

Outbreaks/Emerging Diseases: MEASLES (Rubeola)

Although Measles was declared eradicated in 2000 within the United States, there have been individual cases of measles reported in most years, mostly as outbreaks (3 or more confirmed cases in one area). 2014 had the highest number of cases with 667, followed with preliminary data from 2018 of 372 cases, as a result of 17 outbreaks. Other years had lower levels of measles cases but numbering over 100 (in 2008, 2011, 2013, 2014, 2015, and 2017). According to the CDC and the affected areas' Health Departments, the majority of individuals who got measles were unvaccinated, some of them were under-vaccinated (having received only one dose of vaccine; under normal circumstances, the 2nd dose is due at ages 4-6), some had unknown or unverifiable vaccination, and a very small percentage had been vaccinated. These cases are imported by travelers, either from the U.S. or as visitors to the U.S., who return with the measles. In some communities with clusters of unvaccinated individuals, the disease is transmitted amongst them. This lack of immunization is what leads to outbreaks rather than just one or two isolated cases. Measles is still very common in many countries throughout the world including Europe, Asia, Africa and the Pacific. Per the CDC, depending on the year, an increase in cases can be seen because of an increase in the number of travelers who develop measles abroad and bring it here, with continued spread amongst areas with groups of unvaccinated people, or a combination of both. The majority of cases occur in young children but older children and adults develop it as well. Increased measles cases in older children, teens, and adults may occur as children who are unvaccinated age, but remain unprotected from measles. For updated information on these outbreaks, see <https://www.cdc.gov/measles/cases-outbreaks.html>

Measles (Rubeola) is a very contagious viral disease, which is preventable with adequate immunization, that has the potential for several serious complications and even death. Many of those infected visited public areas such as schools, churches, parks, stores, and sports facilities while they were infectious (capable of passing on the disease). Public notifications have gone out listing those places where these individuals went during their infectious period. As soon as they were diagnosed, they were isolated and reports to public health authorities were made. Appropriate post exposure measures, based on each individual's immune status, would have occurred. More information on Measles can be found at this site: <https://www.cdc.gov/measles/about/index.html>

In response to this outbreak, Washington's Region IV Public Health sent a Health Alert to Physicians and other Health Care Providers regarding a Measles (Rubeola) outbreak in Washington State in the Vancouver area, which is now in King and Clark Counties, as well as into Multnomah County, Oregon. A Public Health Emergency was initially announced by the Governor for Clark County, but that has now been expanded to all of Washington State. Links to these declarations and to information on the investigations, areas of potential exposures with timelines, and more detailed information about Measles are included in a *Resources & Links* page associated with this article. Much of the New York outbreak appears to be an extension from the end of last year (2018), as the measles circulate in

unvaccinated or under-vaccinated individuals. Texas also has cases spread amongst 5 counties, but only Harris County has multiple cases (4).

Measles is transmitted via the air when an infected person coughs, sneezes, or breathes or by direct contact with infectious droplets. It survives for two hours in the air or on surfaces, but 90% of people who are not immune to the virus, will get it if exposed. The incubation period (from exposure to prodrome) averages 10-12 days, with exposure to rash averaging 14 days, but ranging from 7-21 days.

Signs and Symptoms: the prodrome is the time from the first symptoms to the onset of rash, usually lasting 2-4 days, and includes malaise/fatigue, fever that increases over time and peaks with a very high one, cough, runny nose (coryza) and red, watery eyes (conjunctivitis) – referred to as the three C's. Within 2-3 days from the first symptom(s), tiny white or bluish-white spots appear in the mouth; on the cheeks, tongue and/or under the tongue; the nose and throat are often bright red. These spots, called Koplik spots, are typically an early sign and, with the other prodromal symptoms, indicative of Measles infection. It is during this prodrome and until 3-4 days after the onset of rash, that a person is able to transmit the disease to others. Three to five days after the first symptoms and with the progression of fever, the rash appears on the head (seen at the hairline) and face and then spreads to the rest of the rest of the body, down the torso, and then to the extremities.

Complications: Anyone with measles can have serious complications but those under 5 years old and those older than 20 are at greatest risk, along with pregnant women, and any immunocompromised individuals. For every 1000 kids who get measles, one to two (1-2) will die. And, although fairly rare, those who survive, may have permanent hearing loss to complete deafness, permanent neurologic damage, and/or learning disabilities. Pregnant women who get measles may deliver prematurely or have a low birth weight baby. Those with severe complications need to be treated in the hospital.

Common complications include: ear infections (+/- 10%) which can lead to permanent hearing loss and diarrhea, in slightly less than 10% of cases.

Severe complications include: about 5% will develop pneumonia, which is the most common cause of death from measles; 0.1% (1 in 1000) will develop encephalitis (swelling in/around the brain) which can cause seizures, deafness or cognitive disability. An even **rarer complication** (4-11 out of 100,000) is SSPE (subacute sclerosing panencephalitis), a neurologic disease that is fatal, which doesn't appear until 7-10 years after an individual had measles and had appeared to be completely well after the measles. It is very rare in the U.S. since the measles were "eliminated".

Here are some quick resources for measles:

<https://www.cdc.gov/measles/about/faqs.html> and
<https://www.cdc.gov/measles/about/photos.html>

Specific Recommendations for First Responders, particularly those providing EMS care:

1. At all times, but especially when there are measles (or any communicable disease) in an area around you, your employer should assure that everyone knows the ABCs of the disease, appropriate PPE with the guidelines for use, including a requirement to practice donning and doffing, with a trained person watching for errors that could risk contamination. Hand hygiene and appropriate personnel, apparatus, and equipment cleaning and disinfection policies & procedures, with disinfectants KNOWN to kill the measles virus should be used by all responders. If possible, a surgical mask (not an N95 or 100 respirator) should be placed on the individual suspected of having measles, if it's tolerated and not contraindicated by condition, to decrease respiratory droplet in the air. An oxygen mask can be used in lieu of a mask, when indicated.

See the following links for information on basic and specific precautions:

[https://www.cdc.gov/infectioncontrol/basics/transmission-based-](https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html)

[precautions.html](https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html) &

<https://www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/transmission-precautions.html>

2. Only those who are known to be immune should approach patients who may have measles. This suspicion of measles should be based on reported history, travel, contact with foreigners, exposure to measles in the community, or those having signs and symptoms fitting a measles diagnosis, which vary, depending on the stage of infection. Initial signs/symptoms include malaise/fatigue, progression to a high fever and the 3 Cs (conjunctivitis, cough, coryza (runny nose), followed by bluish-white spots anywhere in the mouth, a bright red nose and/or throat, and then development of a small, flat red rash that starts on the head and face and progresses down the torso and then onto the extremities. <https://www.cdc.gov/measles/about/signs-symptoms.html>
3. Measles is extremely infectious (contagious) for those who are not immune by previous disease or vaccination. Because this disease is transmitted by respiratory droplet, and the droplet can persist in the air and on surfaces for two hours, the CDC recommends that **standard** and **airborne precautions** should be followed. This requires a previously fit tested N95 or better respirator mask, and if the patient is coughing, sneezing, or otherwise discharging respiratory secretions, face protection for the eyes and gloves. A jumpsuit or gown should also be in place if cough generating procedures will be done or copious amounts of secretions are present. The IAFF suggests that all of these be worn when the patient is suspected or has confirmed measles <http://infodisease.iaff.org/Diseases/measles.aspx>

4. **The area where the patient has been is considered contaminated with droplet for 2 hours after the patient has moved. Consideration should be given, when possible, to place the transporting vehicle out of service for that period, to protect personnel and subsequent patients. A patient who is immunocompromised (i.e. cancer treatment or post-transplant) may be greatly harmed if exposed to the virus. In either event, careful disinfection should occur (see # 1 above).**
5. Confirm your vaccination status and, if unsure of it, consult your Designated Infection Control Officer, Medical Director, and/or personal health care provider (who knows what you do for a living) for guidance. If potentially exposed, either personally or professionally, notify the appropriate person per your policies & procedures. If you transported to a hospital, their Infection Prevention Practitioner and/or your local public health department may be very helpful with follow-up on the patient, as well as what you should do. Share this with the appropriate person in your chain-of-command. This will protect you and your family, as well as coworkers and patients. Even those with evidence of immunity should watch for signs/symptoms of measles for 21 days after exposure and report immediately if they become ill.
6. If a health care provider (such as a first responder giving medical care) is exposed to measles without evidence of immunity, the MMR vaccine should be administered within 72 hours, or IG (immunoglobulin) should be administered within 6 days, if available. Exclude from duty, all health care providers without evidence of immunity to measles, from Day 5 after the exposure until Day 21, even if PEP of MMR vaccine or IG was given.
7. The following link provides multi-media resources (print, online, PowerPoint, etal) for use by those wanting information to display, provide instruction, etc.
<https://www.cdc.gov/measles/resources/multimedia.html>