



# PINNACLECARE



## Medical Intelligence Report

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# Topic: COVID-19 Research Update



## Delta Variant Updates

A recent evaluation of the immune response to the Delta variant after either natural infection from SARS-CoV2 or vaccination shows that vaccination provides a higher level of protection than previous infection (Planas, 2021). In 56 individuals who had been previously infected with SARS-CoV-2, the antibodies produced had a substantial decline (by four to six-fold) in the neutralization of the Delta variant compared to the Alpha variant. The individuals had been infected at least six months prior in Orleans, France, and therefore were most likely infected with the initial strain of SARS-CoV-2 or the Alpha variant. However, vaccination with the AstraZeneca-Oxford, Pfizer-BioNTech, or Moderna vaccines led to a continued adequate neutralization of all four variants of SARS-CoV-2 currently spreading around the world. Assessment of the neutralization ability of commercially available antibodies used to treat COVID-19 also showed a reduced neutralization capacity for the Delta variant.

**Along with being substantially more transmissible, mutations in the Delta variant reduce the interactions with antibodies making it more likely for the Delta variant to escape the immune response than the Alpha variant.**

Real-life evidence from Israel indicates that as of June 6th there was marked decline in the effectiveness of the Pfizer-BioNTech vaccine in preventing infection (64%) and symptomatic illness (64%) due to an increase in the spread of Delta in the country (Israel Ministry of Health, 2021). The protection from severe illness continued to be high with an effectiveness rate of about 93% for severe illness or hospitalization.

Johnson & Johnson also released a statement reporting that their vaccine generated strong, persistent activity against the rapidly spreading Delta variant and other prevalent variants (Johnson and Johnson, 2021). Additionally, the vaccine has produced an antibody response that lasts at least eight months.

The continued protection from vaccination is also evident in the shift in the age group with the most infections of SARS-CoV-2 (Mallapaty, 2021). For example, in Israel where over 85% of the adult population has been vaccinated, the number of cases in adults dropped to less than a dozen a day in June with a rise to more than a hundred a day in adolescents and those under the age of 16. This trend is additional evidence that vaccination is preventing infection and symptomatic illness, but unvaccinated young people who are not yet eligible are still getting ill. A

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recent study in Israel showed that as of July 5, over half of the new cases in Israel were in individuals under the age of 19. While the current variants of SARS-CoV-2 continue to cause less severe symptoms in younger people, with the potential rapid spread in a large group of susceptible individuals, additional variants are likely to develop and new variants could change in ways that affect children more harshly.

## **SARS-CoV-2 Vaccines**

A clinical trial of 3,975 medical providers in six states investigated the effectiveness of mRNA vaccines in preventing infection from SARS-CoV-2 and reducing the symptoms of infections (Thompson, 2021). In the study, 80% of participants had received at least one dose of vaccine. Of those who had at least one dose, 84% received both recommended doses.

During the study period, December 14, 2020 to April 10, 2021, 204 participants, corresponding to 5%, were diagnosed with COVID-19 through weekly PCR-based testing. Of those who tested positive, five were fully vaccinated, eleven were partially vaccinated, and 156 were unvaccinated. There were 32 individuals who were excluded from the study due to unknown vaccination status. The vaccine effectiveness in the study was 91% with full vaccination and 81% with partial vaccination.

**Full or partial vaccination reduced the amount of virus produced in sick individuals and reduced the risk of symptoms.**

In those who became infected, the amount of virus measured in the testing samples was 40% lower than in partially or fully vaccinated participants than in unvaccinated participants. The risk of having a fever was 58% lower for individuals who had been vaccinated. Additionally, the duration of illness was shorter with six fewer days of symptoms and 2.3 fewer days spent sick in bed.

## **Possibility of Booster to Vaccinations**

Pfizer recently released a statement about the preliminary results from a trial of a third dose of the Pfizer-BioNTech vaccine (Pfizer, 2021). In the trial, researchers found an increase in neutralizing antibody levels of five to ten times when a third dose was administered after the initial two doses. The company also announced that they would seek FDA authorization for a third dose of the vaccine based on a hypothesis that the increased levels of antibodies produced could boost the activity of the vaccine to similar levels of effectiveness against the Delta variant as those currently observed for the Beta variant studied in the trial (Neergard, 2021). Representatives from the company also reference a study from Israel that found evidence that there may be a waning of protection after six months from the second dose of the vaccine (Soucheray, 2021d). Others have suggested the study is too small to make definitive conclusions about a potential reduction in protection.

In response to Pfizer's press release, the FDA and CDC released a statement reiterating that there is no evidence that the protection from the full two doses of mRNA vaccines has started to wane (CDC and FDA, 2021). Additionally, people who are fully vaccinated are protected from

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severe disease and death, including from the variants currently circulating in the country such as Delta.

**The statement reiterated that “Americans who have been fully vaccinated do not need a booster shot at this time,” and the federal agencies continue to review data from all sources including, but not limited to, pharmaceutical companies.**

A number of other experts, including Anthony Fauci, director of the NIH Institute of Allergy and Infectious Diseases and Michael T. Osterholm, PhD, MPH, director of the University of Minnesota’s Center for Infectious Disease Research and Policy, publically supported the FDA and CDC decision that boosters are not currently needed (Soucheray, 2021d). The WHO has also officially come out against pursuing a third booster shot, and chided the pharmaceutical companies for discussing the issue while the majority of individuals around the world do not even have access to initial vaccination yet (Schnirring, 2021).

Based on the current evidence, a booster is not yet required. However, as more data becomes available, this recommendation could change. Health officials want to stress that changes like this do not mean the FDA and CDC are “flip-flopping” or abusing the public’s trust. Instead, officials are responding to the evidence available at the time (Soucheray, 2021d). The CDC and FDA also state that “We are prepared for booster doses if and when the science demonstrates that they are needed.”

## Transmission of SARS-CoV-2

Researchers have been able to assess many of the interventions put into place to prevent the spread of SARS-CoV-2 (Mendez-Brito, 2021). The authors identified 34 trials that were evaluated.

**They found that closing schools was the most effective intervention followed by workplace closing, business and venue closing and public event bans.**

The review of the results also showed that public information campaigns and mask wearing requirements were effective in controlling transmission while being less disruptive. Interventions that showed no effect on reducing transmission were public transport closure, testing and contact tracing strategies and quarantining or isolation of individuals.

**Additionally, early inception was more effective in reducing COVID-19 cases and deaths, while general stringency in following recommendations was not.**

Another report showed that portable HEPA air cleaners are able to reduce the number of infectious particles in the air and provide enhanced protection between people (Lindsley, 2021).

**Supplementation of ventilation systems with portable HEPA air cleaners in classrooms has been shown to reduce overall aerosol particle concentrations by more than 80% within 30 minutes.**

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In simulated conditions without universal masking in a conference room, the use of two HEPA air cleaners that meet the EPA-recommended clean air delivery rate, the overall exposure to simulated exhaled aerosol particles was reduced by 65%. With universal masking in effect and without the HEPA air cleaners, the combined mean aerosol concentration was reduced by 72%.

**The combination of the two HEPA air cleaners and universal masking reduced overall exposure by up to 90%.**

The researchers found that the air cleaners were most effective when they were close to the source of the aerosols.

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