

## Evidence Paper

### Likelihood of Transmission of COVID-19, post-vaccine

Evidence currently suggests that transmission risk is likely to be substantially reduced in vaccinated people.

So far, the available COVID-19 vaccines have not been judged primarily on their ability to prevent transmission – though this is now being evaluated as a secondary endpoint for many of them. Instead, their efficacy was assessed by whether they could prevent symptoms from developing.

One study<sup>1</sup> of British healthcare workers found that people who had antibodies already when the study began – presumably from a first infection – had a 17% chance of catching it a second time. Around 66% of these cases were asymptomatic, but it's thought that you don't need to have symptoms to be at risk of passing the virus on to others.

Below, Table 1 refers to CDC<sup>2</sup>, Background and Evidence for Public Recommendations for Fully Vaccinated People. Further evidence of the impact of vaccination with Pfizer-BioNTech and Moderna COVID-19 vaccine has been demonstrated among healthcare workers with major reductions in SARS-CoV-2 infections among those receiving two doses of COVID-19 vaccine even in the setting of increasing community transmission.<sup>21-23</sup>

In contrast, data from nursing home residents demonstrate blunted antibody responses, which has important implications regarding the quality and durability of protection from COVID-19 vaccination in this population.<sup>24</sup> Recent reports also suggest that people with solid organ transplants or patients on rituximab (an immunomodulating medication) have reduced antibody responses to the first dose of mRNA vaccination.<sup>25, 26</sup> At this time, there are limited data on vaccine protection in people who are immunocompromised. People with immunocompromising conditions, including those taking immunosuppressive medications, should discuss the need for personal protective measures after vaccination with their healthcare provider.

#### **Table 1: Effectiveness against asymptomatic SARS-CoV-2 infection and transmission**

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<sup>1</sup> <https://www.bbc.com/future/article/20210203-why-vaccinated-people-may-still-be-able-to-spread-COVID-19>

<sup>2</sup> <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/fully-vaccinated-people.html>

Country	Population	Vaccine	Outcome	Vaccine effectiveness or risk reduction
United States <sup>27</sup>	General adult population	Pfizer-BioNTech or Moderna	Asymptomatic infection	80%*
United Kingdom (Scotland) <sup>28</sup>	Healthcare workers and household members	Pfizer-BioNTech or AstraZeneca	Household members: SARS-CoV-2 infection	54%**
Israel <sup>19</sup>	General adult population	Pfizer-BioNTech	Asymptomatic infection	94%**

\* 0 days after second dose

\*\* 14 days after second dose

**Table 2: Model results examining percent risk reduction relative to baseline where unvaccinated individual is exposed at origin and takes no precautions**

Vaccine effectiveness against infection	Pre-travel test <sup>a</sup>	7-day quarantine	Post-travel test day 3–5	Median Post Travel risk reduction
No vaccine	✓	✓	✓	97.1%
60%	✓	✓	✓	98.9%

What seems to be problematic in the eyes of Keith Neal, professor emeritus of epidemiology at the University of Nottingham, is that there are two factors – countries have lockdowns and a vaccine. This makes it quite difficult to identify the effectiveness of the vaccine as a combination of both can reduce the transmission of COVID-19.

### Conclusion<sup>3</sup>

The potential for reduced viral load in vaccinated people who develop COVID-19, suggest that any associated transmission risk is likely to be substantially reduced in vaccinated people. While vaccine efficacy against emerging SARS-CoV-2 variants remains under investigation, preliminary evidence suggests that the COVID-19

<sup>3</sup> <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/fully-vaccinated-people.html>

vaccines will likely be effective against emerging variants, though reduced antibody neutralization and efficacy has been observed for the B.1.351 variant.

The risks of SARS-CoV-2 infection in fully vaccinated people cannot be completely eliminated in the setting of continued widespread community transmission of the virus. Vaccinated people could potentially still become infected and spread the virus to others. However, the benefits of avoiding disruptions such as unnecessary quarantine and social isolation may outweigh these potential residual risks. A balanced approach to phasing out certain prevention measures may be a powerful motivator for vaccination.

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