# The Evidence Cited by the CDC Does Not Show That Vaccinated and Unvaccinated COVID-19 Carriers Are Equally Likely To Transmit the Virus

That conclusion is not justified by the CDC's Provincetown data, and it is inconsistent with a new study from Singapore.

CDC Director Rochelle Walensky (Michael Brochstein/Sipa USA/Newscom)

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Rochelle Walensky, director of the Centers for Disease Control and Prevention (CDC), has sent mixed messages about the likelihood that people vaccinated against COVID-19 will be infected by the delta variant of the coronavirus. While she has described so-called breakthrough infections as "rare" and this week reiterated the point that vaccinated people face a "far lower" infection risk than unvaccinated people, she also has offered an estimate implying the reverse:

that vaccination somehow makes people *more* vulnerable to infection.

Walensky's statements about the likelihood that vaccinated carriers will transmit the virus likewise have been inconsistent, confusing, and sometimes stronger than the evidence supports. That evidence includes a new study that found viral loads in vaccinated and unvaccinated COVID-19 patients were initially similar but dropped faster in the vaccinated group.

"The breakthrough infections, as rare as they are, have the potential to forward transmit with the same capacity as an unvaccinated person," Walensky told reporters on July 27, the day the CDC issued new guidance recommending that vaccinated people resume wearing face masks in public places if they live in "areas of substantial or high transmission." That statement contradicted a "science brief" that the CDC published the same day.

"COVID-19 vaccines currently authorized in the United States have been shown to be effective against SARS-CoV-2 infections, including asymptomatic and symptomatic infection, severe disease, and death," the CDC said. "These findings, along with the early evidence for reduced viral load in vaccinated people who develop COVID-19, suggest that any associated transmission risk is likely to be substantially reduced in vaccinated people."

The brief cited "early data" from India and "unpublished data" from the United States suggesting that "breakthrough Delta infections are transmissible." But it did not say they were as transmissible as infections in unvaccinated people. Nor did the CDC's new mask advice. "Preliminary evidence suggests that fully vaccinated people who do become infected with the Delta variant can be infectious and can spread the virus to others," it said.

An article published in the CDC's *Morbidity and Mortality Weekly Report* (*MMWR*) on July 27 likewise did not back up Walensky's claim that vaccinated delta carriers have "the same capacity" to transmit the virus as unvaccinated carriers. "Emerging evidence suggests that fully vaccinated persons who do become infected with the Delta variant are at risk for transmitting it to others," it said, citing "unpublished data" from the CDC COVID-19 Response Team.

Three days later, we finally got a look at some of those data, reported in an *MMWR* article about a July outbreak in Provincetown, Massachusetts, that

primarily involved the delta variant. The researchers reported that cycle threshold (Ct) values, which indicate the extent to which the nucleic acid targeted by a RT-PCR virus test has to be amplified before the fluorescent signal rises above the background level, "were similar among specimens from patients who were fully vaccinated and those who were not." But they cautioned that "Ct values obtained with SARS-CoV-2 qualitative RT-PCR diagnostic tests might provide a crude correlation to the amount of virus present in a sample and can also be affected by factors other than viral load." While the similar Ct values "might mean that the viral load of vaccinated and unvaccinated persons infected with SARS-CoV-2 is also similar," they said, "microbiological studies are required to confirm these findings."

Walensky disregarded that caveat in the press release the CDC issued when it published the Provincetown study, saying the researchers found "Delta infection resulted in similarly high SARS-CoV-2 viral loads in vaccinated and unvaccinated people." Still, she did not claim that vaccinated carriers were as infectious as unvaccinated carriers. "High viral loads suggest an increased risk of transmission and raised concern that, unlike with other variants, vaccinated people infected with Delta can transmit the virus," she said. "This finding is concerning and was a pivotal discovery leading to CDC's updated mask recommendation."

During a White House briefing on Monday, Walensky likewise did not say vaccinated and unvaccinated carriers are equally infectious. Citing the Provincetown outbreak, she said the "higher viral loads" associated with the delta variant "are seen not just in those who are unvaccinated and infected but also, and importantly, in the small proportion of those who are vaccinated and become infected." She said that indicates "vaccinated people can spread the virus if they get a breakthrough infection," although "the odds of them getting sick in the first place are far lower than [the odds for] those who are unvaccinated."

In addition to the issue of inferring viral loads from Ct values, the Provincetown study has other limitations. The authors note that "asymptomatic breakthrough infections might be underrepresented because of detection bias." Consistent with that possibility, 79 percent of the breakthrough infections described by the CDC involved "symptoms consistent with COVID-19." Those are the cases that tend to be identified, since people who are infected by the COVID-19 virus but don't develop noticeable symptoms are less likely to be tested.

Even if the viral loads in nasal samples from vaccinated and unvaccinated carriers in this study were indeed similar, that might not be true of asymptomatic infections, which is the crucial issue when it comes to precautions like face masks. "We already know symptomatic [carriers] can transmit" COVID-19, Harvard public health professor Joseph Allen notes. The "key question," he says, is whether asymptomatic breakthrough infections also spread the disease. Since vaccinated people infected by the coronavirus tend to have milder symptoms, it seems plausible that they are, on average, less infectious than unvaccinated carriers.

Another issue is whether viral loads in nasal samples are a good indicator of transmissibility. In symptomatic cases, Allen says, viral loads in the nose correspond with viral loads in the lungs, "where most aerosol [is] generated." But in asymptomatic cases, that is not true.

Allen also notes that the "unvaccinated" group in the Provincetown study included people who were partially vaccinated or whose vaccination status was unknown, which could have biased the results. And he questions whether the data from the Provincetown outbreak, which featured a "very specific set of circumstances," should have been used "as [a] basis to set national policy."

During the two-week period covered by the study, about 60,000 people were visiting Provincetown, which ordinarily has a population of 3,000. The CDC study says "persons with COVID-19 reported attending densely packed indoor and outdoor events at venues that included bars, restaurants, guest houses, and rental homes." In a *New York Times* opinion piece, Zeynep Tufekci notes that "it rained a lot during those two weeks, driving more people to crowded, poorly ventilated bars and restaurants."

Even in these unusual circumstances, it still is not clear to what extent the cases described by the CDC were caused by vaccinated carriers. *The Washington Post* reports that researchers "are analyzing the genetic fingerprints of the virus samples" to "trace chains of transmission and determine how commonly fully vaccinated people were infecting one another."

A preprint study from Singapore, which was posted the day after the CDC's Provincetown study, suggests that Walensky was right to retreat from her suggestion that vaccinated and unvaccinated people infected by the delta variant

are equally likely to transmit it. The researchers looked at 218 patients who had been infected by delta, 84 of whom had received an mRNA vaccine, including 71 who were fully vaccinated. They found that Ct values “were similar between both vaccinated and unvaccinated groups at diagnosis, but viral loads decreased faster in vaccinated individuals,” who showed “a robust serological response.” A chart indicates that the Ct values in the two groups began to diverge within five days. That finding, the authors note, “has implications [for] secondary transmission and public health policy.”

The vaccinated patients also “were significantly more likely to be asymptomatic” and, if not, had fewer and less severe symptoms. “The finding of diminished severity with B.1.617.2 [delta] infection in vaccinated individuals is reassuring and
corroborates emerging data from the United Kingdom,” where researchers “have found that mRNA vaccination remains protective against symptomatic and severe disease,” the authors say. They conclude that “the mRNA vaccines are highly effective at preventing symptomatic and severe COVID-19 associated with B.1.617.2 infection.”

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