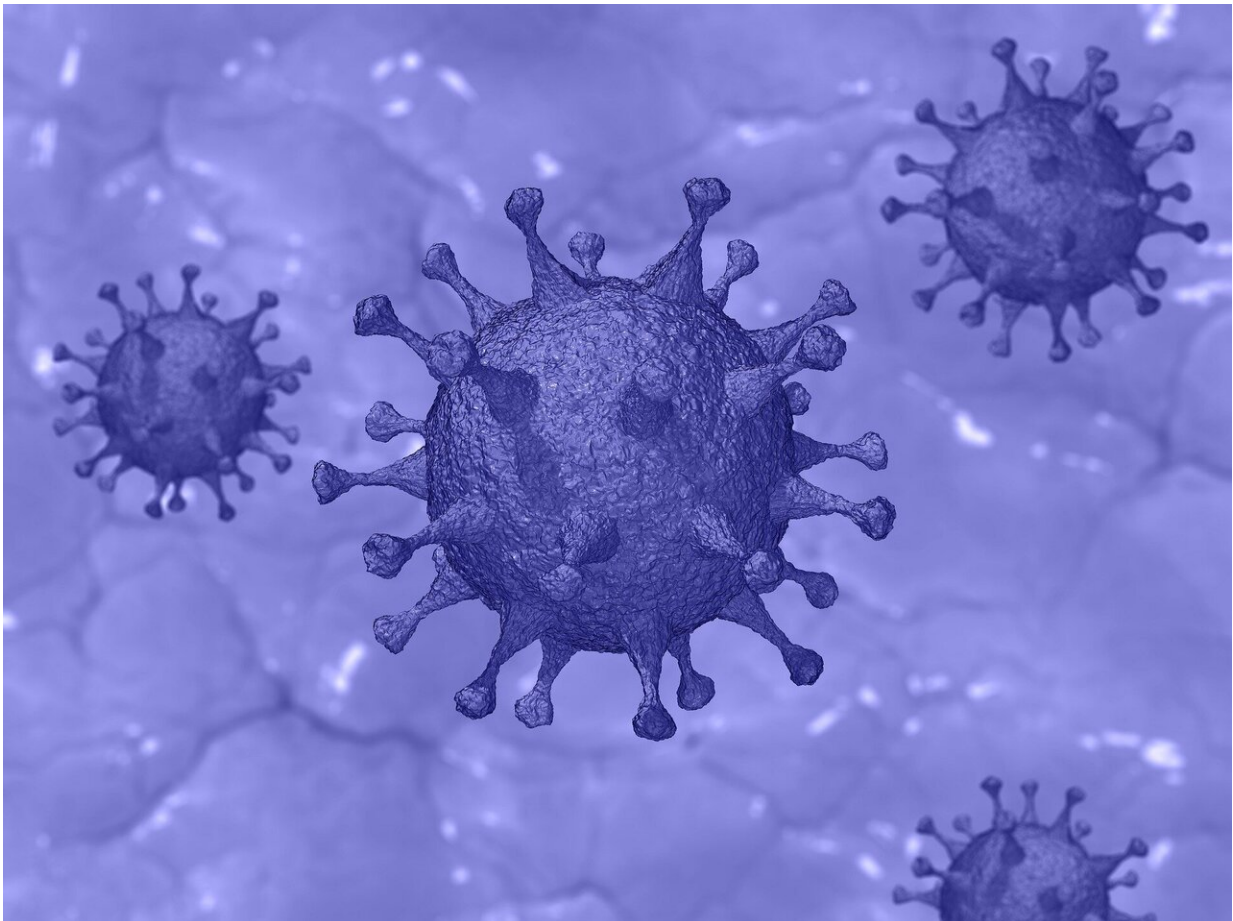


# Explaining COVID-19 breakthrough infections

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The U.S. has now vaccinated more than 208 million people with at least

one dose of COVID-19 vaccine. More people are getting vaccinated, but transmission rates in communities are still high, with 94% of U.S. counties classified as areas of high transmission. Amid the recent surge of infections and hospitalizations with Delta variant, people have questions about how well vaccines protect against COVID-19 infection.

To answer these questions, Jodie Guest, professor and vice chair of the department of epidemiology at Emory's Rollins School of Public Health, spoke with Jay Varkey, associate professor of medicine at Emory University School of Medicine and hospital epidemiologist at Emory University Hospital.

Their conversation is part of an online video series hosted by Guest, who also leads the Emory COVID-19 Outbreak Response Team, addressing topics related to the COVID-19 pandemic. Watch the full conversation between Guest and Varkey [here](#).

## **Q: What is a breakthrough infection?**

A: A [breakthrough infection](#) occurs when a person tests positive for COVID-19 more than 14 days after completing a vaccination series. This would be two weeks after the second dose of Pfizer or Moderna or two weeks after the single dose of Johnson & Johnson vaccine.

## **Q: Are breakthrough cases expected?**

A: "Absolutely," Varkey says. "It is totally normal and expected that there will be breakthrough infections, especially now when there is substantial or high transmission in close to 96% of the country."

Even the most effective vaccines cannot prevent infection 100% of the time. However, COVID-19 vaccines have proven highly effective at

preventing severe illness and death due to COVID-19.

## **Q: How well do vaccines protect people against severe disease and hospitalization?**

"The data that we have today show that these vaccinations are performing excellent so far—even including the Delta variant—at what they were designed to do, which is prevent severe illness and death," Varkey says.

The CDC recently published research showing that unvaccinated individuals are five times more likely to become infected, 10 times more likely to be hospitalized and 11 times more likely to die of COVID-19 than vaccinated individuals.

While there are some fully vaccinated patients with COVID-19 who are in the hospital, these individuals are typically immunosuppressed, over the age of 70 or are hospitalized for reasons unrelated to their COVID-19 infection.

"At this stage, hospitals are disproportionately full of folks who are unvaccinated," Varkey says.

## **Q: What kinds of symptoms can you get from a breakthrough case?**

A: "For most people who are vaccinated, their COVID-19 experience will be mild," but symptoms can range in severity, Varkey says. Some people may remain asymptomatic, while others have mild symptoms or "a case of the sniffles." Others may feel like they have a bad cold, or that they have "the worst flu of their life, but not necessarily sick enough to be in the hospital."

Like anyone who is infected with COVID-19, individuals with breakthrough cases are also at risk of developing long COVID symptoms. However, early data suggest that vaccinated individuals may be at lower risk.

**Q: Are breakthrough cases infectious?**

A: A person with a breakthrough case of COVID-19 can transmit infection, which is why masking is currently recommended even for those who are vaccinated when they are indoors in public spaces.

People with breakthrough cases may not be as infectious as those who are unvaccinated. Recent data on breakthrough cases among [health care workers](#) in the Netherlands "found that though viral load levels were the same with vaccinated compared to the unvaccinated samples, unvaccinated people were 25% more likely to be infectious compared to those who were vaccinated," Guest says.

People with breakthrough cases are also infectious for fewer days than those who are unvaccinated. "We're most contagious to those around us, so the people that we live with—our spouse, our kids, a grandparent that might be in the house, our coworkers—they are less at risk if you are vaccinated, because you will be infectious for a shorter period of time," Varkey says.

**Q: What can vaccinated people do to prevent breakthrough infections, and how concerned should they be about getting sick?**

A: "I think the concern that people have is warranted when community transmission is sky-high," Varkey says. "But we are in such a better place now than we were a year ago this time because of vaccination."

Staying aware of areas of high transmission and continuing simple precautions such as wearing masks indoors in public, safely distancing and carefully washing hands can mitigate the risk of infection.

"We don't want to be wearing our masks forever, but they help us keep transmission down," Guest says. Varkey calls masking in indoor spaces with people outside of your household "the easiest, most sensible precaution that has worked throughout this pandemic."

"Rather than panic, it's always good to prepare," Varkey adds. "This is really the end game of the pandemic—it's not going to be turning a faucet off. It's going to be us learning how to safely live with this virus."

## **Q: When will the pandemic end?**

A: "In a post-pandemic world, if the vast majority of people who get COVID-19 have essentially a case of the sniffles or a minor cold that keeps them at home out of work for a few days—but doesn't land them in the hospital, doesn't land them on a respirator, doesn't end up with them dying—I would totally be willing to accept that," Varkey says, but because so many Americans are not yet fully vaccinated, "we're just not there yet."

"Vaccines continue to help keep us safe on the individual-level: they keep us from getting as sick or needing to go into the hospital," Guest says. "They also help on a population-level: a vaccinated person plays less of a role in the transmission process than a person who is unvaccinated and fewer cases keeps those who cannot yet be vaccinated safer and gives the virus fewer places to mutate. This will help us end the immense suffering of the pandemic."

"If you think about COVID-19 as a fire and if you think about these waves as a forest fire, vaccinated people are like wet logs," Varkey says,

borrowing a metaphor from colleague and Emory anesthesiologist Michelle Au. "Unvaccinated people are like dry kindling. Delta is the accelerant, almost like gasoline on the fire."

While a wet log can catch and spread fire, "it is much harder to start a fire with a wet log and nearly impossible when there's no kindling," he continues. In the same way, vaccination is a critical tool to prevent the spread of COVID-19 in our communities.

Provided by Emory University

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