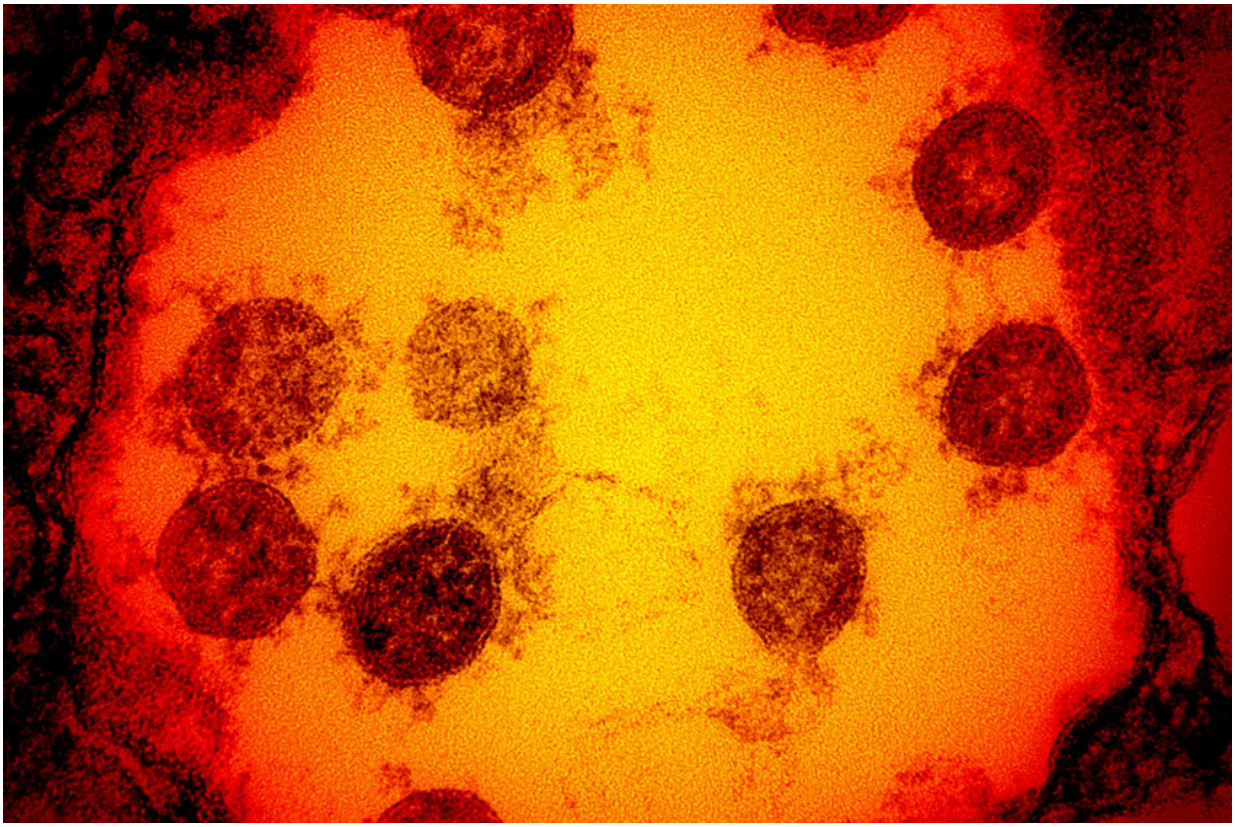
New COVID breakthrough data, and what to know about boosters

September 8 2021, by Helen Adams



Micrograph of coronavirus particles isolated from a patient. Credit: National Institute of Allergy and Infectious Diseases

Research on breakthrough COVID-19 infections at MUSC Health offers some clues about what's likely happening in the larger community.

About 2% of the more than 14,800 fully vaccinated employees and students have had lab-confirmed breakthrough COVID-19 infections so far, but the number is steadily growing. Just two of the breakthrough cases have been bad enough to warrant hospitalization.

"There's a big difference between feeling like you have a cold for a few days from a breakthrough infection versus being on a ventilator if you're unvaccinated. If you don't want to risk being on a ventilator, I suggest you get vaccinated," said Scott Curry, M.D.

"Breakthrough infections are not landing vaccinated people in the intensive care unit unless they're transplant patients or have something seriously wrong with their ability to respond to a vaccine."

Curry, an infectious diseases specialist at MUSC Health and an assistant professor in the Medical University of South Carolina's College of Medicine, has been tracking breakthrough infections since the first documented case in late January of this year at MUSC Health.

They're on the rise as research from the Centers for Disease Control and Prevention suggests immunity from vaccines may decline over time. "Breakthrough cases at MUSC Health have increased exponentially to 70 per week, with no sign of a decrease in sight yet," Curry said.

The average number of days since vaccination in those breakthrough cases was 174. Most of the people in his study had the Pfizer vaccine, but some had Moderna, AstraZenaca or Johnson & Johnson.

The top breakthrough symptoms in Curry's research:

- Headache (67%)
- Cough (63%)

- Runny nose (63%)
- Muscle aches (48%)
- Sore throat (45%)
- Fever (44%)
- Loss of taste/smell (42%)
- Chills (40%)
- Hoarseness (35%)
- Diarrhea (20%)

But Curry said those symptoms usually didn't stick around long. "One of the things we are seeing qualitatively is that most of these folks are really high in terms of their viral load at infection onset, but they seem to get better very quickly compared to unvaccinated patients. Patients seem to be sick for a day or up to five days, and then they feel well enough to work again."

His research does not include people with asymptomatic breakthrough infections or cases so mild that they don't bother to get tested. "There could be many more less-symptomatic breakthrough infections out there, but the few we've documented so far have barely detectable virus. It's not clear we need to care as much about very mild infections because the transmission potential for those infections is unclear, and making people less sick is what we want the vaccine to do to begin with."

Curry said one factor helping to fuel the breakthrough infections he is seeing is the high COVID rate in South Carolina. The state recently ranked worst in the country for cases per capita, and its vaccination rate put it 41st in the country as of September 7.

"The risk of breakthrough is completely predicated on the external pressure of COVID out there. If we lived in a low incidence state, then we would see the vaccines become substantially more effective. But we live in a highly unvaccinated state where COVID is ripping through like

a wildfire. And no matter how much fireproof gear you wear, you're going to get burned if you run into a wildfire," Curry said.

As for whether booster shots for everyone are part of the solution, Curry wants to see more data before deciding. "Everybody seems to take this leap of faith that a booster shot would have prevented all the breakthrough infections we've observed so far. We have no evidence to that effect yet," he said.

"I want to see a trial done where people whose immune systems work well get three doses at some predetermined schedule and compare them to people who've had two doses to see if that one group gets less sick than the other. That's really the gold standard of what we want to see."

More information: Ashley Fowlkes et al, Effectiveness of COVID-19 Vaccines in Preventing SARS-CoV-2 Infection Among Frontline Workers Before and During B.1.617.2 (Delta) Variant Predominance—Eight U.S. Locations, December 2020–August 2021, *MMWR. Morbidity and Mortality Weekly Report* (2021). DOI: 10.15585/mmwr.mm7034e4

Provided by Medical University of South Carolina