

Airborne coronavirus transmission raises new questions and worries

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Half a year into the pandemic, it's well-accepted that coronavirus can be spread when an infected person expels respiratory droplets by coughing or sneezing.

But can the virus be transmitted in microscopically small droplets that are released into the air by talking or just breathing? And if so, could you contract the virus from across a room, or after the infected person leaves the room?

As with so many aspects of the [coronavirus](#), the answer is unclear, debated, and under study.

Still, evidence that these invisible "aerosols" can spread infection indoors more stealthily than thought prompted 239 scientists, including engineers and ventilation experts, to urge the World Health Organization to address the risk. "We are advocating for the use of preventive measures to mitigate this route of [airborne transmission](#)," said a letter published this week in the journal *Clinical Infectious Diseases*.

Charles Haas, a professor of environmental engineering at Drexel University and an endorser of the letter, ticked off those measures: "Universal masking. Avoid crowds. Avoid confined spaces. Keep a physical distance. And for indoor spaces, improve ventilation."

In other words, we should do all the difficult, sometimes impractical things we are doing now—and more.

Here are some things to consider.

Some experts dismiss this distinction as a matter of semantics because the only difference between droplets and microscopic droplets is size. But size matters for several reasons.

Virus-laden droplets from a cough or sneeze are comparatively large and heavy, and quickly fall to the ground or a surface such as a table. It is possible—though not conclusively shown—that you can be infected by touching a contaminated surface, then touching your nose, mouth, or

eyes. That's why [public health experts](#) urge frequent hand washing.

In contrast, microdroplets, also called aerosols, are so tiny (an average human hair is 10 times wider) that they can float in the air. The measles virus is highly contagious because it can survive in the air for a couple of hours, infecting people who walk by and inhale it. Before vaccination, each person with measles spread it to 12 to 18 others on average.

Coronavirus seems to be far less contagious; on average, an infected person infects two to three others. But there have been notable "superspreader" events in which large numbers of infections were connected to one initial case.

"Airborne [transmission](#) appears to be the only plausible explanation for several superspreading events," says the letter to the WHO.

Until now, WHO's position has been that airborne coronavirus has been confirmed only as a result of aerosol-generating medical procedures performed in health-care settings, such as intubation. Health professionals should wear protective gear during such procedures.

The evidence for indoor airborne transmission is "admittedly incomplete," the scientists say in their letter.

Among the unknowns: How long the virus can survive in the air? How many particles need to be inhaled to cause infection? How long do you have to be indoors to inhale that many particles?

And while RNA from the coronavirus has been detected in air samples, it is not clear that the genetic material could generate an actual infection.

Philadelphia Health Commissioner Thomas Farley on Tuesday expressed skepticism about airborne spread. If it plays a significant role in

transmission, he believes there would be reports of people getting infected by walking into an empty room used by an infected person.

Still, case reports, [data analysis](#), and simulations point to airborne spread. In March, for example, a single member of a choir in Skagit Valley, Wash., infected 53 of the 61 people who rehearsed in a large room; two eventually died.

"A centrally important point for interpreting the cause of transmission is that the cases were broadly distributed throughout the room with no clear spatial pattern," researchers wrote in a paper submitted to the journal *Indoor Air*.

Airborne transmission also seemed be the culprit in a poorly ventilated restaurant in China, researchers concluded.

Airborne spread is a frightening idea, because it would add to the challenges of curbing COVID-19. But just as expert opinion has shifted to accept the disturbing reality of asymptomatic spread, it seems to be shifting on airborne transmission.

"Many of us have claimed its relevance from very early in this pandemic. It was real then. It is real now. Period. We all benefit if we acknowledge this and act accordingly," tweeted Richard Corsi, an indoor air quality researcher and engineer at Portland State University who endorsed the WHO letter.

" 'Airborne' does not mean clouds of virus roaming the streets, coming for you like the body snatchers," tweeted Linsey Marr, a civil and environmental engineer at Virginia Tech who endorsed the letter to the WHO. "There are simple things we can do to lower the risk of transmission by aerosols."

Among those things: Whenever possible, be outdoors for gatherings or events because studies show transmission outdoors is uncommon. Wear a mask when you leave home or have visitors. Open windows to improve ventilation.

Of course, some risk-reducing measures are anything but simple. Schools, dorms, office buildings, churches, nursing homes—anywhere that large numbers of people live or meet indoors—are already struggling with the standard precautions of social distancing and masking.

Now, the airborne transmission experts say, other measures should be considered, such as upgrading heating and cooling systems, installing powerful air filters and germicidal ultraviolet lights.

WHO's infectious-disease epidemiologist, Maria Van Kerkhove, said on Tuesday that the organization is reviewing the possibility of airborne spread and will publish a brief on the issue "in the coming days."

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