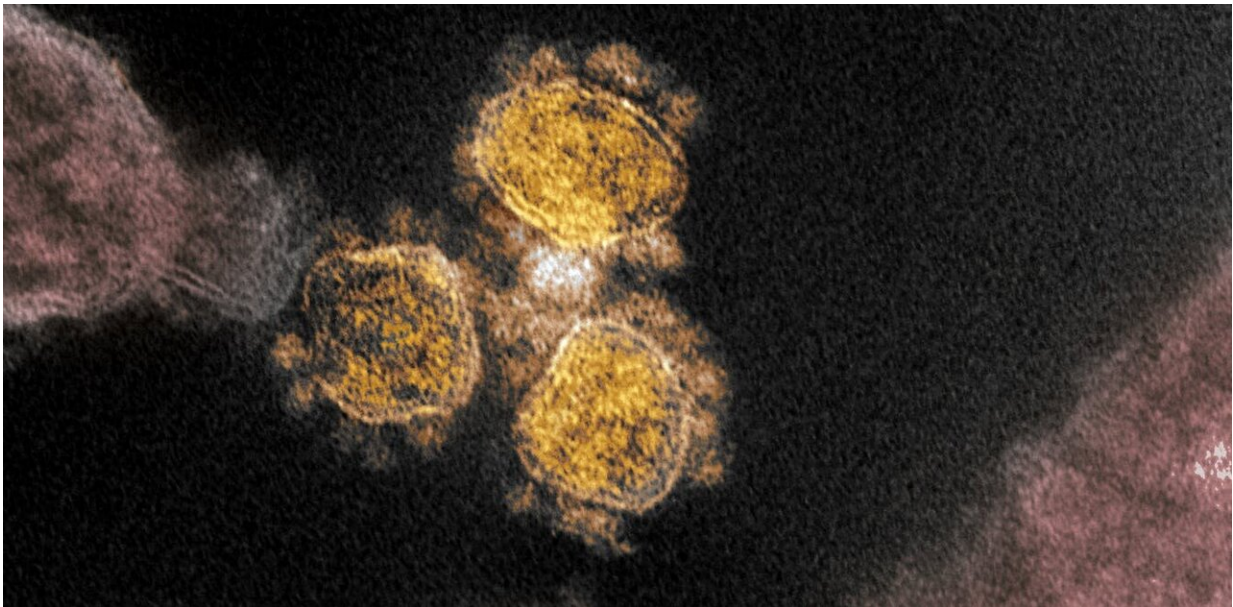


How to stay safe with a new fast-spreading coronavirus variant on the loose

January 18 2021, by Suresh Dhaniyala and Byron Erath



The new SARS-CoV-2 variant's increased transmissibility is believed to come from a change in the spike protein, visible here in yellow under an electron microscope. Credit: [National Institute of Allergies and Infectious Diseases](#)

A fast-spreading variant of the coronavirus that causes COVID-19 has been found [in at least 10 states](#), and people are wondering: How do I protect myself now?

We saw what the new variant, known as B.1.1.7, can do as it [spread quickly through southeastern England](#) in December, causing case

numbers to spike and triggering stricter lockdown measures.

The new variant has been estimated to be [50% more easily transmitted than common variants](#), though it [appears to affect people's health in the same way](#). The increased transmissibility is believed to arise from a [change in the virus's spike protein](#) that can allow the virus to more easily enter cells. These and other [studies on the new variant](#) were released before peer review to share their findings quickly.

Additionally, there is some evidence that patients infected with the new B.1.1.7 variant may have a [higher viral load](#). That means they may expel more virus-containing particles when they breathe, talk or sneeze.

As professors who study [fluid dynamics and aerosols](#), we investigate how airborne particles carrying viruses spread. There is still a lot that scientists and doctors don't know about the [coronavirus](#) and its mutations, but there are some clear strategies people can use to protect themselves.

Airborne particles are still the biggest problem

The SARS-CoV-2 variants are believed to spread primarily through the air rather than on surfaces.

When someone with the coronavirus in their respiratory tract coughs, talks, sings or even just breathes, infectious respiratory droplets can be expelled into the air. These droplets are tiny, predominantly in the range of [1-100 micrometers](#). For comparison, a human hair is about 70 micrometers in diameter.

The larger droplets fall to the ground quickly, rarely traveling farther than 6 feet from the source. The bigger problem for disease transmission is the tiniest droplets—those less than 10 micrometers in

diameter—which can remain suspended in the air as aerosols for [hours at a time](#).

With people possibly having more virus in their bodies and the virus being more infectious, everyone should take extra care and precautions. Wearing [face masks](#) and social distancing are essential.

Spaces and activities that were previously deemed "safe," such as some indoor work environments, may present an elevated infection risk as the variant spreads.

The concentration of aerosol particles is usually highest right next to the individual emitting the particles and decreases with [distance from the source](#). However, in indoor environments, aerosol concentration levels can quickly build up, similar to how cigarette smoke accumulates within enclosed spaces. This is particularly problematic in spaces that have poor ventilation.

With the new variant, aerosol concentration levels that might not have previously posed a risk could now lead to infection.

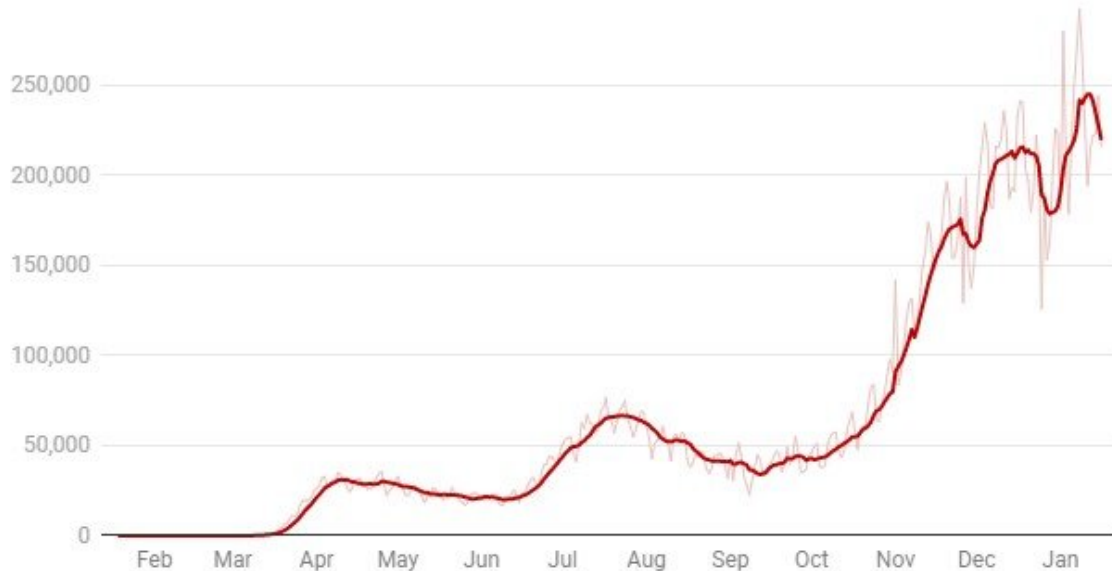
What can you do to stay safe?

(1) Pay attention to the type of face mask you use, and how it fits.

Most off-the-shelf face coverings are not 100% effective at preventing droplet emission. With the new variant spreading more easily and likely infectious at lower concentrations, it's important to select coverings with materials that are most effective at stopping droplet spread.

US averages over 200,000 new COVID-19 cases per day

COVID-19 case numbers were already high when a new, more transmissible variant of the coronavirus began turning up in the U.S. in early January.



Daily case reports and 7-day rolling average as of Jan. 16, 2021. Credit: The Conversation, CC-BY-ND

When available, N95 and surgical masks consistently perform the best. Otherwise, face coverings that use [multiple layers of material](#) are preferable. Ideally, the material should be a tight weave. High thread count cotton sheets are an example. Proper fit is also crucial, as gaps around the nose and mouth can [decrease the effectiveness by 50%](#).

(2) Follow social distancing guidelines.

While the current social distancing guidelines are not perfect—6 feet isn't always enough—they do offer a useful starting point. Because aerosol concentrations levels and infectivity are highest in the space

immediately surrounding anyone with the virus, increasing physical distancing can help reduce risk. Remember that people are infectious [before they start showing symptoms](#), and they many never show symptoms, so don't count on seeing signs of illness.

(3) Think carefully about the environment when entering an enclosed area, both the ventilation and how people interact.

Limiting the size of gatherings helps reduce the potential for exposure. Controlling indoor environments in other ways can also be a highly effective strategy for reducing risk. This includes increasing ventilation rates to bring in fresh air and filtering existing air to dilute [aerosol](#) concentrations.

On a personal level, it is helpful to pay attention to the types of interactions that are taking place. For example, many individuals shouting can create a higher risk than one individual speaking. In all cases, it's important to minimize the amount of time spent indoors with others.

The CDC has warned that B.1.1.7 could [become the dominant SARS-CoV-2 variant](#) in the U.S. by March. Other fast-spreading variants have also been found in [Brazil](#) and [South Africa](#). Increased vigilance and complying with health guidelines should continue to be of highest priority.

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