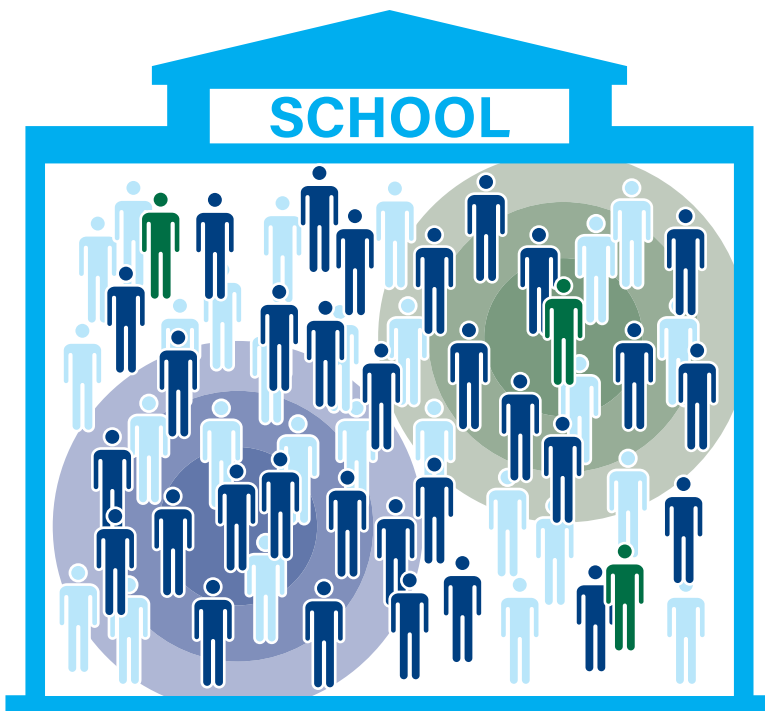


Waning Immunity and the MMR Vaccine

Nearly 50% of Vaccinated Schoolchildren Can Become Infected with Measles



Susceptibility to Measles in School



= **Vaccinated, susceptible to *subclinical infection* and spread of measles**

35% of 7-year-olds
60% of 15-year-olds
>60% of adults

Subclinical measles infection: Cases can develop illness without rash, with or without symptoms that include fever, cough, sore throat, and diarrhea.



= **Vaccinated, susceptible to *clinical infection* and spread of measles**

Projected 33% of adults by age 24–26

Clinical measles infection: Cases develop illness with fever and rash, with other symptoms that can include cough, runny nose, and eye irritation.



= **Vaccinated and immune**

65% of 7-year-olds
40% of 15-year-olds
<40% of adults

Nearly 50% of schoolchildren and most adults vaccinated with two doses of the MMR vaccine can still be infected with measles virus and spread it to others, even with mild or no symptoms of their own.¹⁻⁴



DOES IMMUNITY FROM THE MMR VACCINE WANE OVER TIME?

Yes. In 2007, the Centers for Disease Control and Prevention (CDC) conducted a study on **waning immunity after two doses of the measles, mumps and rubella (MMR) vaccine.**¹ The results, published in *Archives of Pediatrics and Adolescent Medicine*, show:

- About **35%** of vaccinated 7-year-olds are susceptible to **subclinical infection** with measles virus.
- About **60%** of vaccinated 15-year-olds are susceptible to **subclinical infection** with measles virus.
- By age 24–26, a projected **33%** of vaccinated adults are susceptible to **clinical infection**.

Consequently, **nearly 50% of schoolchildren and most adults** vaccinated with the MMR vaccine can still be infected with measles virus and **spread it to others**, even with mild or no symptoms of their own.¹⁻⁴ (See figure above.)



WOULD ANOTHER BOOSTER SHOT SOLVE THE PROBLEM OF WANING MMR VACCINE IMMUNITY?

No. The CDC conducted another study in 2016, published in *The Journal of Infectious Diseases*, which concludes that a third dose (booster shot) of the MMR vaccine is short-lived, lasting only one year.⁵ The authors state:

“MMR3 [a third dose of MMR] is unlikely to solve the problem of waning immunity in the United States... We did not find compelling data to support a routine third dose of MMR vaccine.”

Note: Children with measles antibody levels less than 900 mIU/mL are susceptible to subclinical infection with measles virus but not to clinical infection. About 35% of vaccinated children 7 years of age have a measles antibody level less than 900 mIU/mL. This level steadily declines through childhood, resulting in about 60% of children 15 years of age with a measles antibody level less than 900 mIU/mL. Consequently, nearly 50% of schoolchildren [(35%+60%)/2] and most adults (greater than 60%) are susceptible to infection with measles virus.¹

All references are available at physiciansforinformedconsent.org/mmr-waning-immunity.

These statements are intended for informational purposes only and should not be construed as personal medical advice.

REFERENCES

1. LeBaron CW, Beeler J, Sullivan BJ, Forghani B, Bi D, Beck C, Audet S, Gargiullo P. Persistence of measles antibodies after 2 doses of measles vaccine in a postelimination environment. *Arch Pediatr Adolesc Med.* 2007 Mar;161(3):294-301.
2. Chen RT, Markowitz LE, Albrecht P, Stewart JA, Mofenson LM, Preblud SR, Orenstein WA. Measles antibody: reevaluation of protective titers. *J Infect Dis.* 1990 Nov;162(5):1036-42.
3. Pedersen IR, Mordhorst CH, Glikmann G, von Magnus H. Subclinical measles infection in vaccinated seropositive individuals in arctic Greenland. *Vaccine.* 1989 Aug;7(4):345-8.
4. Mizumoto K, Kobayashi T, Chowell G. Transmission potential of modified measles during an outbreak, Japan, March–May 2018. *Euro Surveill.* 2018 Jun 14;23(24):1800239.
5. Fiebelkorn AP, Coleman LA, Belongia EA, Freeman SK, York D, Bi D, Kulkarni A, Audet S, Mercader S, McGrew M, Hickman CJ, Bellini WJ, Shivakoti R, Griffin DE, Beeler J. Measles virus neutralizing antibody response, cell-mediated immunity, and immunoglobulin G antibody avidity before and after receipt of a third dose of measles, mumps, and rubella vaccine in young adults. *J Infect Dis.* 2016 Apr 1;213(7):1115-23.