Israeli Study Shows How COVID-19 Immunity Wanes over Time

Posted on November 9th, 2021 by Dr. Francis Collins

Credit: bbernard/Shutterstock

The winter holidays are approaching, and among the many things to be grateful for this year is that nearly 200 million Americans are fully vaccinated for COVID-19. That will make it safer to spend time with friends and family, though everyone should remain vigilant just to be on the safe side. Though relatively uncommon, breakthrough infections are possible. That's why the Centers for Disease Control and Prevention (CDC) recommends booster shots for several at-risk groups, including folks 65 years and older, those with underlying medical conditions, and people whose occupations place them at high risk of exposure.

One of the main studies providing the evidence for CDC's recommendation was recently published in the *New England Journal of Medicine* [1]. It found that vaccine-induced immunity, while still quite protective against infection and severe illness from COVID-19, can wane after several months.

The study is yet another highly informative report from Israel, where public health officials launched a particularly vigorous national vaccination campaign in December 2020. More than half of adult Israelis received two doses of the Pfizer vaccine within the first three months of the campaign. By May 2021, Israel had extremely small numbers of confirmed COVID-19 cases—just a few dozen per day.

But the numbers crept back up in June 2021. The rise also included a substantial number of breakthrough infections in vaccinated individuals. The vast majority of those cases in June—98 percent—were caused by the emerging Delta variant.

Researchers led by Yair Goldberg, Technion-Israel Institute of Technology, Haifa, wondered whether this resurgence of COVID-19 could be fully explained by the rise of the more infectious Delta variant. Or, they wondered, did the waning of immunity over time also play a role?

To find out, the researchers looked to over 4.7 million fully vaccinated Israeli adults, more than 13,000 of whom had breakthrough infections from July 11 to 31, 2021 with SARS-CoV-2. The researchers looked for an association between the rate of confirmed infections and the time that had passed since vaccination. Without any significant waning of immunity, one shouldn't see any difference in infection rates among people who were fully vaccinated at the earliest opportunity versus those vaccinated later.

The results were clear: the rate of confirmed COVID-19 infection revealed a slow but steady waning of immunity over time. Among individuals 60 years or older who were fully vaccinated last January, the number of confirmed breakthrough infections was 3.3 per 1,000 people during the three weeks of the study. Those who were vaccinated in February and March had lower infection rates of 2.2 per 1,000 and 1.7 per 1,000, respectively. The data revealed a similar pattern in those aged 40 to 59 and those aged 16 to 39.

An important question is whether these breakthrough infections were serious enough to require hospitalization. While such cases were much less common, more than 400 of those with confirmed COVID-19 breakthroughs went on to develop severe illness. And, again, the data show a similar pattern of waning immunity. The rate of severe COVID-19 among adults 60 years of age or older who were fully vaccinated in January was 0.34 cases per 1,000 persons. The rate of severe illness dropped to 0.26 cases per 1,000 among those vaccinated in February and 0.15 cases per 1,000 for those vaccinated in March. The researchers report that the number of severe COVID-19 cases among the younger fully vaccinated groups were too small to draw any conclusions.

While the Delta variant surely has played a role in the resurgence of COVID-19 in recent months, these findings suggest that waning immunity also is an important factor. Understanding these dynamics is essential for making critical policy decisions. In fact, these data were a key factor in the decision by the Israeli Ministry of Health in July 2021 to approve administration of COVID-19 booster shots for individuals who'd been vaccinated at least 5 months before.

Back in the U.S., if you were among those who got your vaccine on the early side—good for you. If it's been more than six months since your original shots, and if you are in one of the risk groups, you should consider a COVID-19 booster shot to remain optimally protected in the

months ahead. I'll be getting my Moderna booster this week. While you're at it, consider getting your annual flu shot taken care of, too. The CDC guidelines state that it's perfectly OK to get your COVID-19 and flu shots at the same time.

Reference:

[1] Waning immunity after the BNT162b2 vaccine in Israel. Goldberg Y, Mandel M, Bar-On YM, Bodenheimer O, Freedman L, Haas EJ, Milo R, Alroy-Preis S, Ash N, Huppert A. N Engl J Med. 2021 Oct 27.

Links:

COVID-19 Research (NIH)

COVID-19 Vaccine Booster Shots (Centers for Disease Control and Prevention)

Frequently Asked Influenza (Flu) Questions: 2021-2022 Season (CDC)

Related

The Latest on COVID-19 Boosters
September 28, 2021
In "News"

Breakthrough Infections Occur in Those with Lower Antibody Levels, Israeli Study Shows
October 26, 2021
In "News"

mRNA Vaccines May Pack More Persistent Punch Against COVID-19 Than Thought
July 13, 2021
In "News"

Posted In: News

Tags: booster shot, breakthrough infections, COVID-19, COVID-19 vaccine, Delta variant, flu shot, immunity, Israel, novel coronavirus, older adults, pandemic, Pfizer, Pfizer/BioNTech vaccine, SARS-CoV-2, waning immunity

One Comment

Steve White **says:**
November 9, 2021 at 11:04 am
I am not against the vaccines or boosters, but I think the numbers the Director is citing from this study indicate the media and CDC have given out very misleading information. Instead of saying "In Israel, 1 in 300 people who got vaccinated in January have gotten infected" – a number which I think CDC knows will not scare people enough – and indeed, their own experts believed was not scary enough (they may not have had all the data available now but they certainly knew breakthroughs were rare when they advised on boosters) – to really push boosters, we are given horror stories about significantly reduced

protection.
Stories about breakthroughs, which probably get some people running for their boosters, and others saying :Heck with it, what is the point?" Or other rationalizations.

Maybe they should have said, "breakthrough are so rare, and so unlikely to be severe, that we do not think boosters are really needed for most healthy people" -or something similar to that. Oh, wait …

Or, how about "while there is extra protection from getting a booster, for those who were already infected, the rate of reinfection is very low in either case" ?

I am not even going into the extremely low rate of severe illness among children, and the strong possibility they are better off with natural immunity – remember, the human race, and for that matter, all our ancestor mammalian races, presumably, have dealt with viruses from other species for millions of years. Think about this deeply – maybe we've evolved so that children strongly tend to not get severely ill, and tend to get lifelong protection, when exposed to novel viruses. Old folks who are no longer breeding – anything can happen to them – just what we see with this thing so far – and maybe giving kids vaccines, which will protect against one variant (the one they were designed to stop) very well, closely related variants less effectively, and other variants maybe not at all, will set them up to be more vulnerable for the coming variants, than kids who caught the first, apparently least virulent, variant, and now have some immunity to every vulnerable part of it.

Reply

Leave a Comment

Enter your comment here...

Recent Items

- Israeli Study Shows How COVID-19 Immunity Wanes over Time November 9, 2021
- NIH Welcomes HHS Leaders to Campus November 8, 2021
- Precision Deep Brain Stimulation Shows Initial Promise for Severe Depression November 4, 2021
- NIH Efforts Recognized at 2021 Sammies November 2, 2021
- Partnership to Expand Effective Gene Therapies for Rare Diseases November 2, 2021

Blog Archives

Select Month

About the NIH Director

Francis S. Collins, M.D., Ph.D.

Appointed the 16th Director of NIH by President Barack Obama and confirmed by the Senate. He was sworn in on August 17, 2009. On June 6, 2017. President Donald Trump announced his selection of Dr. Collins to continue to serve as the NIH Director.

More about Dr. Collins

@NIHDirector on Twitter

Researchers attempting to explain why some young people with no comorbidities get critical #COVID19 found those wit… https://t.co/Lc8QFbggAK **16 hours ago**

Thank you @SecBecerra & @HHSgov Deputy Secretary Andrea Palm for visiting #NIH! It was a pleasure hosting you yeste… https://t.co/AJ30PlGhE7 **4 days ago**

Could electrical stimulation delivered right to #brain areas underlying treatment-resistant #depression offer lasti… https://t.co/BOnhMESfM5 **5 days ago**

Follow @NIHDirector

NIH On Facebook

Follow on Facebook

Blog Info

Editor

Kendall Morgan, Ph.D.

Comments and Questions

If you have comments or questions not related to the current discussions, please direct them to **Ask NIH**.

You are encouraged to share your thoughts and ideas. Please review the **NIH Comments Policy**