

What is Herd Immunity - And Why is it So Important Today?

The recent outbreak of measles has focused national attention on a highly contagious illness that many thought had long been conquered. But the public health emergency in the Pacific Northwest and in the Orthodox Jewish community in the Northeast has also served as a reminder that vaccinations are an important form of disease control and that parental refusal to inoculate their children can lead to serious consequences.

“These cases are a warning of what can happen to a community [without proper vaccination rates],” explains [Dr. Delia Rivera-Hernández](#), a pediatric infectious disease specialist for the University of Miami Health System.

Hundreds of measles cases were first reported last fall in New York state soon after an infected traveler returned from Israel. Months later another traveler from Eastern Europe infected dozens in Washington. Though thousands of miles apart, the two communities have one element in common: both have dangerously low vaccination rates, which enabled the virus to spread quickly.

But it’s not just “fake news” about immunization that can be dangerous. Some parents have also grown lax about having their children inoculated on time.

These regions, however, are not the only ones in crisis. The Centers for Disease Control and Prevention is also tracking outbreaks in at least 10 states, with 29 cases reported in the early weeks of 2019. (As of this writing, Florida claimed no cases this year, but 15 were reported in 2018, according to the Florida Department of Health.

That's an uptick from the previous years, when fewer than 10 cases were reported annually.)

Worldwide, there's also been an alarming increase in cases, with the World Health Organization reporting a 30 percent spike. In the past year alone, the Philippines has had about 8,000 cases, with more than 135 people dying from the disease. Outbreaks have also been reported in Europe where the incidence has more than tripled — a preventable tragedy officials blame on a growing resistance from the public to get life-saving vaccines.

While pockets of infection have popped up before — in California between 2014 and 2015, and in New York City and 23 other states in 2011 — these recent examples underscore the need for public healthcare workers to raise awareness of the need for proper immunization. Vaccinations remain “the most effective way” to prevent the sometimes deadly spread of contagious diseases such as measles, Dr. Rivera-Hernández says. And keeping both children's and adults' immunizations up to date has become even more essential in an era of easy travel, where a single infection in one country can spark a crisis in another community with low immunization rates.

Of course, it's not just measles that have staged a comeback. “Mumps may not be as prevalent,” Dr. Rivera-Hernández says, “but we have seen outbreaks where there shouldn't be.” Cases were recently confirmed in Montana, Georgia, North Dakota, Pennsylvania, Utah, and Wisconsin. In Texas alone, 27 mumps cases were reported in two Immigration and Customs Enforcement facilities.

The kicker: Most of this is preventable.

For infectious disease physicians such as Dr. Rivera-Hernández, flare-ups are frustrating because these diseases are preventable if people, particularly children, keep to recommended [vaccination schedules](#). The MMR (measles, mumps and

rubella) vaccine is usually given to kids between 12 to 15 months of age, with a second dose at 15 months to 6 years of age. It works stupendously: 97 percent are protected against measles, 88 percent against mumps and 97 percent against rubella after two doses.

Other vaccines have proven themselves just as effective, Dr. Rivera-Hernández adds. Cases of smallpox, polio and diphtheria are now extremely rare, and pertussis cases have dropped by more than 90 percent.

In contrast, before the 1970s, measles was a common childhood disease as were mumps and chickenpox. Complications from measles can be serious, especially for babies, leading to pneumonia, deafness, brain damage and, in extreme cases, death. The CDC estimates that 28 percent of children younger than 5 years old who had measles had to be treated in the hospital.

“If you dig far enough, every family has a story of the dangers of a communicable disease,” Dr. Rivera-Hernández says. “I had an aunt I never met who died of diphtheria at 2 years of age. It wasn’t so unusual. Many people were seriously affected.”

A vaccine works much as a natural infection does, except it’s actually safer because it doesn’t cause the disease it protects against. When a person gets inoculated, the body responds by forming an active immune response that shields the vaccinated person from future contamination. Or as Dr. Rivera-Hernández puts it: “When your immune system encounters the real McCoy, it recognizes it and knows it has already fought it.”

What’s more, the more people are vaccinated against a disease, the higher the chance others will likewise be protected, namely because the disease will find it difficult to spread. This concept is known as herd immunity or community immunity,

and it's essential to the health of newborns, pregnant women and immune-compromised people who can't be vaccinated because of medical reasons. Protecting one age group can also protect other age groups. To wit: The push to vaccinate adults against pertussis has reduced the incidence of that disease in infants too young to be vaccinated.

Despite the success and safety of vaccines, however, compliance has been lagging. "People don't have the memory of how bad these diseases can be. They don't recognize the dangers." Dr. Rivera-Hernández says.

Though vaccines are now readily available in the developed world, another factor threatens the public health system's ability to contain these disease: misinformation.

The anti-vaxxer movement, as it is now known, began with a 1998 Lancet journal article that linked the MMR vaccine to autism. Though that article has since been retracted and the United Kingdom General Medical Council stripped author Andrew Wakefield of his medical license for falsifying data, parents everywhere are still clinging to a study that has consistently been proven false.

"It's like a conspiracy theory," Dr. Rivera-Hernández says. "People are basing fears on completely false statements."

Anti-vaccine ads on Facebook have been viewed millions of times since late last year and the social media giant is struggling to remove them. It's no coincidence that the outbreaks have popped up in communities with low vaccination rates. "Think of it as an avalanche," she adds. "It starts off small, one snowball, but then it grows and grows, until it becomes a disaster."

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Some parents have also grown lax about having their children inoculated on time. She recounts the story of a 3 month-old patient who died because the parents, busy with a family move, had skipped the child's PCV13 immunizations. This vaccine, given as a series of four injections, is first administered at two months to protect against pneumococcal infections. That first dose is able to protect 8 in 10 babies against invasive pneumococcal disease caused by the vaccine serotypes.

The World Health Organization has named "vaccine hesitancy" one of the top 10 threats to global health in 2019, saying it "threatens to reverse progress made in tackling vaccine-preventable diseases."

Dr. Rivera-Hernández says she and other physicians must work hard to counteract misinformation with facts and real-life examples. "Vaccinations are safe. They work. Parents need to understand that they must prioritize vaccines and follow the recommended schedule."



Ana Veciana-Suarez, Guest Columnist

Ana is a regular contributor to the University of Miami Health System. She is a renowned journalist and author, who has worked at The Miami Herald, The Miami News, and The Palm Beach Post. Visit her website at anavecianasuarez.com or follow @AnaVeciana on Twitter.