

# Young adults have lowest antibody levels after COVID-19 infection, suggesting vaccination still key

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An analysis of adults who recovered from moderate COVID-19 found that those under the age of 30 had lower neutralizing antibody levels than

older people, suggesting that younger individuals may be less protected from a second infection.

The findings, posted to the preprint website *medRxiv* and announced today, ahead of peer-reviewed publication, indicate that vaccination is important even for young adults who have previously been infected with the SARS-CoV-2 virus.

"I know a lot of people think, 'I had COVID, so I don't need to get a shot,'" said senior author John Alcorn, Ph.D., professor of pediatrics at the University of Pittsburgh School of Medicine and UPMC Children's Hospital of Pittsburgh. "But this study suggests that some patients, particularly [young people](#), don't have particularly good antibody memory after infection, indicating that immune boosting with vaccination is important for these people."

During an infection with SARS-CoV-2, the immune system produces virus-specific antibodies and memory B cells, which stick around in the bloodstream and can help fend off a second infection from the same pathogen. But over time, that protection can wane. Researchers are still trying to understand just how durable this antibody response is after recovery from COVID-19 and whether some groups of people have longer-lasting immune memory than others.

Most studies on [antibody responses](#) to SARS-CoV-2 infection have focused on patients who recovered from severe forms of COVID-19, motivating the researchers to investigate milder forms of the disease.

Alcorn and his team recruited 173 patients aged 19 to 79 with mild or moderate COVID-19 who visited their doctors for treatment, excluding those who were hospitalized, indicating severe disease. The researchers collected blood samples from participants several weeks after recovery, and measured SARS-CoV-2 antibodies. They also showed that the

antibodies were able to inactivate, or neutralize, the virus in a lab dish and that higher antibody levels were linked with higher neutralizing activity.

Comparing patients, the researchers found that some people had high antibody levels while others had much lower responses, and these differences weren't explained by time since infection. But when the researchers broke the participants into different age groups, they found something surprising: Patients under the age of 30 produced lower antibody levels compared with all other age groups.

"Some people, particularly young people, don't respond particularly well in terms of immune memory to prior infection. These people may not be well protected from a second infection," explained Alcorn. "But we now have a tool—vaccines—that can reinduce immune responses and boost protection. This study puts more evidence behind the recommendation that people who had COVID-19 should get vaccinated."

The Centers for Disease Control and Prevention recently released new data showing that unvaccinated people who had a recent infection were five times more likely to get COVID-19 than vaccinated people, indicating that vaccines provide better protection than prior infection and highlighting the importance of the shot even for those who have recovered from the disease.

It's not clear why young people had the poorest immune responses, Alcorn said. Other studies have shown that COVID-19 disease severity is linked with higher antibody levels, so the researchers suspected that low antibody responses in patients under 30 could be because these patients weren't as sick as their older peers.

To examine this hypothesis, the team analyzed patient medical records. Using the number of days of symptoms as a proxy for disease severity,

they found that people aged under 45 were less sick than older patients.

"But people aged under 30 and those aged 31 to 45 had the same symptom duration, but their antibody levels were significantly different," said Alcorn. "These findings suggest that disease severity could influence a person's level of protection, but it doesn't explain everything."

Alcorn and his team plan to follow up with the same patients to measure how neutralizing antibody levels change over longer periods of time. Because some of these patients have now received a COVID-19 vaccine, the researchers will also compare [antibody levels](#) in those who have or haven't been immunized.

**More information:** Bo Zhai et al, SARS-CoV-2 Antibody Response is Associated with Age in Convalescent Outpatients, *medRxiv* (2021). [DOI: 10.1101/2021.11.08.21265888](https://doi.org/10.1101/2021.11.08.21265888)

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