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## Is Covid-19 getting better at airborne transmission?

Business World · 4 Oct 2021 · S1/1 · By Apoorva Mandavilli

NEWER variants of the coronavirus such as Alpha and Delta are highly contagious, infecting far more people than the original virus. Two new studies offer a possible explanation: The virus is evolving to spread more efficiently through air.

The realization that the coronavirus is airborne indoors transformed efforts to contain the pandemic last year, igniting fiery debates about masks, social distancing and ventilation in public spaces.

Most researchers now agree that the coronavirus is mostly transmitted through large droplets that quickly sink to the floor and through much smaller ones, called aerosols, that can float over longer distances indoors and settle directly into the lungs, where the virus is most harmful.

The new studies don't fundamentally change that view. But the findings signal the need for better masks in some situations, and indicate that the virus is changing in ways that make it more formidable.

"This is not an Armageddon scenario," said Vincent Munster, a virus expert at the National Institute of Allergy and Infectious Diseases, who led one of the new studies. "It is like a modification of the virus to more-efficient transmission, which is something I think we all kind of expected, and we now see it happening in real time."

Mr. Munster's team showed that small aerosols traveled much longer distances than larger droplets and the Alpha variant was much more likely to cause new infections via aerosol transmission. The second study found that people infected with Alpha exhaled about 43 times more virus into tiny aerosols than those infected with older variants.

The studies compared the alpha variant with the original virus or other older variants. But the results may also explain why the Delta variant is so contagious — and why it displaced all other versions of the virus.

"It really indicates that the virus is evolving to become more efficient at transmitting through the air," said Linsey Marr, an expert in airborne viruses at Virginia Tech who was not involved in either study. "I wouldn't be surprised if, with Delta, that factor were even higher."

The ultratransmissibility of the variants may come down to a mix of factors. It may be that lower doses of the variants are required for infection, or that the variants replicate faster, or that more of the variant virus is exhaled into aerosols — or all three.

The Alpha variant proved to be twice as transmissible as the original virus, and the Delta variant has mutations that turbocharged its contagiousness even more. As the virus continues to change, newer variants may turn out to be even more transmissible, experts said. But the tools at our disposal all still work well to halt the spread. Even loose-fitting cloth and surgical masks block about half of the fine aerosols containing virus, according to the study of people infected with variants, published this month in the journal *Clinical Infectious Diseases*.

Still, at least in some crowded spaces, people may want to consider switching to more protective masks, said Don Milton, an aerosol expert at the University of Maryland who led the research.

“Given that it seems to be evolving towards generating aerosols better, then we need better containment and better personal protection,” Mr. Milton said of the virus. “We are recommending people move to tighter-fitting masks.”

To compare how different variants spread through the air, his team asked participants with mild or asymptomatic infections to recite the alphabet, sing “Happy Birthday” loudly or shout out the University of Maryland slogan, “Go, Terps!”

People infected with the Alpha variant had copious amounts of virus in their nose and throat, much more than those infected with the original virus. But even after adjusting for that difference, those infected with the variant released about 18 times as much virus into the smallest aerosols. —