

Measles Key Points – 2015 U.S. Situation and General Information*New information is indicated in red.***2015 U.S. Measles Situation****2015 measles cases**

- From January 1 to **March 27**, 2015, 178 people from 17 states in the U.S. and the District of Columbia have been reported as having measles [AZ (7), CA (120), CO (1), DC (2), DE (1), GA (1), IL (15), MI (1), MN (1), NE (2), NJ (2), NY (3), NV (9), PA (1), SD (2), TX (1), UT (2), WA (7)]*. Most of the cases [131 (74%)] are considered to be part of a large, ongoing, multi-state outbreak linked to an amusement park in California. Three other unrelated outbreaks are occurring in Illinois, Nevada, and Washington respectively.
 - Most of these people were unvaccinated (about 5 out of 10) or did not know whether they were vaccinated (about 4 out of 10). A minority of them were vaccinated (about 1 out of 10).
 - Cases have ranged from 6 weeks to 70 years.
 - Some of them have been hospitalized.
 - Nine of these people brought measles into the U.S. after getting infected in other countries (Indonesia, Singapore/Indonesia, India, Dubai/India, Qatar, Azerbaijan, Pakistan, Kyrgyzstan, and Germany respectively). Some of them spread measles to other people in the U.S.
 - Measles genotypes identified to date include B3, D8, and D9.

*Preliminary data reported to CDC's National Center for Immunization and Respiratory Diseases, updated weekly on Mondays.

U.S. multi-state measles outbreak, December 2014—February 2015

- The United States is currently experiencing a large, multi-state outbreak of measles linked to an amusement park in California.
 - From December 28, 2014 to **March 27**, 2015, 146 people from 7 states in the U.S. [AZ (7), CA (130), CO (1), NE (2), OR (1), UT (3), WA (2)] have been reported to CDC as having measles and are considered to be part of this outbreak. Additional cases linked to this outbreak have been reported in Mexico and Canada.
 - The source of the outbreak has not been identified. However, it likely started from one or more travelers who got measles overseas then visited the amusement park while infectious and spread it to others.
 - Analysis by CDC scientists shows that the measles virus type in this outbreak (B3) is identical to the virus type that caused the large measles outbreak in the Philippines in 2014. This virus type has also been identified within the past 6 months in 14 other countries. Additionally, at least six other states in the U.S. have had measles cases with B3 virus type, not associated with the current outbreak.

Guidance for healthcare providers

- Healthcare providers should be vigilant about measles—
 - Ensure all patients are up to date on measles-mumps-rubella (MMR) vaccine.
 - Consider measles in patients presenting with febrile rash illness and clinically compatible measles symptoms (cough, coryza, and conjunctivitis), and ask patients about recent travel internationally or to domestic venues frequented by international travelers, as well as a history of measles in the community.
 - Promptly isolate patients with suspected measles to avoid disease transmission and immediately report the suspect measles case to the health department.
 - Obtain specimens for testing from patients with suspected measles, including viral specimens for genotyping, which can help determine the source of the virus. Contact the local health department with questions about submitting specimens for testing.
 - Treat severe measles cases among children, such as those who are hospitalized, with vitamin A.

Guidance for general public

- Parents should make sure their children are protected against measles with two doses of MMR vaccine—the first dose at 12 through 15 months of age and the second dose 4 through 6 years of age.
- Unless they have evidence of measles immunity, college and other students, health care personnel, and international travelers should get 2 appropriately spaced doses of MMR vaccine, and other adults should get 1 dose. Ask your health care provider if you have questions about whether you need MMR vaccine.

General Measles Information

About measles

- Measles is a serious respiratory disease caused by a virus.
 - Measles starts with a fever. Soon after, it causes a cough, runny nose, and red eyes. Then a rash of tiny, red spots breaks out. It starts at the head and spreads to the rest of the body. The rash can last for a week, and coughing can last for 10 days.
- Measles is highly contagious and spreads through the air when an infected person coughs or sneezes. It is so contagious that if one person has it, 9 out of 10 people around him or her will also become infected if they are not protected.
 - You can get measles just by being in a room where a person with measles has been, even up to two hours after that person has left.
 - An infected person can spread measles to others even before he or she develops symptoms—from four days before they develop the measles rash through four days afterward.
- Measles can cause serious health complications, such as pneumonia or encephalitis, and even death.
 - Children younger than 5 years of age and adults older than 20 years of age are at high risk of getting a serious case of measles.
 - About 1 in 4 unvaccinated people in the U.S. who get measles will be hospitalized.
 - 1 out of every 1,000 people with measles will develop brain swelling (encephalitis).
 - 1 or 2 out of 1,000 people with measles will die, even with the best care.
- Before the U.S. measles vaccination program started in 1963, about 3–4 million people in the U.S. got measles each year; 400–500 of them died, 48,000 were hospitalized, and 4,000 developed encephalitis because of measles.

Measles in the U.S.

- Measles was declared eliminated (absence of continuous disease transmission for greater than 12 months) from the U.S. in 2000 thanks to a highly effective vaccination program.
 - Measles is still commonly transmitted (endemic or large outbreaks) in many parts of the world. This includes some countries in Europe, Asia, the Pacific, and Africa. Worldwide, an estimated 20 million people get measles and 146,000 people, mostly children, die from the disease each year.
- CDC investigates, where possible, all reports of deaths in the U.S. associated with measles, by examining the available information linking these deaths to measles infection. These reports come from multiple sources including CDC's National Center for Health Statistics (NCHS) which provides statistical information about deaths in the United States. Measles deaths are only counted and considered verified when there is evidence that an acute measles infection was responsible for the death.
 - The last verifiable death in the United States from acute measles infection occurred in 2003 when there were 2 reported deaths. Other reports since that time cannot be verified.
- Measles cases continue to be brought into the United States by people who get infected while in other countries.
 - Since 2000, when measles was declared eliminated from the U.S., the annual number of people reported to have measles ranged from a low of 37 people in 2004 to a high of 644 people in 2014.
 - The majority of importations of measles into the U.S. come from U.S. residents. When we can identify vaccine status, almost all are unvaccinated.
 - Anyone who is not protected against measles is at risk of getting the disease anywhere (school, work, the gym, etc.) in the United States and any time of the year, as well as while traveling internationally.

- If you have fever, rash, and other measles-related symptoms, call ahead to your doctor. Tell your doctor about any recent international travel or exposure to others who have recently traveled internationally or if there is measles in your community. Anyone who is suspected of having measles must be promptly isolated to prevent the disease from spreading to others.
- Despite a national MMR vaccination coverage level of about 92%, one in 12 children in the U.S. is not receiving his first dose of MMR vaccine on time, underscoring considerable measles susceptibility across the country. Vaccination coverage continues to vary by state from 86% in some states to 96% in others.
 - At the county or lower levels, vaccine coverage rates may vary considerably. Pockets of unvaccinated people can even exist in states with high vaccination coverage, underscoring considerable measles susceptibility at some local levels.
- When measles gets into communities of unvaccinated people in the U.S. (such as people who refuse vaccines for religious, philosophical or personal reasons), outbreaks are more likely to occur. These communities make it difficult to control the spread of the disease and make us vulnerable to having the virus re-establish itself in our country again.
 - High measles vaccine coverage and rapid public health response are critical for preventing and controlling measles cases and outbreaks.
- All states allow people to refuse vaccines for medical reasons; all but two states allow people to refuse vaccines for religious reasons, and 19 states allow people to refuse them for philosophical or personal reasons.
 - Vaccine exemption rates are higher in states that allow personal belief exemptions than those that allow exemptions for only religious reasons, and exemption rates are highest in states where personal belief exemptions are easy to obtain, for example, signing a health form, compared with those that require parents to receive documented education from a healthcare professional about the benefits of immunization and the risks of the vaccine-preventable disease, and a notarized form.

What CDC does when measles outbreaks occur

- State and local health departments have the lead in investigating measles cases and outbreaks when they occur. Their job is to determine who may have been exposed and is at risk for measles because they have not been vaccinated or are not otherwise immune.
 - CDC helps and supports health departments in these investigations by—
 - communicating with public health officials from states with reported measles cases and providing technical assistance.
 - gathering data reported by states on confirmed measles cases and evaluating and monitoring these data from a national perspective.
 - testing specimens for difficult diagnostic cases of suspected measles infection when requested by states.
 - using Advanced Molecular Detection (AMD) methods to determine measles virus genotypes and strains.
 - providing rapid assistance on the ground during outbreak investigations, often through a formal request by the state health department.
 - investing in state and local health departments for public health infrastructure and laboratory capacity, totaling \$430 million in FY 2015, to support front-line response to suspected and confirmed measles cases.
 - alerting clinicians, healthcare facilities, and public health officials around the country about current outbreaks and providing vaccine policy and clinical guidance for healthcare providers.
 - providing information to public and healthcare providers through a variety of media including the CDC website.
- Measles transmission is considered over after two incubation periods (two times 21 days) have passed without any reported cases.

Measles and mass gatherings

- Mass gatherings, including tourist attractions and sporting events such as the Super Bowl and Olympics, bring together large concentrations of people from throughout the world. Some events may attract people from particular risk groups, such as those who haven't received routine vaccinations. This could increase the chances of infectious diseases, like measles, spreading among those who are susceptible.
 - Measles is highly contagious and can spread among people who are unvaccinated.
 - If you have already been vaccinated against measles or have immunity to the virus, you are considered protected against measles.
- CDC recommends that people of all ages stay up to date with their vaccinations. Planning a trip to a mass gathering or before international travel is a good time to check with your doctor to make sure you and your family are up to date on vaccinations, including MMR vaccine.
- Studies of mass gatherings show that serious outbreaks, significant illness, and death are rare. The top risks include traveler's diarrhea, foodborne and waterborne illness, airborne disease and sexually transmitted disease. However, we urge people to follow standard recommendations: if you are ill don't travel, and stay at home.

Past measles cases and outbreaks

- In 2014, 644 people from 27 states in the U.S. were reported as having measles. This is the greatest number of measles cases reported in the U.S. since measles was declared eliminated in 2000.
 - Most of these people were not vaccinated or did not know their vaccination status.
 - 60 of these people brought measles into the U.S. after getting infected in other countries; 25 of them got infected in the Philippines. Some of them spread measles to other people in the U.S.
 - In 2014, 23 measles outbreaks were reported, accounting for 89% of cases. A large outbreak in Ohio resulted in 383 cases.
- In 2013, 189 people in the U.S. were reported as having measles.
 - In 2013, there were 11 measles outbreaks in various U.S. communities.
 - An outbreak in New York resulted in 58 cases.
 - An outbreak in North Carolina resulted in 23 cases.
 - An outbreak in Texas resulted in 21 cases.
- In 2012, 55 people in the U.S. were reported as having measles.
- In 2011, 220 people in the U.S. were reported as having measles; this is the second greatest number of cases reported in the U.S. since measles was declared eliminated in 2000.
 - More than 30 countries in the WHO European Region reported an increase in measles in 2011, and France was experiencing a large outbreak. Most of the cases that were brought to the U.S. in 2011 came from France.

See CDC's Measles Cases and Outbreaks website (www.cdc.gov/measles/cases-outbreaks) for more information.

Guidance for healthcare providers and healthcare settings

- Healthcare providers should be vigilant about measles—
 - Ensure all patients are up to date on MMR vaccine.
 - Consider measles in patients presenting with febrile rash illness and clinically compatible measles symptoms [cough, coryza (or runny nose) and conjunctivitis], and ask patients about recent travel internationally or to domestic venues frequented by international travelers, as well as a history of measles exposures in their communities.

- o Promptly isolate patients with suspected measles to avoid disease transmission and immediately report the suspect measles case to their health department.
- o Obtain specimens for testing from patients with suspected measles, including viral specimens for genotyping, which can help determine the source of the virus. Contact the local health department with questions about submitting specimens for testing.
- o Treat severe measles cases among children, such as those who are hospitalized, with vitamin A. Vitamin A should be administered immediately on diagnosis and repeated the next day. The recommended age-specific daily doses are
 - 50,000 IU for infants younger than 6 months of age
 - 100,000 IU for infants 6–11 months of age
 - 200,000 IU for children 12 months of age and older

For more information, see page 351 of the World Health Organization measles and vitamin A guidance (<http://www.who.int/wer/2009/wer8435.pdf#page=3>).

- People who work in healthcare settings should have documented evidence of immunity to measles according to the Advisory Committee on Immunization Practices (ACIP).
 - o Refer to “Immunization of Health-Care Personnel: Recommendations of the Advisory Committee on Immunization Practices” (www.cdc.gov/mmwr/pdf/rr/rr6007.pdf).
- Measles outbreaks in healthcare settings can disrupt care of patients and put them at higher risk for severe disease. This is especially important for patients who have underlying medical conditions and weakened immune systems.

Measles vaccination recommendations

- The best protection against measles is MMR vaccine. MMR vaccine provides long-lasting protection against all strains of measles. Make sure you’re up to date on MMR and other vaccinations.
 - o Children should receive two doses of MMR vaccine—the first dose at 12 through 15 months of age and the second dose 4 through 6 years of age. Giving the second dose of the vaccine earlier is allowed at any time as long as it is at least 28 days after the first dose.
 - o Unless they have evidence of measles immunity, college and other students, health care personnel, and international travelers need 2 appropriately spaced doses and other adults need 1 dose. Ask your health care provider if you have questions about whether you need MMR vaccine.
 - o People who received two doses of MMR vaccine as children according to the U.S. vaccination schedule are considered protected for life.
 - o When you get vaccinated, you also protect others around you who are at high risk for complications but can’t get vaccinated because they are too young or have a health condition.
- For those who travel internationally, CDC recommends that all U.S. residents older than 6 months be protected from measles and receive MMR vaccine, if needed, prior to departure.
 - o Infants 6 through 11 months old should receive 1 dose of MMR vaccine before departure.†
 - o Children 12 months of age or older should have documentation of 2 doses of MMR vaccine (separated by at least 28 days).
 - o Teenagers and adults without evidence of measles immunity** should have documentation of 2 appropriately spaced doses of MMR vaccine.
- One dose of MMR vaccine is about 93% effective at preventing measles; two doses are about 97% effective.
 - o Almost everyone who does not respond to the measles component of the first dose of MMR vaccine at age 12 months or older will respond to the second dose. Therefore, the second dose of MMR is administered to address primary vaccine failure.
 - o Very few people—about three out of 100—who get two doses of measles vaccine will still get measles if exposed to the virus. Experts aren’t sure why; it could be that their immune systems didn’t respond as well as

they should have to the vaccine. But the good news is, fully vaccinated people who get measles are much more likely to have a milder illness, and they are also less likely to spread the disease to other people, including people who can't get vaccinated because they are too young or have weakened immune systems.

- o If a fully vaccinated person is exposed to measles but does not develop symptoms, he or she would not spread measles to another person.
- During measles outbreaks, efforts should be made to ensure that everyone at risk for exposure and infection is protected against measles through vaccination or past infection.
- During a measles outbreak health officials may recommend giving a dose of MMR vaccine in addition to, or earlier than, what is recommended in the U.S. vaccination schedule, as an outbreak-control measure. This depends on the epidemiology of the outbreak at the local level considering ongoing risks for exposure when there is community-wide transmission:
 - o If many cases are occurring among infants younger than 12 months of age with an ongoing risk for exposure (e.g., an outbreak in a childcare center), health officials may recommend giving measles vaccine to infants as young as 6 months of age.
 - Note that children vaccinated before their first birthday should be revaccinated when they are 12 through 15 months old, and again when they are 4 through 6 years of age.
 - o If many cases are occurring among preschool-aged children who have received one dose of MMR vaccine, health officials might recommend that a second dose of MMR vaccine be given to children ages 1 through 4 years.
 - o If many cases are occurring among adults who have received one dose of MMR vaccine, health officials might recommend that adults who only have documentation of 1 dose of MMR vaccine be given a second dose.
 - o State health departments have authority to provide revised vaccine recommendations during measles outbreaks.

Possible exposure to measles

- If you're not protected against measles and think you might have been exposed to someone with measles:
 - o Stay home. Do not go straight to the doctor. Instead, call ahead to inform a healthcare professional of your possible exposure so you can get instructions about how to avoid exposing others.
 - o Additionally, talk to your doctor about getting measles vaccine.
 - If given within 72 hours of initial exposure, MMR vaccine may provide some protection or lessen the severity of disease.
 - Except in healthcare settings, unvaccinated people who receive their first dose of MMR vaccine within 72 hours after exposure may return immediately to childcare, school, or work.

Additional Information

- CDC Health Advisory, U.S. Multi-state Measles Outbreak, January 23, 2015 (<http://emergency.cdc.gov/han/han00376.asp>)
- CDC Measles website (www.cdc.gov/measles)
- CDC Educational Measles Resources for Parents & Caregivers (www.cdc.gov/measles/resources/parents-caregivers)
- CDC Measles website for Healthcare Professionals (www.cdc.gov/measles/hcp)
- CDC press briefing transcript: Measles in the U.S., January 29, 2015 (<http://www.cdc.gov/media/releases/2015/t0129-measles.html>)
- California Department of Public Health Measles website (www.cdph.ca.gov/HealthInfo/discond/Pages/Measles.aspx)

† Infants who receive a dose of MMR vaccine before their first birthday should receive 2 more doses of MMR vaccine, the first of which should be administered when the child is 12 through 15 months of age and the second at least 28 days later.

** One of the following is considered evidence of measles immunity for international travelers:

1. documentation of age-appropriate vaccination with a live measles virus-containing vaccine:
 - infants age 6–11 months: 1 dose
 - persons age \geq 12 months: 2 doses, or
2. laboratory evidence of immunity, or
3. laboratory confirmation of disease, or
4. born before 1957