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COVID-19 Literature Review Group

Prepared by The Ohio State University

COVID-19 and Schools, SARS-CoV-2 Vaccinations, Vaccine Effectiveness and Completeness, and Herd Immunity

ODH Literature Review Group
THE OHIO STATE UNIVERSITY

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COVID-19 Literature Review

Prepared by Eliana Burlotos, The Ohio State University

March 20, 2021

Topic: COVID-19 and Schools

Title: Association of Children’s Mode of School Instruction with Child and Parent Experiences and Well-Being During the COVID-19 Pandemic – COVID Experiences Survey, United States, October 8-November 13, 2020

Source: *MMWR*

Publication Date: March 19, 2021

Link: https://www.cdc.gov/mmwr/volumes/70/wr/mm7011a1.htm?s_cid=mm7011a1_w

Study Period: October 8-November 13, 2020

Study Location: United States

Sample Size: N/A

Summary: This article discusses the effects of various modes of school instructions on children and their parents. During the period October 8-November 13, 2020, parents of children aged 5-12 were surveyed using the NORC at the University of Chicago AmeriSpeak panel. There were 1,290 respondents, in which 45.7% reported their child received virtual instruction, 30.9% reported in-person instruction, and 23.4% reported combined instruction. It was found that 62.9% of parents of children receiving virtual instruction reported their children experienced decreased physical activity, whereas only 30.3% of parents of children receiving in-person instruction reported their children experienced decreased physical activity. Similarly, parents of children receiving virtual instruction were more likely than were parents of children receiving in-person instruction to report that their children experienced decreased time spent outside (58% versus 27.4%), decreased in person time with friends (86.2% versus 69.5%), and worsened mental or emotional health (24.9% versus 15.9%). Also, parents of children receiving virtual instruction were more likely than were parents of children receiving in-person instruction to report loss of work (24.7% versus 30.6%), job stability concerns (26.6% and 15.2%), child care challenges (13.5% versus 6.8%), emotional distress (54% versus 38.4%) and difficulty sleeping (21.6% versus 12.9%).

Key Findings Relevant to Ohio’s Response: Changes in modes of instruction can cause psychosocial stressors on children as well as parents that can increase risks to mental health and well-being. Children who are not receiving full-time, in-person instruction and their parents need additional supports to mitigate pandemic impacts.

Title: Minimal SARS-CoV-2 Transmission After Implementation of a Comprehensive Mitigation Strategy at a School – New Jersey, August 20-November 27, 2020

Source: *MMWR*

Publication Date: March 19, 2021

Link: https://www.cdc.gov/mmwr/volumes/70/wr/mm7011a2.htm?s_cid=mm7011a2_w

Study Period: August 20-November 27, 2020

Study Location: Boarding school in New Jersey

Sample Size: N/A

Summary: This article discusses results of a comprehensive COVID-19 mitigation strategy at a New Jersey high school with both residential and commuter students. The school has 520 full-time resident students, 255 commuter students and 405 faculty members. The school’s mitigation strategy included universal masking, RT-PCR testing, improved ventilation, 6 ft physical distancing, contact tracing, and quarantine and isolation protocols. All students and staff were tested twice a week. To aid contact tracing efforts, students and staff were required to wear a Bluetooth personal tracer, “Peace of Mind.” This device helped collect information regarding duration and proximity of contact to help determine whether exposures were of sufficient risk to require quarantine. During the period August 20-November 27, 2020 there were a total of 21,449 tests performed. Of those, 27 tests had positive results. Of the positive tests, 19 belonged to faculty members and 8 belonged to students. There were only 2 identified cases that were caused by secondary transmission on campus.

Key Findings Relevant to Ohio's Response: Even when there is ongoing SARS-CoV-2 community transmission, frequent testing and universal masking in high school settings can help prevent COVID-19 outbreaks even when there is ongoing community transmission.

COVID-19 Literature Review

Prepared by Elena McGoey, The Ohio State University

March 18, 2021

Topic: SARS-CoV-2 vaccinations

Title: Covid-19: WHO says rollout of AstraZeneca vaccine should continue, as Europe divides over safety

Source: *BMJ*

Publication: March 16, 2021

Link: <https://www.bmj.com/content/372/bmj.n728>

Study Period: N/a

Study Location: N/a

Sample Size: N/a

Summary: 11 European countries have suspended all use of the AstraZeneca SARS-CoV-2 vaccine, and 5 European countries have paused the use of batches. The suspension or pause followed reports of blood clotting disorders in some countries after receiving the AstraZeneca vaccine. However, the World Health Organization and the European Medicines Agency (EMA) advise continuation of AstraZeneca vaccine rollout, saying that there does not seem to be an increased risk of blood clots. AstraZeneca reported that 37 blood clots were reported out of over 17 million vaccinated individuals in the EU and Britain, which is much lower than expected for a general population and much lower than the mortality rate due to COVID-19.

Key findings most relevant to Ohio's response: While the incidence of blood clotting disorders needs to be investigated, there does not seem to be an association between these disorders and the AstraZeneca vaccine, making the response of European countries disproportionate to the actual risk. Also, many European countries are experiencing a resurgence of infections, so fears or hesitancy in the public due to news over blood clotting disorders may further undermine efforts of vaccine administration at a time when vaccine rollout is especially needed.

Title: BNT162b2 mRNA Covid-19 Vaccine in a Nationwide Mass Vaccination Setting

Source: PubMed

Publication: February 24, 2021

Link: <https://pubmed.ncbi.nlm.nih.gov/33626250/>

Study Period: December 20, 2020 to February 1, 2021

Study Location: Israel

Sample Size: 1,193,236 individuals (596,618 unvaccinated control, 596,618 vaccinated)

Summary: This study examined the effectiveness of the BioNTech, Pfizer vaccine against COVID-19 outcomes in a nationwide mass vaccination setting in Israel. Vaccine effectiveness during the follow-up period starting 7 days after the second vaccine dose was 92% for documented infection, 94% for symptomatic COVID-19 infection, 87% for hospitalization, and 92% for severe COVID-19. The estimated efficacy of the vaccine against COVID-19 infection for adults 70 years and older 7 days after the second dose is 94-96%.

Key findings most relevant to Ohio's response: A high effectiveness of the Pfizer BNT162b2 vaccine is estimated for preventing symptomatic COVID-19 infection; this vaccine reduced cases by 94% in Israel. However, the effectiveness of this vaccine in all areas (documented infection, symptomatic infection, hospitalization, and severe infection) decreases significantly when looking at the time period between first and second doses. Because of this, it is imperative for

distribution centers for the Pfizer vaccine to stress upon the public the importance of receiving both doses of the vaccine in order to achieve increased benefit.

COVID-19 Literature Review

Prepared by Anjali Prabhakaran, The Ohio State University

March 22, 2021

Topic: COVID Vaccines

Title	Prolonged Viral Shedding and Antibody Persistence in Patients with COVID-19
Source	Microbes and Infection
Publication Date	03/17/2021
Link	https://www.sciencedirect.com/science/article/pii/S1286457921000320?via%3Dihub
Study Period	n/a
Study Location	Iran
Sample Size	113
Summary	The aim of this study was to assess the viral shedding duration and antibody development against SARS-CoV-2 in COVID-19 patients. COVID-19 suspected patients were tested for the infection using RT-PCR analysis, and confirmed cases were followed until a negative test was attained. The median viral shedding among the study population was 34.16 (+/- 17.65) days. Patients who experienced gastrointestinal problems, shivers, and fever experienced longer viral shedding. No correlation was found with age, sex, or any other comorbidities. Furthermore, IgG antibodies were present in 84% of patients after 150 days.
Key Findings Relevant to Ohio's Response	This research suggests that a two-week quarantine period may not be sufficient for a majority of the population. Therefore, policymakers can use the data from this study to assess whether or not revisions to COVID-19 quarantine protocols should be made. Furthermore, the presence of antibodies in a majority of the patients for nearly 6 months also may suggest that a single dose of the COVID-19 vaccine may be sufficient for immunity, which could help streamline vaccine rollout.

Title	Effect of influenza vaccine on COVID-19 mortality: a retrospective study
Source	Internal and Emergency Medicine
Publication Date	03/20/2021
Link	https://link.springer.com/article/10.1007/s11739-021-02702-2
Study Period	3/1/2020 - 06/30/2020

Study Location	Rome, Italy
Sample Size	635
Summary	The objective of this study was to determine whether the influenza vaccine may reduce the susceptibility and severity of SARS-CoV-2 infection. This retrospective study examined 635 patients who were admitted to the emergency department and diagnosed with COVID-19 through RT-PCR analysis. The clinical outcomes of the vaccinated and non-vaccinated patients were then analyzed by univariate and multivariate analysis. After correcting for gender, age, and comorbidities, vaccinated patients had a lower mortality risk at 60 days compared to non-vaccinated patients.
Key Findings Relevant to Ohio's Response	This study provides additional support for the benefits of vaccination against infectious diseases. More importantly, this study provides evidence that vaccines can provide both specific and unspecific protective effects. This information can help policymakers develop new mandates for COVID-19 and influenza vaccine requirements in the future to prevent pandemics of even larger scales.

COVID 19 Literature Review

Prepared by Amanda Seiffert, The Ohio State University

March 19, 2021

Topic: Vaccine Effectiveness and Completion

Title: COVID-19 Vaccine Second-Dose Completion and Interval Between First and Second Doses Among Vaccinated Persons

Source: CDC Morbidity and Mortality Weekly Report

Publication Date: 03/15/2021

Link: https://www.cdc.gov/mmwr/volumes/70/wr/mm7011e2.htm?s_cid=mm7011e2_w

Study Period: 12/14/2020-02/14/2021

Study Location: United States

Sample Size: 26,702,026

Summary: Researchers investigated the rate of completion of the second Covid-19 vaccine dose, measuring the percentage of individuals who received their second dose within the recommended time frame after first vaccination. This time frame ranges from 17 to 25 days for the Pfizer vaccine and 24-32 days for the Moderna vaccine. Researchers found that 88.0% of participants had received their second dose within the recommended time period. 8.6% had not received the second dose within the recommended time frame but were still within the maximum allowable time frame (42 days). Lastly, 3.4% had missed the second dose altogether. They discovered that missing the second dose varies slightly based on demographic characteristics. Moreover, non-Hispanic American Indian/Alaskan Native individuals as well as people aged 16-44 had the highest rates of missing the second dose. However, Native Hawaiian/Pacific Islander as well as White individuals had the highest rates of series completion. Researchers then conducted a second analysis examining individuals who had already received the second dose. They then looked backwards, investigating whether the second dose had been received within the recommended time frame. After analysis, researchers found that 95.6% of such participants had received their second dose within the recommended time period. 1.5% received the second dose too early, 2.8% received it later than the recommended time interval but within the maximum time interval, and only 0.1% received the second dose too late.

Key Findings Relevant to Ohio's Response: Findings from this study indicate that Covid-19 vaccine series incompleteness is relatively uncommon. However, it does occur, and the importance of series completion within the recommended time interval must be emphasized. This has implications for health care providers and vaccine administrators. Additional reminders should be disseminated to individuals approaching their second dose appointment, and the second dose should be scheduled immediately during the appointment for the first dose. Furthermore, there should be a strong monitoring system to ensure vaccine completion.

Title: Effectiveness of the Pfizer-BioNTech COVID-19 Vaccine Among Residents of Two Skilled Nursing Facilities Experiencing COVID-19 Outbreaks

Source: CDC Morbidity and Mortality Weekly Report

Publication Date: 03/15/2021

Link: https://www.cdc.gov/mmwr/volumes/70/wr/mm7011e3.htm?s_cid=mm7011e3_w

Study Period: 12/21/2020-02/12/2021

Study Location: Connecticut

Sample Size: 463

Summary: Researchers conducted a retrospective cohort analysis investigating the effectiveness of the first-dose of the Pfizer Covid-19 vaccine. Moreover, they investigated the percentage of residents in two skilled nursing facilities who still developed Covid-19 despite one dose of the Pfizer vaccine. After analysis, researchers concluded that the effectiveness of one dose is approximately 63%. At least one symptom was reported in 88.6% of cases as well. Researchers suggest that first dose vaccine effectiveness may be higher among younger populations, as residents of the two skilled nursing facilities were elderly and subsequently more vulnerable to Covid-19. However, in this study, 25% of residents had also experienced a confirmed past Covid-19 infection, potentially strengthening their immunity to re-infection.

Key Findings Relevant to Ohio's Response: Findings from this study indicate that partial vaccination is relatively effective in preventing SARS-CoV-2 infection, even among elderly, high-risk individuals. Nevertheless, the estimated 63% effectiveness of one dose compared to the 95% effectiveness of a second dose should be noted. Moreover, the importance of a second dose is clear, and the public should be encouraged to complete the vaccine series.

COVID-19 Literature Review

Prepared by Greta Warmbier, The Ohio State University

March 17, 2021

Topic: Herd Immunity

Title: Can Vaccination and Infection Rates Equal COVID Herd Immunity?

Source: WebMD

Publication Date: March 17, 2021

Link: <https://www.webmd.com/vaccines/covid-19-vaccine/news/20210317/can-vaccination-and-infection-rates-add-up-to-reach-covid-herd-immunity>

Study Period: n/a

Study Location: n/a

Sample Size: n/a

Summary:

An analysis done by Fundstrat Global Advisors suggests that as of March 7, 2021, as many as 9 states have reached herd immunity status. Health experts tend to set the number for herd immunity between 50% and 70%. Most experts, including Dr. Anthony Fauci, the head of the National Institute of Allergy and Infectious Diseases, lean toward the higher end of the spectrum. "I would say 75 to 85% would have to get vaccinated if you want to have that blanket of herd immunity," he told NPR in December 2020.

Ali Mokdad, chief strategy officer for population health at the University of Washington, said the level of immunity needed to reach this goal can vary due to several factors. "Nobody knows what herd immunity for Covid-19 is because it's a new virus," he said. Data from other communities around the world show covid outbreaks happening at or near a 60% level of immunity. Dr. Jeff Engel, senior adviser for Covid at the Council of State and Territorial Epidemiologists, said the question of herd immunity may not even be relevant because, regarding Covid, we may never reach it. The virus may become endemic, which means it will continue circulating like influenza or the common cold. For him, lowering deaths and hospitalizations is more important. "The concept of herd immunity means that once we reach the threshold, it's going to go away," Engel said. "That's not the case. That's a false notion."

Relevance to Ohio's COVID-19 Response: Some health experts consider vaccine-induced immunity to be better than the protection generated by the infection because it may be more robust. It is important that the state continues in its campaign to vaccinate as many people as possible given its resources. People who have already had the virus should still get the vaccine, as there are still many uncertainties about immunity.

Topic: Long Covid Patients & the Vaccine

Title: Some Long Covid Patients Feel Much Better After Getting the Vaccine

Source: NYT

Publication Date: March 17, 2021

Link: <https://www.nytimes.com/2021/03/17/health/covid-vaccine-symptoms-long.html>

Study Period: n/a

Study Location: n/a

Sample Size: n/a

Summary:

People are reporting that the post-Covid symptoms they have experienced for months have begun improving, sometimes significantly, after they got the vaccine. Dr. Daniel Griffin, an infectious disease physician at Columbia University, said about 40% of the long Covid patients he has been treating cite symptom improvement after the vaccine.

This month, a small study by British researchers that has not yet been peer reviewed found that 8 months after people were hospitalized for Covid-19, those who were vaccinated experienced improvement in more long Covid symptoms than those who were not yet vaccinated. The 44 vaccinated patients in the study were older and had more underlying medical conditions, since people with those characteristics qualified for vaccines earlier. 1 month after vaccination, those patients reported improvement in 23% of their long Covid symptoms like joint pain and breathing, while 5.6% of their symptoms had worsened. The 22 unvaccinated people questioned at that time said 15% of their symptoms were better, while 14% of their symptoms were worse. There was no difference in response between people who received the Pfizer-BioNTech and Oxford-AstraZeneca vaccines.

2 surveys of several hundred people with long Covid symptoms, many of whom were never hospitalized, were conducted. 1 survey of 345 people, mostly women and mostly in the U.K., found that 2 weeks or more after their 2nd vaccine dose, 93 felt slightly better and 18 felt back to normal. 32% reported improved long Covid symptoms. 18% felt worse, most of them reporting only a slight decline in their condition. Nearly 50% reported feeling no different. Another survey of a group of over 150,000 Covid survivors found that as of March 16, 207 of 508 respondents reported some improvement, while 231 felt no change and 70 felt worse.

Akiko Iwasaki, an immunologist at Yale, said that a vaccine, by generating antibodies to the coronavirus's spike protein, could potentially eliminate vestiges of the virus or remnants of viral RNA that may linger in some patients. The vaccine might also help people whose long Covid symptoms may be caused by a post-viral response resembling an autoimmune disease if "the vaccine stimulates innate immune responses that dampen these kinds of autoreactive responses," she said. But based on experiences of people with other autoimmune diseases, that relief would "not be very long-lasting and they would kind of revert back" to having symptoms like fatigue.

Relevance to Ohio's COVID-19 Response: People experiencing long Covid symptoms should consider the vaccination as a solution to their symptoms, rather than fear it.