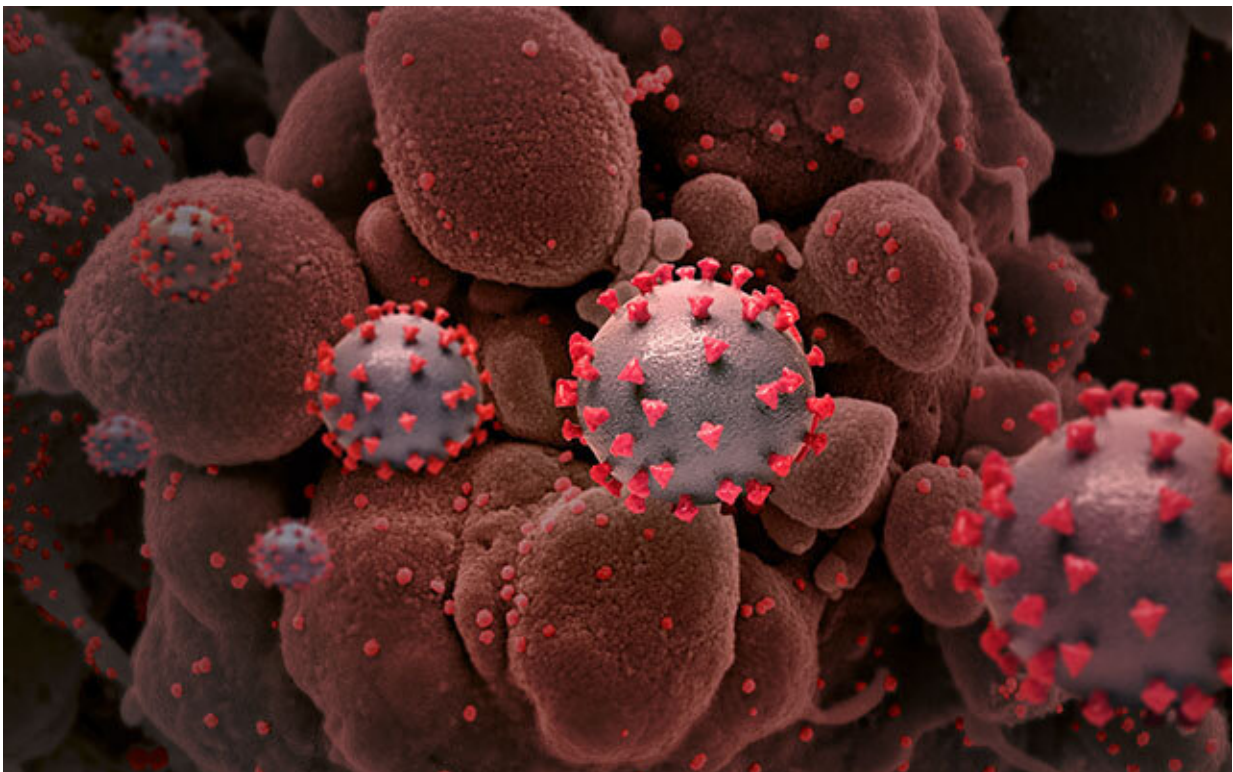


Qatar Omicron-wave study shows slow decline of natural immunity, rapid decline of vaccine immunity

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Creative rendition of SARS-CoV-2 particles (not to scale). Credit: National Institute of Allergy and Infectious Diseases, NIH

A recent Pfizer or Moderna mRNA-vaccine booster provided good but temporary protection against infection by the SARS-CoV-2 Omicron

variant, according to a study from researchers at Weill Cornell Medicine—Qatar.

In the study, published June 15 in the *New England Journal of Medicine*, the researchers analyzed the Omicron wave in Qatar last winter, comparing prior infections, vaccine immunity and combinations thereof among more than 100,000 Omicron-infected and non-infected individuals.

The analysis showed, as expected, that full mRNA vaccination plus a [booster dose](#), atop natural immunity due to [infection](#) by an earlier variant, was associated with the strongest protection from Omicron infection. However, vaccine immunity against new infection appeared to wane rapidly, whereas people with a prior-variant infection were moderately protected from Omicron with little decline in protection even a year after their prior infection.

The study, the most comprehensive of its kind in investigating different combinations of immunity for Omicron-variant SARS-CoV-2 infections, also found evidence that both vaccination and prior infection provided strong and durable protection from severe, critical, or fatal COVID-19 during the Omicron wave.

"We found that the rates of severe COVID-19 during Qatar's Omicron wave were very low even among those who had only two doses of vaccine or only a prior infection," said study first author Dr. Heba Altarawneh, a postdoctoral research associate who conducted this study working with study senior author Dr. Laith Abu-Raddad, a professor of population health sciences at Weill Cornell Medicine—Qatar and at Weill Cornell Medicine in New York.

Qatar's highly centralized and comprehensive electronic health records database, which includes all RT-PCR tests for SARS-CoV-2 performed

in the country, permits unusually rapid and large-scale epidemiological studies. Dr. Abu-Raddad and colleagues have already published prominent papers on infection and illness rates for prior SARS-CoV-2 variants and waves.

For the new study, the researchers cataloged positive PCR tests associated with infection symptoms in Qatar during the country's [omicron](#) (B.1.1.529) wave, from Dec. 23, 2021, through Feb. 21, 2022. They paired each of these infected, symptomatic individuals with a PCR-negative individual from the database—matching by sex, week of testing, age range and nationality (Qatar has a highly diverse resident population that includes many guest workers from Asia and Africa). The researchers then analyzed how the prior-wave infections and vaccination histories of the two groups differed. The analysis included 104,490 people in all.

A key finding was that a history of vaccination with the standard two doses of either the Pfizer or Moderna mRNA vaccine, but no history of prior infection, brought no significant protection against symptomatic omicron infection. Having a booster dose appeared to be about 60 percent protective, though most boosters were received just weeks before the Omicron wave. Overall, the analysis suggested—consistently with prior studies—that mRNA vaccines and boosters work fairly well in protecting against symptomatic omicron infection, though their protective effect wanes rapidly and disappears within six months or so.

For those with no history of vaccination, SARS-CoV-2 infection during a prior-variant wave appeared to provide about 50 percent protection against symptomatic infection during the Omicron wave, and this "natural immunity" was associated with almost the same degree of protection even a year after infection.

The combination of prior, full vaccination and prior infection was

maximally protective: Individuals with prior infection and three doses of either mRNA vaccine were, overall, nearly 80 percent protected from symptomatic infection during the Omicron wave.

The results also indicated that vaccination, prior infection alone or a combination, was protective against severe illness from Omicron infections—the protective effect ranging from about 72 percent for previous infection alone to 100 percent for previous infection plus three [vaccine](#) doses.

"These findings demonstrate the benefits of vaccinating those with prior infection for optimal protection against the Omicron variant," said Dr. Abu-Raddad.

The analysis distinguished between infections with two different sub-lineages of the Omicron variant, BA.1 and BA.2, but found very similar results for both, as well as similar results for both Pfizer's and Moderna's vaccines.

Provided by Weill Cornell Medical College

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