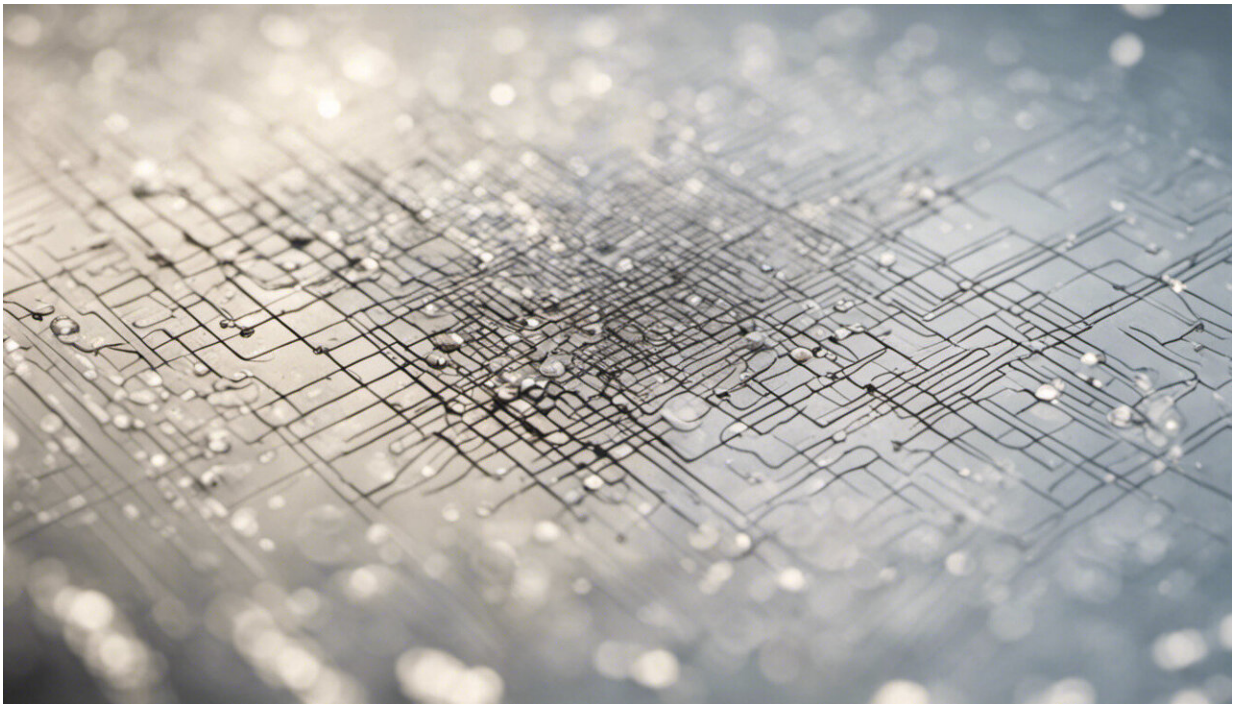


COVID vaccine effects wane over time but still prevent death and severe illness

September 15 2021, by Sheena Cruickshank



Credit: AI-generated image ([disclaimer](#))

[Several countries](#)—including [the UK](#)—are now offering third COVID-19 shots amid reports of vaccines proving less effective over time. But do these countries really need to embark on widespread booster campaigns? Here's what research tells us so far about how vaccines are performing.

One study suggests that after four months of the second dose, the Pfizer/BioNTech [vaccine](#) is less effective at preventing infection (classified as a positive PCR test), with protection falling from [96% to 84%](#). However, the research is a preprint, meaning that its results have yet to be formally reviewed by other scientists.

Similarly, real-life data from [Israel](#) suggests that over-60s who received their second dose of the Pfizer vaccine in March 2021 were 1.6 times better protected against infection than those who received their second dose two months earlier. However, the data was less clear cut when looking across other age groups. This study also hasn't yet been peer reviewed.

Data for the Moderna vaccine shows that functional antibodies (those able to stop viruses from entering cells) persisted in most people for six [months after vaccination](#). However, there was a gradual decrease in performance against the beta variant of the virus, and the study didn't assess the vaccine against the now-dominant delta variant.

A [separate preprint](#) has looked at vaccine effectiveness against delta, and found both the Oxford/AstraZeneca and Pfizer vaccines were less effective at preventing infection when facing this variant. Similar findings [have been reported](#) by the US Centers for Disease Control and Prevention.

While all these studies may sound alarming, most are yet to be formally reviewed, so their results need to be treated with caution. They also measure different things. Some look at numbers of positive PCR tests rather than symptoms or disease. Others consider [antibody levels](#) or the response to different variants. Really, we need to consider what the most important goals of vaccination are when assessing performance.

Vaccines still protective

An ideal vaccine would completely prevent infection and so stop people catching and spreading the virus. However, earlier on in the pandemic, reports appeared of people being reinfected with COVID-19 as well as of antibodies waning—and high levels of antibodies are thought to be important in preventing infection from starting. So it's been suspected for a while that creating a vaccine that completely blocks infection wouldn't be possible.

Indeed, antibodies are just one indicator of an effective immune response. We also need T lymphocytes that kill the virus, and immune memory to enable us to quickly produce lots of these killer T cells and antibody-producing B cells. Here the news is much more positive. Studies have shown that both killer T cells and immune memory persist well.

What this could mean is that some people might not have enough antibodies to completely prevent infection, but can still fight the infection off and stop it from taking hold. If this were the case, you would expect vaccines to reduce the impact or severity of disease. And this is where we are seeing good news.

Reports in the [UK](#) and the [US](#) are showing fewer vaccinated people requiring hospitalization or developing [severe symptoms](#) from the delta variant. For example, fully vaccinated people in the US [have been shown](#) to be five times less likely to get COVID-19 and ten times less likely to be hospitalized or die from it.

Similarly, the [Israeli study](#) mentioned above showed that in people aged 40–59, four months after vaccination, vaccines were 98% effective at preventing people from being hospitalized with COVID-19. After six months, protection remained high, at 94%.

For people over the age of 60, though, the data shows a bigger drop off

in performance, with protection against hospitalization lower after four months (91%) and six months (86%). This difference may be due to older people being less able to mount a good immune response following vaccination, as well as the challenge of the delta variant.

However, what's clear is that the vaccines are highly effective at protecting against severe disease compared with those who have not had a vaccine. And this, really, is the most important goal of vaccination—to stop people getting dangerously ill and dying.

Turning on the boosters

Despite protection against severe disease remaining high many months after vaccination, a number of governments have chosen to launch vaccine booster programs. Will the third doses being rolled out by the UK and other governments be sufficient to provide long-term and even more highly protective immunity in the most vulnerable? The truth is, we don't yet know.

We should remember that vaccination is just one of the ways we protect ourselves from [infection](#), and that maybe other measures, such as mask wearing and ventilation, will still be needed if we cannot achieve sufficient protection. Indeed, as well as boosters, the British government has also [outlined plans](#) for reintroducing home working and mask wearing over the winter should the virus threaten to get out of hand.

The other question we have to ask ourselves is whether we should actually be looking to help other vulnerable people across the world. It's been estimated that the richest countries have more than [enough vaccines](#) already, even if boosters are used and children are vaccinated.

The most important goal of vaccination is to protect against severe disease and death, yet many countries [haven't given even 2% of their](#)

[population](#) a first vaccine dose, enabling the virus to thrive at a huge cost to lives. Really, can we look the other way?

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Provided by The Conversation

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