



2/22/2021

# COVID-19 Literature Review Group

Prepared by The Ohio State University

## COVID-19 Vaccine Immunity, Double Masking, and COVID arm

### **ODH Literature Review Group**

THE OHIO STATE UNIVERSITY

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### **Massachusetts Community Tracing Collaborative**

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## COVID-19 Literature Review

Prepared by Eliana Burlotos, The Ohio State University

February 19, 2021

### Gatherings of COVID-19 Vaccinated Persons

**Title:** When can I see my extended family after being vaccinated for COVID-19?

**Source:** TODAY

**Publication Date:** January 26, 2021

**Link:** <https://www.today.com/health/when-can-families-see-each-other-after-covid-19-vaccines-t206868>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** The two COVID-19 vaccines currently on the market are administered in two doses. The vaccine is not fully effective against the virus until two weeks after the second injection. Dr. David Buchholz says that seeing a few family members that are also vaccinated could be safe, but as the circle gets larger, so does the risk that comes with it. Both vaccines are estimated to be 95% effective; however, Buchholz says that since there is a large amount of virus circulating in the US, that 5% chance can be risky. It will also take time for entire families to be vaccinated. Another issue is that the current vaccines have not been authorized for use in children. Pfizer's vaccine is authorized for people over 16, while Moderna's vaccine is authorized for use in people over 18 years. It is advised that people regardless of vaccination status continue to take precautions by practicing social distancing and wearing masks.

**Key Findings Relevant to Ohio's Response:** It is important that the State of Ohio emphasize that regardless of vaccination status, precautions still need to be taken to avoid COVID-19. Also, those vaccinated must be informed that the vaccine is not fully effective until two weeks after the second injection. The US has a long way until most of the general public is vaccinated.

**Title:** Yes, people with coronavirus vaccinations should still distance from each other. Here's why.

**Source:** The Washington Post

**Publication Date:** January 20, 2021

**Link:** <https://search-proquest-com.proxy.lib.ohio-state.edu/washingtonpost/docview/2479585872/3A0E562035894605PQ/1?accountid=9783>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This article emphasizes that although COVID-19 vaccines are a critical step towards slowing transmission, getting vaccinated is not an immediate return to pre-pandemic life. According to The Washington Post's tracker, as of January 20, 2021 more than 2.2 million people in the US have been fully vaccinated. The article states that at least 70 percent of the population needs to be inoculated for the US to achieve herd immunity. Because SARS-CoV-2 is continuously spreading rapidly across the US, gatherings among people who are fully vaccinated still carry some risk. There is no proof yet that a small gathering of people who have all been vaccinated is 100% safe. Vaccinated people must still follow coronavirus safety measures even around others who have been vaccinated. This is also because protection is not immediate or guaranteed. Additionally, people still do not know whether vaccinated people can transmit the virus as possible carriers

**Key Findings Relevant to Ohio’s Response:** The risk of burnout for following coronavirus safety measures is high. The State of Ohio must recognize this and encourage its citizens to continue practicing safety measures. Perhaps new legislation can be implemented that would reduce the spread of SARS-CoV-2.

**COVID-19 Literature Review**

Prepared by Anjali Prabhakaran, The Ohio State University

February 22, 2020

<b>Title</b>	Early rate reductions of SARS-CoV-2 infection and COVID-19 in BNT162b2 vaccine recipients
<b>Source</b>	The Lancet
<b>Publication Date</b>	2/18/2021
<b>Link</b>	<a href="https://www.thelancet.com/action/showPdf?pii=S0140-6736%2821%2900448-7">https://www.thelancet.com/action/showPdf?pii=S0140-6736%2821%2900448-7</a>
<b>Study Period</b>	December 19, 2020 - January 24, 2021
<b>Study Location</b>	Israel
<b>Sample Size</b>	9109
<b>Summary</b>	This paper describes the COVID-19 infection rate reduction and SARS-CoV-2 immunity rates following a single dose of the Pfizer and BioNTech vaccine in Israel. Vaccination at the Sheba Medical Center, Israel’s largest hospital, began on December 19, 2020 and concluded in January 24, 2021. By this time, 79% of health care workers (HCW) had received a first dose, and 66% had received the second dose. Based on COVID infection rates among the vaccinated healthcare workers, it was determined that the rate reduction of SARS-CoV-2 infection was 30% for days 1-14 following the first dose and 75% for days 15-28 after the first dose. Additionally, the COVID-19 symptom rate reduction was 47% for days 1-14 following the first dose and 85% for days 15-28 after the first dose.
<b>Key Findings Relevant to Ohio’s Response</b>	As vaccine rollout continues in the United States, it is important for policymakers to understand how to space out dosages to best improve nationwide immunity. The data from this study demonstrates that immunity against COVID-19 significantly improves following a single dose of the vaccine, suggesting that spacing out dosages would not be overly detrimental.

<b>Title</b>	When Could the United States Reach Herd Immunity? It's Complicated.
<b>Source</b>	New York Times
<b>Publication Date</b>	02/20/2021
<b>Link</b>	<a href="https://www.nytimes.com/interactive/2021/02/20/us/us-herd-immunity-covid.html">https://www.nytimes.com/interactive/2021/02/20/us/us-herd-immunity-covid.html</a>
<b>Study Period</b>	n/a
<b>Study Location</b>	n/a
<b>Sample Size</b>	n/a
<b>Summary</b>	<p>This New York Times article describes when the United States could achieve COVID-19 herd immunity based on different policy and vaccine distribution scenarios. The estimates are based on a model developed by the Public Health Informatics, Computational, and Operation Research (PHICOR), a public health research group. The U.S. is currently administering about 1.7 million vaccines per day. If that rate increases to 3 million shots per day, as some experts predict will happen by April, the herd immunity threshold could be reached by May. However, this can only occur if social distancing measures continue to be enforced. If restrictions are ended in April, the herd immunity threshold will be reached by June which would also double the amount of COVID deaths when compared to maintaining restrictions. If a more contagious variant spreads, such as the variant first identified in Britain, then the herd immunity threshold will be reached by July.</p>
<b>Key Findings Relevant to Ohio's Response</b>	<p>It is important for policymakers to continue enforcing social distancing measures even as the public continues to be vaccinated. The PHICOR model demonstrates the consequences of failing to adhere to proper preventative measures in terms of both herd immunity and overall COVID-19 death rates.</p>

## COVID 19 Literature Review

Prepared by Amanda Seifferth, The Ohio State University

February 19, 2021

**Title:** Double-masking can increase your COVID-19 protection, but not all masks should be layered

**Source:** The Seattle Times

**Publication Date:** 2/17/21

**Link:** <https://www.seattletimes.com/life/double-masking-can-increase-your-covid-19-protection-but-not-all-masks-should-be-layered/>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** With the rise of increasingly transmissible SARS-CoV-2 variants, talk of double-masking has risen. However, the efficacy of various masking strategies are debated. The CDC still holds that N95 masks should be reserved for healthcare professionals and not worn by the public. Instead, they recommend the KN95 mask, which is the standard in China. However, an estimated 60% of KN95 masks in the U.S. are counterfeit, eliminating their efficacy. Public health officials assert that individuals must be sure their mask is an authentic KN95 in order to ensure protection. Recently, the CDC has recommended double masking, as laboratory testing indicated increased protection from wearing a surgical mask underneath a cloth mask. However, officials emphasize the need for proper fitting. Any gaps created when layering masks defeats the purpose. Furthermore, CDC guidelines detail that the cloth mask should push the surgical mask against the edges of one's face. Research has also indicated that people should refrain from layering surgical masks, as adding a second mask worsens the fit of the first mask. Officials also warn against layering KN95 or N95 masks, believing this practice inhibits airflow.

**Key Findings Relevant to Ohio's Response:** These findings indicate that the public should be advised to check for the legitimacy of their KN95 masks and ensure use of proper masking strategies. Directions should be disseminated regarding doubling masking, instructing residents to wear a surgical mask beneath a cloth mask. Additionally, the use of two masks should be approached with caution, as improper utilization of this method eliminates protection.

**Title:** Can existing unrelated vaccines boost a COVID-19 prime?

**Source:** EClinicalMedicine

**Publication Date:** 02/01/2021

**Link:** [https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370\(21\)00038-9/fulltext](https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(21)00038-9/fulltext)

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** Emerging increasingly contagious SARS-CoV-2 variants have intensified the need to vaccinate as many individuals as possible with a limited vaccine supply. As it is not currently possible to distribute the Covid-19 vaccine to all members of the public, researchers have turned to other methods of enhancing immunity. Moreover, researchers have proposed that the reception of non-related vaccines could boost the immunity achieved from a first dose of the Covid-19 vaccine through heightened trained immunity and killer cell function. More specifically, the Bacillus Calmette-Guerin (BCG) vaccine is believed to potentially boost the function of innate immune cells, initiate cross-reactivity, and instigate bystander activation. These

mechanisms are believed to activate T-cells and increase the quantity of unrelated plasma cells. Currently, research on the effect of the BCG vaccine on Covid-19 immunity is ongoing. However, past research investigating the relationship between the BCG vaccine and various immunities among the elderly discovered enhanced protection against upper respiratory tract infections.

**Key Findings Relevant to Ohio's Response:** These findings indicate that the public should be continuously encouraged to get vaccinated in general. Moreover, it is possible that unrelated vaccines boost the immune system, increasing protection against emerging viruses like SARS-CoV-2. Thus, education regarding the importance of vaccinations should be a focus within public health education initiatives.

### **COVID-19 Literature Review**

Prepared by Greta Warmbier, The Ohio State University

February 17, 2021

**Title:** What Exactly is 'COVID Arm'? Moderna Vaccine Leaves Some Patients with Itchy (But Harmless) Rash

**Source:** Health.com

**Publication Date:** February 5, 2021

**Link:** <https://www.health.com/condition/infectious-diseases/coronavirus/covid-arm-rash-moderna>

**Study Period:** n/a

**Study Location:** n/a

**Sample Size:** n/a

#### **Summary:**

The COVID-19 vaccine comes with the basic side effects that most other vaccines have. However, Moderna has reported a side effect consisting of a large red lesion around the injection site. The professional term for the side effect is delayed cutaneous hypersensitivity, which just means a delayed reaction on the skin. It is an allergic reaction, with firmness and redness at the injection site, along with some reports of itching and pain to the touch. The side effect is unusual because it shows up 5-9 days after the first shot. Most vaccine side effects occur within a day or two.

Chris Gilbert, MD, PhD, experienced "COVID arm" 8 days after her shot. Her arm was very itchy and there was a "red, round lesion about two inches in diameter" at the injection site. "COVID arm" is a brief and harmless response. The rash should go away within 24 hours. It is a part of the body's immune system response. Additionally, there have only been 14 official reports of this reaction. There are more cases reported in women, but this could be attributed to the fact that women are statistically more likely to report. Women experience more side effects in general, accounting for 77% of Moderna's reported side effects. This could also be attributed to the fact that women make up a large percentage of healthcare workers, who were the first to receive the vaccine.

Doctors suggest an antihistamine like Benadryl or a topical steroid to help ease the itching. It is not an infection, and therefore antibiotics are not necessary. "COVID arm" has not happened to people who have received the Pfizer vaccine.

**Relevance to Ohio's COVID-19 Response:** "COVID arm" is harmless and temporary. It occurs in an infinitesimal percentage of recipients of the vaccine and should not deter people away from the Moderna vaccine.

**Title:** Double-masking can increase your protection. But not all masks should be layered.

**Source:** The Philadelphia Enquirer

**Publication Date:** February 15, 2021

**Link:** <https://www.inquirer.com/philly-tips/double-masking-covid19-how-to-layer-20210215.html>

**Study Period:** n/a

**Study Location:** n/a

**Sample Size:** n/a

**Summary:**

What is better – an N95 mask or 2 blue surgical masks? Because supply is limited, the CDC says that N95 masks should be reserved for healthcare workers. Non-essential workers are advised to wear masks with two or more layers of washable, breathable, tightly woven fabric, like cotton, or three-ply surgical masks. KN95 masks are good alternatives, as they are rated to filter out 95% of airborne particles. However, in the United States, 60% of KN95 masks are counterfeit.

Mask fit is the most important factor. It does not matter how many masks you are wearing; if they do not fit properly, you lose the benefit. A well-fitting cloth mask is better than a poor-fitting surgical mask. A verified KN95 mask or three-ply surgical mask that fits snug to the face is better than most cloth masks. Even the smallest gaps can leak respiratory droplets in the air to the nose and mouth. The knot-and-tuck method can help with this. The CDC recommends that cloth masks have multiple layers of fabric and a nose wire.

Double masking can improve protection, when done correctly. It can be an effective way to seal a looser fitting surgical mask to the face. If adding a surgical mask under a cloth mask creates gaps, this defeats the purpose. If double-masking is uncomfortable and causes the wearer to touch their face or constantly readjust, they are better off with just one mask. The outer mask should push the edges of the surgical mask against the face. Because of their loose-fitting nature, surgical masks should never be layered. KN95 masks should not be layered because this would restrict airflow too much. If a mask is over restrictive, it may develop air leaks on the side or cause skin irritation.

**Relevance to Ohio's COVID-19 Response:** Mask fit is the most important thing. If double-masking improves the fit of a loose surgical mask, then do it. If it causes discomfort that affects the wearability and actions of the wearer, then it is not worth it.



## Massachusetts Community Tracing Collaborative

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#### **Vaccine and Immunity Passports** | *Can Vaccinated Individuals be Infected or Contribute to Transmission?*

##### **BBC:** [Can you still transmit Covid-19 after vaccination?](#) (2/3/2021)

Current immunology provides no evidence that SAR-CoV-2 vaccines prevent infections. There are two types of immunity: sterilizing immunity, where a vaccine offers full protection against infection, and effective immunity, where a vaccine only prevents significant symptoms. Most vaccines, such as mumps, pertussis and influenza, merely provide effective immunity. The asymptomatic infections that leak through those vaccines' conferred immunity are frequently contagious. Recent research suggests that those who have natural COVID-19 infections do not develop the antibodies needed to stave off infection altogether. Because the studies that addressed vaccine efficacy focused on symptoms, not transmission, experts cannot know if SARS-CoV-2 vaccines provide protection beyond effective immunity. This does not mean that vaccines cannot curtail transmission, however; even though sterilizing immunity is unlikely, because vaccines make people less-ill, they have the potential to make people less infectious by reducing the amount of virus a patient produces. Vaccine makers are working to understand the extent of immunity provided, and some early data are starting to answer that question:

- **Astra-Zeneca:** During phase three trials, Oxford's vaccine was 59% effective at preventing infections (the study had participants swab themselves) when given as a half dose.
- **Pfizer:** Pfizer claimed that animal studies showed its vaccine significantly curtailed transmission, and recent Israeli data (covered in the 2.3.21 CTC News Digest) revealed that it significantly reduced infections.
- **Moderna:** A small cohort in Moderna's studies suggested that the vaccine prevented two-thirds of asymptomatic infections.
- **Novavax:** A study in macaques showed that Novavax's vaccine could completely prevent transmission and achieve sterilizing immunity.

While scientists have been working on assessing whether vaccines provide sterilizing immunity, modelling studies have suggested that vaccine uptake would only need to be 60-72% if they do. However, if they only offer effective immunity, uptake would need to be significantly closer to 100% in order to achieve herd immunity.

**MIT Technology Review:** [So you got the vaccine. Can you still infect people? Pfizer is trying to find out.](#) (2/2/2021)

Pfizer immunologists believe that their vaccine will slow onward transmission and silent infections. To determine the extent to which it does, Pfizer is routinely testing its study participants for asymptomatic COVID-19. Research from monkeys suggests that vaccinated individuals can still be infected asymptotically. Although asymptomatic individuals are responsible for many transmission events, Pfizer's swabs do not show the extent to which vaccines prevent *transmission*. To address this, scientists have proposed extensive testing and contact tracing studies. The stakes are high for such research; if a vaccine prevents less than two-thirds of transmission events, herd immunity can *never* be achieved. Not knowing what sort of protection vaccines provide also risks inconsistent public health messaging; authorities are simultaneously encouraging vaccination as a path to normalcy and requiring vaccinated individuals to adhere to masking and social distancing guidelines because they may still be infectious.

**Healthline:** [You Can Still Spread, Develop COVID-19 After Getting a Vaccine: What to Know](#) (1/19/2021)

Anecdotal cases show that vaccines do not prevent SARS-CoV-2 infections or even COVID-19, especially in the first weeks after vaccination. In some cases, individuals get infected before receiving their first dose and only develop symptoms after the injection. However, recent research suggests that vaccine-conferred protection does not start for twelve days, and full efficacy is not achieved until about two weeks after the second dose. Once the body has mounted an immune response to the inoculation, a patient is protected from severe illness, not necessarily infection or transmission. Researchers are working to determine what effect vaccines have on asymptomatic infection and spread. Health authorities have issued conservative guidance following an 'act as if you are not vaccinated' position.

**Related Articles | Please find annotations for all related articles on the main resource hub, linked [here](#)**

**Washington Post:** [Many who have received the coronavirus vaccine wonder: What can I safely do?](#) (2/1/2021)

*As scientists struggle to determine the degree to which vaccines provide immunity and new variants emerge, vaccine-provided benefits for those who have received shots are limited. Simultaneously, vaccines are shifting the at-risk population from older people to uninoculated young individuals.*

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## **SAR-CoV-2 Transmission Research and Transmission Information | *Surface and Fomite Transmission***

**Nature:** [COVID-19 rarely spreads through surfaces. So why are we still deep cleaning?](#) (1/29/2021)

Although surfaces do not readily lead to transmission, authorities are continuing costly cleaning schemes because of conflicting advice and misleading research. Research from the very start of the pandemic suggested that surfaces, known as fomites, could harbor viral RNA for days. A slew of lab-based studies also indicated that SARS-CoV-2 could persist on surfaces for days. This research, coupled with the known attributes of other pathogens, led to guidance to clean fomites. It also contributed to mass alarm—sales of sanitation products soared 30% in 2020, and many customers have started to expect regular sanitation in public places. Despite the hysteria, the research was misinterpreted and misleading. Viral RNA is not infectious; the virus-survival studies used unrealistic lab conditions and never suggested that fomites cause infections. The few studies that have looked at fomites outside of the lab have almost always only found RNA. Researchers cannot rule out surface transmission entirely, and definitive studies would be unethical. Still, the most accurate data suggest that the risk of surface transmission is as low as 5 in 10,000, and only one study has claimed to show unequivocal fomite transmission. Thus, although all experts agree that hand washing is necessary, the scientific community is pressuring health authorities to alter their recommendations to reflect the epidemiological reality.

**Nature:** [Coronavirus is in the air — there's too much focus on surfaces](#) (2/2/2021)

According to this editorial, government guidance on surface transmission is unclear and does not reflect the low likelihood of touch-related SARS-CoV-2 spread. Although the WHO and CDC have both acknowledged the scientific consensus that SAR-CoV-2 is unlikely to spread through shared surfaces, known as fomites, both groups continue to recommend 'deep cleaning.' Following this guidance, public facilities continue to engage in costly disinfection regimens and have been distracted from aerosols' threat. For instance, the MTA in New York plans to spend \$380 million cleaning its subways and busses through 2023 but has put little effort into addressing airborne transmission. Given the firm scientific conclusion that air plays a much larger role in transmission than fomites, authorities must update their guidance, and facilities must change their practices.

**Related Articles | Please find annotations for all related articles on the main resource hub, linked [here](#)**

**MedRxiv:** [SARS-CoV-2 Transmission Risk from sports Equipment](#) (2/8/2021)

*This study finds an exponential reduction in SARS-CoV-2 recoverable from sports equipment after a short time period, and virus is barely transferable from materials such as a tennis ball, red cricket ball and cricket glove. Because viral load drops off rapidly, and given transmission from equipment to the*

*mucous membranes of another individual requires significant inoculum, the study posits that sports equipment is unlikely to be a major transmission vector of SARS-CoV-2.*

**Cleaning and Maintenance Management:** [Surface Transmission of Coronavirus Not as Prevalent as Airborne Transmission](#) (1/4/2021)

*Experts suggest that surface-related SARS-CoV-2 transmission is unlikely, and the studies that purported to find it are flawed. According to the article, authorities must focus more on transmission in the air. However, they should not stop cleaning frequently-contacted surfaces.*

**NPR:** [Still Disinfecting Surfaces? It Might Not Be Worth It](#) (12/28/2020)

*According to this article, pandemonium around surface disinfection during the early part of the pandemic did not reflect the scientific reality. There is no need for continuous sanitizing.*

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*Please visit the Massachusetts CTC Contact Tracing and COVID-19 Research Hub for more annotated resources on COVID-19 or to find annotations for all the related resources:* <https://docs.google.com/document/d/1rTXsqHqmoXlqgPtVkqMZCFzHFkI4f9ccIsMugChs7xY/edit?usp=sharing>