

## In brief

### Period of isolation relevant to vaccination status

29 September 2021

---

### Background

- Throughout the COVID-19 pandemic, [public health measures](#) such as quarantine, lockdown, isolation, social distancing and mask wearing have been effective in reducing the transmission of COVID-19.<sup>1</sup>
- COVID-19 vaccines have been shown to be [highly effective in providing protection](#) against symptomatic and severe COVID-19.<sup>2</sup> Vaccines have also been shown to [reduce the chance of onward transmission](#) by 40 to 50%.<sup>3</sup>
- Additionally, for people who are infected with the Delta variant, vaccinated individuals are likely to experience [faster drop in viral loads](#) after day seven of diagnosis compared to unvaccinated individuals and likely to spread the virus for a [lesser time](#).<sup>4, 5</sup>
- As the pandemic progresses and more people are vaccinated, jurisdictions around the world are considering the impact of vaccination on other public health measures. Some jurisdictions have waived the requirement for self-isolation for fully vaccinated individuals that were identified as close contacts. This is on condition that they either don't have symptoms or get tested at various points in time after exposure.

### Vaccinated people and transmission risk

- [Studies](#) have shown that vaccination reduces the likelihood of the individual and their household members (in case of breakthrough infection in an index case) being infected with COVID-19.<sup>6</sup>
  - A UK study which analysed data from the [Household Transmission Evaluation Dataset \(HOSTED\)](#) involving 970,128 household contacts of COVID-19 positive cases reported that the likelihood of household transmission is reduced by 40% to 50% for vaccinated cases ( $\geq 21$  days before testing positive, either with Pfizer or Oxford/AstraZeneca vaccine) than unvaccinated index cases.<sup>3</sup>
  - A [preprint study from Israel](#) involving more than 2.3 million individuals found that vaccine (Pfizer) effectiveness against susceptibility to infection was 80 to 88%; the vaccine effectiveness against infectiousness was 41 to 79% for breakthrough infections among vaccinated individuals; and the overall vaccine effectiveness against transmission was 88.5%.<sup>7</sup>
  - A second [preprint study from Israel](#) involving 210 households with 215 index cases found the likelihood of household transmission is 81% less for vaccinated index cases (with Pfizer) than unvaccinated cases.<sup>8</sup>
  - A [preprint study from Finland](#) found that the indirect effectiveness of vaccination against infection of household members of the vaccinated individual was 8.7% two weeks after first dose and 42.9% ten weeks after.<sup>9</sup>
- A study from [Israel](#) involving 4,938 COVID-19 positive cases reported that individuals infected 12 days or longer after vaccination (with Pfizer, receiving second dose on day 21) had significantly lower viral loads at the time of testing than unvaccinated individuals. There was no

significant difference in viral load between individuals who tested positive one to 11 days after being vaccinated and who were unvaccinated.<sup>10</sup>

- The evidence on vaccine effectiveness against transmission of the Delta variant is currently emerging. While [early evidence](#) suggests the level of viral load among vaccinated individuals infected with Delta variant is similar to that of unvaccinated individuals, the relative role of vaccinated individuals spreading the virus in the community and household is unknown.<sup>11</sup> Vaccinated individuals infected with Delta variant are likely to experience [faster drop in viral loads](#) after day seven of diagnosis compared with unvaccinated individuals.<sup>4</sup>
  - A [CDC report](#) of a Delta variant outbreak in a county involving 469 COVID-19 positive cases found that levels of upper respiratory tract SARS-CoV-2 RNA were similar among fully vaccinated, partially vaccinated, unvaccinated and vaccination status unknown.<sup>12</sup>
  - A [UK study](#) found that the level of viral load in fully vaccinated COVID-19 positive individuals were similar to those who were unvaccinated.<sup>13</sup>
  - A [preprint study from Singapore](#) found that the viral load in vaccinated individuals with Delta variant was similar to that of unvaccinated individuals at the time of diagnosis but experienced a faster decrease than unvaccinated individuals after day seven.<sup>4</sup>
  - A [preprint study from Israel](#) involving 11,000 infections found that the viral load in vaccinated individuals with Delta variant was lower than that of unvaccinated individuals.<sup>14</sup>
  - A [preprint study from Portugal](#) found viral load in vaccinated individuals with either Alpha or Delta variants was lower than that of unvaccinated individuals; however, the difference in viral load is higher for Alpha variant.<sup>15</sup>
  - A [preprint study from the USA](#) found that the level of viral load in nasal swab was similar in fully vaccinated and unvaccinated individuals with Delta variant. Those with high viral load (Ct values <25) had similar capacity to shed infectious SARS-CoV-2 virus regardless of vaccination status.<sup>16</sup>
  - A [preprint study from China](#) found that index cases of Delta variant without vaccination or with one dose of vaccination were more likely to transmit infection to their contacts than those who had received two doses of vaccination.<sup>17</sup>

### Isolation policies for vaccinated close contacts internationally

- Many countries internationally have updated isolation policies for fully vaccinated individuals following close contact with a COVID-19 case. Generally, features of these policies include that people do not need to self-isolate if they have no COVID-19 symptoms, they are advised to undergo COVID-19 PCR testing, they should wear a mask and physical distance when outside the home and self-monitor for symptoms. If COVID-19 symptoms occur, then contacts should immediately self-isolate.
- The [Centres for Disease Control and Prevention](#) have recommendations for fully vaccinated people with no COVID-like symptoms following exposure to a close contact.<sup>18</sup> Most fully vaccinated people with no COVID-like symptoms do not need to quarantine following exposure if they follow the below testing and masking recommendations:
  - Be tested three to five days following the exposure.
  - Wear a mask in public indoor settings for 14 days or until they receive a negative test result
  - Isolate if they test positive.

- Consider masking at home for 14 days if they live with someone who is immunosuppressed, at risk of severe disease or unvaccinated.
- The [European Centre for Disease Prevention and Control](#) in April 2021 advised that vaccinated contacts exposed to a confirmed case should continue to be managed according to existing guidance. However, health authorities may consider undertaking a risk assessment on a case-by-case basis and subsequently classify some fully vaccinated contacts as low-risk contacts. This would consider the local epidemiological situation in terms of circulating variants, the type of vaccine received, the age of the contact and the risk of onward transmission to vulnerable persons.<sup>2</sup>
- International examples of policies for vaccinated close contacts include the following:
  - [Health Service Executive in Ireland](#) have different policies on isolation, including for those who are vaccinated. Fully vaccinated people who are a close contact and do not have any symptoms of COVID-19 may not need to restrict movements or get a test. In this health service a contact tracer advises what the individual should do.<sup>19</sup>
  - In the UK, [fully vaccinated adults in the UK](#) do not have to self-isolate for 10 days if they're told they have been in close contact with a person who has COVID-19.<sup>20</sup> The second vaccine must have been received at least 14 days before contact with the infected person. Instead of self-isolating, [people are advised to get a free PCR test](#) as soon as possible.<sup>21</sup>
  - The [Netherlands quarantine program](#) states people who are protected against COVID-19 and are a close contact do not need to quarantine. Protected against COVID-19 is defined as more than 14 days following being fully vaccinated, having previously had COVID-19 and having one dose, or having COVID-19 within the past six months.<sup>22</sup>
  - In Wales, all people who have been fully vaccinated will [no longer have to self-isolate](#) if they are identified as close contacts. Extra safeguards will be put in place for those working with vulnerable people including a risk assessment for staff working in health and care and daily lateral flow tests. All contacts of a positive case will continue to be advised to have a PCR test on day two and day eight, regardless of vaccination status.<sup>23</sup>
  - In the [Canadian province Saskatchewan](#), fully vaccinated people do not need to self-isolate when named as a close contact. People who experience symptoms should continue to isolate.<sup>24</sup> [In Ontario](#), people who are fully vaccinated for 10 days after their exposure should wear a mask and maintain physical distancing when outside the home and self-monitor for symptoms daily and self-isolate immediately when symptoms develop.<sup>25</sup>
  - The [Norwegian Institute of Public Health](#) states fully vaccinated people and those who have had COVID-19 in the last 12 months are exempt from infection quarantine, and protected people who have had their first vaccine dose between three and 15 weeks ago can be exempt if they take a PCR test between days three and seven.<sup>26</sup>

To inform this brief, PubMed and Google searches were conducted using terms related to viral load, breakthrough infection, reinfection, transmission and vaccinated, isolation and vaccinated close contact on 01 September 2021.

## References

1. Ayouni I, Maatoug J, Dhouib W, et al. Effective public health measures to mitigate the spread of COVID-19: a systematic review. *BMC Public Health*. 2021;21(1):1-14. DOI: 10.1186/s12889-021-11111-1
2. European Centre for Disease Prevention and Control. Interim guidance on the benefits of full vaccination against COVID-19 for transmission risks and implications for non-pharmaceutical interventions [Internet]. Stockholm: European Centre for Disease Prevention and Control. 2021 [cited 31 August 2021]. Available from: <https://www.ecdc.europa.eu/sites/default/files/documents/Interim-guidance-benefits-of-full-vaccination-against-COVID-19-for-transmission-and-implications-for-non-pharmaceutical-interventions.pdf>
3. Harris RJ, Hall JA, Zaidi A, et al. Effect of Vaccination on Household Transmission of SARS-CoV-2 in England. *New England Journal of Medicine*. 2021;385(8):759-60. DOI: 10.1056/NEJMc2107717
4. Chia PY, Xiang Ong SW, Chiew CJ, et al. Virological and serological kinetics of SARS-CoV-2 Delta variant vaccine-breakthrough infections: a multi-center cohort study. *medRxiv*. 2021:1-21. DOI: 10.1101/2021.07.28.21261295
5. Centers for Disease Control and Prevention. Delta Variant: What We Know About the Science [Internet]. USA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 26 August 2021 [cited 31 August 2021]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/variants/delta-variant.html>
6. Agency for Clinical Innovation. Living Evidence - COVID-19 vaccines [Internet]. Australia: Agency for Clinical Innovation; 13 September 2021 [cited 31 August 2021]. Available from: <https://aci.health.nsw.gov.au/covid-19/critical-intelligence-unit/covid-19-vaccines>
7. Prunas O, Warren JL, Crawford FW, et al. Vaccination with BNT162b2 reduces transmission of SARS-CoV-2 to household contacts in Israel. *medRxiv*. 2021:1-26. DOI: 10.1101/2021.07.13.21260393
8. Layan M, Gilboa M, Gonen T, et al. Impact of BNT162b2 vaccination and isolation on SARS-CoV-2 transmission in Israeli households: an observational study. *medRxiv*. 2021:1-20. DOI: 10.1101/2021.07.12.21260377
9. Salo J, Hägg M, Kortelainen M, et al. The indirect effect of mRNA-based Covid-19 vaccination on unvaccinated household members. *medRxiv*. 2021:1-8. DOI: 10.1101/2021.05.27.21257896
10. Levine-Tiefenbrun M, Yelin I, Katz R, et al. Initial report of decreased SARS-CoV-2 viral load after inoculation with the BNT162b2 vaccine. *Nature Medicine*. 2021;27(5):790-2. DOI: 10.1038/s41591-021-01316-7
11. Subbaraman N. How do vaccinated people spread Delta? What the science says [Internet]. USA: Nature; 12 August 2021 [cited 31 August 2021]. Available from: <https://www.nature.com/articles/d41586-021-02187-1>
12. Centers for Disease Control and Prevention. Outbreak of SARS-CoV-2 Infections, Including COVID-19 Vaccine Breakthrough Infections, Associated with Large Public Gatherings — Barnstable County, Massachusetts, July 2021 [Internet]. USA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 6 August 2021 [cited 31 August 2021]. Available from: <https://www.cdc.gov/mmwr/volumes/70/wr/mm7031e2.htm>

13. Nuffield Department of Medicine UoO. New Studies: Impact of Delta on viral burden and vaccine effectiveness against new SARS-CoV-2 infections in the UK [Internet]. United Kingdom: Nuffield Department of Medicine, University of Oxford; 2021 [cited 31 August 2021]. Available from: <https://www.ndm.ox.ac.uk/covid-19/covid-19-infection-survey/results/new-studies>
14. Levine-Tiefenbrun M, Yelin I, Alapi H, et al. Viral loads of Delta-variant SARS-CoV2 breakthrough infections following vaccination and booster with the BNT162b2 vaccine. medRxiv. 2021:1-12. DOI: 10.1101/2021.08.29.21262798
15. Kislaya I, Rodrigues EF, Borges V, et al. Delta variant and mRNA Covid-19 vaccines effectiveness: higher odds of vaccine infection breakthroughs. medRxiv. 2021:1-16. DOI: 10.1101/2021.08.14.21262020
16. Riemersma KK, Grogan BE, Kita-Yarbro A, et al. Shedding of Infectious SARS-CoV-2 Despite Vaccination when the Delta Variant is Prevalent – Wisconsin, July 2021. medRxiv. 2021:1-13. DOI: 10.1101/2021.07.31.21261387
17. Kang M, Xin H, Yuan J, et al. Transmission dynamics and epidemiological characteristics of Delta variant infections in China. medRxiv. 2021:1-26. DOI: 10.1101/2021.08.12.21261991
18. Centers for Disease Control and Prevention. Interim Public Health Recommendations for Fully Vaccinated People [Internet]. USA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; July 27 2021 [cited 31 August 2021]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html>
19. Health Service Executive (HSE). If you are a close contact of COVID-19 [Internet]. Ireland: HSE Live; 2021 [cited 31 August 2021]. Available from: <https://www2.hse.ie/conditions/covid19/contact-tracing/close-contact/#if-you-are-fully-vaccinated>
20. British Broadcasting Corporation (BBC). Covid: Do I have to self-isolate if I'm fully vaccinated? [Internet]. United Kingdom: British Broadcasting Corporation (BBC); 27 August 2021 [cited 31 August 2021]. Available from: <https://www.bbc.com/news/explainers-54239922>
21. Department of Health and Social Care and The Rt Hon Sajid Javid. Press release: Self-isolation removed for double-jabbed close contacts from 16 August [Internet]. United Kingdom: Department of Health and Social Care and The Rt Hon Sajid Javid; 11 August 2021 [cited 31 August 2021]. Available from: <https://www.gov.uk/government/news/self-isolation-removed-for-double-jabbed-close-contacts-from-16-august>
22. National Institute for Public Health and the Environment Ministry of Health, Welfare and Sport. Quarantine and isolation [Internet]. The Netherlands: National Institute for Public Health and the Environment Ministry of Health, Welfare and Sport; 24 August 2021 [cited 31 August 2021]. Available from: <https://www.rivm.nl/en/coronavirus-covid-19/quarantine-and-isolation>
23. Welsh Government. Press release: Changes to self-isolation for fully-vaccinated adults [Internet]. Wales: Welsh Government; 29 July 2021 [cited 31 August 2021]. Available from: <https://gov.wales/changes-self-isolation-fully-vaccinated-adults>
24. Saskatchewan Government. Self-Isolation [Internet] Canada: Saskatchewan Government; 2021 [cited 31 August 2021]. Available from: <https://www.saskatchewan.ca/government/health-care-administration-and-provider-resources/treatment-procedures-and-guidelines/emerging-public-health-issues/2019-novel-coronavirus/about-covid-19/self-isolation>

25. Ontario. COVID-19 Fully Immunized and Previously Positive Individuals: Case, Contact and Outbreak Management Interim Guidance [Internet]. Canada: Ontario; 14 September 2021 [cited 31 August 2021]. Available from: [https://www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/docs/contact\\_mngmt/COVID-19\\_fully\\_vaccinated\\_interim\\_guidance.pdf](https://www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/docs/contact_mngmt/COVID-19_fully_vaccinated_interim_guidance.pdf)
26. Norwegian Institute of Public Health. Advice and rules after you have been vaccinated or have had COVID-19 [Internet]. Norway: Norwegian Institute of Public Health; 30 August 2021 [cited 31 August 2021]. Available from: <https://www.fhi.no/en/op/novel-coronavirus-facts-advice/facts-and-general-advice/after-vaccination-and-recovery-from-covid-19/>

SHPN: (ACI) 210842 | TRIM: ACI/D21/695-37 | Edition 1