



Q/A: Why Are Vaccines and Masks Needed for Protection During the COVID-19 Pandemic?

By Joseph P. McGowan, MD, Chair; Charles G. Gonzalez, MD, Medical Director; Christopher J. Hoffmann, MD, MPH, JHU Director, Medical Care Criteria Committee, New York State Department of Health AIDS Institute; August 17, 2021

Conflicting and changing messages regarding the use of face masks reflect the evolution in knowledge about SARS-CoV-2 transmission and prevention of severe COVID-19. When asked or wondering why face masks are still needed even after vaccination, some facts may help.

WHY DO WE NEED VACCINES? Of all people hospitalized with COVID-19 in the United States during the summer of 2021, [more than 95%](#) were people who have not been fully vaccinated. Vaccination prevents *severe* COVID-19 disease that can lead to hospitalization and death. Before the Delta variant became dominant, the COVID-19 vaccine was found to reduce disease by 95% compared with placebo [Polack FP, Thomas SJ, Kitchin N, et al. [N Engl J Med 2020; 383:2603-2615](#)]. The vaccines are also protective against the now dominant Delta variant, with 70% to 88% effectiveness in preventing COVID-19 [Bernal JL, Andrews N, Gower C, et al. [N Engl J Med 2021; 385:585-594](#)].

DOES THE COVID-19 VACCINE PROTECT AGAINST THE VARIANT? The vaccines are not designed to prevent infection by SARS-CoV-2, the virus that causes COVID-19 disease. Vaccinated people can still develop upper airway infection and transmit SARS-CoV-2, even if they do not have symptoms.

The risk of transmission by an infected person (even when asymptomatic) correlates with the level of viral shedding. This helps to explain the very high infectivity of the Delta variant, which is associated with high levels of virus in the upper airways (1,000-fold higher viral RNA in the nasopharynx than observed with prior strains) [Li B, Deng A, Hu Y, et al. [\(preprint\) medRxiv 2021.07.07.21260122](#)]. Levels of the Delta variant virus rise earlier during infection, and levels are similar in vaccinated and unvaccinated people [Brown CM, Vostok J, Johnson H, et al. [MMWR Morb Mortal Wkly Rep. 2021 Aug 6;70\(31\):1059-1062](#)].

Clinical data from Israel and from the July 2021 COVID-19 outbreak in Barnstable County, MA, have increased understanding of the high infectivity of the Delta variant. The [Israel Health Ministry recently reported](#) that the Pfizer vaccine was only 39% effective in preventing Delta variant infection, whereas it was 95% effective against prior strains during the first quarter of 2021. Notably, the vaccines were found to be 91% effective in preventing severe COVID-19 disease.

In the Massachusetts outbreak, 74% of the 469 infected individuals were fully vaccinated, and most illness was mild. Four individuals were hospitalized, and there were no deaths. During the time of transmission, in the first half of July, local and national public health authorities were recommending that masks be used only by people who were not vaccinated against COVID-19, so not many in the crowds in Provincetown (in Barnstable County) were wearing masks, and a high proportion of transmitted virus was the Delta variant. Vaccination protected against severe disease but did not prevent infection.

WHY DO WE (STILL) NEED FACE MASKS? Face masks (whether surgical or cloth) reduce SARS-CoV-2 transmission by trapping virus-containing respiratory droplets. Masks trap exhaled droplets and block droplet inhalation. By trapping droplets that a person exhales with COVID-19, masks greatly reduce the amount of virus-containing respiratory matter entering shared air, thus greatly reducing the chance that a person will inhale them and become infected.

The Delta variant is highly contagious due to the very high levels of virus in the upper airway of infected people and the large amount of virus spread through respiratory droplets. The use of face masks reduces the inhaled inoculum and the chance of infection. Several studies have reported a 70% reduction in infection among mask wearers [Brooks JT, Butler JC. [JAMA. 2021;325\(10\):998-999](#)]. With the Delta variant, mask-wearing is essential to reducing transmission and infection, even among vaccinated people.

WHAT'S THE BOTTOM LINE? Even with the Delta variant, vaccination prevents severe COVID-19, including hospitalization and death. Vaccination is less effective in preventing transmission, particularly by the Delta variant. The use of face masks reduces the risk of infection and slows the spread of SARS-CoV-2. Universal indoor masking in public settings and universal vaccination are the optimal approach to controlling SARS-CoV-2 transmission and severe COVID-19 among all individuals.