

Does everybody need a booster shot?

Why some people might need Covid-19 booster shots — and some might not.

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The Biden administration has been working for weeks on plans for [Covid-19 booster shots](#), as [the delta variant](#) drives [a new pandemic wave](#) across the country. The debate spilled out into the open last month when top officials from the Food and Drug Administration [stepped down over their reported concerns](#) that the decision-making process was being driven by politics instead of science.

Israel has already pushed ahead with booster shots, with most of that country's population [currently eligible for a third shot](#), based on data that indicates vaccine effectiveness wanes over time. The country is even preparing for [the possibility that patients will require a fourth shot](#). The Biden administration has [reportedly been influenced](#) by the data out of Israel and, for a time, it looked as though the US would quickly take the same path. In a speech last month, President Joe Biden [laid out a plan](#) for every vaccinated American to receive a booster shot — pending FDA approval.

But that announcement faced pushback from parts of the scientific community, who argued that the case for booster shots is not clear-cut. At least not for everybody.

That argument has guided actions taken by the FDA and the Centers for Disease Control and Prevention in the past few days. The FDA, following [the recommendation of its vaccine advisory board](#), approved a third dose of Pfizer's vaccine for [people over 65 and people at higher risk](#) because of their work or their medical conditions. A CDC committee also [recommended](#) booster shots be mostly focused on people older than 65. After some debate, the committee did not specify prioritizing people based on their job, but the [CDC's director overruled the panel](#) and said workers with high occupational risk should be included.

A group of 18 scientists, including the two FDA officials who stepped down, outlined their position in a letter published last week in [The Lancet](#).

"COVID-19 vaccines continue to be effective against severe disease, including that caused by the delta variant," they wrote. "Current evidence does not, therefore, appear to show a need for boosting in the general population."

Other experts I spoke to shared that assessment of the evidence. There may be some waning effectiveness against any symptomatic disease, but for most people, the vaccines continue to do an excellent job of preventing hospitalizations and deaths.

“The science right now tells us that for most people, boosters probably aren’t needed to protect against severe disease or death,” Angela Rasmussen, a research scientist at the Vaccine and Infectious Disease Organization, told me over email.

Many experts [believe](#) boosters do make sense for at least some individuals, and federal officials appear to agree. The debate has been whether they should be prioritized for every vaccinated person — as Biden announced last month — or whether they should be limited to certain vulnerable populations. Should the US focus its vaccine supply on boosting all of its citizens or [should it be doing more to share vaccines with the developing world](#), where vaccination rates remain much lower than in the United States and Europe?

With evidence so far, booster shots may make sense for some more than others

The vast majority of hospitalizations and deaths in the current wave have been concentrated among unvaccinated people. But [the number of “breakthrough” infections](#) among the vaccinated population has also been rising.

That is to be expected when [three out of four US adults](#) have received at least one dose of a Covid-19 vaccine. There are simply more vaccinated people out there than unvaccinated, and while the vaccines provide strong protection against infection, they are not perfect. Sometimes, the virus slips through, though vaccinated people remain [much less likely to be hospitalized with Covid-19](#) or die from it.

But how often does that happen? Is vaccine effectiveness starting to decline, especially with the delta variant now dominant? The answers to those questions influence the debate over booster shots. And we are starting to get some clearer evidence of how well the vaccines are holding up in the real world.

One [recent CDC study](#) tracked new Covid-19 cases and hospitalizations from early May to late July in New York state. The study period covers the transition from the “alpha” variant to delta, which became dominant by the start of July, but only includes part of the recent surge in reported cases.

The Covid-19 vaccines became somewhat less effective in preventing any illness as the delta variant took over, the CDC researchers concluded. Back in May, vaccines had an estimated 90 percent effectiveness at preventing new infections. But by mid-July, the estimated effectiveness had dropped to just under 80 percent. By that point, vaccinated people were more likely to get infected and [feel sick](#).

But the study found that the vaccines remained resilient against the most severe symptoms, with the estimated effectiveness against hospitalization holding steady around 95 percent from the start to the end of the study period.

[Another CDC study through July](#) examined national data on whether the Pfizer/BioNTech and Moderna vaccines are becoming less effective at stopping severe illness over time. Like the New York study, it found vaccines are extremely good at their most important job — about 90 percent effective in preventing hospitalization due to Covid-19. They did not find a meaningful decline almost six months after patients received a second dose of the vaccine. [A newer CDC study](#) found some [divergence between Moderna and Pfizer](#) in preventing severe illness over time, with the former performing better than the latter, but overall effectiveness for both vaccines remained high.

[Recent research out of the United Kingdom](#) reached generally the same conclusions: modest waning in effectiveness against any symptomatic illness but little (if any) against severe outcomes for most people.

The exceptions to those broad findings have been for people who have serious medical conditions, people who are otherwise immunocompromised, and seniors.

People who received the Johnson & Johnson vaccine, which was shown to be less effective at stopping symptomatic illness, may also warrant boosters, though long-range data on that vaccine's effectiveness is still coming in. [Studies so far](#) indicate that the vaccine still offers good protection against hospitalization, but that it may not be quite as robust against the delta variant as it was against prior iterations of the virus. The [newer CDC research](#) found that vaccine was 71 percent effective in preventing hospitalizations from March to August 2021, significantly lower than Moderna or Pfizer.

A [CDC study](#) evaluated vaccine effectiveness for nursing home residents, a population particularly vulnerable to Covid-19 and one of the first groups to get vaccinated at the beginning of this year. That study did find a significant decline in vaccine effectiveness over time against any illness for those Americans, from 75 percent pre-delta to about 50 percent post-delta. So they enjoyed less protection than younger people did from the start, and that protection did decline much more than in their younger counterparts.

Likewise, the new UK study found that the most significant drop in the vaccine's effectiveness against hospitalization was among people 80 years and older, from about 95 percent two to nine weeks after becoming fully vaccinated to about 70 percent more than 20 weeks after. For younger age groups, that protection against severe illness stayed above 90 percent over the study period.

With that in mind, "I think you can make the argument that people who are high risk for severe Covid-19 would benefit from a booster given at least six months after completion of their initial vaccine regimen," Rasmussen said.

What are the risks of approving too many booster shots too soon?

The case for immediately giving everybody a vaccine six or eight months after their second dose, however, is less clear.

Data from Israel suggests that people who receive a third dose have substantially more antibodies than people who have received “only” two doses. But the human immune system is complex. The number of antibodies a person has may not tell you everything about their level of immunity against Covid-19.

“Memory responses and cell-mediated immunity ... are generally longer lived” than antibody responses, the authors of the *Lancet* letter noted, and any drop in antibodies does not necessarily indicate a drop in efficacy against hospitalization or death.

We may end up in a world where everybody eventually receives a third shot, as more data rolls in suggesting that a longer interval between doses does lead to more robust protection. In that case, giving people that third dose could “lock in” long-term immunity, Rasmussen said.

But the question is where the current vaccination drive should be: Should it be focused on third shots? Or should it be directed at unvaccinated people or sending more vaccines to poorer parts of the world where vaccination rates remain much lower than they are in the US or Europe? The WHO has specifically urged wealthy countries not to authorize booster shots until more people in the developing world receive their initial vaccine regimen.

The *Lancet* letter’s authors argue that vaccinating those who are unvaccinated would help stave off future variants that may prove more elusive to the existing vaccines.

“Even if some gain can ultimately be obtained from boosting, it will not outweigh the benefits of providing initial protection to the unvaccinated,” they wrote. “If vaccines are deployed where they would do the most good, they could hasten the end of the pandemic by inhibiting further evolution of variants.”

There are questions about how much America’s internal vaccine decisions would actually influence global supply. And the Biden administration, perhaps anticipating these concerns, is reportedly planning to purchase and distribute hundreds of millions of doses of the Pfizer/BioNTech vaccine for other countries around the world.

One in four people in the United States have not been vaccinated, and the push is still on to get shots in their arms. It remains to be seen what effect the Biden White House’s new rules requiring employers to mandate vaccines or regular testing for their employees will have on vaccination rates. Cities and states are introducing more vaccine mandates of their own. The FDA is also expected to consider approval for vaccinating children ages 5 to 12 in the coming weeks, with approval for younger kids possible later this year.

“I’d argue that it’s more important to get vaccines to unvaccinated populations and offer boosters to high-risk people for now than it is to get a third booster six months out for all,” said Rasmussen.

Polling suggests vaccinated people are [more concerned about Covid-19](#) than the unvaccinated. It’s understandable that they would worry about breakthrough cases and see booster shots as important protection to avoid getting infected at all. But there is no foolproof protection against Covid-19.

The virus is well on its way toward becoming endemic; eradication became an unrealistic goal long ago. [Some level of risk will have to be tolerated.](#)

“Vaccines don’t create magical virus-proof force fields around you,” Rasmussen said, “and they aren’t 100 percent perfect.”

Update, September 24, 6 am: This article was updated with news of the Centers for Disease Control and Prevention’s booster shot recommendation and details of a CDC study comparing vaccine effectiveness.