

Protecting Our Children

Protecting Our Community

## Community Immunity: What It Is and Why It's So Important

---

### What Is Community Immunity?

Simply: Unimmunized persons are protected—indirectly—against some infectious diseases by being surrounded by people who are immunized. This is known as community immunity (or herd immunity).<sup>1</sup>

For example, someone who has never had chickenpox or chickenpox vaccine is susceptible to chickenpox. That means the person can become infected and develop the disease along with its potential complications. But, if everyone around the susceptible person is immune to chickenpox (either by vaccination or having had the disease), then they cannot transmit the infection to others, and the chickenpox virus will be blocked from reaching the susceptible person. Immunized people act as a kind of “firebreak” in the spread of disease, slowing or preventing the transmission of the disease to others.

### Why Is Community Immunity Important?

Community Immunity protects the community from an outbreak of disease...or an epidemic. It particularly protects:

- ★ Those too young to be vaccinated.
- ★ Those who cannot be vaccinated for medical reasons.
- ★ Those for whom the vaccine proves ineffective (vaccines are rarely 100% effective ~ up to 5% of children may not be protected by one or more of the vaccines they receive).
- ★ Those, like the elderly, whose immunity has worn off.

### How Does Community Immunity Work?

**Community immunity only works when the vast majority of the population is immune.** A population needs high immunization rates to get the benefits of community immunity and to protect those in need. **Nevada County has the lowest percentage of any county in California of children entering kindergarten who are fully immunized against vaccine-preventable diseases—78% in Nevada County compared to 93% state-wide.**

Community immunity only applies to diseases transmitted from person to person, such as measles, smallpox, rubella, and chickenpox, among others. Tetanus, on the other hand, is not spread from person to person but acquired from the environment, so there can be no community immunity—in this case, only the immunized person is protected.

**Unvaccinated children are not only at greater risk of catching diseases that can be prevented by vaccines, but they can also affect community immunity, putting others at risk.**<sup>2</sup> Various studies have looked at the health consequences of exemptions from immunization laws. These studies have found that individuals claiming religious or philosophical exemptions from immunization are at a greater risk of contracting the diseases and in this way they put the rest of the population at risk by spreading infection.



## How Many People Need to Be Immunized and Why?

For some diseases, such as measles and whooping cough, a population needs more than 94% immunity to achieve community immunity. Otherwise, the disease could spread to the susceptible population. This percentage is known as the *community immunity threshold*, and it varies for each vaccine-preventable disease. The thresholds for diphtheria and rubella, for example, are around 85%.

Reaching the thresholds for these diseases is important for the public health because no vaccine is 100% effective. For instance, measles vaccine protects 95% of the people receiving the vaccine. Even though the vaccine fails in the other 5% of people who have been immunized, they are still protected from the disease by others being immune. **Only community immunity provides full protection for everyone.**

## Did You Know?

### Vaccine-preventable diseases still exist.

- ★ Only small pox has been eradicated around the world.
- ★ Living in a “global village” increases the need for local community immunity, because travel makes the spread of disease easier and more likely.
- ★ From 1997 to 2000, nearly 30,000 pertussis (whooping cough) cases were reported; 62 resulted in death.

### Prior to vaccines parents could expect that every year:

- ★ Polio would paralyze 10,000 children.
- ★ Rubella would cause birth defects and mental retardation in as many as 20,000 newborns.
- ★ Measles would infect about 4 million children, killing 3,000.
- ★ Diphtheria would be one of the most common causes of death in school-aged children.
- ★ Pertussis (whooping cough) would kill thousands of infants.

## Protecting Our Children, Protecting Our Community

Some parents worry about their children getting sick or having negative side effects as a result of being vaccinated. But the reality is that children will be much sicker if they catch the disease than they will be if they experience the possible side effects of the vaccines. In the vast majority of cases, vaccines cause no side effects or only mild reactions like fever or soreness at the site of the injection. Severe reactions to vaccines occur so rarely that the risk is usually difficult to calculate.

Thanks to the success of immunization programs and the effects of community immunity, diseases such as polio, diphtheria and measles are much less common in the United States than they were in the last century, even though those diseases are still prevalent elsewhere in the world. Smallpox has been eradicated worldwide. When an infection can no longer spread because so few people are susceptible, the disease will disappear.

**By protecting your children you are protecting the community. Please vaccinate.**

1. Fine PE. Community Immunity (Chapter 56). In: Plotkin SA, Orenstein WA (Eds.). *Vaccines (4th Edition)*. Philadelphia, PA: W.B. Saunders Company, 2004.

2. Smith PJ, Chu SY, and Barker LE (2004). Children Who Have Received No Vaccines: Who Are They and Where Do They Live? *Pediatrics*, 114(1): 187-195.

Additional Reference: UK Department of Health. Flash animation of herd immunity.