

Study: Vaccines still effective against delta variant

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Obtaining two vaccine doses remains the most effective way to ensure protection against the COVID-19 delta variant of concern dominant in the UK today, according to [a study](#) from the University of Oxford.

Conducted in partnership with the Office of National Statistics (ONS) and the Department for Health and Social Care (DHSC), the study found that with delta, Pfizer-BioNTech and Oxford-AstraZeneca vaccines still offer good protection against new infections, but effectiveness is reduced compared with Alpha.

Two doses of either [vaccine](#) still provided at least the same level of protection as having had COVID-19 before through natural infection; people who had been vaccinated after already being infected with COVID-19 had even more protection than vaccinated individuals who had not had COVID-19 before.

However, delta infections after two [vaccine doses](#) had similar peak levels of virus to those in unvaccinated people; with the Alpha variant, peak virus levels in those infected post-vaccination were much lower.

Professor Sarah Walker, professor of medical statistics and epidemiology at the University of Oxford and chief investigator and academic lead for the COVID-19 Infection Survey, said: "We don't yet know how much transmission can happen from people who get COVID-19 after being vaccinated—for example, they may have high levels of virus for shorter periods of time.

"But the fact that they can have high levels of virus suggests that people who aren't yet vaccinated may not be as protected from the delta variant as we hoped. This means it is essential for as many people as possible to get vaccinated—both in the UK and worldwide."

Other key findings from the study:

- A single dose of the Moderna vaccine has similar or greater effectiveness against the delta variant as single doses of the other vaccines.

- Two doses of Pfizer-BioNTech have greater initial effectiveness against new COVID-19 infections, but this declines faster compared with two doses of Oxford-AstraZeneca.
- Results suggest that after four to five months effectiveness of these two vaccines would be similar—however, researchers say long-term effects need to be studied.
- The time between doses does not affect effectiveness in preventing new infections, but younger people have even more protection from vaccination than older people.

Dr. Koen Pouwels, senior researcher in Oxford University's Nuffield Department of Population Health, said: "The fact that we did not see any effect of the interval between first and second doses, and the greater effectiveness of having had two doses, rather than one dose, supports the decision to reduce this to eight weeks now delta is the main variant of concern in the UK.

"However, whilst vaccinations reduce the chance of getting COVID-19, they do not eliminate it. More importantly, our data shows the potential for vaccinated individuals to still pass COVID-19 onto others, and the importance of testing and self-isolation to reduce transmission risk."

This study from the COVID-19 Infection Survey is the largest to evaluate, and directly compare, the real-world effectiveness of the Pfizer-BioNTech and Oxford-AstraZeneca vaccines against all infections, including those without symptoms, after the delta variant has dominated. It is the first to show how protection against COVID-19 infections changes over time following second vaccinations in a large group of adults from the general population.

Released today as a pre-print, the study compares protection from infections from COVID-19 vaccines before and after 17 May 2021, when delta became the main variant in the UK. It also looks in detail at

how effectiveness changes over time as well as other factors like previous infection. Researchers analyzed 2,580,021 test results from nose and throat swabs taken from 384,543 participants aged 18 years or older between 1 December 2020 and 16 May 2021, and 811,624 test results from 358,983 participants between 17 May 2021 and 1 August 2021.

The COVID-19 Infection Survey will continue monitoring the pandemic in the UK on a weekly basis to look for early warning signs of rising infection rates in different regions, sub-regions, and demographic groups, as well as continuing to compare the effectiveness of different vaccines and monitor the impact of immunity on protection against COVID-19.

Professor Sarah Walker said: "Without large community surveys such as ours, it is impossible to estimate the impact of vaccination on infections without symptoms—these have the potential to keep the epidemic going, particularly if people who have been vaccinated mistakenly think they cannot catch COVID-19. We are very grateful to all our participants for giving up their time to help us."

Ruth Studley, Deputy Director for Infection Survey Analysis at ONS, said: "I'm delighted to be working in collaboration with such an excellent team at Oxford, who inform our work and put the data from our survey to such invaluable use. There's still a lot for us to learn about COVID-19, but this kind of research is key to informing how we continue to navigate our way through the pandemic. Participants on the COVID Infection Survey have helped us to learn a huge amount about the virus and I would like to thank them all for their continued participation—we are very grateful."

About the National COVID-19 Infection Survey (CIS)

Researchers analyzed 2,580,021 test results from nose and throat swabs taken from 384,543 participants aged 18 years or older between 1 December 2020 and 16 May 2021, and 811,624 test results from 358,983 participants between 17 May 2021 and 1 August 2021. In this latter period, when delta was the main variant causing SARS-CoV-2 infection, 21 days after a single dose of Oxford-AstraZeneca, Pfizer-BioNTech or mRNA-1273 vaccines (with no second dose), the rates of all new COVID-19 infections had dropped by 43%, 58% and 75% respectively in those aged 18 to 64. Fourteen days after a second dose of Oxford-AstraZeneca or Pfizer-BioNTech, rates had dropped by 67% and 82% respectively. In comparison, people who had not been vaccinated but had had COVID-19 before had rates which were 73% lower than unvaccinated individuals.

The effectiveness of ChAdOx1 or Pfizer-BioNTech did not depend on the time between first and second doses. However, people vaccinated after having already had COVID-19 had more protection from vaccination than those who were vaccinated but had not had COVID-19 before. For example, 14 days after a second dose of Oxford-AstraZeneca, on average the rates of all new COVID-19 infections had dropped by 88% among those with prior infection versus 68% in those without; and 93% versus 85%, respectively for Pfizer-BioNTech.

Younger people also had significantly greater protection from both vaccines. The effectiveness of a single dose of ChAdOx1 was slightly lower in those reporting long-term health conditions.

With delta, infections that happened after two doses had similar peak viral burden to those in unvaccinated individuals. Previously with Alpha, infections that happened after two doses had much lower peak viral burden. Similarly to [effectiveness](#), viral burden was lower immediately after two Pfizer-BioNTech doses, but increased faster with time after second vaccination than with Oxford-AstraZeneca, leading to similar

levels of viral burden with the two vaccines ~3 months after second doses.

The COVID-19 Infection Survey is the largest longitudinal community survey of SARS-CoV-2 [infection](#) across the UK, including a representative sample of households (and over 450,000 individuals aged two and older in total) in England, Wales, Northern Ireland and Scotland. Participants completed a questionnaire and nose and throat swabs at regular visits, and a subset also give blood for antibody testing.

More information: Impact of Delta on viral burden and vaccine effectiveness against new SARS-CoV-2 infections in the UK, www.ndm.ox.ac.uk/files/coronav...mbinedve20210816.pdf

Provided by University of Oxford

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