Measles—United States, 2000

In 2000, a provisional total of 86 confirmed measles cases were reported to CDC by state and local health departments, representing a record low and a 14% decrease from the 100 cases reported in each of the previous 2 years. This report describes the epidemiology of measles in the United States during 2000 and documents the continued absence of endemic measles and the continued risk for internationally imported measles cases that might result in indigenous transmission.

Following state laws and regulations, health-care providers, laboratories, and other health-care personnel report confirmed measles cases to state public health departments; this information is forwarded to CDC. Data on vaccination status, age, complications, setting of transmission, and serologic confirmation of cases also are collected.

Of the 86 reported measles cases, 26 (30%) were internationally imported. Of the 60 indigenous cases, 18 were import-linked, nine were imported virus, and 33 were of unknown source. Importation-associated cases (i.e., imported, import-linked, and imported virus cases) accounted for 62% of all reported cases.

The proportion of cases classified as “internationally imported” cases has been relatively stable since 1998. Of the 26 imported cases, 14 occurred in United States residents who had traveled abroad and 12 in international visitors. Measles was imported from 10 countries. The largest numbers of imported cases reported were from Japan (seven cases) and Korea and Ethiopia (four each). The states reporting the most imported measles cases were New York (eight cases), California (six), and Hawaii and Vermont (three each). Four counties had more than one imported case in 2000.

On average, imported cases resulted in <1 import-linked case (range: 0-5). Measles virus was isolated from eight chains of transmission linked to an imported measles case (including three chains of one case). In each chain, the viral genotype sequenced was consistent with the genotype of virus known to be circulating in the source country of the imported case. Virologic evidence of importation was found in five chains of transmission (nine cases) that were not linked epidemiologically to imported cases. Genotype D5 was cultured from two isolated cases and genotypes G2, H1, and H2 were each isolated from one chain of transmission. These genotypes are known to circulate in Japan, China, and Vietnam, respectively. The lack of any consistently repeating genotype indicates that there is no endemic genotype. Therefore, all indigenous cases with genotype information and no epidemiologic link to an imported case were classified as imported virus cases.

During 2000, a total of 20 states reported confirmed measles cases. Three states accounted for 57% of cases: New York (23 [13 from New York City]), California (19), and Nevada (seven). The remaining 17 states each reported from one to three measles cases. Of the 3,140 counties in the United States, 41 (1%) reported a confirmed measles case; seven counties (<1%) reported more than three cases.

In 2000, 68 (79%) of the 86 reported cases occurred during weeks 1-26, and 18 (21%) occurred during weeks 27-52. The median number of cases per week was one (range: 0-9). During 18 weeks, no cases were reported. During 17 additional weeks, all reported cases were import-associated. During five periods of 4 weeks, all reported cases were import-associated.

Ten cases (12% of total cases) were in infants aged <12 months, 27 (31%) in children aged 1-4 years, 17 (20%) in persons aged 5-19 years, 20 (23%) in persons aged 20-34 years, and 12 (14%) in persons aged ≥35 years. Of the 86 patients, 23 (27%) had a documented history of measles vaccination; 40 (46%) had not been vaccinated, nine of these were aged <12 months; and 23 (27%) patients had unknown vaccination status. Among 48 cases in persons for whom vaccine was recommended and vaccination status was known, 24 (50%) were unvaccinated.

Of 71 cases in U.S. residents (57 indigenous and 14 imported), 54 (77%) occurred in vaccine-eligible persons. Of these residents, 20 (37%) were known to be vaccinated, 20 (37%) were not vaccinated, and 14 (26%) had unknown vaccination status.

In 2000, 10 measles outbreaks (i.e., three or more confirmed cases) occurred in nine states accounting for 48 (56%) of the 86 cases. An epidemiologic link to an imported case was documented in five of the 10 outbreaks.

The largest outbreaks occurred in New York: one in Oswego/Onondaga counties involving nine persons and a second in Kings County involving eight persons. The Oswego/Onondaga outbreak occurred in a high school; the source of infection was unknown. Of the six high school students eligible for vaccination, five had been vaccinated. Each of these students had received a single dose of measles vaccine, which was in compliance with state requirements at that time. The outbreak in Kings County occurred in a religious community in Brooklyn following an imported case from the United Kingdom. Two cases were in infants aged <12 months. Among the six patients who were vaccine eligible, three were unvaccinated.

One outbreak in 2000 illustrates the difficulty in linking indigenous cases to their imported source. A U.S. resident
and Olympic athlete aged 24 years developed prodromal measles symptoms while competing in an athletic event in Utah. The athlete had no known exposure to measles; however, 2 weeks before arriving in Utah, she had participated in an athletic competition in Japan. Following the competition in Utah, the athlete flew to Italy and subsequently developed a rash consistent with measles. The team physician notified CDC of the case from Italy. On return to the United States, the athlete tested IgM positive for measles. Three confirmed measles cases were linked epidemiologically to the athletic event in Utah. No viral strain was obtained from any of the cases.

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CDC Editorial Note: Measles is still endemic in many countries and results in approximately 800,000 deaths per year. However, the reported incidence of measles in the United States has been <1 case per million for the past 4 years. The high percentage of cases resulting from importations and very limited indigenous spread from these imported cases also has continued over the same period. The consistently small number of unknown source cases suggests that measles is no longer endemic in the United States. However, unknown source cases continue to occur sporadically. Many of these cases, especially isolated cases, might be misclassifications resulting from false-positive laboratory tests. However, even among true measles cases, it is impossible to identify the imported case in every chain of transmission.

The outbreak in Utah demonstrates the difficulty in linking every case to an imported source. CDC was informed of the case only because it occurred in an Olympic athlete. The case was not reported as a U.S. case because rash onset and diagnosis had occurred in Italy. If the team physician had not called from Italy to report this case, the three associated cases in Utah would have been classified as unknown source cases. Because most visits to the United States are of a relatively short duration, many persons shedding measles virus might leave the country before the rash begins and before measles is diagnosed. Many other international visitors who develop measles in the United States might choose to return home before they seek care because they are unfamiliar with the U.S. health-care system or lack valid health insurance in the United States. In both situations, the imported case would not be detected except under special circumstances.

Difficulty in epidemiologically linking every case to an imported source highlights the crucial role of virologic surveillance in monitoring the absence of endemic measles. Collection of viral specimens is an important part of any measles case investigation. Worldwide, during large outbreaks and in areas where disease is endemic, one measles genotype is usually found. Since 1992 in the United States, no genotypes have been found consistently, and when genotypic data are available, all isolates from imported cases have the genotype found in the country of origin.

Imported measles cases consistently test the level of population immunity to measles in the United States. The average of less than one import-linked case following an international importation suggests that the level of population immunity is high, probably as a result of successful vaccination efforts in the United States. First-dose vaccination coverage among preschool children has been ≥90% for the past 4 years. Two doses of measles vaccine are required for school-aged children in 49 states (CDC, unpublished data, 2002). Sustaining high levels of vaccination is important in limiting indigenous spread of measles from imported cases and preventing measles from becoming re-established as an endemic disease in the United States.

Acknowledgement

This report is based on data contributed by state and local health departments.

REFERENCES

3. CDC. Case definitions for public health surveillance. MMWR 1990;39(No. RR-13).
elements of or questions should be sent before March 15, 2002, to ghs@cdc.gov or to Group B Strept Prevention Coordinator, CDC, 1600 Clifton Road, MS C-23, Atlanta, GA 30333.

REFERENCE
1. CDC. Prevention of perinatal group B streptococcal disease: a public health perspective. MMWR 1996;45(No. RR-7).

Status of US Department of Defense Preliminary Evaluation of the Association of Anthrax Vaccination and Congenital Anomalies

MMWR. 2002;51:127

The U.S. Department of Defense (DoD), Center for Deployment Health Research at Naval Health Research Center, San Diego, used computerized medical records to conduct a preliminary evaluation of the potential association between the use of anthrax vaccine in the first trimester of pregnancy and the diagnosis of congenital anomalies in children. Review of preliminary data indicated important limitations in computerized medical records that preclude drawing conclusions from this preliminary study. Investigators are conducting a systematic evaluation of original medical records, including vaccination and infant health records. This evaluation will require several months.

Although influenza activity in the United States remained low from October through mid-January, the number and percentage of specimens testing positive for influenza viruses have increased in recent weeks. Laboratory-confirmed influenza infections have been reported from 45 states. The predominant influenza viruses isolated this season have been type A (H3N2) viruses that are well matched by this season’s influenza vaccine. This report summarizes U.S. influenza activity from September 30, 2001 through January 19, 2002 and updates the previous summary.1

During September 30–January 19, World Health Organization collaborating laboratories and National Respiratory and Enteric Virus Surveillance System laboratories in the United States tested 25,779 respiratory specimens for influenza viruses; 1,299 (5%) were positive. The weekly percentage of specimens testing positive for influenza increased from 3.9% during the week ending December 1 to 13.9% during the week ending January 19 (week 3). During week 3, the percentage of visits for ILI was 2.2%, slightly above the national baseline of 1.9%. During the same week, influenza activity was reported by state epidemiologists as widespread in Colorado, New York, Utah, and Virginia and regional in 11 states.

During week 3, 7.7% of recorded deaths in the 122 Cities Mortality Reporting System were attributed to pneumonia and influenza (P&I), which is below the epidemic threshold of 8.1% for that week. The percentage of P&I deaths has remained below the epidemic threshold for each week during September 30–January 19.

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lated so far this season have been influenza A (H3N2) viruses, and all of the U.S. isolates characterized antigenically at CDC this season have been well matched by the vaccine strains.

The best protection against influenza is vaccination, and approximately 10 million doses of 2001-02 influenza vaccine remain available. Health-care providers should continue to offer influenza vaccine during February because influenza activity is expected to increase, and unvaccinated persons can benefit from vaccination even after influenza has been detected in their communities. Influenza vaccine is strongly recommended for those at increased risk for serious complications from influenza (e.g., persons aged 6 months–64 years with certain chronic medical conditions and persons aged ≥65 years) and healthcare providers. In addition, household contacts of high-risk persons, healthy persons aged 50-64 years, and any person who wants to reduce their risk for becoming ill with influenza should be vaccinated.

Prompt laboratory diagnosis of influenza can guide clinical decision-making and confirm influenza as the cause of respiratory outbreaks in all settings (e.g., nursing homes and hospitals). Immunofluorescence and enzyme immunoassay are available in some laboratories. Commercially available rapid influenza diagnostic tests differ by their ability to detect and distinguish between influenza A and B virus infections, methodologies, processing time, acceptable respiratory specimens, and cost. Some rapid tests are approved for use in a physician's office, and others are considered moderately complex and must be performed at a clinical laboratory. One test detects only influenza A viruses, another test detects and distinguishes between influenza A and B viruses, and three tests detect but do not distinguish between infection with influenza A or B viruses. Respiratory specimens for rapid testing generally should be obtained within 3–4 days of illness onset. The sensitivities of the rapid tests are lower than viral culture of respiratory specimens and a negative result might not exclude influenza virus infection. When rapid tests are used to detect influenza outbreaks, respiratory specimens also should be obtained and sent for confirmatory viral culture. Information has been published about detection and control of influenza outbreaks in acute-care and long-term-care facilities.

Antiviral medications can be useful for early treatment of influenza and as an adjunct to influenza vaccination for influenza prevention and control. Influenza antiviral drugs differ in approved uses, recommended dosages, routes of administration, adverse effects, development of antiviral resistance, and cost. When administered within 48 hours of symptom onset, antiviral treatment of influenza can reduce the duration of illness by approximately 1 day in healthy adults. Four prescription antiviral medications (amantadine, rimantadine, oseltamivir, and zanamivir) are approved for treatment of influenza A virus infections. Oseltamivir and zanamivir also are approved for treatment of influenza B virus infections. Antiviral chemoprophylaxis is approximately 70%-90% effective in preventing illness in healthy adults. Amantadine, rimantadine, and oseltamivir are approved for chemoprophylaxis of influenza A viruses infections; only oseltamivir is approved for chemoprophylaxis of influenza B virus infections. Physicians should consult the package inserts of the antiviral drugs for information on approved age groups, dosing, and adverse effects.

CDC collects and reports U.S. influenza surveillance data during October–May. This information is updated weekly and is available through CDC voice information, 888-232-3228, fax information, 888-232-3299 (request document number 361100), or at http://www.cdc.gov/ncidod/diseases/flu/weekly.htm.

Acknowledgement
This report was based on data contributed by participating state and territorial epidemiologists and state health laboratories; WHO collaborating laboratories; National Respiratory and Enteric Virus Surveillance System laboratories; Sentinel Physicians Influenza Surveillance System; Div of Public Health Surveillance and Informatics; Epidemiology Program Office; Div of Vital Statistics; and the National Center for Health Statistics, CDC.

REFERENCES

*As of January 24, 2002.
†Temperature of ≥100°F (≥37.8°C) and either cough or sore throat in the absence of a known cause.
§The national baseline was calculated as the mean percentage of visits for ILI during noninfluenza weeks plus two standard deviations. Because of wide variability in regional level data, to calculate region-specific baselines is not possible and to apply the national baseline to regional level data is not appropriate.
¶Levels of activity: (1) no activity, (2) sporadic—sporadically occurring ILI or laboratory-confirmed influenza with no outbreaks detected, (3) regional—outbreaks of ILI or laboratory-confirmed influenza in counties with a combined population of <50% of the state’s population, and (4) widespread—outbreaks of ILI or laboratory-confirmed influenza in counties with a combined population of ≥50% of the state’s population.
*The expected baseline proportion of P&I deaths reported by the 122 Cities Mortality Reporting System is projected using a robust regression procedure in which a periodic regression model is applied to the observed percentage of deaths from P&I since 1983. The epidemic threshold is 1.654 standard deviations above the seasonal baseline. Before the 1999-2000 season, a new case definition for a P&I death was introduced. During the summer of 2000, the baseline and epidemic thresholds were adjusted manually to account for these changes in case definition. For the 2001-02 season, sufficient data have been collected using the new case definition to allow provision of the baseline using the regression procedure employed before the 2000-01 season.