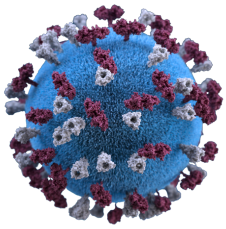
Clean Air Allies
cleanairallies.org

Measles in Schools:
Indoor Air Quality as a Risk-Reduction Tool

Measles cases are rising, and schools are vulnerable to this serious respiratory virus, which threatens health, attendance, and learning.

Relying heavily on CDC sources, this brief introduces cleaner air as an important tool schools can use as part of a comprehensive strategy to prevent the spread of infections.



Measles Virus
(CDC, 2016)

Measles Is a Respiratory Illness that Can Cause Serious Complications

Measles is an acute respiratory illness caused by infection with an enveloped RNA virus (CDC, 2026b).

Initial symptoms, such as fever, cough, runny nose, and conjunctivitis (pink eye), usually develop 7 to 14 days after exposure to the virus. White spots in the mouth (Koplik spots), followed by the measles rash, may appear several days later (CDC, 2026g).

Measles can cause serious near- and long-term complications. Ear infections and diarrhea are common. About 1 in 5 unvaccinated people with measles in the U.S. are hospitalized. Among children, around 1 in 20 develop pneumonia. Encephalitis, or brain swelling, occurs in roughly 1 in 1,000 child cases and can lead to convulsions, deafness, and intellectual disability (CDC, 2026g).

As many as 3 in 1,000 children with acute measles die due to respiratory and neurological issues. Also, very rarely, a childhood measles infection can result, years later, in a fatal disease, subacute sclerosing panencephalitis (SSPE) (CDC, 2026g).

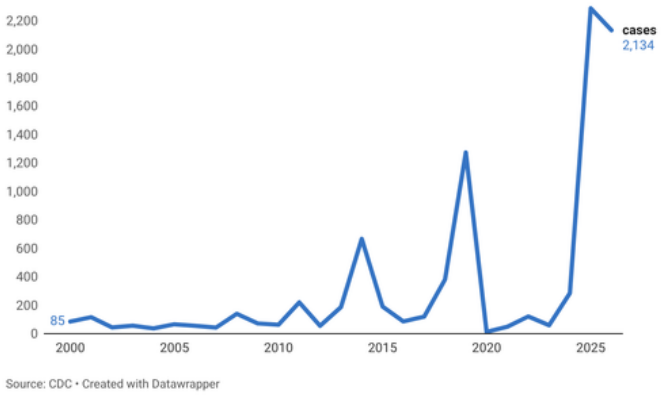
Measles Is on the Rise

Measles cases significantly declined following development of a measles vaccine in the 1960s. Now, after being virtually eliminated in the United States, measles is resurging due to lower vaccination rates (CDC, 2026d).

Measles cases in 2025 were more than 25 times higher than in 2000. Year-to-date cases as of late June 2026 were nearly equal to those for the entirety of 2025 (CDC, 2026f).

In 2025, and already by mid-2026, a majority of states saw cases; almost all were domestic, not introduced by international travelers (CDC, 2026f). In a number of instances, schools played a role in community spread.

Measles Cases in the United States, 2000 to June 2026



Little-Known Fact: Measles Causes Immune Amnesia

Measles can cause “immune amnesia” because the virus destroys infected persons’ immune memory that protects against other viruses and bacteria. People may be more vulnerable to other infectious diseases for months to years after a measles infection, as their immune memory recovers (Mina et al., 2019). Preventing measles infections thus prevents other infections.

Measles Spreads through the Air

Measles is highly contagious—up to 9 in 10 susceptible people exposed to an infected person also get sick (CDC, 2026b).

Measles virus lives in the noses and throats of infected persons, who are contagious for days before and days after the blotchy red measles rash appears (CDC, 2026e).

The virus can be spread through shared surfaces and shared air—specifically by "infectious droplets" and airborne viral particles emitted "when an infected person breathes, coughs, or sneezes" (CDC, 2026b).

Measles viral particles can remain "infectious in the air for up to 2 hours after an infected person leaves an area" (CDC, 2026b). If someone inhales these particles, they too can be infected.

Schools Are Measles Hotspots

Based on historical data, researchers have described schools as measles "hotspots." This means they often play an outsized role in community transmission and outbreaks (Becker et al., 2016).

Recently, a research team from the Harvard T.H. Chan School of Public Health focused on schools as "one of the most vulnerable environments in transmission of airborne infectious disease." They attributed this vulnerability to the "extensive amount of time that students regularly spend in schools" and the "high levels of interactions among schoolchildren [...] in these environments." At the same time, they found that specific "school educational formats and building and HVAC characteristics play critical roles in measles transmission" (Azimi et al., 2020).

Indoor Air Quality Can Be a Tool to Reduce Measles Risk

Because measles spreads through the air, cleaner air can be a tool to help reduce infection risk in schools.

The CDC's "*Be Ready for Measles* Toolkit" (CDC, 2026a) links to its "Preventing Spread of Infections in K-12 Schools" guidance, first issued in 2024 (CDC, 2026h). The guidance explains things schools can do to mitigate transmission of respiratory illnesses.

The CDC recommends that schools should "take steps for cleaner air" as an "everyday action" to prevent infections. Increasing outdoor air or using air cleaning technology can reduce the number of viral particles in school air (CDC, 2026c).

Fewer viral particles in school air means fewer particles that students and staff can inhale into their lungs or "come into contact with through their eyes, nose, and mouth," or that can "accumulate on surfaces" (CDC, 2024).

The CDC's "Ventilation" guidance, referenced in "Preventing Spread of Infections in K-12 Schools," as well as in the August 2025 "Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings," offers more detailed indoor air quality recommendations (CDC, 2025a).

Topics addressed include how air circulation can be increased by adjusting heating, ventilation, and air conditioning (HVAC) systems, opening doors and windows, and using fans. Also covered is how viral particles can be reduced by deploying air cleaning technologies, including HVAC filters with a Minimum Efficiency Reporting Value (MERV) of 13 or better, in-room air cleaners, and germicidal ultraviolet (GUV) (CDC, 2024).

Cleaner Air Should Be Part of a Comprehensive Strategy

The CDC considers taking steps for cleaner air to be a "core prevention strategy" for respiratory viruses (CDC, 2025b). However, indoor air interventions can "reduce the spread of disease [...] not eliminate risk completely" (CDC, 2024).

Based on modeling, the Harvard research team estimated that the average number of infected cases could be reduced by "up to 56% when a combination of advanced air filtration, ventilation, and purification approaches was adopted." Still, they stressed that it should not be treated as a standalone control strategy (Azimi et al., 2020).

"Preventing Spread of Infections in K-12 Schools" emphasizes the importance of "comprehensive prevention strategies." It situates steps for cleaner air within a multi-layered planning and implementation framework to "keep students, staff, families, and school communities healthy" and support learning (CDC, 2026h).

The CDC also has a "Preparing and Responding to Measles: Checklist for K-12 Schools," with measles-specific information that can be used in conjunction with the broader guidance (CDC, n.d.).

Disclaimer: This is an educational document introducing issues and resources related to schools, measles, and indoor air quality. It is not intended as a substitute for advice from public health officials or other relevant experts.

Learn More about Measles

CDC, "Measles": Offers educational and practical measles resources for both the public and professionals.

CDC, "Preparing and Responding to Measles: Checklist for K-12 schools": Covers sick policies, training, isolation, partnerships, PPE, and other preparation and response items.

CDC, "Preventing Spread of Infections in K-12 Schools": Provides a comprehensive infection-prevention framework schools can use, ranging from policies to everyday actions (air quality, cleaning, hygiene, vaccinations) to emergency preparedness and response.

For a succinct overview of this framework, also see Clean Air Allies' Resource Summary of the guidance.

CDC, "Ventilation Mitigation Strategies": Gives a detailed overview of how outdoor air, HVAC filtration, in-room air cleaners, and other indoor air interventions can be used as infection-mitigation measures.

ASHRAE, *ASHRAE Standard 241-2023: Control of Infectious Aerosols*: Sets minimum requirements for control of airborne infectious disease transmission in buildings.

Many state and local public health departments also have relevant resources, including ones that cover local data and requirements.

CLEAN AIR *Allies*

Written by JuNelle Harris
June 2026

Clean Air Allies is a nonprofit organization dedicated to increasing access to healthy indoor air in PK-12 (Prekindergarten through Grade 12) schools. For more information, please visit cleanairallies.org.

Full Citations

American Society of Heating, Refrigerating and Air-Conditioning Engineers. (2023). *ASHRAE Standard 241-2023: Control of infectious aerosols*. https://www.ashrae.org/technical-resources/bookstore/ashrae-standard-241-control-of-infectious-aerosols

Azimi, P., Keshavarz, Z., Cedeno Laurent, J. G., & Allen, J. G. (2020). Estimating the nationwide transmission risk of measles in US schools and impacts of vaccination and supplemental infection control strategies. *BMC Infectious Diseases*, *20*, Article 497. https://doi.org/10.1186/s12879-020-05200-6

Becker, A. D., Birger, R. B., Teillant, A., Gastanaduy, P. A., Wallace, G. S., & Grenfell, B. T. (2016). Estimating enhanced prevaccination measles transmission hotspots in the context of cross-scale dynamics. *Proceedings of the National Academy of Sciences*, *113*(51), 14595–14600. https://doi.org/10.1073/pnas.1604976113

Centers for Disease Control and Prevention (CDC). (n.d.). *Preparing and responding to measles: Checklist for K-12 schools*. https://www.cdc.gov/measles/downloads/measles-checklist-K12-schools.pdf

CDC. (2024, October 3). Ventilation mitigation strategies. National Institute for Occupational Safety and Health. https://www.cdc.gov/niosh/ventilation/prevention/index.html

CDC. (2025a, August 19). Interim infection prevention and control recommendations for measles in healthcare settings. https://www.cdc.gov/infection-control/hcp/measles/index.html

CDC. (2025b, August 18). Taking steps for cleaner air for respiratory virus prevention. https://www.cdc.gov/respiratory-viruses/prevention/air-quality.html

CDC. (2026a, May 11). Be ready for measles toolkit. https://www.cdc.gov/measles/php/toolkit/index.html

CDC. (2026b, March 3). Clinical overview of measles. https://www.cdc.gov/measles/hcp/clinical-overview/index.html

CDC. (2026c, May 12). Everyday actions for schools to prevent and control the spread of transmissible infections. Office of Readiness and Response. https://www.cdc.gov/children-and-school-preparedness/infection-prevention/actions.html

CDC. (2026d, April 29). History of measles. https://www.cdc.gov/measles/about/history.html

CDC. (2026e, April 29). How measles spreads. https://www.cdc.gov/measles/causes/index.html

CDC. (2026f, June 26). Measles cases and outbreaks. https://www.cdc.gov/measles/data-research/index.html

CDC. (2026g, April 29). Measles symptoms and complications. https://www.cdc.gov/measles/signs-symptoms/index.html

CDC. (2026h, May 12). Preventing spread of infections in K-12 schools. Office of Readiness and Response. https://www.cdc.gov/children-and-school-preparedness/infection-prevention/index.html

Clean Air Allies. (2025). *Resource summary: The CDC's guidance for preventing infections in K-12 schools to promote health, attendance, and learning*. https://cleanairallies.org/wp-content/uploads/2025/12/Clean-Air-Allies-Resource-Summary-CDC-Guidance-for-Preventing-Infections-in-K12-Schools.pdf

Eckert, A. (Illustrator), & Maiuri, A. M. (Content provider). (2016). 3D graphic representation of a measles virus particle [Digital illustration]. CDC Public Health Image Library. https://wwwn.cdc.gov/phil/Details.aspx?pid=21074

Mina, M. J., Kula, T., Leng, Y., Li, M., de Vries, R. D., Knip, M., Siljander, H., Rewers, M., Choy, D. F., Wilson, M. S., Larman, H. B., Nelson, A. N., Griffin, D. E., de Swart, R. L., & Elledge, S. J. (2019). Measles virus infection diminishes preexisting antibodies that offer protection from other pathogens. *Science*, *366*(6465), 599–606. https://doi.org/10.1126/science.aay6485