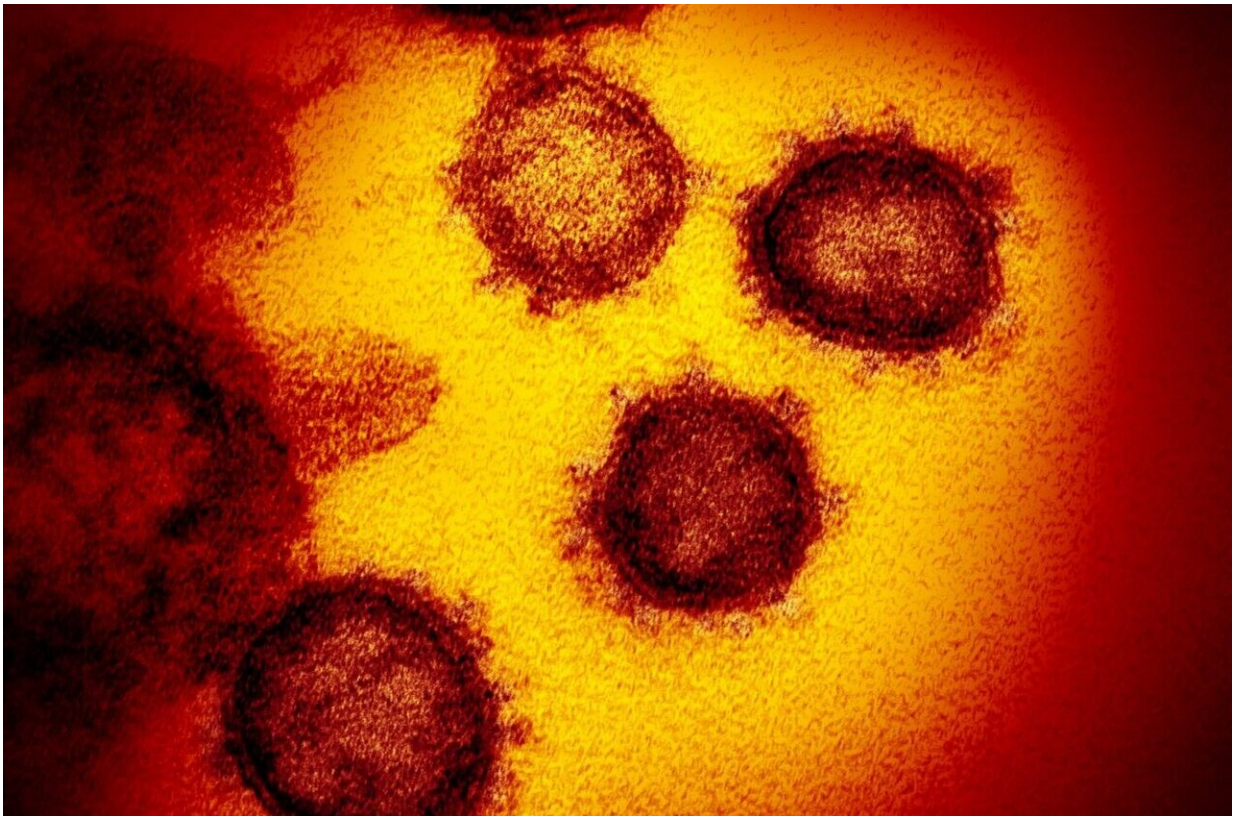


COVID-19 vaccine reduces severity, length, viral load for those who still get infected

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Transmission electron microscope image of SARS-CoV-2, the virus that causes COVID-19, emerging from human cells. Credit: NIAID

Individuals who contract COVID-19 even after vaccination are likely to have a lower viral load, experience a shorter infection time and have

milder symptoms than people who are unvaccinated, according to research that includes data from ongoing University of Arizona Health Sciences studies.

"If you get vaccinated, about 90% of the time you're not going to get COVID-19," said Jeff Burgess, MD, MS, MPH, associate dean for research and professor at the Mel and Enid Zuckerman College of Public Health and principal investigator of the Arizona Healthcare, Emergency Response, and Other Essential Workers Surveillance (AZ HEROES) study. "Even if you do get it, there will be less of the virus in you and your illness is likely to be much milder."

While the COVID-19 vaccines are proving to be highly effective in preventing COVID-19 [infection](#), no vaccine is 100% effective and breakthrough infections do occur. Among 3,975 participants in two studies, SARS-CoV-2 infections were identified in five participants who were fully vaccinated and 11 who were partially vaccinated, as well as in 156 unvaccinated participants. Approximately half of the participants were from Arizona study sites.

Researchers found that study participants who were partially or fully vaccinated with the Pfizer and Moderna messenger RNA vaccines at the time of infection had a viral load that was 40% less than that of unvaccinated participants. Viral load—the amount of SARS-CoV-2 virus found in a test sample—is not an indicator of how contagious an individual is, though early COVID-19 research suggests [viral load](#) could play a role in disease severity and secondary transmission.

In addition to [disease severity](#), researchers looked at infection longevity. The majority of infections among unvaccinated participants were detected for two or more weeks, compared with only one week among vaccinated participants. That represents a 66% reduction in the risk that a vaccinated person will have a confirmed infection for more than one

week.

Additionally, the risk of having COVID-19 with an accompanying fever was 58% lower for vaccinated participants, who reported two fewer days sick in bed, on average, and an overall length of illness that was six days shorter than that of unvaccinated people.

The paper, published in the *New England Journal of Medicine*, incorporates data from two ongoing CDC-funded studies: the AZ HEROES study and the Abt Associates-led Research on the Epidemiology of SARS-CoV-2 in Essential Response Personnel (RECOVER) study. Study participants—health care personnel, first responders, and other essential and frontline workers in eight U.S. locations—continue to undergo weekly nasal swabs to test for COVID-19, as well as quarterly blood tests.

Including data from Dec. 14 to April 10, researchers found that two doses of an mRNA COVID-19 vaccine were 91% effective against infection with SARS-CoV-2, the virus that causes COVID-19. Additionally, the report indicated a single dose of vaccine proved 81% effective against SARS-CoV-2 infection. This is on par with study data published in the U.S. Centers for Disease Control and Prevention's Morbidity and Mortality Weekly Report on March 29.

"We are still seeing the same high levels of vaccine effectiveness, so we feel good about that," Dr. Burgess said. "But more importantly, we've added a number of measures of the severity of infection among individuals who have been vaccinated as a comparison to those who haven't, and we measured how much virus there is and for how long."

In addition to continuing research into COVID-19 immunity and vaccine efficacy, AZ HEROES researchers are beginning to examine the frequency of SARS-CoV-2 variants. The study was originally funded

with a \$7.7 million CDC grant.

"We recently were awarded another year of funding," said AZ HEROES research team member Karen Lutrick, Ph.D., assistant professor in the Department of Family and Community Medicine at the College of Medicine—Tucson. "We really appreciate the participation of all of our AZ HEROES and RECOVER participants, because without them and their work, we wouldn't have this information to share."

More information: Mark G. Thompson et al, Prevention and Attenuation of Covid-19 with the BNT162b2 and mRNA-1273 Vaccines, *New England Journal of Medicine* (2021). [DOI: 10.1056/NEJMoa2107058](https://doi.org/10.1056/NEJMoa2107058)

Provided by University of Arizona

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