

# Epidemiology: Measles Virus

<http://www.cdc.gov/vaccines/pubs/pinkbook/meas.html>

## Measles Epidemiology

- Reservoir - Human
- Transmission - Respiratory Airborne
- Temporal pattern - Peak in late winter - spring
- Communicability - 4 days before to 4 days after rash onset

## Occurrence

Measles occurs throughout the world. However, interruption of indigenous transmission of measles has been achieved in the United States and other parts of the Western Hemisphere.

## Reservoir

Measles is a human disease. There is no known animal reservoir, and an asymptomatic carrier state has not been documented.

## Transmission

Measles transmission is primarily person to person via large respiratory droplets. Airborne transmission via aerosolized droplet nuclei has been documented in closed areas (e.g., office examination room) for up to 2 hours after a person with measles occupied the area.

## Temporal Pattern

In temperate areas, measles disease occurs primarily in late winter and spring.

## Communicability

Measles is highly communicable, with greater than 90% secondary attack rates among susceptible persons. Measles may be transmitted from 4 days before to 4 days after rash onset. Maximum communicability occurs from onset of prodrome through the first 3–4 days of rash.

## Measles Vaccines

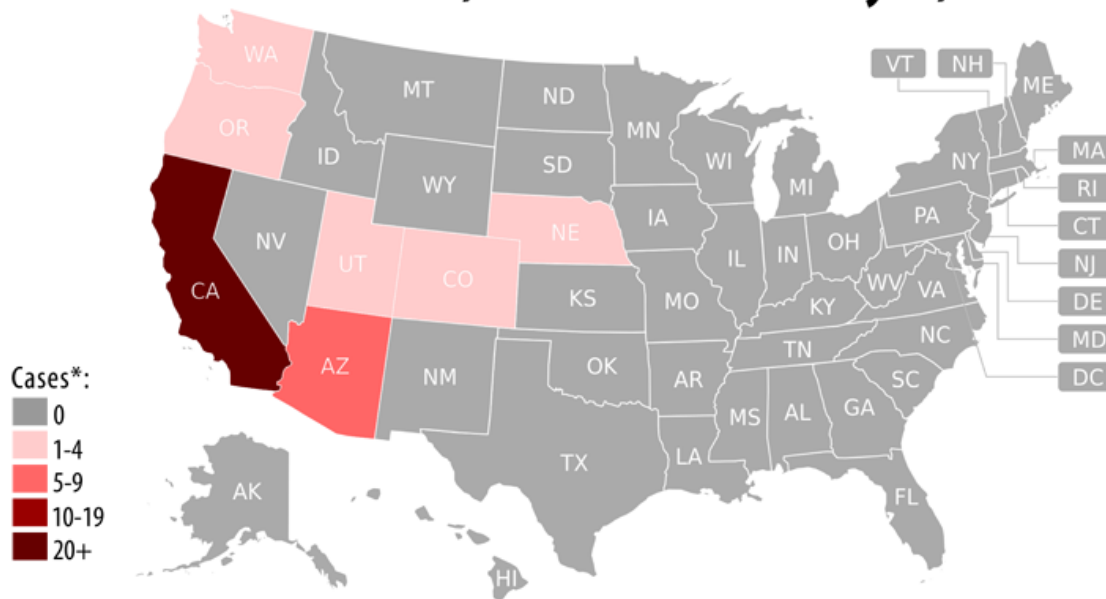
- Composition - Live virus
- Efficacy - 95% (range, 90%-98%)
- Duration of Immunity - Lifelong
- Schedule - 2 doses (dose one given at 12-15m dose two give at 4-6 y)
- Should be administered with mumps and rubella as MMR or with mumps, rubella and varicella as MMRV

- Before a vaccine was available, infection with measles virus was nearly universal during childhood, and more than 90% of persons were immune by age 15 years. Measles is still a common and often fatal disease in developing countries. The World Health Organization estimates there were 164,000 deaths globally from measles in 2008.

### Measles Outbreak Case Study

The United States is currently experiencing a large, multi-state outbreak of measles linked to an amusement park in California.

## U.S. Multi-state Measles Outbreak December 28, 2014 - February 6, 2015



From December 28 to February 6, 2015, 114 people from 7 states [AZ (7), CA (99), CO (1), NE (1), OR (1), UT (3), WA (2)] were reported to have measles and are considered to be part of a large, ongoing outbreak linked to an amusement park in California\*.

\*Provisional data reported to CDC's National Center for Immunization and Respiratory Diseases



The outbreak likely started from a traveler who became infected overseas with measles, then visited the amusement park while infectious. However, no source has been identified.

Analysis by CDC scientists shows that the measles virus in this outbreak is identical to the virus type that caused the [large measles outbreak in the Philippines in 2014](#). However, the same virus type has been identified within the past 6 months in 14 other countries and at least 6 U.S. states not associated with the current outbreak.

On January 23, 2015, CDC issued a [Health Advisory](#) to notify public health departments and healthcare facilities about this multi-state outbreak and to provide guidance for healthcare providers nationwide.

## **New Cases Of Measles Confirmed In Cook, DuPage Issues Exposure Warning**

*February 10, 2015 2:43 PM*

*UPDATE: 6:30 p.m.*

**(CBS/AP)** — Health officials in DuPage County are warning residents about possible exposure to measles at several locations.

Officials say there are no confirmed cases in DuPage. According to the DuPage County Health Department, the three sites of potential exposure are:

- Advanced Pediatrics Neonatal Medicine 473 W. Army Trail Road, Suite 103, Bloomingdale on Jan. 26 from 2:30 p.m. to 5 p.m., Jan. 30 from 9:30 a.m. to 12:30 p.m. or Jan. 31 from 10 a.m. to 12:30 p.m.
- Hand and Stone Massage and Facial Spa, 792 W. Army Trail Road, Carol Stream, on Feb. 6 from 9 a.m. to 5 p.m. or Feb. 7 from 8 a.m. to 12 p.m.
- Jewel Osco, 750 Army Trail Road, Carol Stream, on Feb. 6 from 11:30 a.m. to 2:30 p.m.

All locations are now safe to visit and the warning applies to people who were unvaccinated at the time. Health Department spokesman Dave Hass says the virus only remains airborne for several hours.

Mother Khavna Joshi told CBS 2's Mike Parker one of her two kids had been vaccinated and the hadn't.

"I am from India and people get it and survive," Khavna Johsni. "I am not really worried."

The warning comes as the number of confirmed measles cases in Cook County rose to 10 on Tuesday with health officials saying two more infants from a suburban daycare have the disease.

Chicago and Cook County health officials said Tuesday that nine of the 10 cases are associated with a KinderCare Learning Center in Palatine. All of the cases are among unvaccinated infants and adults.

According to Elgin Community College, a student from Cook County has a confirmed case of measles. The school says that before diagnosis, the student attended classes on Feb. 3 and Feb. 5 and visited the library on Feb. 3.

Public health nurses have been in daily contact with families of infants enrolled at the day care who may have been exposed to the contagious virus.

Dr. Julie Morita of the Chicago Department of Public Health says the cases show the importance of maintaining high levels of vaccination.

The government recommends a first dose of measles vaccine for children ages 12 months to 15 months, with a second dose before starting kindergarten.

Symptoms of measles include fever, red and sore eyes, runny nose, cough, and rash. Measles can cause more severe health problems, including pneumonia, encephalitis, and death; it is transmitted by coughing and sneezing, and can survive in the air and on surfaces for up to two hours. People who have measles are contagious from four days before a rash starts, through four days afterward.

[For more information, visit the Illinois Department of Health website.](#)

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Questions: From your examination of the cases studies please answer the following questions.

1. Measles cases in the US had been nearly eliminated in the early 2000, why did an outbreak occur in California? Where did the virus come from?

2. In the 2015 measles outbreak, what populations of people have the highest rate of infection? Why might this be?

3. What is the prevalence of measles in the US over the months of December- February? Looking at the rate of spread of the disease what does that tell you about mode of transmission for this virus?

4. What public health policies should be put in place in order to slow the spread of measles?

5. What are the limitations of these policies?