

## What is a COVID-19 variant?

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All viruses, including SARS-CoV-2 (the virus that causes COVID-19), evolve over time. When the virus makes copies of itself it changes, and these changes are known as “mutations.” Most mutations have little to no impact on the virus’s ability to cause infection and disease. However, some mutations increase the virus’s ability to spread and cause more severe disease. A variant in a virus develops after that virus mutates. Sometimes that mutation results in a new strain (variant) of the virus. In the case of COVID-19, the CDC says that new variants will continue to emerge with some variants disappearing while others will persist.

### Types of variants

The SARS-CoV-2 variants are classified into four groups: variants of concern, variants of high consequence, variants being monitored and variants of interest. Some variants spread more quickly than others, cause more severe disease and demonstrate a significant reduction in neutralization by antibodies generated during previous infection or vaccination, and are therefore classified as variants of concern. Delta and Omicron are examples of variants of concern.

### Omicron & Delta variants

The Delta variant (B.1.617.2) was identified in India in December 2020. In the United States, the first Delta variant case was identified in March 2021. According to the CDC:

- The Delta variant spreads more easily than other variants previously identified.
- It can cause breakthrough infections in people who are fully vaccinated.
- Fully vaccinated people who become infected with the Delta variant can spread the virus to others.
- All Food and Drug Administration-approved or authorized vaccines are effective in protecting against severe illness, hospitalization and death. All eligible individuals should receive a COVID-19 vaccine and booster dose.
- Delta responds to treatment with FDA-authorized monoclonal antibody treatments.

While the Delta variant has impacted the U.S. population, the Omicron variant currently accounts for most COVID-19 cases.

Omicron (B.1.1.529) was first identified and reported in South Africa in November 2021. In the United States, the first Omicron variant case was identified in December 2021. According to the CDC:

- The Omicron variant may spread more easily than other variants, including the Delta variant.
- Breakthrough infections are possible in people who are fully vaccinated. Fully vaccinated people who become infected with the Omicron variant can spread the virus to others.
- All FDA-approved or authorized vaccines are effective against severe illness, hospitalization and death. All eligible individuals should receive a COVID-19 vaccine and booster dose.
- Some monoclonal antibody treatments (bamlanivimab and etesevimab, administered together) and REGEN-COV (casirivimab and imdevimab) are not as effective against Omicron.

## What experts are saying about COVID-19 variants

According to the World Health Organization (WHO), Omicron is concerning because it has several mutations that may increase the risk of how easily it spreads and the severity of illness it causes.

Stephen Parodi, MD, associate executive director at The Permanente Medical Group, said that early indications showed that Omicron was going to be more contagious than previous variants.

“In the U.S. we had our first case detected—it seems like a long time ago and yet it wasn’t that long ago—December 1st,” he said. “As of January 1st, 95% of the reported cases in the U.S. are the Omicron variant. It’s in all states and is now the dominant strain.”

Physicians are concerned that the Omicron variant may have immune-escape properties due to all its mutations in the spike protein. “I’m hoping there will be enough virus-neutralizing antibodies to cross-neutralize the Omicron variant in people who got triply immunized,” said Peter Hotez, MD, PhD, dean of the National School of Tropical Medicine at Baylor College of Medicine and co-director of the Texas Children’s Hospital Center for Vaccine Development in Houston, during a Dec. 6, 2021 episode of the COVID-19 Video Update. All of us are looking at that now.”

People fully vaccinated against COVID-19 can be infected with the Omicron variant, but they are less likely to develop serious illness than those who are unvaccinated. Even a person who is up to date with COVID-19 vaccinations can have a breakthrough infection with Omicron. For both the Delta and Omicron variants, vaccines remain effective in protecting against severe illness, hospitalizations and death.

## Protection against variants

In a Jan. 26, 2021 episode of the COVID-19 Video Update, Andrea Garcia, JD, MPH, the AMA's director of science, medicine & public health, says that even though hospital admissions are leveling off, hospitals are still full. Regarding boosters and the variants, Garcia pointed to recent studies that suggest that the Pfizer-BioNTech and Moderna booster doses not only reduce the number of infections with Omicron, but also keep infected people out of the hospital. "The extra doses are 90% effective at preventing hospitalization with the variant. And they are also reducing the likelihood of visits to the emergency department or to urgent care clinics," said Garcia.

In January the AMA released a statement supporting the FDA's decision to remove emergency use authorization for monoclonal antibody treatments ineffective against the Omicron variant. "Given the latest data showing the Omicron variant of SARS-CoV-2 is responsible for 99% of current COVID-19 infections, we are pleased that the FDA is following the scientific evidence and limiting the use of monoclonal antibody treatments to those that are effective against the Omicron variant," said AMA President Gerald E. Harmon, MD.

"I do think we should be looking at the end game, and by end game, I don't mean that we will have eradicated COVID," said Leana Wen, MD, MSc, public health professor, George Washington University, during the Jan. 24, 2021 episode of the COVID-19 Video Update. "In fact, we need to accept that COVID is going to be with us, just like the Spanish flu from 1918-1919 still is with us in some way now. And so, I think we need to prepare for a number of different scenarios." Dr. Wen added that one of these scenarios could be a new variant that may evade the immune protection that people already have.

## Explore other AMA resources on COVID-19

The AMA has developed frequently-asked-questions documents on COVID-19 vaccination covering safety, allocation and distribution, administration and more. There are two FAQs, one designed to answer patients' questions (PDF), and another to address physicians' COVID-19 vaccine questions (PDF).

The AMA's COVID-19 resource center has evidence-based news, guidance, videos, podcasts, research highlights and more on the pandemic. Read about the latest on COVID-19 vaccines.

Other key COVID-19 resources include:

- JAMA Network™ coronavirus resource center
- AMA Ed Hub™ coronavirus education center

- *AMA Journal of Ethics* COVID-19 Ethics resource center
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