

# Why measles matters

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Measles is so contagious that one infected person can spread the respiratory virus to 90 percent of people in the same room—and it can live in the air for two hours. Often, an infected person doesn't even know they have measles for several weeks.

Early symptoms include a fever, cough, runny nose, and red eyes, all of which could be overlooked as part of a common cold. A skin rash doesn't typically appear until three to five days after the first symptoms appear. Someone with measles is contagious four days before the rash begins and four days after. There is no cure for measles, but if you've received the [measles vaccine](#) or are immune from a previous infection, consider yourself protected.

And protection is a good thing, because measles is not a disease anyone—especially a child—wants to get. As many as one in 20 children who contract measles get pneumonia. That's a dangerous risk because pneumonia is the leading cause of measles-related deaths in children under age 5.

## From vaccine to 'elimination' to outbreaks

Before the measles [vaccine](#) was introduced in 1963, the disease caused major epidemics every

two to three years—and 2.6 million deaths worldwide each year. But by 2000, measles was considered "eliminated" in the United States, thanks primarily to vaccination efforts.

Eliminated is a term that means a disease was not continuously transmitted for more than a year in a specific geographic area. Another term—eradicated—means a disease has been eliminated worldwide. For example, polio was eliminated from the U.S. in 1979, but still exists in other places around the world. Smallpox, however, was eradicated globally in 1980.

But if measles was eliminated in 2000 in the U.S., why are there reports of new cases now?

Basically, if a disease is eliminated, outbreaks (defined as three or more cases) can still happen if someone who is unvaccinated travels to a country where the disease is still common and becomes infected. Once back at home in the U.S., that traveler can transmit measles to anyone who is unvaccinated. A number of outbreaks have occurred in recent years, with a spike of 667 cases in 2014.

So far this year, 15 states, including Connecticut, have reported more than 300 measles cases, with more than 70 alone in Washington.

"This is a serious, highly contagious viral disease and the only strategy we have to fight it is vaccination. And that is a strategy that has worked very well for many, many years," says Marietta Vázquez, MD, a Yale Medicine pediatric infectious disease specialist and vaccine expert. "If people are saying no to this vaccine, we need to consider what their reasons are and if they have the information they need."

## The power of the herd

Also known as community immunity, herd immunity is achieved when a large majority of a population is immune to a specific disease. This indirectly

protects people who are not immunized, and in some cases, those who cannot receive the measles-mumps-rubella (MMR) vaccine, including children younger than 12 months and people who have weakened immune systems from a disease (cancer or HIV/AIDS) or are receiving certain [medical treatments](#) (radiation, chemotherapy, immunotherapy).

If much of the population is immunized, it is difficult for a disease to spread. And as the number of people vaccinated increases, so does the protection of the herd. Depending on the disease, herd immunity may begin to show beneficial effects when just 40 percent of the population is vaccinated. But for particularly contagious diseases, that threshold is far higher, exceeding 80 percent. To achieve herd immunity for measles, the vaccination rate should be about 96 percent.

### Young children at highest risk

Unvaccinated [young children](#) are at the highest risk for measles and its complications, which in addition to pneumonia, can include swelling of the brain, severe diarrhea (and related dehydration), and blindness. Severe complications are most common in children who are malnourished or have immune systems weakened by HIV or other diseases.

Children under age 5 are more susceptible to complications because they are more fragile in general and don't yet have fully mature immune systems, Dr. Vázquez explains. "When you are smaller, your lung volume is not as large and your chest muscles are not as strong, so if you get pneumonia, that's a lot harder to fight," she says.

In some ways, the global measles immunization program has been a victim of its own success, particularly in the U.S. and Europe, says Dr. Vázquez.

"We've been so successful in decreasing the number of cases, and that allows people to say no to a vaccine because the disease is something they haven't seen before. Suddenly, people incorrectly believe the vaccine itself is the threat," she adds. "It boils down to education. As medical providers, it is our duty to not just say, 'Get vaccinated,' but to

explain in very clear terms why this vaccine matters."

### Parents' opinions matter

While physicians are armed with the most up-to-date information about the harm a disease like measles can cause, and the safety of the vaccine, it doesn't mean a parent's reservations don't matter. Talking to parents about any vaccination—whether it's for measles or the flu or HPV (human papillomavirus)—is important, says Caitlin Hansen, MD, a pediatric infectious disease specialist.

"Pediatricians want to vaccinate their patients and feel strongly that these vaccines are safe and effective, but when parents hear things in the news or through social media about vaccines, sometimes it can be challenging to have the time to discuss those concerns and explain why vaccines are so important during a busy office visit," she says.

So, Dr. Hansen is researching ways to solve some of these problems. "I am looking at how we can use the time in the visit more effectively so that pediatricians can address the questions parents have about vaccines in ways that satisfy the parent's questions and they feel comfortable," she explains.

Jaspreet Loyal, MD, a pediatric hospitalist (a doctor who only sees patients inside the hospital), agrees. She sometimes meets resistance from parents who don't want their newborns to receive a vitamin K injection, which has been routinely given to newborns since 1961 to prevent a rare but potentially lethal bleeding disorder. "Although the vitamin K injection is not a vaccine, many parents who refuse childhood vaccinations also decline it," Dr. Loyal says. "Physicians need to understand where parents are coming from. For us to partner and take care of a child together, we need to be respectful and nonjudgmental. We really need to listen to each other."

### Herd immunity protects vulnerable children

The Centers for Disease Control and Prevention (CDC) recommends all children get their first dose of the MMR vaccine between ages 12 and 15

months, and then a second dose between ages 4 and 6 years. Adults who were never vaccinated should receive at least one dose of the MMR vaccine. Those who were either born before 1957 or are immune (which can be determined through a laboratory blood test) don't need the vaccine.

The MMR vaccine is 97 percent effective at preventing measles (no vaccine is 100 percent effective, according to the CDC). "In the unlikely case of vaccinated patients who develop measles, the [disease](#) tends to be weakened," Dr. Vázquez notes. "The fact that measles is occurring in communities should not cause panic; it should lead to all of us ensuring we have done everything we can to be protected."

Maryellen Flaherty-Hewitt, MD, a pediatrician, stresses the value of herd immunity in protecting children who can't have the MMR vaccine. The vaccine is "live," which means it contains a weakened version of the virus. Therefore, children with an immunodeficiency (from receiving chemotherapy for cancer, for example) are unable to receive the vaccine while their [immune system](#) is compromised, Dr. Flaherty-Hewitt says.

"This is one of the most important reasons to vaccinate the rest of the population—to protect our most vulnerable children who cannot receive the vaccine due to these illnesses," she adds. "They benefit from the herd immunity provided by the rest of their community being immune to diseases like the [measles](#), and are at most risk during these outbreaks."

Provided by Yale University

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