How long does COVID-19 immunity last?

Long-lived memory immune cells continue to provide protection even after antibody levels drop.

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A year into the new pandemic, there's still much to learn about immunity to SARS-CoV-2, the new coronavirus that causes COVID-19. Immunity to other coronaviruses that cause the common cold usually lasts a matter of months and reinfection is common. But immunity to the original SARS coronavirus appears to last for many years. It is not yet clear which pattern SARS-CoV-2 will follow.

After natural infection or vaccination, the immune system produces antibodies against the virus; this usually happens within a couple of weeks. But studies that only measure antibody levels don't tell the whole story. Antibody levels in the blood normally decline over time, but the long-lived memory B cells that make antibodies remain on guard and ready to resume antibody production if they encounter the virus again. T cells, a different type of immune cell, also play a role in maintaining long-lasting protection.

One recent study found that people who recover from COVID-19 are protected for at least six months and likely much longer. Although antibody levels waned by six months, memory B cells were still going strong. Another study showed that antibody, memory B cell and memory T cell responses lasted at least eight months and did not appear to decline further after that point. A third study found that antibodies still guard against reinfection after five months. But further follow-up is needed to see how long such protection lasts.

Now that around 10 million people have had COVID-19 worldwide (almost certainly an undercount), SARS-CoV-2 reinfection appears to be rare, with only a small number of confirmed cases reported. And people who do become reinfected typically have milder disease. This offers real-world evidence that past infection confers protection.

Some research indicates that people with more severe COVID-19 develop a stronger immune response. And people with compromised immunity—such as cancer patients and HIV-positive people who are not on treatment—may have a weaker response.

Vaccines appear to provide SARS-CoV-2 immunity similar to that of natural infection. Receiving two doses of the Pfizer/BioNTech and Moderna vaccines is expected to provide longer-lasting protection than a single dose.

Most experts expect that population or herd immunity will be achieved when approximately 75% of the population as been exposed, either via natural infection or vaccination. Once this threshold is reached, the virus cannot easily spread. But this level of protection depends on long-lasting immunity.

So far, newly identified SARS-CoV-2 variants do not appear to escape natural or vaccine-induced immunity. However, this remains a risk as the virus continues to evolve. The best way to stop the emergence of viral mutations is to ramp up vaccination as quickly as possible and to maintain precautions such as social distancing and wearing masks in the meantime.
