 99.65% was observed, within the CI of the manufacturer's specifications.

Another persistent increase in false-positive oral fluid test results began in late 2007. Beginning in November 2007, the number of false-positive oral fluid tests increased from 23 (0.51% of 4,503 tests) to a peak of 54 (1.11% of 4,858 tests) in February 2008 (Figure 1). During November 2007–April 2008, the monthly specificity of the oral fluid test ranged from 98.88%–99.49%. In May 2008, fewer false-positive tests occurred; in that month, five (0.11% of 4,749 oral fluid tests) were found to be false positive (specificity: 99.89%).

* The OraQuick rapid HIV test can be used to test either blood (finger-stick or venipuncture whole-blood or plasma specimens) or oral fluid.

FIGURE 1. Total number of oral fluid rapid human immunodeficiency virus (HIV) tests administered and number of actual and expected false-positive results,* by month and year — New York City,† March 2005–May 2008§



* As confirmed by Western blot performed on serum. Expected number of false-positive tests and corresponding 95% confidence intervals calculated based on number of oral fluid tests performed monthly and manufacturer's claim for specificity with oral fluid (Orasure Technologies, Inc., OraQuick® Advance Rapid HIV-1/2 Antibody Test customer letter and package insert. Available at http://www.orasure.com/uploaded/398.pdf).

† Among patients tested in 10 sexually transmitted disease clinics.

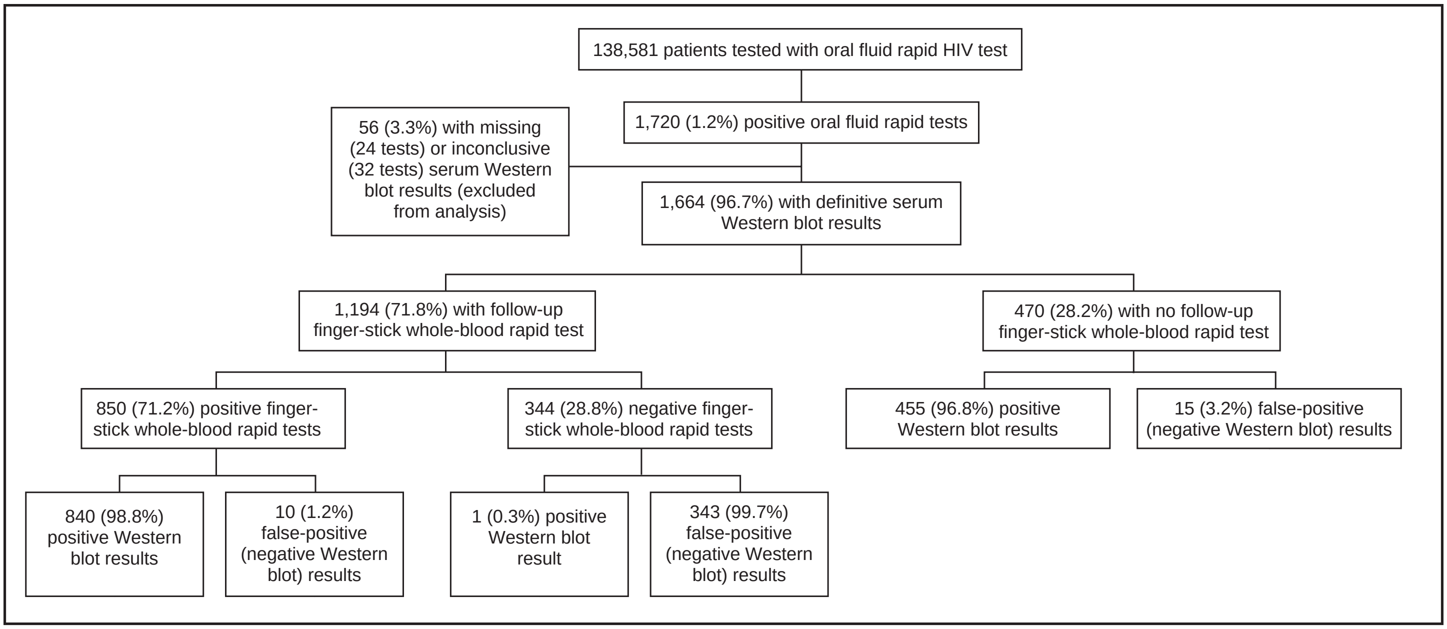
§ Oral fluid rapid HIV tests were introduced in March 2005. They were suspended for 3 weeks in December 2005 and replaced by finger-stick whole-blood testing.

During this second instance of increasing numbers of false-positive oral fluid tests, the clinics continued offering immediate follow-up finger-stick whole-blood rapid tests for all patients with reactive oral fluid tests. The usefulness of the NYC DOHMH policy was affirmed by the strong correlation between results from whole-blood rapid tests and confirmatory Western blot tests. During December 2005–May 2008, 1,720 patients had reactive oral fluid rapid tests, and definitive Western blot results were recorded for 1,664 (Figure 2). Missing Western blot results (24 patients) and inconclusive Western blot results (32 patients) were excluded from additional analysis. Of these 1,664 patients, 1,194 also provided a finger-stick specimen; 850 (71.2%) had a reactive finger-stick test, of whom 840 (98.8%) were positive by Western blot. Only one (0.3%) of 344 patients with a reactive oral fluid and negative finger-stick whole-blood rapid test was positive by Western blot.

Despite the NYC DOHMH policy that STD clinics should retest using whole-blood specimens after reactive oral fluid tests, 550 patients with reactive oral fluid results did not receive a finger-stick test.† For 80 of these patients, the test was ordered but not completed; of these, 77 (96.3%) had a positive serum Western blot result. A total of 470 (28.2%) patients with reactive oral fluid tests declined the finger-stick test. Of these, 455 (96.8%) were confirmed positive by serum Western blot, compared with 850 (71.2%) of the 1,194 patients who agreed to a finger-stick test. Additional investigation indicated that 29% of patients with a reactive oral fluid test result who then declined the finger-stick test had been reported previously as HIV-positive to the local HIV/AIDS Reporting System, compared with 21% of patients who agreed to a follow-up finger-stick test.

† Before patients were examined by a clinician, STD clinic staff members drew two vials of blood from all patients who visited the clinics (one for syphilis testing and one for confirmation of HIV, if needed). Clinic providers offered the HIV test to all patients; if accepted, providers requested the signed consent form required by the state of New York, and, when the oral fluid test was being used, they conducted the oral fluid rapid HIV test. Patients with reactive oral fluid tests were offered the finger-stick whole-blood test. The clinics were able to obtain confirmation of results for patients who refused the finger-stick test because the initially drawn tube of blood was sent routinely for Western blot confirmation of all reactive tests.

FIGURE 2. Number and percentage of positive and false-positive oral fluid and finger-stick whole-blood rapid human immunodeficiency virus (HIV) tests, as confirmed by serum Western blot results — New York City,* December 2005–May 2008



* Among patients tested in 10 sexually transmitted disease clinics.

Although 442 (0.27%) of all 166,058 oral fluid rapid HIV tests performed during March 2005–May 2008 were false positive and demand for rapid HIV testing in NYC DOHMH STD clinics remains high, test operators and counselors have expressed a lack of confidence in oral fluid rapid HIV testing since the abrupt and sustained increase in false-positive test results during November 2007–April 2008. During this period, nearly half of reactive oral fluid tests in the STD clinics were false positive. Of 31,122 patients tested during those 6 months, 213 (0.69%) reactive oral fluid tests were false positive (specificity: 99.31%, below the lower limit of the CI of the manufacturer's specifications) compared with 231 (0.70%) reactive oral fluid tests confirmed positive by Western blot. Consequently, in late May, because results from rapid tests performed on whole-blood specimens were consistently more accurate than those from oral fluid tests and because rapid testing of whole-blood specimens required fewer additional tests for confirmation of HIV infection, NYC DOHMH again discontinued use of oral fluid specimen testing in STD clinics. Finger-stick whole-blood specimen testing was reinstituted as the initial rapid HIV testing method. Oral fluid HIV testing data for May 2008, which became available only after discontinuation of oral fluid testing in the STD clinics, indicated that the recent increase in false-positive oral fluid tests did not continue in May and the test's specificity with oral fluid specimens (99.89%) was within the CI of the manufacturer's specifications; however, rapid HIV testing of oral fluid specimens has not resumed.

Reported by: *J Cummiskey, MPH, M Mavinkurve, MPH, R Paneth-Pollak, MPH, J Borrelli, MPH, A Kowalski, MPH, Bur of Sexually Transmitted Disease Control, New York City Dept of Health and Mental Hygiene. S Blank, MD, B Branson, MD, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC.*

Editorial Note: Both the number of patients tested for HIV and the percentage who receive their test results have increased since rapid HIV testing was introduced in the New York City STD clinics in 2004. Nationally, public health laboratories report that rapid tests overall and oral fluid tests specifically account for an increasing proportion of all HIV tests (*2*), and patients are substantially more likely to receive rapid test results than conventional test results (*3*). The New York City data in this report underscore the importance of routinely comparing reactive rapid test results with confirmatory Western blot test results as an essential component of quality assurance in HIV testing (*4*). Several other jurisdictions have noted clusters of false-positive oral fluid rapid HIV tests since an initial report from Minnesota in 2004 (*5–8*). Although the causes of these clusters of false-positive tests remain unexplained (*6*), investigations are under way to determine which specific factors (e.g., test device, site, operator, or oral fluid characteristics of specific patients) might be associated with increased numbers of false-positive test results. Several programs have adopted strategies similar to the one used in New York City and are immediately repeating the rapid test on whole-blood specimens from patients who have reactive oral fluid tests. Other strategies under investigation include repeat testing with a second rapid test from a different manufacturer (*9*).

The specificity of OraQuick rapid tests performed on oral fluid specimens is lower than that of OraQuick rapid tests performed on whole-blood specimens (*5*). The test manufacturer's 99.8% specificity estimate with oral fluid is based on a clinical trial of 3,682 participants. In New York City STD clinics, performing approximately 5,000 oral fluid tests per month for 3 years, overall specificity has been 99.73%, but the month-to-month specificity has ranged from 98.88% to 99.98%. Although specificity was lower than the manufacturer's claim during certain months, the test's performance in the New York City clinics was not below the Food and Drug Administration (FDA) minimum threshold of 98% for rapid HIV tests.[§]

Because the prevalence of positive HIV tests has decreased among STD clinic patients concomitant with the increasing number of tests, a slight increase in the percentage of reactive rapid tests that are determined to be false positive (decreased positive predictive value) was expected. However, this change does not account for recurrent clusters of false-positive tests.

The advantages of rapid HIV tests, particularly with oral fluid specimens, include increased availability and acceptability of testing among populations at high risk for HIV infection and increased receipt of test results among those tested (*3*). The strategy used in New York City, with immediate follow-up using a retest on whole-blood specimens, allowed the STD clinics to continue oral fluid rapid testing while mitigating, somewhat, the adverse effects of false-positive results on both patients and clinic personnel. The strategy also allowed health department staff members to detect the increase in false-positive tests promptly, avert the majority of instances in which patients might have left the clinic with an oral fluid test result only (e.g., with a false-positive result), and avoid the logistical difficulties inherent with training and maintaining inventory, proficiency, quality assurance, and external controls for rapid HIV tests from more than one manufacturer.

CDC continues to encourage the use of rapid HIV tests because they increase the number of persons who are tested and who receive their test results. Six rapid HIV tests have been approved by FDA since 2002 (*10*). The New York City data indicate that repeating a rapid test on finger-stick whole blood after receiving a reactive oral fluid test result allows clinic counselors to provide more accurate test-result information to patients while minimizing the number of finger-stick tests that must be performed. Regardless, confirmatory testing is required to confirm both oral fluid and whole-blood reactive rapid HIV tests. Before testing, all patients should be informed that reactive rapid HIV test results are preliminary and require confirmation. In general, testing with blood or serum specimens is more accurate than testing with oral fluid and is preferred when feasible, especially in settings where blood specimens already are obtained routinely.

Overall, oral fluid rapid tests have performed well and make HIV testing possible in many venues where performing phlebotomy or finger sticks is impractical for screening. However, users should be aware of the unexplained variability in the rate of false-positive test results. CDC will continue to work with FDA and the manufacturer to investigate the causes and extent of increases in false-positive oral fluid tests, monitor the performance of oral fluid and other rapid tests to ensure that they continue to perform as expected in testing programs, and investigate other combination test strategies to minimize false-positive test results.

Acknowledgments

The findings in this report are based, in part, on contributions by S Wright, S Wang, Bur of Sexually Transmitted Disease Control; D Hanna, C Ramaswamy, Bur of HIV/AIDS Prevention and Control, New York City Dept of Health and Mental Hygiene; the staff and patients of the New York City Dept of Health and Mental Hygiene STD clinics; and J Schillinger and S Rubin, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC.

References

1. OraSure Technologies, Inc., OraQuick® Advance Rapid HIV-1/2 Antibody Test customer letter and package insert. Available at http://www.orasure.com/uploaded/398.pdf.
2. Association of Public Health Laboratories. Public health laboratory issues in brief: 2006 HIV diagnostics survey. Silver Spring, MD: Association of Public Health Laboratories; 2007. Available at http://www.aphl.org/aphlprograms/infectious/documents/hiv_issue_brief_2007.pdf.

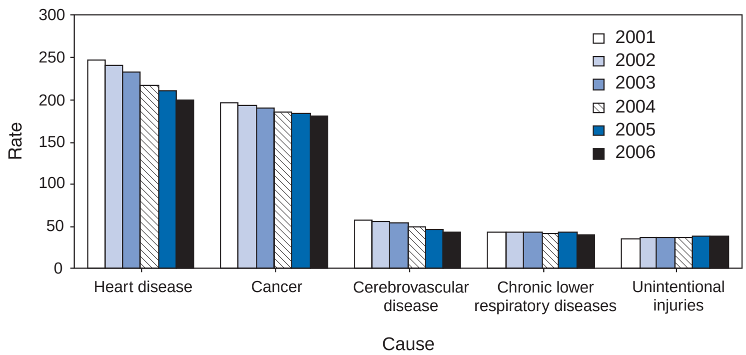
[§] US Department of Health and Human Services, Food and Drug Administration, Center for Drug Evaluation and Research. Development of rapid HIV tests. In: Blood Products Advisory Committee Sixty-Sixth Meeting (vol I); June 15, 2000; Silver Spring, Maryland. Available at http://www.fda.gov/ohrms/dockets/ac/00/transcripts/3620t1.pdf.

3. Hutchinson AB, Branson BM, Kim A, Farnham PG. A meta-analysis of the effectiveness of alternative HIV counseling and testing methods to increase knowledge of HIV status. AIDS 2006;20:1597–604.
4. CDC. Quality assurance guidelines for testing using rapid HIV antibody tests waived under the Clinical Laboratory Improvement Amendments of 1988. Atlanta, GA: US Department of Health and Human Services, CDC; 2007. Available at http://www.cdc.gov/hiv/topics/testing/resources/guidelines/pdf/qa_guidlines.pdf.
5. Delaney KP, Branson BM, Uniyal A, et al. Performance of an oral fluid rapid HIV-1/2 test: experience from four CDC studies. AIDS 2006;20:1655–60.
6. Jafa K, Patel P, MacKellar DA, et al. Investigation of false positive results with an oral fluid rapid HIV-1/2 antibody test. PLoS One 2007;1:1–6.
7. Walensky R, Arbelaez C, Reichmann W, et al. Revisiting expectations from rapid HIV tests and confirmation algorithms in the emergency department [Poster]. Presented at 15th Conference on Retroviruses and Opportunistic Infections, February 3–6, 2008, Boston, Massachusetts. Available at http://www.retroconference.org/2008/pdfs/534.pdf.
8. CDC. Supplemental testing for confirmation of reactive oral fluid rapid HIV antibody tests. MMWR 2005;54:1287–8.
9. Knoble T, Delaney K, Menendez O, Dowling T, Facente S. Implementing RTA to identify false positives and immediately refer to care. San Francisco, CA 2007. Presented at the HIV Diagnostics Conference, Atlanta, GA; December 5–7, 2007. Available at http://hivtestingconference.org/powerpoint/4_knoble.pps.
10. CDC. FDA-approved rapid HIV antibody screening tests. Atlanta, GA: US Department of Health and Human Services, CDC; 2008. Available at http://www.cdc.gov/hiv/topics/testing/rapid/rt-comparison.htm.

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Age-Adjusted Death Rates* for the Five Leading Causes of Death — United States, 2001–2006†



* Per 100,000 standard population.
† Preliminary 2006 data.

During 2001–2006, heart disease and cancer were the leading causes of death in the United States, accounting for nearly half of all deaths each year. During this period, the age-adjusted death rate for heart disease declined 19.5%, from 247.8 per 100,000 standard population to 199.4, and the age-adjusted cancer death rate declined 7.8%, from 196.0 to 180.8. Changes in the other leading causes of death were less pronounced.

SOURCE: Heron M, Hoyert DL, Xu J, Scott C, Tejada B. Deaths: preliminary data for 2006. Natl Vital Stat Rep 2008;56(16). Available at http://www.cdc.gov/nchs/data/nvsr/nvsr56/nvsr56_16.pdf.

TABLE I. Provisional cases of infrequently reported notifiable diseases (<1,000 cases reported during the preceding year) — United States, week ending June 14, 2008 (24th Week)*

Disease	Current week	Cum 2008	5-year weekly average†	Total cases reported for previous years 2007	2006	2005	2004	2003	States reporting cases during current week (No.)
Anthrax	—	—	—	1	1	—	—	—	
Botulism:									
foodborne	—	4	0	32	20	19	16	20	
infant	—	32	2	85	97	85	87	76	
other (wound & unspecified)	—	5	1	27	48	31	30	33	
Brucellosis	1	35	2	129	121	120	114	104	CA (1)
Chancroid	—	23	0	23	33	17	30	54	
Cholera	—	—	0	7	9	8	6	2	
Cyclosporiasis§	4	35	11	92	137	543	160	75	FL (4)
Diphtheria	—	—	—	—	—	—	—	1	
Domestic arboviral diseases§,¶:									
California serogroup	—	—	1	53	67	80	112	108	
eastern equine	—	—	0	4	8	21	6	14	
Powassan	—	—	0	7	1	1	1	—	
St. Louis	—	—	0	9	10	13	12	41	
western equine	—	—	—	—	—	—	—	—	
Ehrlichiosis/Anaplasmosis§,**:									
Ehrlichia chaffeensis	12	73	13	827	578	506	338	321	MD (5), VA (1), GA (1), TN (4), AL (1)
Ehrlichia ewingii	—	—	—	—	—	—	—	—	
Anaplasma phagocytophilum	—	20	17	834	646	786	537	362	
undetermined	—	2	8	337	231	112	59	44	
Haemophilus influenzae,††									
invasive disease (age <5 yrs):									
serotype b	—	17	0	23	29	9	19	32	
nonserotype b	1	81	3	196	175	135	135	117	OK (1)
unknown serotype	3	106	3	181	179	217	177	227	PA (1), GA (1), CO (1)
Hansen disease§	—	32	2	101	66	87	105	95	
Hantavirus pulmonary syndrome§	—	6	1	32	40	26	24	26	
Hemolytic uremic syndrome, postdiarrheal§	2	47	5	292	288	221	200	178	OH (1), VA (1)
Hepatitis C viral, acute	16	335	16	856	766	652	720	1,102	NY (2), MI (1), MD (1), VA (1), NC (5), FL (1), OK (2), CA (3)
HIV infection, pediatric (age <13 yrs)§§	—	—	4	—	—	380	436	504	
Influenza-associated pediatric mortality§,¶¶	5	86	1	76	43	45	—	N	IL (2), WI (1), VA (1), NC (1)
Listeriosis	2	210	14	808	884	896	753	696	NY (1), PA (1)
Measles***	—	77	1	43	55	66	37	56	
Meningococcal disease, invasive†††:									
A, C, Y, & W-135	1	144	6	322	318	297	—	—	TX (1)
serogroup B	—	79	4	166	193	156	—	—	
other serogroup	—	16	0	34	32	27	—	—	
unknown serogroup	8	337	13	552	651	765	—	—	PA (2), MD (1), CO (1), CA (4)
Mumps	2	224	29	798	6,584	314	258	231	ID (1), NV (1)
Novel influenza A virus infections	—	—	—	1	N	N	N	N	
Plague	—	1	0	7	17	8	3	1	
Poliomyelitis, paralytic	—	—	—	—	—	1	—	—	
Poliovirus infection, nonparalytic§	—	—	—	—	N	N	N	N	
Psittacosis§	—	3	0	12	21	16	12	12	
Q fever§,§§§ total:	2	46	4	173	169	136	70	71	
acute	2	42	—	—	—	—	—	—	NY (1), CO (1)
chronic	—	4	—	—	—	—	—	—	
Rabies, human	—	—	0	1	3	2	7	2	
Rubella¶¶¶	—	6	0	12	11	11	10	7	
Rubella, congenital syndrome	—	—	—	—	1	1	—	1	
SARS-CoV§,****	—	—	—	—	—	—	—	8	

—: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts.

* Incidence data for reporting years 2007 and 2008 are provisional, whereas data for 2003, 2004, 2005, and 2006 are finalized.

† Calculated by summing the incidence counts for the current week, the 2 weeks preceding the current week, and the 2 weeks following the current week, for a total of 5 preceding years. Additional information is available at http://www.cdc.gov/epo/dphsi/phs/files/5yearweeklyaverage.pdf.

§ Not notifiable in all states. Data from states where the condition is not notifiable are excluded from this table, except in 2007 and 2008 for the domestic arboviral diseases and influenza-associated pediatric mortality, and in 2003 for SARS-CoV. Reporting exceptions are available at http://www.cdc.gov/epo/dphsi/phs/infdis.htm.

¶ Includes both neuroinvasive and nonneuroinvasive. Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ArboNET Surveillance). Data for West Nile virus are available in Table II.

** The names of the reporting categories changed in 2008 as a result of revisions to the case definitions. Cases reported prior to 2008 were reported in the categories: Ehrlichiosis, human monocytic (analogous to *E. chaffeensis*); Ehrlichiosis, human granulocytic (analogous to *Anaplasma phagocytophilum*), and Ehrlichiosis, unspecified, or other agent (which included cases unable to be clearly placed in other categories, as well as possible cases of *E. ewingii*).

†† Data for *H. influenzae* (all ages, all serotypes) are available in Table II.

§§ Updated monthly from reports to the Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. Implementation of HIV reporting influences the number of cases reported. Updates of pediatric HIV data have been temporarily suspended until upgrading of the national HIV/AIDS surveillance data management system is completed. Data for HIV/AIDS, when available, are displayed in Table IV, which appears quarterly.

¶¶ Updated weekly from reports to the Influenza Division, National Center for Immunization and Respiratory Diseases. Eighty-four cases occurring during the 2007–08 influenza season have been reported.

*** No measles cases were reported for the current week.

††† Data for meningococcal disease (all serogroups) are available in Table II.

§§§ In 2008, Q fever acute and chronic reporting categories were recognized as a result of revisions to the Q fever case definition. Prior to that time, case counts were not differentiated with respect to acute and chronic Q fever cases.

¶¶¶ No rubella cases were reported for the current week.

**** Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases.

TABLE I. (*Continued*) Provisional cases of infrequently reported notifiable diseases (<1,000 cases reported during the preceding year) — United States, week ending June 14, 2008 (24th Week)*

Disease	Current week	Cum 2008	5-year weekly average†	Total cases reported for previous years 2007	2006	2005	2004	2003	States reporting cases during current week (No.)
Smallpox§	—	—	—	—	—	—	—	—	
Streptococcal toxic-shock syndrome§	1	74	2	132	125	129	132	161	CT (1)
Syphilis, congenital (age <1 yr)	—	70	8	423	349	329	353	413	
Tetanus	—	2	1	27	41	27	34	20	
Toxic-shock syndrome (staphylococcal)§	—	27	2	92	101	90	95	133	
Trichinellosis	1	4	0	5	15	16	5	6	FL (1)
Tularemia	—	17	4	137	95	154	134	129	
Typhoid fever	1	161	6	437	353	324	322	356	ND (1)
Vancomycin-intermediate *Staphylococcus aureus*§	—	4	0	28	6	2	—	N	
Vancomycin-resistant *Staphylococcus aureus*§	—	—	—	2	1	3	1	N	
Vibriosis (noncholera *Vibrio* species infections)§	5	69	2	403	N	N	N	N	GA (1), FL (3), CA (1)
Yellow fever	—	—	—	—	—	—	—	—	

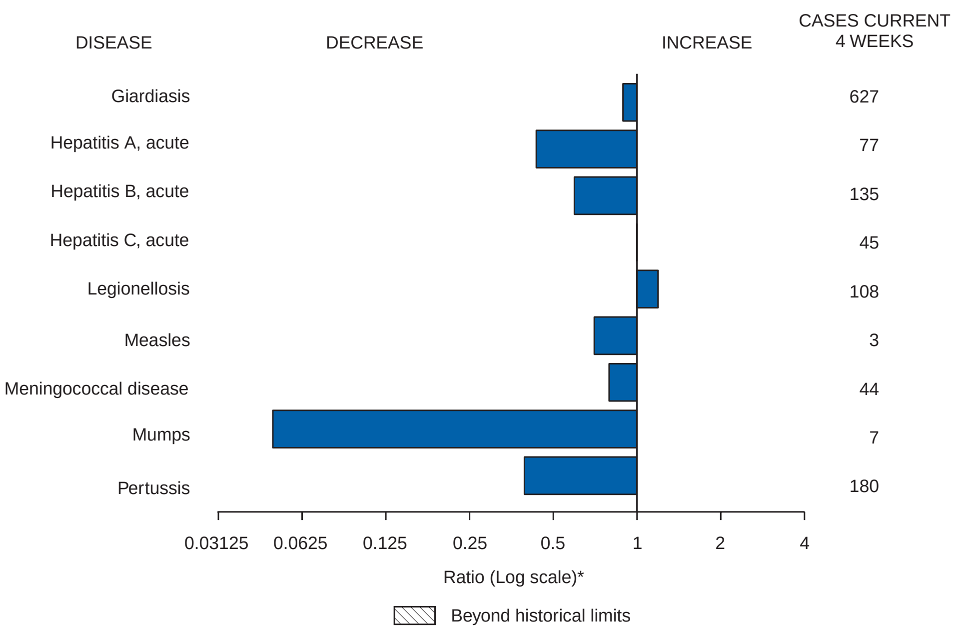
—: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts.

* Incidence data for reporting years 2007 and 2008 are provisional, whereas data for 2003, 2004, 2005, and 2006 are finalized.

† Calculated by summing the incidence counts for the current week, the 2 weeks preceding the current week, and the 2 weeks following the current week, for a total of 5 preceding years. Additional information is available at http://www.cdc.gov/epo/dphsi/phs/files/5yearweeklyaverage.pdf.

§ Not notifiable in all states. Data from states where the condition is not notifiable are excluded from this table, except in 2007 and 2008 for the domestic arboviral diseases and influenza-associated pediatric mortality, and in 2003 for SARS-CoV. Reporting exceptions are available at http://www.cdc.gov/epo/dphsi/phs/infdis.htm.

FIGURE I. Selected notifiable disease reports, United States, comparison of provisional 4-week totals June 14, 2008, with historical data



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

Notifiable Disease Data Team and 122 Cities Mortality Data Team

Patsy A. Hall

Deborah A. Adams	Rosaline Dhara
Willie J. Anderson	Carol Worsham
Lenee Blanton	Pearl C. Sharp

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

Reporting area	Chlamydia† Current week	Chlamydia† Previous 52 weeks Med	Chlamydia† Previous 52 weeks Max	Chlamydia† Cum 2008	Chlamydia† Cum 2007	Coccidioidomycosis Current week	Coccidioidomycosis Previous 52 weeks Med	Coccidioidomycosis Previous 52 weeks Max	Coccidioidomycosis Cum 2008	Coccidioidomycosis Cum 2007	Cryptosporidiosis Current week	Cryptosporidiosis Previous 52 weeks Med	Cryptosporidiosis Previous 52 weeks Max	Cryptosporidiosis Cum 2008	Cryptosporidiosis Cum 2007
United States	12,429	21,368	28,892	474,793	496,702	124	129	341	3,059	3,578	30	88	975	1,516	1,395
New England	520	676	1,516	15,750	16,056	—	0	1	1	2	—	6	15	103	119
Connecticut	192	206	1,093	4,343	4,712	N	0	0	N	N	—	0	13	13	42
Maine§	—	48	67	1,091	1,180	N	0	0	N	N	—	1	6	10	12
Massachusetts	230	311	660	7,860	7,245	N	0	0	N	N	—	2	11	31	34
New Hampshire	26	39	73	954	903	—	0	1	1	2	—	1	4	24	16
Rhode Island§	54	56	98	1,347	1,540	—	0	0	—	—	—	0	3	3	4
Vermont§	18	15	36	155	476	N	0	0	N	N	—	1	4	22	11
Mid. Atlantic	2,788	2,740	4,840	66,039	65,185	—	0	0	—	—	6	13	120	205	161
New Jersey	217	406	526	7,857	9,826	N	0	0	N	N	—	1	8	10	10
New York (Upstate)	601	561	2,177	12,562	11,735	N	0	0	N	N	5	5	20	66	47
New York City	1,360	951	3,149	26,534	23,467	N	0	0	N	N	—	2	8	34	32
Pennsylvania	610	800	1,031	19,086	20,157	N	0	0	N	N	1	6	103	95	72
E.N. Central	1,157	3,460	4,373	76,205	82,813	—	1	3	22	16	7	22	134	373	307
Illinois	—	1,014	1,711	18,989	23,403	N	0	0	N	N	—	2	13	26	36
Indiana	279	395	656	9,450	9,712	N	0	0	N	N	—	2	41	63	22
Michigan	569	766	1,220	21,148	17,804	—	0	2	15	12	—	5	11	84	69
Ohio	37	859	1,530	18,133	22,848	—	0	1	7	4	6	5	60	106	80
Wisconsin	272	378	614	8,485	9,046	N	0	0	N	N	1	7	60	94	100
W.N. Central	810	1,229	1,695	28,875	28,741	—	0	77	—	4	4	17	126	264	204
Iowa	127	164	251	3,911	3,971	N	0	0	N	N	2	4	61	53	39
Kansas	211	158	529	4,203	3,742	N	0	0	N	N	1	1	16	20	27
Minnesota	—	256	372	5,607	6,160	—	0	77	—	—	—	4	34	70	46
Missouri	328	468	576	11,089	10,564	—	0	1	—	4	1	3	14	60	38
Nebraska§	70	91	162	1,979	2,381	N	0	0	N	N	—	3	24	39	10
North Dakota	7	33	65	796	799	N	0	0	N	N	—	0	51	2	1
South Dakota	67	53	81	1,290	1,124	N	0	0	N	N	—	2	16	20	43
S. Atlantic	3,172	3,958	7,609	86,826	95,561	—	0	1	2	2	7	19	65	305	323
Delaware	94	65	144	1,644	1,554	—	0	0	—	—	—	0	4	6	2
District of Columbia	89	116	202	2,921	2,759	—	0	1	—	—	—	0	2	3	1
Florida	1,026	1,301	1,554	31,411	23,568	N	0	0	N	N	3	8	35	143	143
Georgia	8	649	1,338	2,936	18,585	N	0	0	N	N	3	4	14	96	73
Maryland§	227	469	683	10,146	9,433	—	0	1	2	2	—	0	3	7	12
North Carolina	350	206	4,783	9,289	13,879	N	0	0	N	N	—	1	18	11	35
South Carolina§	750	472	3,081	12,945	12,812	N	0	0	N	N	1	1	15	14	26
Virginia§	621	508	1,062	14,116	11,525	N	0	0	N	N	—	1	6	18	27
West Virginia	7	62	96	1,418	1,446	N	0	0	N	N	—	0	5	7	4
E.S. Central	715	1,493	2,394	35,335	38,627	—	0	0	—	—	—	4	64	47	61
Alabama§	12	481	605	9,768	11,627	N	0	0	N	N	—	1	14	18	23
Kentucky	191	222	361	5,057	3,671	N	0	0	N	N	—	1	40	9	18
Mississippi	—	300	1,048	7,893	10,355	N	0	0	N	N	—	1	11	5	9
Tennessee§	512	518	716	12,617	12,974	N	0	0	N	N	—	1	18	15	11
W.S. Central	1,553	2,718	4,426	66,258	54,126	—	0	1	1	—	—	6	29	64	83
Arkansas§	237	229	455	6,389	4,113	N	0	0	N	N	—	1	8	12	11
Louisiana	—	380	851	7,909	8,400	—	0	1	1	—	—	0	4	3	26
Oklahoma	223	235	416	5,396	5,675	N	0	0	N	N	—	1	11	16	15
Texas§	1,093	1,809	3,923	46,564	35,938	N	0	0	N	N	—	3	18	33	31
Mountain	282	1,392	1,836	25,787	33,779	92	89	170	2,095	2,214	6	9	567	124	101
Arizona	55	458	679	8,280	10,906	89	87	168	2,050	2,150	3	1	4	20	20
Colorado	61	313	488	5,031	8,088	N	0	0	N	N	—	2	26	31	29
Idaho§	17	55	233	1,483	1,779	N	0	0	N	N	3	2	71	28	5
Montana§	—	50	363	1,307	1,300	N	0	0	N	N	—	1	7	14	6
Nevada§	149	185	411	4,446	4,342	3	1	7	30	23	—	0	6	3	4
New Mexico§	—	145	561	2,636	4,450	—	0	3	12	16	—	2	9	13	28
Utah	—	119	209	2,593	2,352	—	0	7	3	25	—	1	484	9	2
Wyoming§	—	14	34	11	562	—	0	1	—	—	—	0	8	6	7
Pacific	1,432	3,371	4,676	73,718	81,814	32	31	217	938	1,340	—	2	20	31	36
Alaska	56	94	129	2,122	2,262	N	0	0	N	N	—	0	2	1	—
California	1,211	2,796	4,115	64,354	63,947	32	31	217	938	1,340	—	0	0	—	—
Hawaii	—	110	152	2,440	2,629	N	0	0	N	N	—	0	4	1	—
Oregon§	165	189	402	4,689	4,307	N	0	0	N	N	—	2	16	29	36
Washington	—	278	659	113	8,669	N	0	0	N	N	—	0	0	—	—
American Samoa	—	0	22	62	73	N	0	0	N	N	N	0	0	N	N
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	12	26	86	380	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	113	612	3,064	3,560	N	0	0	N	N	N	0	0	N	N
U.S. Virgin Islands	—	6	21	260	97	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional. Data for HIV/AIDS, AIDS, and TB, when available, are displayed in Table IV, which appears quarterly.
† Chlamydia refers to genital infections caused by *Chlamydia trachomatis*.
§ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

Reporting area	Giardiasis					Gonorrhea					*Haemophilus influenzae*, invasive All ages, all serotypes†				
	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007
United States	194	302	1,158	6,081	6,578	3,413	6,451	8,913	132,785	158,398	31	46	173	1,328	1,246
New England	5	24	58	449	490	79	96	227	2,241	2,563	5	3	12	79	85
Connecticut	—	6	18	126	126	45	43	199	954	964	5	0	9	19	19
Maine§	4	3	10	47	59	—	2	7	43	49	—	0	4	8	7
Massachusetts	—	9	27	157	218	25	47	127	1,017	1,238	—	2	6	36	47
New Hampshire	—	1	4	40	8	2	2	6	57	76	—	0	2	5	8
Rhode Island§	—	1	15	28	25	6	7	13	157	210	—	0	2	5	4
Vermont§	1	3	9	51	54	1	1	5	13	26	—	0	3	6	—
Mid. Atlantic	32	62	131	1,186	1,170	654	624	1,028	14,364	16,449	6	9	31	244	251
New Jersey	—	7	15	132	162	107	114	174	2,209	2,824	—	1	7	32	41
New York (Upstate)	20	23	111	440	396	158	134	545	2,823	2,605	4	3	22	73	66
New York City	2	15	29	324	368	252	176	526	4,325	4,991	—	1	6	40	48
Pennsylvania	10	15	29	290	244	137	227	394	5,007	6,029	2	3	9	99	96
E.N. Central	14	50	96	857	1,078	332	1,354	1,735	26,688	33,286	3	7	28	178	192
Illinois	—	13	34	173	325	—	393	589	5,956	8,468	—	2	7	42	59
Indiana	N	0	0	N	N	87	161	311	3,814	3,953	—	1	20	41	28
Michigan	—	10	22	197	277	163	306	657	7,761	7,158	—	0	3	10	16
Ohio	11	16	36	352	296	6	344	685	6,677	10,606	3	2	6	78	56
Wisconsin	3	9	26	135	180	76	121	214	2,480	3,101	—	0	4	7	33
W.N. Central	16	25	621	655	400	215	338	440	7,267	9,154	—	3	24	97	69
Iowa	4	5	24	112	88	14	31	56	625	888	—	0	1	2	1
Kansas	3	3	11	48	57	55	41	130	1,014	1,070	—	0	4	11	8
Minnesota	—	0	575	191	6	—	62	92	1,288	1,582	—	0	21	17	24
Missouri	5	9	23	177	170	117	174	235	3,593	4,800	—	1	6	45	28
Nebraska§	4	4	8	89	48	25	25	51	589	647	—	0	3	16	7
North Dakota	—	0	36	14	6	1	2	7	43	51	—	0	2	6	1
South Dakota	—	1	6	24	25	3	5	10	115	116	—	0	0	—	—
S. Atlantic	65	55	102	1,018	1,163	994	1,468	3,072	29,672	36,255	11	11	29	358	313
Delaware	—	1	6	17	15	24	22	44	529	622	—	0	1	3	5
District of Columbia	—	1	5	19	31	33	47	104	1,138	1,066	1	0	1	5	1
Florida	37	23	47	509	508	385	472	616	10,739	9,989	4	3	10	95	85
Georgia	17	11	28	198	251	5	274	561	1,188	7,386	2	2	9	81	71
Maryland§	7	5	18	89	111	51	123	237	2,670	2,877	2	1	5	57	53
North Carolina	N	0	0	N	N	86	135	1,949	3,952	6,528	1	0	9	38	36
South Carolina§	1	3	7	51	35	282	191	836	4,678	4,613	1	1	7	29	29
Virginia§	3	8	39	113	200	125	135	486	4,448	2,778	—	2	22	41	22
West Virginia	—	0	8	22	12	3	16	38	330	396	—	0	3	9	11
E.S. Central	6	9	23	169	197	252	564	945	12,788	14,629	—	3	8	73	69
Alabama§	2	5	11	91	106	5	198	287	3,926	4,969	—	0	2	11	17
Kentucky	N	0	0	N	N	78	81	161	1,973	1,373	—	0	1	1	3
Mississippi	N	0	0	N	N	—	128	401	2,931	3,784	—	0	2	11	4
Tennessee§	4	4	16	78	91	169	174	261	3,958	4,503	—	2	6	50	45
W.S. Central	4	6	41	89	138	529	1,019	1,355	22,315	22,356	2	2	29	63	48
Arkansas§	1	3	11	46	54	83	77	138	1,996	1,914	—	0	3	3	4
Louisiana	—	1	14	11	41	—	182	384	3,586	4,956	—	0	2	3	3
Oklahoma	3	3	35	32	43	99	93	171	1,996	2,199	2	1	21	52	37
Texas§	N	0	0	N	N	347	646	1,102	14,737	13,287	—	0	3	5	4
Mountain	19	31	68	506	614	97	246	333	4,623	6,134	4	4	14	169	146
Arizona	1	3	11	47	84	14	85	130	1,296	2,287	2	2	11	78	58
Colorado	12	11	26	207	195	51	62	91	1,357	1,525	2	1	4	30	34
Idaho§	3	3	19	59	51	1	4	19	65	118	—	0	4	8	4
Montana§	—	1	8	24	35	—	1	48	43	44	—	0	1	1	—
Nevada§	2	3	6	45	63	31	45	129	1,136	1,054	—	0	1	10	6
New Mexico§	—	2	5	25	54	—	28	104	481	714	—	0	4	16	25
Utah	1	6	32	88	113	—	12	36	245	360	—	1	6	26	16
Wyoming§	—	1	3	11	19	—	0	5	—	32	—	0	1	—	3
Pacific	33	64	185	1,152	1,328	261	643	810	12,827	17,572	—	3	7	67	73
Alaska	2	1	5	31	29	8	11	24	231	230	—	0	4	10	5
California	30	40	91	808	921	230	557	683	11,731	14,748	—	0	4	15	23
Hawaii	—	1	5	13	38	4	11	22	250	322	—	0	1	8	6
Oregon§	1	9	19	189	170	19	24	63	598	501	—	1	4	32	38
Washington	—	9	87	111	170	—	50	142	17	1,771	—	0	3	2	1
American Samoa	—	0	0	—	—	—	0	1	2	3	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	1	—	1	—	1	9	25	58	—	0	1	—	—
Puerto Rico	—	2	31	27	128	—	5	23	112	148	—	0	1	—	1
U.S. Virgin Islands	—	0	0	—	—	—	1	5	46	25	N	0	0	N	N

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional.
† Data for *H. influenzae* (age <5 yrs for serotype b, nonserotype b, and unknown serotype) are available in Table I.
§ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

	Hepatitis (viral, acute), by type†										Legionellosis				
	A					B									
	Current	Previous 52 weeks		Cum	Cum	Current	Previous 52 weeks		Cum	Cum	Current	Previous 52 weeks		Cum	Cum
Reporting area	week	Med	Max	2008	2007	week	Med	Max	2008	2007	week	Med	Max	2008	2007
United States	15	54	167	1,132	1,241	39	79	261	1,468	1,961	22	50	117	788	744
New England	1	2	7	46	49	—	1	6	21	59	—	3	14	30	40
Connecticut	1	0	3	11	8	—	0	5	8	22	—	1	4	8	4
Maine§	—	0	1	2	—	—	0	2	5	3	—	0	2	1	—
Massachusetts	—	1	5	18	23	—	0	3	3	24	—	0	3	1	19
New Hampshire	—	0	2	4	10	—	0	1	1	4	—	0	2	3	1
Rhode Island§	—	0	2	10	6	—	0	3	3	5	—	0	5	13	14
Vermont§	—	0	1	1	2	—	0	1	1	1	—	0	2	4	2
Mid. Atlantic	2	7	18	124	198	4	9	18	181	267	4	15	37	186	194
New Jersey	—	1	6	22	62	—	2	7	36	83	—	1	13	17	27
New York (Upstate)	1	1	6	30	34	1	2	7	36	39	2	4	15	57	54
New York City	—	2	7	37	63	—	2	7	34	58	—	2	12	16	45
Pennsylvania	1	1	6	35	39	3	3	7	75	87	2	6	21	96	68
E.N. Central	2	6	13	136	145	1	7	17	149	227	3	11	35	161	164
Illinois	—	2	6	36	59	—	1	6	29	80	—	1	16	18	35
Indiana	—	0	4	7	4	—	0	8	12	20	—	1	7	12	12
Michigan	—	2	7	60	34	1	2	6	56	62	1	3	11	47	50
Ohio	2	1	3	21	31	—	2	6	49	65	2	4	17	80	57
Wisconsin	—	0	2	12	17	—	0	1	3	—	—	0	5	4	10
W.N. Central	—	4	29	153	79	1	2	9	40	54	2	2	10	39	30
Iowa	—	1	7	65	16	—	0	2	7	11	—	0	2	6	3
Kansas	—	0	3	8	3	—	0	2	5	7	—	0	1	1	3
Minnesota	—	0	23	16	42	—	0	5	3	8	—	0	6	4	5
Missouri	—	1	3	26	8	1	1	4	22	19	2	1	3	18	15
Nebraska§	—	1	5	36	6	—	0	1	3	6	—	0	2	9	3
North Dakota	—	0	2	—	—	—	0	1	—	—	—	0	2	—	—
South Dakota	—	0	1	2	4	—	0	2	—	3	—	0	1	1	1
S. Atlantic	3	9	22	143	200	13	16	60	397	486	8	8	28	156	156
Delaware	—	0	1	3	2	—	0	3	5	8	—	0	2	4	3
District of Columbia	—	0	0	—	—	—	0	0	—	—	—	0	2	6	7
Florida	1	3	8	68	63	7	6	12	156	161	5	3	10	65	60
Georgia	2	1	5	19	36	3	3	8	55	65	—	1	3	11	19
Maryland§	—	1	4	18	38	2	2	6	33	56	2	2	6	35	26
North Carolina	—	0	9	9	7	—	0	17	48	63	—	0	7	8	18
South Carolina§	—	0	4	6	5	—	1	6	30	33	—	0	1	3	8
Virginia§	—	1	5	17	46	1	2	16	47	73	1	1	6	21	12
West Virginia	—	0	2	3	3	—	0	30	23	27	—	0	3	3	3
E.S. Central	2	2	9	34	42	6	7	13	148	154	2	2	5	46	38
Alabama§	—	0	4	4	8	—	2	5	43	56	—	0	1	5	4
Kentucky	—	0	2	12	7	1	2	7	39	21	2	1	3	21	16
Mississippi	—	0	1	1	6	1	0	3	15	16	—	0	1	1	—
Tennessee§	2	1	6	17	21	4	2	8	51	61	—	1	4	19	18
W.S. Central	—	5	51	110	95	5	17	134	294	373	1	2	23	20	40
Arkansas§	—	0	1	3	6	—	1	3	16	34	—	0	2	2	6
Louisiana	—	0	3	4	15	—	1	8	14	44	—	0	2	—	1
Oklahoma	—	0	7	4	3	3	2	37	38	20	1	0	3	3	1
Texas§	—	5	49	99	71	2	12	110	226	275	—	1	18	15	32
Mountain	—	4	10	97	119	5	3	7	78	111	1	2	6	40	34
Arizona	—	2	8	43	84	—	1	4	18	49	—	1	5	12	9
Colorado	—	0	3	19	17	—	0	3	10	17	—	0	2	3	7
Idaho§	—	0	3	14	2	—	0	2	4	5	1	0	1	2	3
Montana§	—	0	2	—	2	—	0	1	—	—	—	0	1	2	1
Nevada§	—	0	1	3	7	—	1	3	19	26	—	0	2	6	3
New Mexico§	—	0	3	14	3	—	0	2	6	8	—	0	1	3	3
Utah	—	0	2	2	2	5	0	2	19	4	—	0	3	12	5
Wyoming§	—	0	1	2	2	—	0	1	2	2	—	0	0	—	3
Pacific	5	13	51	289	314	4	9	29	160	230	1	4	18	110	48
Alaska	—	0	1	2	2	—	0	2	7	4	—	0	1	1	—
California	5	10	42	237	282	4	6	19	112	174	1	3	14	87	38
Hawaii	—	0	2	4	3	—	0	2	3	5	—	0	1	4	1
Oregon§	—	1	3	19	13	—	1	4	20	27	—	0	2	7	3
Washington	—	1	7	27	14	—	1	9	18	20	—	0	3	11	6
American Samoa	—	0	0	—	—	—	0	0	—	14	N	0	0	N	N
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	1	—	2	—	0	0	—	—
Puerto Rico	—	0	4	7	40	—	1	5	20	36	—	0	1	—	3
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional.
† Data for acute hepatitis C, viral are available in Table I.
§ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

Reporting area	Lyme disease					Malaria					Meningococcal disease, invasive† All serogroups				
	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007
United States	190	267	1,626	2,815	6,426	12	24	132	336	473	9	18	52	576	575
New England	—	47	675	170	1,886	2	1	35	10	19	—	1	3	16	27
Connecticut	—	13	280	—	929	2	0	27	5	1	—	0	1	1	4
Maine§	—	6	61	43	34	—	0	2	—	3	—	0	1	3	4
Massachusetts	—	13	280	28	657	—	0	3	2	14	—	0	3	12	15
New Hampshire	—	7	96	84	243	—	0	4	1	1	—	0	0	—	1
Rhode Island§	—	0	77	—	—	—	0	8	—	—	—	0	1	—	1
Vermont§	—	1	13	15	23	—	0	2	2	—	—	0	1	—	2
Mid. Atlantic	138	129	662	1,608	2,375	—	7	18	79	134	2	3	6	67	64
New Jersey	—	31	220	264	1,053	—	0	7	—	28	—	0	1	3	9
New York (Upstate)	84	50	453	389	462	—	1	8	13	25	—	0	3	20	18
New York City	—	3	27	4	101	—	4	9	55	70	—	0	2	12	13
Pennsylvania	54	49	293	951	759	—	1	4	11	11	2	1	5	32	24
E.N. Central	1	7	221	32	617	1	2	7	47	69	—	3	9	90	89
Illinois	—	0	16	2	48	—	1	7	20	36	—	1	4	26	36
Indiana	—	0	7	2	11	—	0	1	2	5	—	0	4	15	13
Michigan	1	0	5	9	8	—	0	2	7	8	—	0	2	14	15
Ohio	—	0	4	6	5	1	0	3	15	11	—	1	4	26	20
Wisconsin	—	5	201	13	545	—	0	3	3	9	—	0	2	9	5
W.N. Central	—	3	740	86	127	—	0	8	21	19	—	2	8	53	36
Iowa	—	1	8	10	54	—	0	1	2	2	—	0	3	11	8
Kansas	—	0	1	1	7	—	0	1	3	1	—	0	1	1	2
Minnesota	—	0	731	64	63	—	0	8	6	11	—	0	7	15	9
Missouri	—	0	4	8	1	—	0	4	6	2	—	0	3	15	10
Nebraska§	—	0	1	1	2	—	0	2	4	2	—	0	2	9	2
North Dakota	—	0	9	1	—	—	0	2	—	—	—	0	1	1	2
South Dakota	—	0	1	1	—	—	0	0	—	1	—	0	1	1	3
S. Atlantic	47	59	221	789	1,337	6	5	15	88	96	1	3	7	79	83
Delaware	17	12	34	274	272	—	0	1	1	2	—	0	0	—	1
District of Columbia	—	2	9	43	48	—	0	1	—	2	—	0	0	—	—
Florida	2	0	4	12	2	3	1	7	27	20	—	1	5	30	30
Georgia	—	0	3	3	3	—	1	3	19	13	—	0	3	9	9
Maryland§	24	29	136	343	759	1	1	5	25	27	1	0	2	9	17
North Carolina	—	0	8	2	14	—	0	2	2	12	—	0	4	3	6
South Carolina§	—	0	4	3	10	—	0	1	3	4	—	0	3	12	8
Virginia§	4	14	68	106	223	2	1	7	11	16	—	0	3	14	12
West Virginia	—	0	9	3	6	—	0	1	—	—	—	0	1	2	—
E.S. Central	—	0	5	9	18	—	0	3	7	14	—	1	5	33	31
Alabama§	—	0	2	3	7	—	0	1	3	2	—	0	1	2	7
Kentucky	—	0	2	1	—	—	0	1	3	3	—	0	2	7	5
Mississippi	—	0	1	—	—	—	0	1	—	1	—	0	2	9	8
Tennessee§	—	0	4	5	11	—	0	2	1	8	—	0	3	15	11
W.S. Central	1	1	9	18	30	—	1	60	16	36	1	2	13	57	62
Arkansas§	—	0	1	—	—	—	0	1	—	—	—	0	1	5	7
Louisiana	—	0	0	—	2	—	0	1	—	12	—	0	3	12	20
Oklahoma	—	0	1	—	—	—	0	4	2	3	—	0	5	9	11
Texas§	1	1	8	18	28	—	1	56	14	21	1	1	7	31	24
Mountain	—	0	3	3	11	—	1	5	11	27	1	1	4	33	43
Arizona	—	0	1	2	—	—	0	1	4	5	—	0	2	5	10
Colorado	—	0	1	1	—	—	0	2	3	10	1	0	2	8	14
Idaho§	—	0	2	—	3	—	0	2	—	—	—	0	2	2	4
Montana§	—	0	2	—	1	—	0	1	—	2	—	0	1	4	1
Nevada§	—	0	2	—	6	—	0	3	4	1	—	0	2	6	3
New Mexico§	—	0	2	—	—	—	0	1	—	1	—	0	1	4	2
Utah	—	0	1	—	1	—	0	3	—	8	—	0	2	2	7
Wyoming§	—	0	1	—	—	—	0	0	—	—	—	0	1	2	2
Pacific	3	4	8	100	25	3	3	10	57	59	4	4	17	148	140
Alaska	—	0	2	1	2	—	0	2	2	2	—	0	2	3	1
California	3	2	8	95	21	3	2	8	45	41	4	3	17	110	102
Hawaii	N	0	0	N	N	—	0	1	2	2	—	0	2	1	4
Oregon§	—	0	1	4	2	—	0	2	4	9	—	1	3	20	19
Washington	—	0	7	—	—	—	0	3	4	5	—	0	5	14	14
American Samoa	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	1	1	—	—	0	0	—	—
Puerto Rico	N	0	0	N	N	—	0	1	1	1	—	0	1	2	5
U.S. Virgin Islands	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional.
† Data for meningococcal disease, invasive caused by serogroups A, C, Y, & W-135; serogroup B; other serogroup; and unknown serogroup are available in Table I.
§ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

Reporting area	Pertussis					Rabies, animal					Rocky Mountain spotted fever				
	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007
United States	55	161	844	2,827	4,142	67	90	176	1,739	2,560	16	27	195	234	539
New England	—	26	49	268	641	8	8	20	154	243	—	0	2	—	4
Connecticut	—	1	5	—	30	6	4	17	86	101	—	0	0	—	—
Maine†	—	1	5	16	37	1	1	5	22	39	N	0	0	N	N
Massachusetts	—	18	35	224	513	N	0	0	N	N	—	0	2	—	4
New Hampshire	—	1	5	9	36	1	1	4	15	19	—	0	1	—	—
Rhode Island†	—	0	25	14	4	N	0	0	N	N	—	0	0	—	—
Vermont†	—	0	6	5	21	—	2	6	31	84	—	0	0	—	—
Mid. Atlantic	11	22	43	338	571	17	19	29	383	443	—	1	6	23	32
New Jersey	—	2	9	3	93	—	0	0	—	—	—	0	2	2	11
New York (Upstate)	7	7	23	127	284	17	9	20	184	205	—	0	2	5	1
New York City	—	2	7	29	63	—	0	2	10	25	—	0	2	10	12
Pennsylvania	4	8	23	179	131	—	8	18	189	213	—	0	2	6	8
E.N. Central	5	18	188	592	790	2	3	43	28	40	—	0	3	3	19
Illinois	—	3	8	51	87	N	0	0	N	N	—	0	3	1	14
Indiana	—	0	12	21	17	—	0	1	1	5	—	0	2	1	1
Michigan	2	4	16	76	126	1	1	32	16	22	—	0	1	—	2
Ohio	3	9	176	444	373	1	1	11	11	13	—	0	2	1	2
Wisconsin	—	0	13	—	187	N	0	0	N	N	—	0	1	—	—
W.N. Central	1	11	143	257	279	6	4	13	55	111	5	4	33	56	93
Iowa	—	2	8	30	87	1	0	3	9	12	—	0	5	—	6
Kansas	—	1	4	24	51	—	0	7	—	67	—	0	2	—	5
Minnesota	—	0	131	63	40	—	0	6	19	6	—	0	4	—	1
Missouri	—	2	18	107	41	2	0	3	12	9	4	3	25	55	74
Nebraska†	1	1	12	28	14	—	0	0	—	—	1	0	2	1	5
North Dakota	—	0	5	1	3	3	0	8	13	7	—	0	0	—	—
South Dakota	—	0	2	4	43	—	0	2	2	10	—	0	1	—	2
S. Atlantic	8	13	50	260	455	29	39	61	912	1,054	2	9	109	69	245
Delaware	—	0	2	5	5	—	0	0	—	—	—	0	2	3	9
District of Columbia	—	0	1	2	7	—	0	0	—	—	—	0	2	2	2
Florida	4	3	9	81	105	—	0	25	57	128	—	0	3	3	3
Georgia	—	0	3	4	23	13	6	37	163	108	—	0	6	10	28
Maryland†	1	1	6	29	61	—	9	18	183	182	—	1	6	14	19
North Carolina	2	0	38	61	159	15	9	16	228	230	—	0	96	11	131
South Carolina†	—	1	22	31	42	—	0	0	—	46	1	0	5	9	20
Virginia†	1	2	11	45	46	—	12	27	226	323	1	1	10	16	32
West Virginia	—	0	12	2	7	1	0	11	55	37	—	0	3	1	1
E.S. Central	3	7	31	92	122	—	1	7	64	9	1	4	16	38	101
Alabama†	—	1	6	19	33	—	0	0	—	—	—	1	10	11	26
Kentucky	1	0	4	14	11	—	0	3	14	9	—	0	2	—	2
Mississippi	—	3	29	37	31	—	0	1	2	—	—	0	3	3	5
Tennessee†	2	1	4	22	47	—	0	6	48	—	1	1	10	24	68
W.S. Central	12	18	192	253	423	3	12	40	51	539	8	2	153	37	29
Arkansas†	1	2	17	28	92	3	1	6	35	11	—	0	15	1	1
Louisiana	—	0	2	2	11	—	0	0	—	—	—	0	2	2	1
Oklahoma	2	0	26	12	2	—	0	32	16	45	8	0	132	28	20
Texas†	9	15	175	211	318	—	9	34	—	483	—	1	8	6	7
Mountain	9	19	37	404	543	—	2	8	22	14	—	0	4	6	14
Arizona	1	3	10	93	146	N	0	0	N	N	—	0	2	4	3
Colorado	3	4	13	66	136	—	0	0	—	—	—	0	2	—	—
Idaho†	—	1	4	18	21	—	0	4	—	—	—	0	1	—	2
Montana†	—	0	11	56	30	—	0	3	—	1	—	0	1	1	—
Nevada†	—	0	7	15	21	—	0	2	1	1	—	0	0	—	—
New Mexico†	—	1	7	21	27	—	0	3	14	4	—	0	1	1	2
Utah	5	5	27	131	147	—	0	2	1	4	—	0	0	—	—
Wyoming†	—	0	2	4	15	—	0	4	6	4	—	0	2	—	7
Pacific	6	18	303	363	318	2	4	10	70	107	—	0	1	2	2
Alaska	1	1	29	37	19	—	0	4	12	36	N	0	0	N	N
California	5	9	129	149	180	2	3	8	56	70	—	0	1	1	1
Hawaii	—	0	2	4	10	—	0	0	—	—	N	0	0	N	N
Oregon†	—	2	14	65	45	—	0	3	2	1	—	0	1	1	1
Washington	—	5	169	108	64	—	0	0	—	—	N	0	0	N	N
American Samoa	—	0	0	—	—	N	0	0	N	N	N	0	0	N	N
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	0	—	—	N	0	0	N	N
Puerto Rico	—	0	0	—	—	—	1	5	27	19	N	0	0	N	N
U.S. Virgin Islands	—	0	0	—	—	N	0	0	N	N	N	0	0	N	N

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional.
† Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

	Salmonellosis					Shiga toxin-producing *E. coli* (STEC)†					Shigellosis				
	Current	Previous 52 weeks		Cum	Cum	Current	Previous 52 weeks		Cum	Cum	Current	Previous 52 weeks		Cum	Cum
Reporting area	week	Med	Max	2008	2007	week	Med	Max	2008	2007	week	Med	Max	2008	2007
United States	522	810	2,117	12,631	15,810	61	77	244	1,363	1,278	286	379	1,235	7,075	6,435
New England	5	20	190	525	1,141	—	4	16	62	140	1	3	21	64	134
Connecticut	—	0	161	161	431	—	0	12	12	71	—	0	19	19	44
Maine§	2	2	14	56	51	—	0	4	4	16	1	0	1	3	12
Massachusetts	—	14	60	221	528	—	2	9	24	38	—	2	8	34	67
New Hampshire	1	3	10	37	56	—	0	5	12	9	—	0	1	1	4
Rhode Island§	—	1	13	27	44	—	0	3	6	2	—	0	9	6	5
Vermont§	2	1	5	23	31	—	0	3	4	4	—	0	1	1	2
Mid. Atlantic	73	85	212	1,602	2,189	6	8	194	324	148	29	24	78	832	231
New Jersey	—	17	48	238	475	—	1	7	6	40	—	5	14	147	48
New York (Upstate)	48	25	73	452	531	5	3	190	273	45	28	5	36	284	45
New York City	—	22	48	403	490	1	1	5	18	17	—	8	35	354	102
Pennsylvania	25	30	83	509	693	—	2	11	27	46	1	2	65	47	36
E.N. Central	33	82	263	1,459	2,269	15	10	36	131	157	21	72	145	1,187	787
Illinois	—	24	187	302	797	—	1	13	12	24	—	16	37	269	239
Indiana	—	9	34	149	216	—	1	12	10	13	—	10	83	348	27
Michigan	4	17	43	298	362	5	2	10	33	29	1	1	7	31	23
Ohio	27	27	65	526	483	9	2	9	47	46	17	23	104	360	239
Wisconsin	2	13	37	184	411	1	3	16	29	45	3	12	39	179	259
W.N. Central	42	50	95	957	1,074	10	14	38	193	191	1	23	57	399	962
Iowa	2	9	18	155	178	1	2	13	39	39	1	2	9	64	37
Kansas	17	6	18	104	172	3	1	4	14	20	—	0	3	7	16
Minnesota	—	13	39	256	258	—	3	15	43	59	—	4	11	97	111
Missouri	19	14	29	277	287	2	3	12	59	33	—	10	37	129	761
Nebraska§	3	5	13	102	88	4	2	6	25	23	—	0	3	—	11
North Dakota	1	0	35	19	14	—	0	20	2	4	—	0	15	31	3
South Dakota	—	2	11	44	77	—	1	5	11	13	—	2	31	71	23
S. Atlantic	182	228	442	3,342	3,758	13	12	40	231	230	67	75	149	1,459	2,150
Delaware	2	3	8	51	50	—	0	2	6	9	1	0	2	7	4
District of Columbia	—	1	4	21	23	—	0	1	5	—	—	0	3	5	7
Florida	90	91	181	1,594	1,505	2	2	18	72	57	22	26	75	432	1,211
Georgia	28	36	86	515	588	1	1	6	16	27	19	27	56	572	779
Maryland§	22	14	44	224	280	1	2	5	42	33	1	2	7	24	38
North Carolina	18	20	228	344	541	4	1	24	24	36	1	1	12	47	28
South Carolina§	10	18	52	294	300	2	0	3	16	5	22	7	30	304	34
Virginia§	12	17	49	246	417	3	2	9	42	62	1	4	14	64	48
West Virginia	—	4	25	53	54	—	0	3	8	1	—	0	61	4	1
E.S. Central	33	51	144	851	1,003	1	5	26	98	56	27	55	178	932	547
Alabama§	6	16	50	237	285	—	1	19	33	10	2	13	43	208	218
Kentucky	11	9	23	136	188	—	1	12	16	15	13	12	35	163	82
Mississippi	6	14	57	216	233	—	0	1	2	2	1	18	112	217	161
Tennessee§	10	16	34	262	297	1	2	12	47	29	11	11	32	344	86
W.S. Central	41	97	900	1,035	1,294	5	5	24	83	96	105	53	756	1,423	819
Arkansas§	17	12	50	156	178	—	1	4	19	18	11	2	18	167	43
Louisiana	—	10	44	58	255	—	0	1	—	6	—	5	22	58	232
Oklahoma	24	10	72	198	151	5	0	14	12	12	1	3	32	44	40
Texas§	—	51	800	623	710	—	4	11	52	60	93	38	710	1,154	504
Mountain	46	51	83	1,074	1,032	9	8	42	147	137	9	18	40	277	327
Arizona	18	17	40	328	335	1	1	8	25	42	4	9	30	126	165
Colorado	17	11	44	353	246	4	2	17	42	26	1	2	6	34	43
Idaho§	5	3	10	65	48	1	2	16	31	18	—	0	2	5	5
Montana§	—	1	10	32	42	—	0	3	13	—	—	0	1	1	13
Nevada§	2	5	12	81	107	—	0	3	8	12	4	2	10	87	15
New Mexico§	—	5	14	83	108	—	0	3	11	21	—	1	6	12	52
Utah	4	5	17	113	107	3	1	9	14	18	—	1	5	9	9
Wyoming§	—	1	5	19	39	—	0	1	3	—	—	0	2	3	25
Pacific	67	110	399	1,786	2,050	2	8	40	94	123	26	28	79	502	478
Alaska	—	1	5	21	43	—	0	1	3	—	—	0	1	—	6
California	66	80	286	1,356	1,550	2	5	34	61	65	26	25	61	432	385
Hawaii	—	5	14	86	107	—	0	5	3	14	—	1	43	17	15
Oregon§	1	6	14	133	131	—	1	11	8	15	—	1	6	24	26
Washington	—	12	103	190	219	—	1	13	19	29	—	2	20	29	46
American Samoa	—	0	1	1	—	—	0	0	—	—	—	0	1	1	3
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	2	5	11	—	0	0	—	—	—	0	3	9	9
Puerto Rico	—	12	55	138	336	—	0	1	2	—	—	0	2	3	18
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional.
† Includes *E. coli* O157:H7; Shiga toxin-positive, serogroup non-O157; and Shiga toxin-positive, not serogrouped.
§ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

	Streptococcal disease, invasive, group A					*Streptococcus pneumoniae*, invasive disease, nondrug resistant[†] Age <5 years				
	Current	Previous 52 weeks		Cum	Cum	Current	Previous 52 weeks		Cum	Cum
Reporting area	week	Med	Max	2008	2007	week	Med	Max	2008	2007
United States	90	99	258	2,968	3,010	18	35	166	877	966
New England	12	6	31	199	229	—	2	14	40	79
Connecticut	12	0	28	71	49	—	0	11	—	11
Maine[§]	—	0	3	15	18	—	0	1	1	1
Massachusetts	—	3	7	83	127	—	1	5	30	52
New Hampshire	—	0	2	16	19	—	0	1	7	8
Rhode Island[§]	—	0	6	5	2	—	0	1	1	5
Vermont[§]	—	0	2	9	14	—	0	1	1	2
Mid. Atlantic	12	16	43	617	611	4	4	19	102	182
New Jersey	—	3	9	94	119	—	1	6	21	36
New York (Upstate)	7	6	18	214	181	4	2	14	56	59
New York City	—	3	10	111	150	—	1	12	25	87
Pennsylvania	5	5	16	198	161	N	0	0	N	N
E.N. Central	14	17	59	609	641	1	5	23	180	177
Illinois	—	5	15	150	199	—	1	6	39	42
Indiana	—	2	11	78	66	—	0	14	24	11
Michigan	—	3	10	101	130	—	1	5	43	52
Ohio	11	4	15	176	156	1	1	5	33	36
Wisconsin	3	1	38	104	90	—	1	9	41	36
W.N. Central	4	4	39	237	206	2	2	16	71	51
Iowa	—	0	0	—	—	—	0	0	—	—
Kansas	1	0	6	33	25	—	0	3	12	1
Minnesota	—	0	35	101	97	—	0	13	24	31
Missouri	1	2	10	58	53	—	1	2	21	13
Nebraska[§]	2	0	3	24	15	1	0	3	5	5
North Dakota	—	0	5	9	10	1	0	2	4	1
South Dakota	—	0	2	12	6	—	0	1	5	—
S. Atlantic	23	22	51	583	650	5	6	13	136	161
Delaware	—	0	2	6	4	—	0	0	—	—
District of Columbia	1	0	2	12	13	—	0	1	1	2
Florida	8	6	16	144	152	1	1	4	36	34
Georgia	3	4	10	113	141	1	1	5	9	38
Maryland[§]	6	4	9	107	115	1	1	5	37	41
North Carolina	3	2	22	77	55	N	0	0	N	N
South Carolina[§]	2	1	5	35	66	2	1	4	26	18
Virginia[§]	—	3	12	73	88	—	0	6	23	25
West Virginia	—	0	3	16	16	—	0	1	4	3
E.S. Central	5	4	13	98	111	1	2	11	60	53
Alabama[§]	N	0	0	N	N	N	0	0	N	N
Kentucky	—	0	3	17	28	N	0	0	N	N
Mississippi	N	0	0	N	N	—	0	3	15	4
Tennessee[§]	5	3	13	81	83	1	2	9	45	49
W.S. Central	11	7	84	238	174	2	5	66	136	128
Arkansas[§]	—	0	2	4	14	—	0	2	5	8
Louisiana	—	0	1	3	13	—	0	2	1	24
Oklahoma	1	1	19	64	41	1	2	7	45	28
Texas[§]	10	5	64	167	106	1	3	58	85	68
Mountain	9	11	22	321	314	3	5	12	142	126
Arizona	4	4	9	119	115	3	2	8	73	63
Colorado	4	3	8	91	81	—	1	4	41	29
Idaho[§]	—	0	2	9	6	—	0	1	2	2
Montana[§]	N	0	0	N	N	—	0	1	1	—
Nevada[§]	—	0	2	6	3	N	0	0	N	N
New Mexico[§]	—	2	7	54	54	—	0	3	11	26
Utah	1	1	5	37	51	—	0	4	13	6
Wyoming[§]	—	0	2	5	4	—	0	1	1	—
Pacific	—	3	9	66	74	—	0	2	10	9
Alaska	—	0	3	19	15	N	0	0	N	N
California	—	0	0	—	—	N	0	0	N	N
Hawaii	—	2	9	47	59	—	0	2	10	9
Oregon[§]	N	0	0	N	N	N	0	0	N	N
Washington	N	0	0	N	N	N	0	0	N	N
American Samoa	—	0	12	22	4	N	0	0	N	N
C.N.M.I.	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	0	—	—
Puerto Rico	N	0	0	N	N	N	0	0	N	N
U.S. Virgin Islands	—	0	0	—	—	N	0	0	N	N

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional.
† Includes cases of invasive pneumococcal disease, in children aged <5 years, caused by *S. pneumoniae*, which is susceptible or for which susceptibility testing is not available (NNDSS event code 11717).
§ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

Reporting area	*Streptococcus pneumoniae*, invasive disease, drug resistant† — All ages: Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Age <5 years: Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Syphilis, primary and secondary: Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007
United States	15	47	262	1,378	1,445	7	9	43	227	284	145	230	351	4,910	4,737
New England	—	1	41	25	82	—	0	8	4	12	9	6	14	130	105
Connecticut	—	0	37	—	51	—	0	7	—	4	2	0	6	10	13
Maine§	—	0	2	11	7	—	0	1	1	1	—	0	2	2	2
Massachusetts	—	0	0	—	—	—	0	0	—	2	7	4	11	110	61
New Hampshire	—	0	0	—	—	—	0	0	—	—	—	0	3	5	11
Rhode Island§	—	0	3	5	13	—	0	1	1	3	—	0	3	2	16
Vermont§	—	0	2	9	11	—	0	1	2	2	—	0	5	1	2
Mid. Atlantic	3	3	8	92	87	—	0	2	15	20	37	32	45	800	725
New Jersey	—	0	0	—	—	—	0	0	—	—	3	4	10	93	85
New York (Upstate)	1	1	4	31	27	—	0	2	4	8	2	3	13	59	61
New York City	—	0	3	3	—	—	0	0	—	—	29	17	30	511	458
Pennsylvania	2	1	8	58	60	—	0	2	11	12	3	5	12	137	121
E.N. Central	4	13	50	396	399	2	2	14	64	66	7	17	31	389	394
Illinois	—	2	15	51	74	—	0	6	11	24	—	7	19	67	205
Indiana	—	3	28	125	86	—	0	11	15	11	2	2	6	66	19
Michigan	—	0	2	6	1	—	0	1	1	1	5	2	17	100	50
Ohio	4	7	15	214	238	2	1	4	37	30	—	4	14	135	90
Wisconsin	—	0	0	—	—	—	0	0	—	—	—	1	4	21	30
W.N. Central	1	2	106	99	105	—	0	9	7	17	4	8	15	180	144
Iowa	—	0	0	—	—	—	0	0	—	—	—	0	2	7	8
Kansas	—	1	5	42	57	—	0	1	2	2	2	0	5	18	8
Minnesota	—	0	105	—	1	—	0	9	—	11	—	1	4	39	31
Missouri	1	1	8	57	39	—	0	1	2	—	2	5	10	113	92
Nebraska§	—	0	0	—	2	—	0	0	—	—	—	0	1	3	3
North Dakota	—	0	0	—	—	—	0	0	—	—	—	0	1	—	—
South Dakota	—	0	2	—	6	—	0	1	3	4	—	0	3	—	2
S. Atlantic	6	20	39	573	615	5	4	10	99	135	49	48	215	1,037	1,014
Delaware	—	0	1	2	5	—	0	1	—	1	1	0	4	6	6
District of Columbia	—	0	0	—	4	—	0	0	—	—	—	2	11	47	91
Florida	3	11	26	323	342	5	2	6	66	71	10	18	34	405	337
Georgia	3	7	18	190	224	—	1	6	28	56	—	10	175	121	135
Maryland§	—	0	2	3	1	—	0	1	1	—	5	6	13	136	130
North Carolina	N	0	0	N	N	N	0	0	N	N	18	6	18	153	163
South Carolina§	—	0	0	—	—	—	0	0	—	—	2	1	5	40	49
Virginia§	N	0	0	N	N	N	0	0	N	N	13	4	17	129	97
West Virginia	—	1	7	55	39	—	0	2	4	7	—	0	1	—	6
E.S. Central	1	4	12	151	82	—	1	4	27	16	14	20	31	467	357
Alabama§	N	0	0	N	N	N	0	0	N	N	2	8	17	191	142
Kentucky	—	1	4	38	17	—	0	2	8	2	2	1	7	44	33
Mississippi	—	0	0	—	—	—	0	0	—	—	—	2	15	60	54
Tennessee§	1	4	12	113	65	—	1	3	19	14	10	7	14	172	128
W.S. Central	—	1	5	25	49	—	0	2	6	7	20	40	60	900	755
Arkansas§	—	0	2	8	1	—	0	1	2	2	—	2	10	52	52
Louisiana	—	0	5	17	48	—	0	2	4	5	—	11	22	189	206
Oklahoma	N	0	0	N	N	N	0	0	N	N	—	1	5	35	31
Texas§	—	0	0	—	—	—	0	0	—	—	20	26	47	624	466
Mountain	—	1	6	17	26	—	0	2	4	9	1	8	29	120	189
Arizona	—	0	0	—	—	—	0	0	—	—	—	3	21	24	99
Colorado	—	0	0	—	—	—	0	0	—	—	—	1	7	48	21
Idaho§	N	0	0	N	N	N	0	0	N	N	—	0	1	1	1
Montana§	—	0	0	—	—	—	0	0	—	—	—	0	3	—	1
Nevada§	N	0	0	N	N	N	0	0	N	N	1	2	6	34	40
New Mexico§	—	0	1	1	—	—	0	0	—	1	—	1	3	13	21
Utah	—	0	6	16	15	—	0	2	4	7	—	0	2	—	5
Wyoming§	—	0	1	—	11	—	0	1	—	1	—	0	1	—	1
Pacific	—	0	0	—	—	—	0	1	1	2	4	40	70	887	1,054
Alaska	N	0	0	N	N	N	0	0	N	N	—	0	1	—	5
California	N	0	0	N	N	N	0	0	N	N	4	37	59	792	977
Hawaii	—	0	0	—	—	—	0	1	1	2	—	0	2	11	5
Oregon§	N	0	0	N	N	N	0	0	N	N	—	0	2	6	8
Washington	N	0	0	N	N	N	0	0	N	N	—	3	13	78	59
American Samoa	N	0	0	N	N	N	0	0	N	N	—	0	0	—	4
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	0	0	—	—	—	0	0	—	—	—	2	10	72	66
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional.
† Includes cases of invasive pneumococcal disease caused by drug-resistant *S. pneumoniae* (DRSP) (NNDSS event code 11720).
§ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending June 14, 2008, and June 16, 2007 (24th Week)*

	Varicella (chickenpox)					West Nile virus disease† Neuroinvasive					West Nile virus disease† Nonneuroinvasive§				
Reporting area	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2008	Cum 2007
United States	374	642	1,692	16,125	24,203	—	1	143	3	19	—	1	307	6	36
New England	7	20	68	274	1,488	—	0	2	—	—	—	0	2	—	—
Connecticut	—	12	38	—	853	—	0	1	—	—	—	0	1	—	—
Maine¶	—	0	26	—	205	—	0	0	—	—	—	0	0	—	—
Massachusetts	—	0	0	—	—	—	0	2	—	—	—	0	2	—	—
New Hampshire	2	6	18	122	202	—	0	0	—	—	—	0	0	—	—
Rhode Island¶	—	0	0	—	—	—	0	0	—	—	—	0	1	—	—
Vermont¶	5	6	17	152	228	—	0	0	—	—	—	0	0	—	—
Mid. Atlantic	70	57	117	1,324	3,003	—	0	3	—	—	—	0	3	—	—
New Jersey	N	0	0	N	N	—	0	1	—	—	—	0	0	—	—
New York (Upstate)	N	0	0	N	N	—	0	2	—	—	—	0	1	—	—
New York City	N	0	0	N	N	—	0	3	—	—	—	0	3	—	—
Pennsylvania	70	57	117	1,324	3,003	—	0	1	—	—	—	0	1	—	—
E.N. Central	70	152	359	3,858	6,604	—	0	19	—	1	—	0	12	—	1
Illinois	—	5	62	567	98	—	0	14	—	1	—	0	8	—	—
Indiana	—	0	222	—	—	—	0	4	—	—	—	0	2	—	—
Michigan	44	62	154	1,636	2,663	—	0	5	—	—	—	0	1	—	—
Ohio	23	56	128	1,468	3,154	—	0	4	—	—	—	0	3	—	1
Wisconsin	3	7	80	187	689	—	0	2	—	—	—	0	2	—	—
W.N. Central	6	23	144	712	1,105	—	0	41	—	2	—	0	118	—	17
Iowa	N	0	0	N	N	—	0	4	—	1	—	0	3	—	1
Kansas	3	7	36	244	440	—	0	3	—	—	—	0	7	—	1
Minnesota	—	0	0	—	—	—	0	9	—	—	—	0	12	—	—
Missouri	3	11	47	402	605	—	0	8	—	—	—	0	3	—	—
Nebraska¶	N	0	0	N	N	—	0	5	—	—	—	0	16	—	6
North Dakota	—	0	140	48	—	—	0	11	—	1	—	0	49	—	2
South Dakota	—	1	5	18	60	—	0	9	—	—	—	0	32	—	7
S. Atlantic	46	97	157	2,604	3,005	—	0	12	—	—	—	0	6	—	—
Delaware	—	1	4	17	21	—	0	1	—	—	—	0	0	—	—
District of Columbia	—	0	3	16	20	—	0	0	—	—	—	0	0	—	—
Florida	25	30	87	1,049	696	—	0	1	—	—	—	0	0	—	—
Georgia	N	0	0	N	N	—	0	8	—	—	—	0	5	—	—
Maryland¶	N	0	0	N	N	—	0	2	—	—	—	0	2	—	—
North Carolina	N	0	0	N	N	—	0	1	—	—	—	0	2	—	—
South Carolina¶	8	15	66	480	675	—	0	2	—	—	—	0	1	—	—
Virginia¶	—	22	82	635	922	—	0	1	—	—	—	0	1	—	—
West Virginia	13	15	66	407	671	—	0	0	—	—	—	0	0	—	—
E.S. Central	1	16	91	727	309	—	0	11	2	6	—	0	14	3	1
Alabama¶	1	16	91	719	308	—	0	2	—	—	—	0	1	—	—
Kentucky	N	0	0	N	N	—	0	1	—	—	—	0	0	—	—
Mississippi	—	0	2	8	1	—	0	7	2	5	—	0	12	2	1
Tennessee¶	N	0	0	N	N	—	0	1	—	1	—	0	2	1	—
W.S. Central	161	172	927	5,421	6,945	—	0	36	—	4	—	0	19	3	3
Arkansas¶	—	13	42	326	428	—	0	5	—	1	—	0	2	—	—
Louisiana	—	1	7	27	86	—	0	5	—	—	—	0	3	—	—
Oklahoma	N	0	0	N	N	—	0	11	—	—	—	0	8	1	—
Texas¶	161	159	894	5,068	6,431	—	0	19	—	3	—	0	11	2	3
Mountain	13	38	105	1,181	1,720	—	0	36	1	3	—	0	148	—	9
Arizona	—	0	0	—	—	—	0	8	1	2	—	0	10	—	—
Colorado	6	16	43	542	667	—	0	17	—	—	—	0	67	—	4
Idaho¶	N	0	0	N	N	—	0	3	—	—	—	0	22	—	2
Montana¶	—	6	25	164	255	—	0	10	—	—	—	0	30	—	—
Nevada¶	N	0	0	N	N	—	0	1	—	—	—	0	3	—	1
New Mexico¶	—	4	22	115	264	—	0	8	—	—	—	0	6	—	—
Utah	7	9	55	355	517	—	0	8	—	1	—	0	9	—	2
Wyoming¶	—	0	9	5	17	—	0	8	—	—	—	0	34	—	—
Pacific	—	1	4	24	24	—	0	18	—	3	—	0	23	—	5
Alaska	—	1	4	24	24	—	0	0	—	—	—	0	0	—	—
California	—	0	0	—	—	—	0	18	—	3	—	0	20	—	4
Hawaii	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
Oregon¶	N	0	0	N	N	—	0	3	—	—	—	0	4	—	1
Washington	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
American Samoa	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	2	17	54	165	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	11	37	243	411	—	0	0	—	—	—	0	0	—	—
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.
* Incidence data for reporting years 2007 and 2008 are provisional.
† Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ArboNET Surveillance). Data for California serogroup, eastern equine, Powassan, St. Louis, and western equine diseases are available in Table I.
§ Not notifiable in all states. Data from states where the condition is not notifiable are excluded from this table, except in 2007 for the domestic arboviral diseases and influenza-associated pediatric mortality, and in 2003 for SARS-CoV. Reporting exceptions are available at http://www.cdc.gov/epo/dphsi/phs/infdis.htm.
¶ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE III. Deaths in 122 U.S. cities,* week ending June 14 2008 (24th Week)

Reporting Area	All causes, by age (years)						
	All Ages	≥65	45-64	25-44	1-24	<1	P&I[†] Total
New England	591	398	134	32	17	10	33
Boston, MA	160	97	42	15	2	4	8
Bridgeport, CT	35	27	5	1	2	—	3
Cambridge, MA	19	16	3	—	—	—	2
Fall River, MA	27	24	1	—	—	2	—
Hartford, CT	56	33	15	4	3	1	8
Lowell, MA	17	16	1	—	—	—	—
Lynn, MA	8	6	2	—	—	—	—
New Bedford, MA	30	20	8	2	—	—	1
New Haven, CT	59	42	9	3	4	1	5
Providence, RI	56	36	16	1	3	—	—
Somerville, MA	6	5	1	—	—	—	—
Springfield, MA	33	22	7	2	2	—	4
Waterbury, CT	29	17	8	3	—	1	1
Worcester, MA	56	37	16	1	1	1	1
Mid. Atlantic	2,021	1,387	451	109	34	40	79
Albany, NY	40	31	7	1	1	—	—
Allentown, PA	18	10	6	2	—	—	—
Buffalo, NY	77	51	22	1	2	1	2
Camden, NJ	21	12	3	3	2	1	2
Elizabeth, NJ	16	12	4	—	—	—	—
Erie, PA	42	29	12	—	1	—	1
Jersey City, NJ	18	11	4	—	—	3	—
New York City, NY	946	647	209	59	13	18	31
Newark, NJ	36	21	9	3	1	2	—
Paterson, NJ	18	9	5	1	1	2	—
Philadelphia, PA	396	255	92	28	11	10	18
Pittsburgh, PA[§]	38	28	8	2	—	—	3
Reading, PA	27	18	8	1	—	—	1
Rochester, NY	114	85	25	2	1	1	11
Schenectady, NY	14	9	3	1	1	—	—
Scranton, PA	34	27	7	—	—	—	2
Syracuse, NY	112	91	17	3	—	1	6
Trenton, NJ	25	17	7	—	—	1	—
Utica, NY	11	10	1	—	—	—	1
Yonkers, NY	18	14	2	2	—	—	1
E.N. Central	2,015	1,310	469	128	47	60	137
Akron, OH	56	34	17	3	2	—	3
Canton, OH	29	22	6	—	—	1	3
Chicago, IL	290	167	85	23	9	5	31
Cincinnati, OH	95	62	19	4	1	9	6
Cleveland, OH	235	160	49	16	7	3	9
Columbus, OH	199	123	50	13	3	10	12
Dayton, OH	142	93	36	6	5	2	15
Detroit, MI	144	85	43	13	1	2	8
Evansville, IN	42	30	9	2	1	—	4
Fort Wayne, IN	68	43	13	7	3	2	3
Gary, IN	16	9	3	1	—	3	1
Grand Rapids, MI	46	30	6	5	—	5	4
Indianapolis, IN	220	130	54	18	9	9	14
Lansing, MI	43	38	4	—	1	—	2
Milwaukee, WI	93	67	15	7	—	4	8
Peoria, IL	52	34	13	2	2	1	3
Rockford, IL	53	40	9	4	—	—	1
South Bend, IN	47	34	10	1	1	1	3
Toledo, OH	84	62	14	3	2	3	4
Youngstown, OH	61	47	14	—	—	—	3
W.N. Central	625	402	152	43	11	17	51
Des Moines, IA	70	52	12	4	2	—	6
Duluth, MN	29	21	6	1	1	—	2
Kansas City, KS	23	14	4	4	—	1	4
Kansas City, MO	100	64	25	5	1	5	3
Lincoln, NE	36	22	13	1	—	—	2
Minneapolis, MN	58	30	20	5	2	1	6
Omaha, NE	98	62	24	7	2	3	11
St. Louis, MO	95	58	23	6	2	6	11
St. Paul, MN	57	35	14	6	1	1	1
Wichita, KS	59	44	11	4	—	—	5

Reporting Area	All causes, by age (years)						
	All Ages	≥65	45-64	25-44	1-24	<1	P&I[†] Total
S. Atlantic	1,138	689	296	91	31	30	76
Atlanta, GA	120	68	33	8	9	2	5
Baltimore, MD	168	81	61	16	7	2	19
Charlotte, NC	113	70	29	7	4	3	7
Jacksonville, FL	161	98	44	14	2	3	6
Miami, FL	119	80	25	8	2	4	22
Norfolk, VA	36	19	11	4	1	1	—
Richmond, VA	60	37	15	4	—	4	2
Savannah, GA	58	31	17	5	2	3	2
St. Petersburg, FL	47	38	6	2	—	1	6
Tampa, FL	146	99	29	14	1	3	6
Washington, D.C.	98	58	25	8	3	4	—
Wilmington, DE	12	10	1	1	—	—	1
E.S. Central	837	551	194	49	22	21	60
Birmingham, AL	178	109	48	13	4	4	13
Chattanooga, TN	92	70	14	6	1	1	3
Knoxville, TN	115	84	24	4	1	2	7
Lexington, KY	68	40	22	3	2	1	6
Memphis, TN	151	106	30	4	8	3	21
Mobile, AL	99	65	23	8	—	3	5
Montgomery, AL	19	10	4	1	2	2	—
Nashville, TN	115	67	29	10	4	5	5
W.S. Central	1,501	944	350	114	53	40	66
Austin, TX	88	57	19	7	3	2	6
Baton Rouge, LA	54	37	13	4	—	—	—
Corpus Christi, TX	79	53	21	2	1	2	5
Dallas, TX	189	114	43	18	11	3	11
El Paso, TX	78	54	18	3	2	1	2
Fort Worth, TX	118	71	29	7	5	6	4
Houston, TX	405	230	101	44	20	10	14
Little Rock, AR	79	49	22	5	2	1	4
New Orleans, LA[¶]	U	U	U	U	U	U	U
San Antonio, TX	207	137	43	14	4	9	9
Shreveport, LA	54	35	12	2	2	3	9
Tulsa, OK	150	107	29	8	3	3	2
Mountain	1,089	723	248	70	30	17	78
Albuquerque, NM	110	70	24	10	3	3	5
Boise, ID	44	31	8	2	1	2	6
Colorado Springs, CO	98	66	20	6	4	2	—
Denver, CO	78	50	20	7	—	1	9
Las Vegas, NV	259	176	63	12	7	1	12
Ogden, UT	37	20	12	—	3	2	3
Phoenix, AZ	180	105	47	18	6	3	14
Pueblo, CO	37	29	6	2	—	—	3
Salt Lake City, UT	121	80	24	9	6	2	17
Tucson, AZ	125	96	24	4	—	1	9
Pacific	1,667	1,105	398	97	30	37	130
Berkeley, CA	12	8	2	1	—	1	—
Fresno, CA	115	74	32	6	—	3	14
Glendale, CA	41	30	10	1	—	—	6
Honolulu, HI	70	48	12	7	2	1	4
Long Beach, CA	74	48	22	2	—	2	7
Los Angeles, CA	229	153	51	17	6	2	20
Pasadena, CA	19	15	4	—	—	—	1
Portland, OR	129	74	44	8	2	1	7
Sacramento, CA	207	131	47	15	6	8	12
San Diego, CA	151	97	32	10	3	9	10
San Francisco, CA	133	86	33	11	1	2	21
San Jose, CA	182	120	49	7	3	3	10
Santa Cruz, CA	29	26	2	1	—	—	4
Seattle, WA	100	67	24	3	2	4	10
Spokane, WA	79	58	16	2	2	1	3
Tacoma, WA	97	70	18	6	3	—	1
Total	11,484**	7,509	2,692	733	275	272	710

U: Unavailable. —:No reported cases.
* Mortality data in this table are voluntarily reported from 122 cities in the United States, most of which have populations of ≥100,000. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.
† Pneumonia and influenza.
§ Because of changes in reporting methods in this Pennsylvania city, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.
¶ Because of Hurricane Katrina, weekly reporting of deaths has been temporarily disrupted.
** Total includes unknown ages.

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

Data in the weekly *MMWR* are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the following Friday. Data are compiled in the National Center for Public Health Informatics, Division of Integrated Surveillance Systems and Services. Address all inquiries about the *MMWR* Series, including material to be considered for publication, to Editor, *MMWR* Series, Mailstop E-90, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30333 or to *mmwrq@cdc.gov*.

☆U.S. Government Printing Office: 2008-723-026/41103 Region IV ISSN: 0149-2195