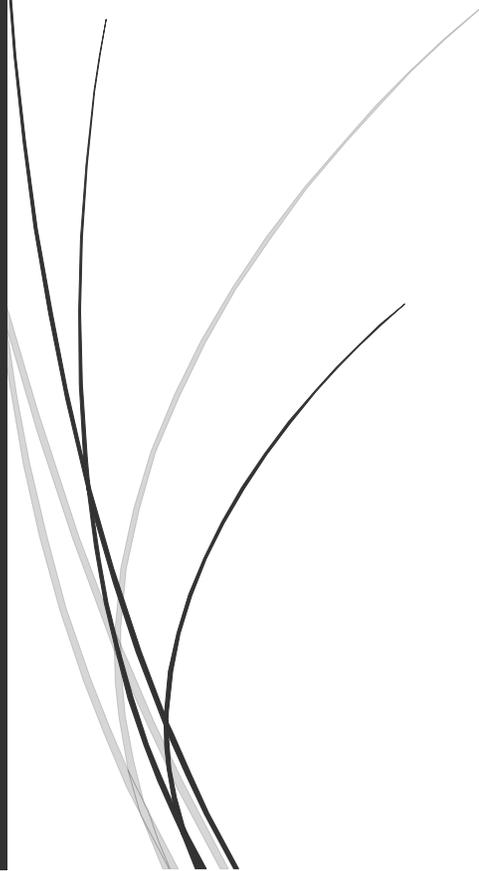




10/23/2020

# COVID-19 Literature Review Group

Prepared by The Ohio State University



**ODH Literature Review Group**  
THE OHIO STATE UNIVERSITY

COPYRIGHT 2020 THE AUTHORS. COPYING AND DISTRIBUTION PERMITTED  
FOR EDUCATIONAL PURPOSES ONLY. ALL OTHER RIGHTS RESERVED.

## Table of Contents

Contact Tracing.....	1
COVID-19 and Mental Health.....	3
Winter Surges.....	5
School Re-Openings.....	7
COVID-19 and Long-term Complications.....	11
Outbreaks.....	13
Diagnostic Tests.....	15
Healthcare Access Issues Due to Pandemic.....	17
Healthcare Capacity.....	19
PPE Capacity.....	24
University/Persons Aged 18-22 Outbreaks.....	28
COVID Effects on Special Populations.....	31
Maternal/Child Health Issues with COVID-19.....	33

**COVID-19 Literature Review: Contact Tracing**  
Prepared by Eliana Burlotos, The Ohio State University  
October 16, 2020

**Title:** COVID-19 Contact Tracing Workforce Barely ‘Inching Up’ As Cases Surge

**Source:** NPR

**Publication Date:** October 14, 2020

**Link:** <https://www.npr.org/sections/health-shots/2020/10/14/923468159/covid-19-contact-tracing-workforce-barely-inching-up-as-cases-surge>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This article analyzes a survey conducted by the Johns Hopkins Center for Health Security in collaboration with National Public Radio. The survey revealed a low amount of contact tracers reported in the U.S. Although, the number has increased by four times since the initial survey in late April, the number of 53,116 reported contact tracers in the US is still less than the desired amount of more than 100,000, which public health experts have called for since the beginning of the pandemic. Crystal Watson, a senior scholar at the Johns Hopkins Center for Health Security, mentions how she does not see a collective preparation among people for what might come this winter in regard to COVID-19, as cases are currently increasing across the world. Currently, 44 US states, including Ohio, are not reaching the contact tracing workforce need; however, more than half the states reported plans of hiring more contact tracers. In addition, 21 states have their transmission data publicly available, with Ohio not being one of them. The survey also found that 20 states are currently utilizing a contact tracing app or related technology, and 9 states are planning on implementing one. The main concerns facing contact tracing apps are public acceptance and privacy matters. Despite the high demand for contact tracers, no significant federal resources have been allocated for contact tracing. Lastly, the article emphasizes that contact tracing alone cannot eradicate COVID-19, and in order for it to work, people must comply.

**Key Findings Relevant to Ohio’s Response:** This article encourages the state of Ohio to increase contact tracing efforts since the state is not meeting its estimated need. Furthermore, it encourages the state to make its transmission data publicly available, which could help reduce the spread of SARS-CoV-2.

**Title:** U.S. States Are Rolling Out Covid-19 Contact Tracing Apps. Months of Evidence From Europe Shows They’re No Silver Bullet

**Source:** Time

**Publication Date:** October 9, 2020

**Link:** <https://time.com/5898559/covid-19-contact-tracing-apps-privacy/>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This article reviewed the use of contact tracing apps. On October 1, New York released an app called “COVID Alert NY,” which notifies people if they have been in contact with someone who has tested positive for COVID-19. In addition to “COVID Alert NY,” there are 9 other apps in the U.S. that utilize Google and Apple’s contact tracing system. Google and Apple’s contact tracing system was designed to maintain privacy of individuals, while providing health officials useful information about the pandemic. In South Korea, where the outbreak was largely controlled, contact tracing was a lot more privacy invading. Authorities used phone logs, card transaction records, and surveillance camera footage to monitor infected citizens and identify their contacts. Contrarily, European countries adopted a voluntary-based app, which researchers said that 60% of any population would need to properly use the app in order to be effective. No country has come close to achieving this. One of countries that uses this app the most is Ireland, with 34%

of the population using the app on a daily basis. Through July and September, there were over 7,000 cases in Ireland, but the app only helped identify 2,000 contacts. In contrast to this, South Korea's more extensive contact tracing system identified more than 10 contacts per case between January and May. In addition to the 10 apps already in use in the U.S., 7 more states and Washington, D.C., are releasing apps in the future that are all based on the same privacy-preserving system as used in Europe. Although Google and Apple's privacy-preserving system is not going to eliminate the spread of COVID-19, it is still going to prevent infections and save lives. Key takeaways from Europe's experience with contact tracing apps include that emphasizing that data is protected and no one, including the government, Google, or Apple, can collect personal information from the data collected is crucial to people's acceptance of the app. Another key takeaway is that contact tracing will not work without broader public health infrastructure, most importantly an effective testing regime.

**Key Findings Relevant to Ohio's Response:** This article encourages the state of Ohio that if they were to adopt a contact tracing app, they should emphasize that personal information is not collected by anyone. If Ohio chooses to adopt an app, expectations of the app must be realistic and associated limitations must be known. Lastly, Ohio must increase public health messaging to the public because this is crucial to reducing the transmission of SARS-CoV-2.

**Title:** New York and New Jersey launch COVID-19 contact tracing apps

**Source:** Live Science

**Publication Date:** October 2, 2020

**Link:** <https://www.livescience.com/contact-tracing-apps-new-york-new-jersey.html>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This article discusses New York and New Jersey's new contact tracing apps called "COVID Alert NY" and "COVID Alert NJ," respectively, that were released on October 1<sup>st</sup>. These apps use Google and Apple's contact tracing software. Bluetooth functions on phones are utilized to connect to nearby phones and alert users if they have been in close contact of someone who has COVID-19. New York has about 15,000 contact tracers but have been looking for a technology-based solution. The app is voluntary and does not release any private information or names. After someone has been within 6 feet of someone for more than 10 minutes, their phone exchanges a "secure" and "random" code with the other person's phone and stores this code. If someone tests positive for COVID-19, a public health official will call and ask if they would be willing to share the app's list of random codes to help reduce the spread of the virus. Sharing your list of codes is secure and private. The app will also constantly compare its own list to the list of infected codes, so if there is a match it will alert the person they may have been in close contact with an infected individual. Furthermore, the apps launched by New York, New Jersey, Delaware, Pennsylvania, and the one that will be launched in Connecticut soon will work together. So even when traveling, you will still be in the system.

**Key Findings Relevant to Ohio's Response:** This article encourages the state of Ohio to increase contact tracing efforts and follow other states by adopting a contact tracing app. Furthermore, it encourages the state to encourage people to participate in contact tracing efforts.

**COVID-19 Literature Review: COVID-19 and Mental Health**  
**Prepared by Anjali Prabhakaran, The Ohio State University**  
**October 15, 2020**

<b>Title</b>	Incidence of Post-Traumatic Stress Disorder After Coronavirus Disease
<b>Source</b>	Healthcare
<b>Publication Date</b>	09/30/2020
<b>Link</b>	<a href="https://www.mdpi.com/2227-9032/8/4/373">https://www.mdpi.com/2227-9032/8/4/373</a>
<b>Study Period</b>	April 2020
<b>Study Location</b>	Korea
<b>Sample Size</b>	64 patients
<b>Summary</b>	This study examined the prevalence of PTSD among patients who were treated for COVID-19 in a hospital and then discharged in Daegu, Korea. The 64 patients involved in this study were hospitalized from February to April 2020. The mean patient age was 54.6 +/- 16.6, the sex ratio was 28:36 male:female, and the mean duration of admission was 31.2 +/- 18.1 days. The Post-Traumatic Stress Disorder Checklist-5 (PCL-5) was used to assess patients through a telephone interview, and a diagnosis of PTSD occurred with a score above 33 (score range 0-80). The researchers diagnosed 20.3% (13 patients) of the sample population with PTSD. However, there were no statistically significant associations between the prevalence of PTSD and hospitalization time, duration after discharge, sex, or age.
<b>Key Findings Relevant to Ohio's Response</b>	Given the high prevalence of PTSD among patients who were treated for COVID-19, it is incredibly important for clinicians to provide the proper mental health services to affected individuals. Policymakers and healthcare administrators can use the results of this study, as well as information from other studies identifying patients more susceptible to suffer adverse mental health effects, to inform their decisions regarding the provision of mental health interventions.

<b>Title</b>	Evaluation of the effect of COVID-19 pandemic on anxiety severity of physicians working in the internal medicine department of a tertiary care hospital: a cross-sectional survey
<b>Source</b>	Internal Medicine Journal
<b>Publication Date</b>	10/02/2020
<b>Link</b>	<a href="https://onlinelibrary.wiley.com/doi/10.1111/imj.14981">https://onlinelibrary.wiley.com/doi/10.1111/imj.14981</a>
<b>Study Period</b>	04/01/2020 - 04/14/2020
<b>Study Location</b>	Turkey
<b>Sample Size</b>	113 physicians
<b>Summary</b>	This cross-sectional study to examine the prevalence and severity of anxiety among 113 internal medicine physicians caring for patients with COVID-19. The screening questionnaire was conducted online, and consisted of three

	<p>sections. The first section asked questions regarding sociodemographic characteristics, family member status, and work information. The second section asked questions regarding their knowledge and fears about COVID-19. The third section used the 7-item Generalized Anxiety disorder scale (GAD-7) and Beck Anxiety Inventory (BAI) to assess anxiety severity. The researchers found that 31% (35) suffered from mild anxiety, 10.6% (12) suffered from moderate anxiety, and 8% (9) of physicians suffered from severe anxiety. Having family members over 65 years old and/or with chronic diseases and being female were significantly associated with experiencing more severe anxiety.</p>
<b>Key Findings Relevant to Ohio's Response</b>	<p>While a significant body of research has emerged studying the effects of COVID-19 on patient mental health, there has been much less research investigating physician and healthcare provider health. The results of this study emphasize the importance of having the proper mental health resources available for hospital workers. Providing healthcare workers with the tools and support to take care of their mental health can also help ensure that their patient receive the proper treatment and have positive outcomes.</p>

<b>Title</b>	Association of a Prior Psychiatric Diagnosis With Mortality Among Hospitalized Patients With Coronavirus Disease 2019 (COVID-19) Infection
<b>Source</b>	JAMA Network Open
<b>Publication Date</b>	09/30/2020
<b>Link</b>	<a href="https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2771037?resultClick=1">https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2771037?resultClick=1</a>
<b>Study Period</b>	2/15/20 - 5/27/20
<b>Study Location</b>	Yale University
<b>Sample Size</b>	1685 patients
<b>Summary</b>	<p>This cohort study examined the correlation between COVID-19 mortality and a prior psychiatric diagnosis. A total of 1685 patients were included in this study, of which 28% (473) were previously diagnosed with a psychiatric illness. Patients with psychiatric diagnoses were more likely to be older and have medical comorbidities (malignant cancer, diabetes, myocardial infarction, etc.). However, even after controlling for these medical comorbidities, demographic characteristics, and hospital location, the risk of COVID-19 related hospital death was significantly higher (hazard ratio = 1.5) for patients with a psychiatric disorder.</p>
<b>Key Findings Relevant to Ohio's Response</b>	<p>There is a significant body of research that demonstrates psychiatric disorders result in overall shortened lifespan, and increase mortality rates for patients with chronic diseases such as cancer and diabetes. This article demonstrates that the correlation between psychiatric illness and mortality extends to COVID-19 patients as well. Thus, these findings further emphasize the importance of providing adequate mental health support to patients with COVID-19. Not only will psychiatric resources improve the mental health of patients, but it can also improve their chances of survival.</p>

**COVID-19 Literature Review: Winter Surges**  
**Prepared by Eliana Burlotos, The Ohio State University**  
**October 23, 2020**

**Title:** Worried About COVID-19 in the Winter? Alaska Provides a Cautionary Tale

**Source:** The New York Times

**Publication Date:** October 21, 2020

**Link:** <https://www.nytimes.com/2020/10/21/us/coronavirus-cold-weather-winter-alaska.html>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This article discusses the coronavirus situation in Alaska. During the summer, the state of Alaska was successfully containing the coronavirus. They performed more testing than almost any other state and employed a large amount of contact tracers, who would call infected individuals and close contacts daily. Alaska was recording some of the fewest coronavirus cases per capita in the US; however, now as the temperature drops and the sun sets earlier, people are gathering indoors more. During the week of October 12<sup>th</sup>, the weekly case average reached an all-time high. Additionally, the percentage of positive cases has recently doubled, and tribal villages have been forced into lockdown. Their previously successful contact tracing system is now strained. Alaska's surge in cases is an early warning that winter could bring the world the most devastating phase of the pandemic. Cases in the US are already exceptionally rising. More than 60,000 new cases were identified on October 20<sup>th</sup>. The article states there exists evidence of the coronavirus being more severe with colder weather and lower relative humidities. Dr. Mohammad Sajadi of the University of Maryland stated that researchers have found the following: certain viruses persist longer in colder and drier conditions; aerosolized viruses are more stable in cooler air; and viruses can replicate more easily in such conditions.

**Key Findings Relevant to Ohio's Response:** This article encourages the state of Ohio to prepare for a great increase in cases in the coming winter months. Furthermore, it encourages the state to perhaps take stronger legislative measures, such as a lockdown, to reduce the spread of SARS-CoV-2 before the imminent cold winter months.

**Title:** What's Coming This Winter? Here's How Many More Could Die In The Pandemic

**Source:** National Public Radio

**Publication Date:** October 16, 2020

**Link:** <https://www.npr.org/sections/health-shots/2020/10/16/924240204/how-bad-will-coronavirus-be-this-winter-model-projects-170-000-more-u-s-deaths>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This article reviews the current rise in coronavirus cases and predicts what is to come if current trends continue. Tara Smith, a professor of epidemiology at Kent State University, says they were hoping to lower and contain the cases in the fall in preparation for a bad winter; however, the opposite has occurred. The US is currently averaging more than 52,000 new cases a day. Contributing to this rise in cases is the return of students to campus, resistance to social distancing and mask wearing mandates, and more people spending time socializing indoors. Dr. Michael Mina, a professor at Harvard T.H. Chan School of Public Health, says we are likely to see massive explosions of cases and outbreaks. It is estimated that more than 170,000 people could die from COVID-19 between now and February 1<sup>st</sup>, which would bring the overall death toll to nearly 400,000. Right now, the US is averaging over 700 deaths per day, but this could rise to more than 2,000 per day by mid-January. Places that have already come back from devastating outbreaks are still vulnerable to a resurgence over the winter. A University of Washington professor, Ali Mokdad says the US is stuck in a reactive cycle of when cases spike, people change their behavior by staying home and wearing masks, but

once the situation improves, people return to their previous behavior. Because of this, cases spike again, leading to a vicious cycle.

**Key Findings Relevant to Ohio's Response:** This article encourages the state of Ohio to take strong legislative measures to reduce the exceptionally high spread of SARS-CoV-2, especially because the winter is expected to be even more disastrous for SARS-CoV-2 transmission.

**Title:** Covid-19 could kill 2,900 Americans a day in December, researchers say. Here's why, and how you can make fall and winter better

**Source:** CNN

**Publication Date:** October 5, 2020

**Link:** <https://www.cnn.com/2020/10/05/health/fall-winter-covid-19-surge-impact/index.html>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This article discusses the state of COVID-19 in the current fall and upcoming winter season. According to projections from the University of Washington's Institute for Health Metrics and Evaluation, by the end of December, COVID-19 could kill more than 2,900 people a day in the US. The fall and winter months will be worse because due to colder weather, more people will be gathering indoors, increasing the risk of the spread of SARS-CoV-2. Additionally, flu season will collide with the pandemic, which can burden our health care system as well as one's immune system if one were to get both the flu and COVID-19 at the same time. The article emphasizes the importance of getting a flu shot this year. Also, the large outbreaks in schools and on college campuses is going to increase in the coming months, which resultantly spreads the virus in communities. To prevent this fall/winter surge, everyone should limit their interactions at indoor settings and stay outside as much as possible. Mask wearing will also help save tens of thousands of lives. Lastly, with the holidays coming up, people should find ways to visit family safely. The CDC offers an extensive list of ideas on how to celebrate Halloween and Thanksgiving safely.

**Key Findings Relevant to Ohio's Response:** This article encourages the state of Ohio to increase mask wearing and limit indoor gatherings. Also, the state of Ohio should provide the public with numerous ways of celebrating the holidays safely. All Ohioans should be encouraged to get a flu shot this season.

**COVID 19 Literature Review: School Reopenings**  
**Prepared by Amanda Seiffert, The Ohio State University**  
**October 16, 2020**

**Title:** Adolescent with Covid-19 as the Source of an Outbreak at a 3-Week Family Gathering

**Source:** CDC Morbidity and Mortality Weekly Report

**Publication Date:** October 5, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6940e2.htm?s\\_cid=mm6940e2\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6940e2.htm?s_cid=mm6940e2_w)

**Study Period:** July-August 2020

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** Researchers from the CDC worked with 4 state health departments to investigate a Covid-19 outbreak during a 3 week family gathering involving 5 separate households. A 13 year old adolescent girl was suspected to be the index case, transmitting the virus to a subsequent 11 identified contacts. The adolescent was exposed to a confirmed positive case during a trip away from home and only experienced nasal congestion. Following her trip, she tested negative for a rapid antigen test, but researchers now believe this to be a false negative. She then attended a family reunion with her parents, two brothers, and 15 other relatives. Fourteen relatives, including the index patient, stayed in the same house, and no one wore masks or engaged in physical distancing. Three days later, an additional 6 relatives arrived and stayed for 10 hours. They too did not wear face masks, but they did practice physical distancing and remained outdoors the entire stay. Among the 15 individuals who stayed in the same home, 12 were positive for Covid-19, including the index patient. However, none of the 6 additional relatives became infected, indicating the effectiveness of physical distancing and open spaces.

**Key Findings Relevant to Ohio's Response:** This study highlights the ability of adolescents to transmit the virus. Stronger understanding of child transmission may help inform public health policy. Findings also reinforce the effectiveness of physical distancing and remaining outdoors, which has implications for public policy, especially approaching indoor seasons. Additionally, this study suggests that rapid-antigen tests are less accurate than RT-PCR tests. This could indicate that individuals should continue isolating for 14 days after known exposure even after a negative test result.

**Title:** Factors Influencing Risk for Covid-19 Exposure Among Young Adults Aged 18-23 Years

**Source:** CDC Morbidity and Mortality Weekly Report

**Publication Date:** October 9, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6941e2.htm?s\\_cid=mm6941e2\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6941e2.htm?s_cid=mm6941e2_w)

**Study Period:** March-July 2020

**Study Location:** Winnebago County, Wisconsin

**Sample Size:** 30 key informants

**Summary:** On May 13, 2020, the Supreme Court of Wisconsin declared the stay at home order unlawful, resulting in an uptick of Covid-19 cases, especially among the 18-23 age group. Through individual interviews, researchers investigated the factors influencing the disproportionate exposure to Covid-19 experienced by 18-23 year olds in Winnebago County, Wisconsin. Respondents cited misinformation, conflicting information, and opposing views on mask effectiveness as factors in the lack of adherence to mask guidelines. Thirteen young adult interviewees discussed peer pressure to not wear a mask as well as a lack of concern over the severity of the disease. Researchers concluded that this perception of low severity could explain young adults' lack of adherence. However, young adults did express concern over the severity of the disease for a loved one, indicating that messages targeting the youth's responsibility to protect others could be effective. Researchers concluded that misinformation and unclear messages contribute to young adults' risky behavior,

implying the need for clear and consistent communication. Researchers also concluded that messages targeting peer pressure could be effective in gaining stronger youth adherence and limiting the spread of Covid-19. Another factor found to contribute to a lack of mask-wearing was the absence of county-wide measures. Furthermore, researchers interviewed business owners, who cited the lack of a county-wide mandate as a barrier to implementing a mask requirement at their establishment.

**Key Findings Relevant to Ohio's Response:** This study highlights effective strategies for communicating with the youth about the need for Covid-19 mitigation. Moreover, public health efforts should be directed towards tailored messages fighting peer pressure and emphasizing the need to protect others. Additionally, public health communications in Ohio should be clear and consistent in order to gain the strongest youth adherence. County-wide mandates were also shown to be effective in obtaining greater health and safety guideline adherence.

**Title:** Transmission Dynamics by Age Group in Covid-19 Hotspot Counties

**Source:** CDC Morbidity and Mortality Weekly Report

**Publication Date:** October 9, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6941e1.htm?s\\_cid=mm6941e1\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6941e1.htm?s_cid=mm6941e1_w)

**Study Period:** June-July 2020

**Study Location:** 767 U.S. hotspot counties

**Sample Size:** N/A

**Summary:** The CDC analyzed trends in Covid-19 among various age groups from June-July 2020 within 767 U.S. hotspot counties before and after their classification as a hotspot. Researchers discovered that increases in percent positivity among individuals 24 years old or younger preceded an uptick in cases among the 25 and older age group by a few weeks. Moreover, prevalence of confirmed cases increased among the 0-17 and 18-24 age groups approximately 31 days before the counties were declared hotspots. Percent positivity increased among the 25-44 age group 28 days following the rise among 0-24 year olds. It increased among the 45-64 and 65+ age groups 23 and 20 days respectively following the spike among 0-24 year olds. Thus, researchers concluded that a focus needs to be placed on preventing transmission among the youth (those ages 24 or younger) in order to fight the spread of the virus.

**Key Findings Relevant to Ohio's Response:** This study highlights the role of the youth in the transmission of the virus. With children going back to school, this study indicates the probability of transmission to outside contacts such as parents or other older age groups. Such a scenario is important for schools to consider when deciding whether or not to remain open.

**Title:** Intermittent occupancy combined with ventilation: An efficient strategy for the reduction of airborne transmission indoors

**Source:** Science of the Total Environment

**Publication Date:** November 20, 2020

**Link:** <https://www-sciencedirect-com.proxy.lib.ohio-state.edu/science/article/pii/S0048969720344375?via%3Dihub>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** Since early in the pandemic, it has been known that ventilation is an important strategy for airborne transmission reduction. Scientists have called for increased outdoor air supply in order to effectively dilute aerosols. However, it has become increasingly apparent that most ventilation systems do not have the capacity to sufficiently increase clean air supply. Thus, researchers recently proposed an alternative, combined strategy of ventilation and

source control. Source control refers to intermittent breaks in room occupancy whereby all occupants exit the room periodically. It also entails a reduction in occupancy time. Researchers modeled this strategy in a classroom, discovering that after an infected person enters the room, the concentration of infectious aerosols increases as long as the infected person remains in the room, eventually reaching a steady state. However, if the infected person leaves the room, the concentration of infectious aerosols begins to decrease. This pattern repeats every time an infected individual leaves and re-enters an enclosed space. Researchers hold that such a strategy lowers the time-averaged exposure of other occupants to infectious aerosols. Moreover, researchers found that requiring all students to leave the room during breaks reduced the rate of cross-infection by 35%. They also discovered that longer lectures/lessons resulted in a 14% increase in intake fraction of aerosols. However, increasing the length of breaks by 5 minutes resulted in a 6% reduction in intake fraction. Lastly, they found that intake fraction decreases 2.8% when room volume increases by 17%.

**Key Findings Relevant to Ohio's Response:** Researchers make 6 key recommendations applicable to classrooms in Ohio. First, ventilation systems in classrooms must operate to maximize supply airflow rate. Secondly, it is beneficial for occupants to leave the room every hour for a 10-20 minute break. Thirdly, the shorter the occupation time and the longer the breaks, the more effective this strategy. Fourth, an increase in room occupancy must be followed by a proportional increase in airflow rate. Fifth, researchers recommend that fans, air-handling units, or other sources of additional air flow are placed in classrooms. Lastly, they state increased volume of classrooms slightly decreases risk of infection. These recommendations should all be taken into consideration when maximizing safety of classrooms as schools reopen.

**Title:** Physical Activity in Adolescents During the Social Distancing Policies of the Covid-19 Pandemic

**Source:** CDC Morbidity and Mortality Weekly Report

**Publication Date:** October 5, 2020

**Link:** <https://www.ncbi.nlm.nih.gov.proxy.lib.ohio-state.edu/research/coronavirus/publication/33016086>

**Study Period:** N/A

**Study Location:** Saudi Arabia

**Sample Size:** 63 adolescents

**Summary:** Researchers investigated the changes in physical activity of 63 adolescents, aged 14-18 years old.

Furthermore, they compared differences in such measures between boys and girls. In order to do so, they assessed physical activity prior to the social distancing order and 2 months after the social distancing order. Researchers discovered a significant decline in physical activity rates among the entire sample. However, magnitude of declines differed between boys and girls, with boys experiencing a greater decrease in physical activity. Researchers also investigated fitness variables among the adolescents, such as explosive strength, flexibility, and aerobic endurance. They found that baseline physical activity level largely determined fitness level after follow up. Moreover, both boys and girls with a higher baseline physical activity level were found to be more fit at the follow up assessment. Researchers concluded that physical literacy is the crucial determinant of physical activity level among adolescents during social distancing periods.

**Key Findings Relevant to Ohio's Response:** This study indicates the importance of maintaining physical activity practices at home or in open schools. Additionally, researchers emphasize the need for greater physical literacy among children. They suggest virtual physical activity classes as well, which could be implemented in Ohio.

**Title:** Covid-19 Trends Among School-Aged Children - United States, March 1 - September 19, 2020

**Source:**

**Publication Date:** October 2, 2020

Link: <https://www.ncbi-nlm-nih-gov.proxy.lib.ohio-state.edu/research/coronavirus/publication/33001869>

Study Period: March 1 - September 19, 2020

Study Location: U.S.

Sample Size: 277,285

**Summary:** Researchers analyzed demographic characteristics, underlying conditions, clinical outcomes, and trends in weekly incidence of Covid-19 among school-aged children from March 1 to September 19, 2020. They separated school aged children into two groups: those aged 5-11 and those aged 12-17. Researchers discovered that average weekly incidence of the 12-17 age group increased at about twice the rate of the 5-11 age group. Incidence peaked during July but decreased and plateaued during August and September. It then decreased further in September, but researchers note it may now be on the rise. Researchers also investigated severe outcomes of Covid-19 among school-age children and found that serious illness often corresponded with at least one underlying condition. Furthermore, 16% of children who were hospitalized, 27% of children who were admitted to the ICU, and 28% of children who died had at least one underlying medical condition. Overall, 1.2% of the school age children in this study were hospitalized, .1% required ICU admission, and .01% died. 58% of confirmed cases had at least 1 symptom, 5% reported asymptomaticity, and the symptoms of 37% are unknown.

**Key Findings Relevant to Ohio's Response:** These findings offer a baseline for monitoring trends in Covid-19 among children. Researchers hold that this is an important tool when reopening schools. Findings from this analysis may also help inform schools on the risks involved in reopening. Although the number of young children who become severely ill or die from the virus remains a very small proportion, it is still a possibility. Thus, mitigation strategies and effective communication about reducing the spread of Covid-19 remains of great importance.

## COVID-19 Literature Review: COVID-19 and Long-Term Complications

Prepared by Anjali Prabhakaran, The Ohio State University

October 15, 2020

<b>Title</b>	Interim Guidance on the Pre-participation Physical Examination for Athletes During the SARS-CoV-2 Pandemic
<b>Source</b>	Clinical Journal of Sports Medicine
<b>Publication Date</b>	10/07/2020
<b>Link</b>	<a href="https://journals-lww-com.proxy.lib.ohio-state.edu/cjsportsmed/Abstract/9000/Interim_Guidance_on_the_Preparticipation_Physical.98923.aspx">https://journals-lww-com.proxy.lib.ohio-state.edu/cjsportsmed/Abstract/9000/Interim_Guidance_on_the_Preparticipation_Physical.98923.aspx</a>
<b>Study Period</b>	n/a
<b>Study Location</b>	U.S.
<b>Sample Size</b>	n/a
<b>Summary</b>	This paper highlights the recommendations set forth by the American Medical Society for Sports Medicine (AMSSM) regarding the evaluation protocols prior to athletes returning-to-play. The primary goals of the preparticipation physical evaluation (PPE) is to ensure that athletes are not suffering from any long-term COVID-19 life-threatening or disabling conditions. The guidelines primarily focus on athletes with pre-existing conditions that increase the risk of COVID-19 infection, such as pregnant, hypertensive, asthmatic, and obese athletes. Furthermore, the AMSSM suggests that all COVID-19 positive athletes who experience symptoms should have a cardiac evaluation prior to discharge.
<b>Key Findings Relevant to Ohio's Response</b>	Given the limited research regarding the long-term complications of COVID-19, it is essential that athletes are carefully monitored as the return to play. These advisory guidelines can serve as a reference point for physicians when advising athletes and monitoring their COVID-19 recovery. Although each athlete must be evaluated on a case-by-case basis, this article also emphasizes the need to closely monitor cardiac health, as current available evidence suggests that myocarditis is a common lingering symptom of COVID-19.

<b>Title</b>	Is extensive cardiopulmonary screening useful in athletes with previous asymptomatic or mild SARS-CoV-2 infection?
<b>Source</b>	British Journal of Sports Medicine
<b>Publication Date</b>	10/06/2020
<b>Link</b>	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7536638/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7536638/</a>
<b>Study Period</b>	04/01/2020 - 04/14/2020
<b>Study Location</b>	UK
<b>Sample Size</b>	18 soccer players
<b>Summary</b>	This study aimed to determine which clinical tests and screenings were useful at determining an athlete's readiness to play following a mild or asymptomatic SARS-CoV-2 infection. The clinical investigation involved a personal history,

	antigen swabs, blood tests, spirometry, resting/stress-test ECG with oxygen saturation monitoring, echocardiogram, Holger and chest CT. The clinical profiles and test results were compared between the COVID-19 positive and negative group, and within the COVID-19 positive group, the examination results following the outbreak and preceding the outbreak (9-11 months prior) were compared. The researchers concluded that extensive cardiorespiratory and hematological screening in athletes with mild/no COVID-19 symptoms appears unnecessary as the comprehensive screening protocol did not identify any relevant abnormalities.
<b>Key Findings Relevant to Ohio's Response</b>	The findings of this study suggest that full screenings for athletes that do not experience moderate/severe COVID-19 symptoms seem to be unnecessary. This can prevent athletes from undergoing unnecessary testing and discomfort while also saving healthcare dollars by preserving testing resources. However, it is still highly necessary for more research (preferably with larger sample sizes) to be conducted on this topic.

<b>Title</b>	Assessment and Characterization of Post-COVID-19 manifestations.
<b>Source</b>	International Journal of Clinical Practice
<b>Publication Date</b>	09/29/2020
<b>Link</b>	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7536922/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7536922/</a>
<b>Study Period</b>	2/15/20 - 5/27/20
<b>Study Location</b>	Egypt
<b>Sample Size</b>	287 individuals
<b>Summary</b>	This study examined the symptoms experienced by COVID-19 survivors following infection and recovery, and examined how these symptoms related to comorbidities and COVID-19 severity. A questionnaire collecting demographic, COVID-19 status, comorbidity, and post-COVID-19 symptom data was sent to 287 patients. After examining the response surface plots, the most common post-COVID-19 symptom was fatigue, which 72.8% of subjects experienced. Roughly 10% of all subjects had no symptoms following recovery, and critical symptoms such as stroke and myocarditis were only reported by a few percent of the patients. These symptoms mirror the symptoms experienced by individuals following SARS syndrome. The researchers also found a positive correlation between post-COVID-19 symptom severity and COVID-19 severity, as well as the presence of post-COVID-19 symptoms and the presence of other comorbidities.
<b>Key Findings Relevant to Ohio's Response</b>	Much like the previous two publications, this study also found that post-COVID-19 manifestations are more severe in individuals that experienced moderate/severe COVID-19 and those with preexisting conditions. Therefore, more extensive monitoring and testing is required for those individuals, while those with no pre-existing symptoms or severe COVID-19 symptoms appear to return to normal health after COVID-19 recovery.

## COVID 19 Literature Review: Outbreaks

Prepared by Amanda Seifferth, The Ohio State University

October 23, 2020

**Title:** Covid-19 in a Correctional Facility Employee Following Multiple Brief Exposures to Persons with Covid-19- Vermont, July - August 2020

**Source:** CDC Morbidity and Mortality Weekly Report

**Publication Date:** 10/21/2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6943e1.htm?s\\_cid=mm6943e1\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6943e1.htm?s_cid=mm6943e1_w)

**Study Period:** July-August 2020

**Study Location:** Vermont

**Sample Size:** 7

**Summary:** One employee at a Vermont correctional facility tested positive for Covid-19 on August 11, 2020, following contact with 6 asymptomatic, positive prisoners. Interactions between the employee and incarcerated persons were scattered and brief, thus not qualifying as official exposures due to inadequate length of contact. The Vermont Department of Health defines close contact as interaction within 6 ft of an infectious individual for a minimum of 15 minutes. After the 6 incarcerated persons received positive test results on July 29, 2020, the employee continued to work, as he had not technically experienced an exposure. Onset of symptoms occurred August 4th, and on August 5th, the employee was tested for Covid-19. His positive result was reported to the Vermont Department of Health on August 11th. Working with additional correctional facility staff, the VDH executed reviews of surveillance footage. They discovered that despite a lack in 15 minutes of consecutive exposure, the employee did have numerous brief exposures to asymptomatic inmates, culminating in over 15 minutes of exposure. Moreover, the employee was estimated to have come within 6 ft of an infectious individual 22 times for a cumulative period of 17 minutes. During interactions with inmates, the employee wore a microfiber cloth mask, gown, gloves, and goggles. Inmates wore microfiber cloth masks during contact with the employee, except in cell doorways and recreational rooms. Due to the correctional officer's lack of outside contacts or travel prior to illness onset, VDH concluded he contracted the virus during the aforementioned interactions. These findings call into question the accuracy of the current operational definition of an exposure.

**Key Findings Relevant to Ohio's Response:** As previously stated, findings challenge the previous operational definition of a close contact. This led the CDC to alter their definition of a close contact, holding that brief, non-consecutive exposures within 6 ft of an infectious individual, when culminating in 15 minutes or more of interaction over a 24 hour period, qualifies as an exposure. This could influence quarantine requirements, as it could presumably increase the number of people with a technical exposure. The CDC's new definition of a close contact should be noted as Ohio institutions create policies aimed at mitigating SARS-CoV-2 transmission.

**Title:** An Outbreak of Covid-19 Associated with a Recreational Hockey Game- Florida, June 2020

**Source:** CDC Morbidity and Mortality Weekly Report

**Publication Date:** October 16, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6941a4.htm?s\\_cid=mm6941a4\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6941a4.htm?s_cid=mm6941a4_w)

**Study Period:** June 2020

**Study Location:** Tampa Bay, Florida

**Sample Size:** 22

**Summary:** Throughout the Covid-19 pandemic, few reports of transmission during sport games or practices have been recorded. However, on June 19, 2020, the Florida Health Department was notified of a potential Covid-19 case following a recreational ice hockey game among 22 men, ages 19-53. The game had taken place on June 16, and 5 days later, 15

men reported symptoms associated with Covid-19. Thirteen of these 15 men received a positive test result, and the other two were not tested. All asymptomatic players did not seek testing. Researchers note that ice hockey requires extensive physical exertion, resulting in heavy respiration. Players also had frequent shared contact with the bench, and face coverings varied. While some players wore metal cages, others used plastic half face shields over the eyes and nose, and some refrained from any type of face covering. Cloth face masks, covering the nose and mouth, were not utilized during the game nor within locker rooms. Furthermore, plexiglass surrounding the rink enclosed players in a segregated area, and the men frequently came within less than six feet of each other. Researchers assert that the ice rink created an opportune environment for Covid-19 transmission, encompassing an enclosed space, heavy respiration, and low proximity between individuals.

**Key Findings Relevant to Ohio's Response:** These findings may help inform school and recreational sports of the risks associated with resumption. Moreover, it conveys that close contact sports requiring high physical exertion present suitable conditions for the transmission of the SARS-Cov-2 virus. This information should contribute to decisions regarding mitigation strategies, especially among the youth.

**Title:** Preventing Covid-19 Outbreaks in Long-Term Care Facilities Through Preemptive Testing of Residents and Staff Members

**Source:** CDC Morbidity and Mortality Weekly Report

**Publication Date:** September 18, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6937a4.htm?s\\_cid=mm6937a4\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6937a4.htm?s_cid=mm6937a4_w)

**Study Period:** March-May 2020

**Study Location:** Fulton County, Georgia

**Sample Size:** 28 long term care facilities

**Summary:** Researchers sought to analyze the relationship between time of mass testing implementation and number of infections incurred within long term care facilities in Fulton County, Georgia. Moreover, they compared Covid-19 prevalence among the "response group" (long term care facilities that only implemented facility-wide testing following the first positive, confirmed case) and the "preventive group" (facilities that implemented mass testing prior to a confirmed case). Researchers discovered that in the 15 long term care facilities comprising the response group, a high prevalence of additional positive cases were quickly found among both residents and staff. Moreover, 28% of residents and 7.4% of staff tested positive. This suggests the presence of facility spread prior to identification of the index case. In these 15 facilities, prevalence remained high during follow-up. In contrast, researchers found that within the 13 facilities comprising the preventive group, the prevalence of positive cases was significantly lower among both residents and staff, averaging .5% and 1.0% respectively. Likewise, fewer cases occurred among the preventive group during follow-up.

**Key Findings Relevant to Ohio's Response:** Findings from this study support previous conclusions regarding the importance of mass, asymptomatic testing. Moreover, the effectiveness of such a program is exemplified through this study and the drastic differences in Covid-19 prevalence among the response and preventive groups. This trend should be taken into consideration when forming policies and/or guidelines for schools and other institutions.

**COVID-19 Literature Review: Diagnostic Tests**  
**Prepared by Eliana Burlotos, The Ohio State University**  
**October 9, 2020**

**Title:** Assessing a novel, lab-free, point-of-care test for SARS-CoV-2 (CovidNudge): a diagnostic accuracy study

**Source:** Lancet Microbe

**Publication Date:** September 17, 2020

**Link:** [https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247\(20\)30121-X/fulltext#seccestitle140](https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247(20)30121-X/fulltext#seccestitle140)

**Study Period:** April 2 – May 18, 2020

**Study Location:** London and Oxford, UK

**Sample Size:** 386 persons

**Summary:** This article describes the accuracy assessment of a novel, rapid point-of-care real time RT-PCR CovidNudge test. The test has been utilized in clinical settings in the UK since May, 2020. The test analyzed is a direct sample-to-answer test that does not require a laboratory like traditional RT-PCR and does not have as long a run-time as traditional RT-PCR does. Furthermore, the CovidNudge test has a run-time of less than 90 minutes. Unfortunately, the CovidNudge processing unit can only process one cartridge at a time, meaning the device has a relatively low throughput. In this study, nasopharyngeal swab samples were collected from three groups: self-referred health-care workers with suspected COVID-19, patients attending emergency departments with suspected COVID-19, and hospital inpatient admissions with or without suspected COVID-19. Swab samples were tested in parallel using the CovidNudge platform, where the swabs were inserted into a cartridge, and with standard laboratory RT-PCR using a viral transport medium. 386 paired samples were obtained, among those 67 tested positive using CovidNudge and 71 tested positive with standard laboratory RT-PCR. The sensitivity of the CovidNudge test compared with the laboratory-based test was 94% with an overall specificity of 100%.

**Key Findings Relevant to Ohio's Response:** Ohio could utilize the CovidNudge platform, which would reduce delays in diagnoses, ultimately reducing the transmission of SARS-CoV-2. Additionally, the CovidNudge test will accelerate clinical decision making, remove pressure on overburdened labs, and allow testing in community settings.

**Title:** Inner Workings: Researchers race to develop in-home testing for COVID-19, a potential game changer

**Source:** PNAS

**Publication Date:** September 30, 2020

**Link:** <https://www.pnas.org/content/early/2020/09/29/2019062117>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This article discusses the various diagnostic tests that exist for active SARS-CoV-2 infections and emphasizes the need for a new test that is widely available, quick, and can be used at-home. The most common tests are nucleic acid tests and antigen tests. Nucleic acid tests are considered to be the most accurate and are typically done by polymerase chain reaction (PCR). PCR tests are timely, require a laboratory, and require expensive equipment, thus they are not a test one could perform at home. Other tests also detect nucleic acids, without PCR. Among these are the Loop Mediated Isothermal Amplification and CRISPR-based tests, which both require less equipment than PCR. At the end of July, the US Food and Drug Administration (FDA) released recommendations that encouraged companies to pursue diagnostic tests that could be used at home and widely available to the public. A test like this would have a drastic impact on the status and transmission of SARS-CoV-2. These tests must be reliable, affordable, and user friendly. Mammoth Biosciences is currently working on a CRISPR-based test that is disposable and would have a cost similar to a

home pregnancy test. A swab sample would be inserted into a cartridge, and the test will reveal a simple color result in less than 20 minutes. The cartridge contains a preloaded CRISPR-CAS enzyme that recognizes a target sequence of the viral genome, producing a positive result. Mammoth's technology has an Emergency Use Authorization (EUA) from the FDA; however, it is only for use by trained medical lab professionals, not yet for use for the general public at home. Another EUA will be needed for an at-home test.

**Key Findings Relevant to Ohio's Response:** Utilizing a widely available, rapid, at-home test would dramatically reduce community transmission of SARS-CoV-2 and identify emerging hotspots. Furthermore, a test like this can be utilized to screen all individuals, not just those who are sick.

## **COVID-19 Literature Review: Healthcare access issues due to pandemic (delays in screening, vaccination, preventive care)**

**Prepared by Elena McGoey, The Ohio State University**

**October 14, 2020**

**Title:** Digital cardiovascular care in COVID-19 pandemic: A potential alternative?

**Source:** Journal of Cardiac Surgery

**Publication:** October 10, 2020

**Link:** <https://onlinelibrary.wiley.com/doi/10.1111/jocs.15094>

**Study Period:** N/A (review on published literature)

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This commentary provides insight into the potential role of digital health care for cardiovascular patients following a systemic review of the limited literature published on digital cardiovascular care thus far. The COVID-19 pandemic has negatively impacted or disrupted usual cardiovascular care, especially the implementation of preventive measures, but digital cardiovascular care has expanded in its availability and roles. Digital health technologies now in place address different subsets of cardiovascular disease: preventative cardiology, hypertension, atrial fibrillation and rhythm disorders, heart failure, cardiovascular surgical patients, and cardiac rehabilitation. While the role of digital care for cardiovascular cases seems to be an effective alternate strategy to in-person consultations during the pandemic, digital methods come with limitations, such as a lack of standardized guidelines for implementation and data privacy concerns. Cardiovascular telehealthcare also places barriers on low-income, elderly, and non-English speaking populations of patients.

**Key findings most relevant to Ohio's response:** Since patients with underlying cardiovascular disease or conditions are at a higher risk for COVID-19, it is important that these patients limit their exposure during healthcare appointments, so digital cardiovascular care should be recommended when possible by health practitioners within Ohio. Healthcare systems can develop guidelines on which digital care programs should be consistently used within that healthcare system and then distribute that information to all health practitioners. Focus by healthcare systems can also be placed on determining how to alleviate the barriers to digital care that low-income, elderly, and non-English speakers face, along with alternate care methods for these groups.

**Title:** COVID-19 and emergency department volume: The patients return but have different characteristics

**Source:** American Journal of Emergency Medicine

**Publication:** October 11, 2020

**Link:** <https://doi.org/10.1016/j.ajem.2020.09.009>

**Study Period:** February 1, 2019-May 31, 2019 and February 1, 2020-May 31, 2020

**Study Location:** Level 1 Trauma urban care center in Louisville, Kentucky

**Sample Size:** 34,213 emergency department visits during the study periods (18,471 during 2019, 15,742 during 2020)

**Summary:** A review of all emergency department (ED) visits at a level 1 trauma center from February-May 2019 and February-May 2020 was used to compare any significant differences (in volume, diagnoses, etc.) and then determine the impact of COVID-19 on emergency department metrics. Statistically significant decrease in volume of visits was observed in 2020 compared to 2019 levels, with April and May showing the greatest difference in visit levels between the two years, with a rebound of visits starting in May 2020 but still not reaching 2019 levels. In 2020, patients were more likely to arrive by ambulance, suggesting a greater patient perception of condition severity and 'need' for ambulance transportation. Proportions of ED diagnoses in 2020 were lower for musculoskeletal, neurologic, and genitourinary

categories and higher in toxicology, psychiatry, and infectious disease categories. Medicare patients comprised a significantly higher (27% increase) proportion of ED visits in 2020.

**Key findings most relevant to Ohio's response:** Public health officials within Ohio should continue to encourage the public to seek emergency care rather than minimizing concerns and delaying ED visits due to anxiety related to COVID-19. Greater proportion of arrival of ED patients by ambulance in 2020 suggests a greater patient perception of their condition severity and 'need' for ambulance transportation. This implies that patients waited until their condition became more severe to 'warrant' an ED visit and/or that potential patients avoided ED visits because their condition was, in the patients' perceptions, 'not severe enough' to warrant a visit. Additionally, healthcare systems should continue to provide mental health resources, since an increase in psychiatry-related admissions to the ED in 2020 is likely caused by heightened anxiety and complications of preexisting mental health conditions due to the pandemic.

**Title:** The Impact of COVID-19 on Cancer-Screening: Challenges and Opportunities

**Source:** JMIR Cancer

**Publication:** October 7, 2020

**Link:** <https://preprints.jmir.org/preprint/21697/accepted>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This commentary focuses on the disruptions that COVID-19 has brought to patients, health practitioners, and healthcare systems relating to the preventive service of cancer screenings. These disruptions (delays, cancellations) in cancer screening services are more likely to negatively affect individuals who have low socioeconomic status or identify as part of a minority group, with delayed screening leading to higher cancer mortality rates for these already underserved populations. In terms of health practitioners and healthcare systems, reduced preventive cancer care such as screening will likely lead to decreased profits and diminished cancer research funding/investments. Recommended solutions to address disruptions to cancer screening include opportunities within telemedicine and other technology-based programs and leveraging social media to boost the awareness and rates of cancer screening.

**Key findings most relevant to Ohio's response:** Within Ohio healthcare systems, emphasis can be placed on the education of health practitioners to provide adequate training for telemedicine programs and knowledge to identify at-risk communities for health disparities such as cancer. This way, health practitioners can both be comfortable and efficient long-term with providing care via telemedicine and can recommend and/or offer cancer screening services to patients, especially those whom may have an increased risk of being disproportionately affected by chronic health concerns. Additionally, healthcare systems can immediately start implementing the 'solutions' proposed by the commentary, with emphasis on the possible opportunities for boosting cancer screening awareness amid the pandemic through use of far-reaching yet comparatively inexpensive social media initiatives.

**COVID-19 Literature Review: Healthcare Capacity**  
**Prepared by Anjali Prabhakaran, The Ohio State University**  
**October 8 and 21, 2020**

<b>Title</b>	Utilizing Pharmacists to Optimize Medication Management Strategies During the COVID-19 Pandemic.
<b>Source</b>	SAGE Journal of Pharmacy of Practice
<b>Publication Date</b>	10/05/2020
<b>Link</b>	<a href="https://journals.sagepub.com/doi/10.1177/0897190020961655">https://journals.sagepub.com/doi/10.1177/0897190020961655</a>
<b>Study Period</b>	March 2020 – April 2020
<b>Study Location</b>	Nashville, Tennessee
<b>Sample Size</b>	One healthcare site
<b>Summary</b>	This article details the measures taken by an health-system to mobilize clinical pharmacy services to address management of COVID-19 patients. By involving clinical pharmacists in patient care, healthcare system capacity can be improved by preventing COVID-19 transmission within the hospital, maximizing healthcare worker efficiency, and streamlining medical supply/medication usage. The best practice recommendations emerging from this study were: converting patients from intravenous (IV) to oral medication, transitioning to IV push medication administration, evaluating standard medication administration timing, reviewing metered dose inhaler (MDI) and nebulizer utilization, using alternatives for medications in short supply, reviewing coronavirus disease COVID-19 treatment recommendations, reviewing COVID-19 patient care on interdisciplinary rounds, de-prescribing and de-escalating to eliminate unnecessary medications, and assessing for appropriate venous thromboembolism prophylaxis. By following these guidelines, staff entries into patient rooms can be minimized, PPE supplies can be conserved, nursing time can be maximized, and the medication supply can be protected.
<b>Key Findings Relevant to Ohio’s Response</b>	As hospitals cope with higher patient populations, it is imperative for medications, PPE, and healthcare workers’ time to be used efficiently. The medication management guidelines developed by the healthcare system can help Ohio clinicians better understand how to improve healthcare system capacity by involving pharmacists in patient care.

<b>Title</b>	Solving Community SARS-CoV-2 Testing with Telehealth
<b>Source</b>	JMIR
<b>Publication Date</b>	09/22/2020
<b>Link</b>	<a href="https://preprints.jmir.org/preprint/20419/accepted">https://preprints.jmir.org/preprint/20419/accepted</a>
<b>Study Period</b>	03/08/2020 - 04/11/2020
<b>Study Location</b>	Thomas Jefferson University Hospital
<b>Sample Size</b>	4663 patients
<b>Summary</b>	One of the main challenges that emerged during the COVID-19 pandemic was how to efficiently screen and test patients efficiently without overloading hospital capacity. At Thomas Jefferson Hospital, clinicians came up with a

	<p>method to integrate telehealth and SARS-CoV-2 testing to streamline this task. If a patient needed to be tested, they were first directed to schedule a telehealth visit with a TJH physician. The physician used screening protocols devised by infectious disease specialists and health system clinical and occupational medicine leadership to determine who should be screened. Patients that were required screening had a lab order placed on their electronic medical records. Mobile testing sites were linked to the telehealth program, and once patients were tested, the test results got uploaded to their medical records. The usage of this scalable telehealth system minimized clinician and patient exposure within the hospital, maximized efficient use of PPE, and increased safe access to COVID-19 related testing.</p>
<b>Key Findings Relevant to Ohio's Response</b>	<p>Rapid COVID-19 testing is still an imminent need, and will likely continue to be at least until an effective vaccine is developed and disseminated. However, in areas with limited COVID-19 testing kits, an efficient protocol must be developed to determine which patients do/do not need testing and direct patients to testing sites quickly. The model described in this paper uses an already established telehealth system to execute this task in a cost-effective, safe, and efficient manner. Ohio clinicians can replicate this model in Ohio healthcare systems to achieve similar testing efficiency and maximize healthcare system capacity.</p>

<b>Title</b>	Spatiotemporal transmission dynamics of the COVID-19 pandemic and its impact on critical healthcare capacity
<b>Source</b>	Elsevier
<b>Publication Date</b>	07/20/2020
<b>Link</b>	<a href="https://www.sciencedirect.com/science/article/pii/S1353829220309400?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S1353829220309400?via%3Dihub</a>
<b>Study Period</b>	n/a
<b>Study Location</b>	Ohio
<b>Sample Size</b>	n/a
<b>Summary</b>	<p>This paper studied geospatial COVID-19 infection patterns and healthcare access disparities in Ohio using a mathematical model designed to simulate COVID-19 transmission dynamics. The model showed that localized areas had higher disease attack rates, and so did areas with connectivity enhanced by air transport. While rural areas had only 7% of the total number of ICU beds available in the state, the model suggested that the lower transmission rates in these rural areas prevented the critical care capacity of these hospitals from being saturated. Urban areas would experience exhaustion of critical care capacity much faster, despite having more hospital capacity, due to higher rates of transmission. If social distancing measures are relaxed, the model predicted that healthcare capacity in Cuyahoga, Franklin, Lucas, Montgomery, and Summit would reach 94% of maximum capacity within eight weeks.</p>
<b>Key Findings Relevant to Ohio's Response</b>	<p>Few studies studying geospatial disparities in relation to the COVID-19 pandemic have been conducted. Since this study was conducted specifically within the context of Ohio, the results are highly relevant to healthcare administrators and</p>

	<p>policymakers. The findings of this model are especially relevant when preparing to relax social distancing regulations; this study suggests that urban areas must be highly cautious, while rural areas are unlikely to have capacity maximized. In a worst case scenario, urban areas could even draw from the resources of rural areas to treat their patients during a large patient surge.</p>
--	---

<b>Title</b>	Spatiotemporal analysis of medical resource deficiencies in the U.S. under COVID-19 pandemic
<b>Source</b>	PLOS ONE
<b>Publication Date</b>	10/14/2020
<b>Link</b>	<a href="https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0240348">https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0240348</a>
<b>Study Period</b>	02/15/2020 – 05/01/2020
<b>Study Location</b>	U.S.
<b>Sample Size</b>	3,143 counties
<b>Summary</b>	<p>This study used spatiotemporal data analysis methods to extract medical resource features and COVID-19 patient statistics to develop two different medical resource deficiency indices, MRDI (general) and MRDI<sub>d</sub> (local daily). MRDI represents the number of active confirmed cases normalized by local maximum potential medical resources; and MRDI<sub>d</sub> represents the number of hospitalized patients than can be supported per ICU beds per critical care staff. MRDI and MRDI<sub>d</sub> were then visualized using ArcGIS to overlay the clustering patterns and trends on a map. The analysis revealed that the spatial distribution of medical resources at county level is highly variable across the U.S., and the number of ICU beds and critical care staff are not highly spatially correlated. Ultimately, MRDI and MRDI<sub>d</sub> can serve as useful tools to understand U.S. pandemic preparedness during peak pandemic periods.</p>
<b>Key Findings Relevant to Ohio's Response</b>	<p>As hospitals cope with higher patient populations, it is imperative for policymakers to understand which regions are properly prepared to handle the influx of COVID-19 cases, and which hospitals need more support. Once this is determined, healthcare administrators can then distribute supplies/personel to different hospitals effectively. The model developed in this paper (publicly available at <a href="https://umdmppgis.maps.arcgis.com/apps/opsdashboard/index.html#/2bd01ebf8d984eed8a6d46e54ee989c">https://umdmppgis.maps.arcgis.com/apps/opsdashboard/index.html#/2bd01ebf8d984eed8a6d46e54ee989c</a>) is a useful tool for policymakers and administrators to properly provide for COVID-19 patients during a surge.</p>

<b>Title</b>	Tele-ICUs for COVID-19: A Look at National Prevalence and Characteristics of Hospitals Providing Teleintensive Care
<b>Source</b>	The Journal of Rural Health
<b>Publication Date</b>	10/08/2020
<b>Link</b>	<a href="https://onlinelibrary.wiley.com/doi/full/10.1111/jrh.12524">https://onlinelibrary.wiley.com/doi/full/10.1111/jrh.12524</a>
<b>Study Period</b>	n/a (datasets from 2018)
<b>Study Location</b>	U.S.

<b>Sample Size</b>	4288 facilities
<b>Summary</b>	The goal of this research study was to examine the trends in tele-ICU capacity among short-term, acute care hospitals across the United States. The key variables examined were whether or not a hospital had tele-ICU capability, ownership, region, beds, ICU beds, outpatient visits, ED visits, full-time employees, and whether a hospital was rural, a critical access hospital, a major teaching hospital, or part of a health system. The study concluded that larger, not-for-profit, nonrural, noncritical access, teaching hospitals that were part of a health system, particularly in the Midwest, were more likely to have tele-ICU capacity. The median percent of hospitals with tele-ICU by hospital referral region (HRR) weighted by outpatient visits was 11.3%, while over a third of HRRs had zero hospitals with tele-ICUs.
<b>Key Findings Relevant to Ohio's Response</b>	During large surges of COVID-19 patients, many ICUs in the United States became overwhelmed, resulting in the deployment of tele-ICU technology. The findings of this research study will allow healthcare administrators make informed decisions regarding the implementation of tele-ICU care in their hospitals.

<b>Title</b>	Locally Informed Modeling to Predict Hospital and Intensive Care Unit Capacity During the COVID-19 Epidemic
<b>Source</b>	Ochsner Journal
<b>Publication Date</b>	10/20/2020
<b>Link</b>	<a href="http://www.ochsnerjournal.org/content/20/3/285">http://www.ochsnerjournal.org/content/20/3/285</a>
<b>Study Period</b>	March 16 – April 15 2020
<b>Study Location</b>	Louisiana
<b>Sample Size</b>	8 hospitals
<b>Summary</b>	The study looked to develop a COVID-19 modelling system that could be deployed locally without the use of complex statistical modeling. In this study, the researchers used a susceptible-infected-recovered (SIR) model to make operational decisions for the Ochsner Health System. The model parameters included several assumptions regarding hospitalization rate, ICU rate, etc. Some values were developed by researchers and others were the same as the UPENN CHIME model. The researchers concluded that this simplified SIR model can be useful for assessing the needs of different hospital service areas during the COVID-19 pandemic.
<b>Key Findings Relevant to Ohio's Response</b>	Many different modeling systems have emerged to help hospitals prepare for COVID-19 patient surges. Having an accurate modeling system will allow hospitals to efficiently deploy their healthcare workforce, purchase an appropriate amount of medical supplies, and make sure that patients are properly cared for. This article will help healthcare administrators make an

	informed decision on which type of modeling system would be best for their facility.
--	--

## COVID-19 Literature Review: PPE Capacity

Prepared by Anjali Prabhakaran, The Ohio State University

October 8 and 21, 2020

<b>Title</b>	<b>State Actions and Shortages of Personal Protective Equipment and Staff in U.S. Nursing Homes</b>
<b>Source</b>	Journal of the American Geriatrics Society
<b>Publication Date</b>	10/06/2020
<b>Link</b>	<a href="https://onlinelibrary.wiley.com/doi/10.1111/jgs.16883">https://onlinelibrary.wiley.com/doi/10.1111/jgs.16883</a>
<b>Study Period</b>	06/21/2020 - 07/19/2020
<b>Study Location</b>	United States
<b>Sample Size</b>	13,445 facilities
<b>Summary</b>	While most research regarding PPE shortages focus on hospital settings, this paper examined staff and PPE shortages in long-term care (LTC) facilities. This study examined the correlation between whether or not a facility experienced staff or PPE shortages and state actions and nursing home characteristics. Over the course of the five-week study period, the researchers determined that 27.6% of facilities reported at least one week of PPE shortage, 30.2% facilities reported at least one week of staffing shortage, and 46.5% experienced both a PPE and staff shortage for at least one week. States with facilities in the Northeastern PPE consortium or those that had LTC teams were less likely to have a PPE shortage, and facilities within states that implemented processes to match job seekers with LTC facilities were significantly less likely to experience a staffing shortage.
<b>Key Findings Relevant to Ohio's Response</b>	Elderly populations are incredibly vulnerable to COVID-19 mortality and infection. Therefore, it is incredibly important that LTC facilities and nursing homes are properly equipped to treat individuals and protect their staff. It is incredibly important for Ohio policymakers to recognize that nearly half of U.S. nursing homes faced a shortage of PPE and/or staff when evaluating funding decisions during the pandemic.

<b>Title</b>	Contributing factors to personal protective equipment shortages during the COVID-19 pandemic
<b>Source</b>	Preventive Medicine
<b>Publication Date</b>	10/02/2020
<b>Link</b>	<a href="https://www.sciencedirect.com/science/article/pii/S0091743520302875?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S0091743520302875?via%3Dihub</a>
<b>Study Period</b>	n/a
<b>Study Location</b>	U.S.
<b>Sample Size</b>	n/a
<b>Summary</b>	This review examines the factors that influenced PPE shortages in the U.S. during the COVID-19 pandemic and provides suggestions to ensure an adequate supply of PPE is

	available for healthcare workers. As of May 2020, 8% of nurses had reported having to reuse a single-use mask or N95 respirator, and 27% of nurses reported being exposed to a confirmed COVID-19 patient without the proper PPE as a result of PPE shortages. This study identified four contributing factors that affected PPE shortage: the way hospitals budget PPE, domestic demand shocks, federal government failures, and disruptions to the global supply chain. Based on the conducted analysis, the researchers developed seven recommendations to alleviate this issue, which included removing hospitals' profit motive consideration in purchasing and maintaining PPE inventories and implementing strategic industrial policy to increase US production of PPE.
<b>Key Findings Relevant to Ohio's Response</b>	Given that healthcare worker deaths are strongly correlated with CDC confirmed COVID death in the general population, it is incredibly important that healthcare workers are properly protected when treating patients. The recommendations set forth by the authors of this paper can assist Ohio policymakers in making decisions regarding PPE shortages, specifically in the types of industrial and occupational health policy to implement.

<b>Title</b>	COVID-19 Creating another problem? Sustainable solution for PPE disposal through LCA approach
<b>Source</b>	Environment, Development, and Sustainability
<b>Publication Date</b>	10/09/2020
<b>Link</b>	<a href="https://link.springer.com/article/10.1007/s10668-020-01033-0">https://link.springer.com/article/10.1007/s10668-020-01033-0</a>
<b>Study Period</b>	n/a
<b>Study Location</b>	India
<b>Sample Size</b>	n/a
<b>Summary</b>	The abundant use of PPE during the COVID-19 has highlighted the necessity of developing a proper disposal system. The researchers involved in this study used the Life Cycle Assessment (cradle to grave analysis) of PPE to evaluate the most environmentally sound methods of PPE kit treatment and disposal. The variables analyzed were Global Warming Potential (GWP), Human Toxicity Potential (HTP), Eutrophication Potential (EP), Acidification Potential (AP), Freshwater Aquatic Ecotoxicity Potential (EP), and Photochemical Ozone Depletion Potential (POCP). Disposal of PPE bodysuits had the maximum GWP impact, followed by gloves and goggles. Metal face-strips in masks had the highest HTP impact. The researchers also concluded that decentralized incineration was the most environmental sound disposal strategy for PPE equipment.
<b>Key Findings Relevant to Ohio's Response</b>	Balancing human and environmental welfare are especially important during the COVID-19 pandemic, given the significant use of disposable medical supplies. This paper will help policymakers evaluate which PPE treatment and disposal methods are most optimal in terms of environmental impact. Additionally, the analyses used in this paper can help healthcare administrators make more sustainable medical supply purchasing decisions.

<b>Title</b>	Scalable In-hospital Decontamination of N95 Filtering Facepiece Respirator with a Peracetic Acid Room Disinfection System.
<b>Source</b>	Infection Control and Hospital Epidemiology
<b>Publication Date</b>	10/12/2020
<b>Link</b>	<a href="https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/scalable-inhospital-decontamination-of-n95-filtering-facepiece-respirator-with-a-peracetic-acid-room-disinfection-system/4B56043CF6D905CA6E8EF07B19FCF054">https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/scalable-inhospital-decontamination-of-n95-filtering-facepiece-respirator-with-a-peracetic-acid-room-disinfection-system/4B56043CF6D905CA6E8EF07B19FCF054</a>
<b>Study Period</b>	n/a
<b>Study Location</b>	Ohio (Cleveland institutions)
<b>Sample Size</b>	n/a
<b>Summary</b>	This study assessed the use of an ultrasonic room high-level disinfection system (HLDS) that generates aerosolized peracetic acid (PAA) and hydrogen peroxide for disinfecting N95 masks. A total cycle time of 1 hour and 16 minutes consistently disinfected N95 respirators (>6 log <sub>10</sub> reductions in bacteriophage MS2 and <i>Geobacillus stearothermophilus</i> spores inoculated onto respirators). The disinfection process did not adversely affect filtration efficiency, structural integrity, or strap elasticity of the masks even after five treatment cycles. Additionally, no off-gassing of PAA and hydrogen peroxide was detected after 20 and 60 minutes of the treatment cycle.
<b>Key Findings Relevant to Ohio's Response</b>	With increased use of PPE comes a heightened risk of PPE shortages. During the height of the COVID-19 pandemic, many hospitals across the nations dealt with N-95 makes shortages in particular. This paper has developed a scalable disinfection model that could help healthcare facilities preserve their mask supply without compromising healthcare worker or patient safety.

<b>Title</b>	To PPE or not to PPE? Making sense of conflicting international recommendations for PPE during chest compressions in patients with COVID-19.
<b>Source</b>	Resuscitation Journal
<b>Publication Date</b>	09/22/2020
<b>Link</b>	<a href="https://www.resuscitationjournal.com/article/S0300-9572(20)30467-6/fulltext">https://www.resuscitationjournal.com/article/S0300-9572(20)30467-6/fulltext</a>
<b>Study Period</b>	12/1/19 - 06/29/2020
<b>Study Location</b>	Global
<b>Sample Size</b>	10 countries
<b>Summary</b>	This study evaluated the global guidelines regarding the use of PPE during chest compressions. The researchers reviewed guidelines from ten different countries, including Iran, Italy, Spain, Chile, Peru, the UK, India, Russia, Brazil, and the USA. Recommendations were highly variable across countries, and some countries, such as the UK, had conflicting views between different national health organizations. The USA's CDC and American Heart Association

	<p>(AHA) recommend the use of full PPE for compressions. However, Italy and UK's Public Health England (PHE) both recommend chest compressions to be performed without full PPE (as suggested by the WHO). The researchers also found little evidence for or against transmission of SARS-CoV-2 during chest compressions.</p>
<b>Key Findings Relevant to Ohio's Response</b>	<p>The use of PPE during chest compressions remains a highly debated topic, as evidenced by the conflicting recommendations between and within nations. While more research is clearly needed in this area, this paper provides healthcare workers with the available knowledge on this topic from a wide variety of national health organizations and the WHO.</p>

## COVID-19 Literature Review: University/persons aged 18-22 outbreaks

Prepared by Greta Warmbier, The Ohio State University

October 12, 2020

**Title:** Recent Increase in in COVID-19 Cases Reported Among Adults Aged 18-22 Years – United States, May 31 – September 5, 2020

**Source:** Morbidity and Mortality Weekly Report (CDC)

**Publication Date:** October 2, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6939e4.htm?s\\_cid=mm6939e4\\_x](https://www.cdc.gov/mmwr/volumes/69/wr/mm6939e4.htm?s_cid=mm6939e4_x)

**Study Period:** May 31 – September 5, 2020

**Study Location:** United States

**Sample Size:** n/a

**Summary:** 45% of people aged 18-22 were enrolled in colleges in 2019. From August 2 – September 5, weekly rates among this population rose by 55.1%. Rates increased by 144% in the Northeast and 123.4% in the Midwest. Changes in testing volume decreased by 6.2% in the West and increased by 170.6% in the Northeast. From May 31 – September 5 the proportion of cases involving White people aged 18-22 increased from 33.8% to 77.3%. From August 2 – September 5, of the 999,579 cases of COVID-19 were reported to the CDC, 15.6% were individuals aged 18-22. National weekly COVID-19 incidence among this same population increased by 62.7% during the 4-week period from August 2 – August 29. The statistics went from 110 to 180 cases per 100,000 cases. From August 30 – September 5, cases declined to 171 cases per 100,000 cases. From August 2 – September 5, weekly incidence increased by 144% in the Northeast, 123.4% in the Midwest, and 43.8% in the South. In the Northeast, weekly incidence has not passed 53 cases per 100,000 cases for this age group since July 4. In the West, incidence declined until August 22 and then increased through September 5. In August as a whole, there was a 1.7% decline in the West. From August 2 – September 5, the proportion of all cases that occurred among people aged 18-22 doubled from 10.5% to 22.5%. Weekly tests for that population increased 49.3% from the week of August 2 – August 8 to the week of August 30 – September 5. Tests increased by 170.6% in the Northeast, 65.2% in the Midwest, and 7% in the South, and 6.2% in the West. From August 2 – September 5, weekly incidence among White people aged 18-22 increased by 149.7%. From May 31 – June 20, the same value increased from 33.8% to 50.8%. From August 2 – September 5, the same value increased from 52.1% to 77.3%. Notable increases for this group were in the Midwest (198.2%) and the Northeast (168.4%). Incidence among other racial groups remained stable or declined during this same period.

**Key findings most relevant to Ohio's response:** 71% of persons aged 18–22 years reside with a parent, nearly 50% attend colleges and universities, and 33% live with a parent while enrolled. Universities need to develop a comprehensive COVID-19 policy involving CDC guidelines, particularly on quarantine, so that these students do not infect their older relatives that are at greater risk of mortality from COVID-19. Social media is a good way to encourage mask wearing, social distancing, and handwashing for this age group.

**Title:** Multiple COVID-19 Clusters on a University Campus – North Carolina, August 2020

**Source:** Morbidity and Mortality Weekly Report (CDC)

**Publication Date:** October 2, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6939e3.htm?s\\_cid=mm6939e3\\_x](https://www.cdc.gov/mmwr/volumes/69/wr/mm6939e3.htm?s_cid=mm6939e3_x)

**Study Period:** August 2020

**Study Location:** North Carolina

**Sample Size:** 19,690 undergraduate students

**Summary:** On August 3, 2020, university A in North Carolina opened its campus back up for in-person activities after previously transitioning to remote in March. Students returned to residence halls on August 3 - 9. In-person classes began August 10. Aside from 2 dormitories reserved for isolation and quarantine, residence halls opened at 60-85% capacity, with most students having 1 roommate. Enrollment for fall 2020 was 19,690 undergraduate students, with 29% living on-campus, and 83% being residents of North Carolina. From August 3 – 25, there were 670 positive COVID-19 cases on campus. 96% of these cases were among patients under 22 years. 18 clusters of 5 or more epidemiologically linked cases within 14 days of one another were reported. 30% of cases were linked to a cluster. Of the 18 clusters that were identified, 8 were in residence halls, 5 were among students involved in a sorority or fraternity, 1 was in an off-

campus apartment, and 4 were among athletic teams. Clusters ranged from 5 to 106 patients, with the median being 5. The largest cluster was associated with a university-affiliated apartment complex. On August 19, university A transitioned all in-person classes to remote after accumulating 334 associated cases since opening back up. Of the 670 positive COVID-19 cases from August 3 – 25, the median patient age was 19. 47% of cases occurred in males. 36% of cases were from individuals who resided on campus. 8% were members of a fraternity or sorority. 8% were student athletes. As of August 25, no patients were hospitalized or had died.

**Key findings most relevant to Ohio’s response:** Rapid increases in COVID-19 cases occurred in North Carolina within 2 weeks of opening university A to students. The state of Ohio has 14 four-year research universities, 24 branch and regional campuses, 23 two to four-year community and technical colleges, 13 graduate schools, 7 medical schools, 6 law schools, and 10 business schools within campuses. There are plenty of campuses in which clusters have and will continue to occur. It is important that the state remains vigilant and treats all returns from breaks, especially this upcoming winter break, as a “reopening,” accompanied by an abundance of caution.

**Title:** COVID-19 in a Correctional Facility Employee Following Multiple Brief Exposures to Persons with COVID-19 — Vermont, July–August 2020

**Source:** Centers for Disease Control and Protection (CDC)

**Publication Date:** October 21, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6943e1.htm?s\\_cid=mm6943e1\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6943e1.htm?s_cid=mm6943e1_w)

**Study Period:** n/a

**Study Location:** Vermont, United States

**Sample Size:** n/a

**Summary:** On August 11, a confirmed case of COVID-19 in a male correctional facility employee aged 20 years was reported to the Vermont Department of Health (VDH). On July 28, the correctional officer had multiple brief encounters with 6 incarcerated or detained persons (IDPs) while their test results were pending. The 6 asymptomatic IDPs arrived from an out-of-state correctional facility on July 28 and were housed in a quarantine unit. In accordance with Vermont Department of Corrections (VDOC) policy for state prisons, nasopharyngeal swabs were collected from the 6 IDPs on their arrival date and tested for COVID-19 at the Vermont Department of Health Laboratory, using real-time reverse transcription–polymerase chain reaction. On July 29, all 6 IDPs received positive test results. VDH and VDOC conducted a contact tracing investigation and used video surveillance footage to determine that the correctional officer did not meet VDH’s definition of close contact (i.e., being within 6 feet of infectious persons for  $\geq 15$  consecutive minutes); therefore, he continued to work. At the end of his shift on August 4, he experienced loss of smell and taste, myalgia, runny nose, cough, shortness of breath, headache, loss of appetite, and gastrointestinal symptoms. He stayed home from work beginning August 5. He tested positive on August 11. He identified 2 contacts outside of work. Neither contact tested positive. Although the correctional officer never spent 15 consecutive minutes within 6 feet of an IDP with COVID-19, numerous brief (approximately 1-minute) encounters that cumulatively exceeded 15 minutes did occur. During his 8-hour shift on July 28, the correctional officer was within 6 feet of an infectious IDP an estimated 22 times while the cell door was open, for an estimated 17 total minutes of cumulative exposure. IDPs wore microfiber cloth masks during most interactions with the correctional officer that occurred outside a cell; however, during several encounters in a cell doorway or in the recreation room, IDPs did not wear masks. During all interactions, the correctional officer wore a microfiber cloth mask, gown, and eye protection (goggles). The correctional officer wore gloves during most interactions. The correctional officer’s cumulative exposure time is an informed estimate; additional interactions might have occurred that were missed during this investigation. The correctional officer reported no other known close contact exposures to persons with COVID-19 outside work and no travel outside Vermont during the 14 days preceding illness onset. COVID-19 cumulative incidence in his county of residence and where the correctional facility is located was relatively low at the time of the investigation at 20 cases per 100,000 persons. Among 7 employees with exposures to the infectious IDPs that did meet the VDH close contact definition, only 1 person received a positive test result. Among

13 employees (including the correctional officer) with exposures to the infectious IDPs that did not meet the VDH close contact definition during contact tracing, only the correctional officer received a positive test result.

**Relevance to Ohio's COVID-19 Response:** Public health officials should consider transmission-risk implications of cumulative exposure time within settings such as correctional institutions which provide poor ventilation and close quarters.

**COVID-19 Literature Review: COVID effects on special populations: Minorities, social determinants of health, others**  
Prepared by Greta Warmbier, The Ohio State University  
October 20, 2020

**Title:** Excess Deaths Associated with COVID-19, by Age and Race and Ethnicity —United States, January 26–October 3, 2020

**Source:** Centers for Disease Control and Protection (CDC)

**Publication Date:** October 20, 2020

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6942e2.htm?s\\_cid=mm6942e2\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6942e2.htm?s_cid=mm6942e2_w)

**Study Period:** January 26 –October 3, 2020

**Study Location:** United States

**Sample Size:** n/a

**Summary:** As of October 15, there were 216,025 reported deaths from COVID-19 in the United States. Excess deaths are defined as the number of persons who have died from all causes, more than the expected number of deaths for a given place and time. Expected numbers of deaths were estimated using over dispersed Poisson regression models with spline terms to account for seasonal patterns, using provisional mortality data from CDC's National Vital Statistics System. An estimated 299,028 excess deaths have occurred in the United States from late January through October 3, with 2/3 of these attributed to COVID-19. The largest percentage increases were seen among adults aged 25–44 years and among Hispanic or Latino people. Excess deaths reached their highest points during the weeks ending April 11 (40.4%) and August 8 (23.5%). The total number of excess deaths ranged from a low of approximately 841 in the youngest age group (<25 years) to a high of 94,646 among adults aged 75–84 years. Overall, numbers of deaths among people aged <25 years were 2.0% below average, and among adults aged 45–64, 65–74 years, 75–84, and ≥85 years were 14.4%, 24.1%, 21.5%, and 14.7% above average, respectively. For White people, deaths were 11.9% higher when compared to average numbers during 2015–2019. Hispanic people experienced a 53.6% increase, American Indian/Alaskan Native (AN/IN) a 28.9% increase, Black people a 32.9% increase, other ethnicities a 34.6% increase, and Asian people a 36.6% increase.

**Relevance to Ohio's COVID-19 Response:** The study notes that estimates of excess deaths attributed to COVID-19 might underestimate the actual number directly attributable to COVID-19, because deaths from other causes might represent misclassified COVID-19–related deaths or deaths indirectly caused by the pandemic. Specifically, deaths from circulatory diseases, Alzheimer disease and dementia, and respiratory diseases have increased in 2020 relative to past years, and it is unclear to what extent these represent misclassified COVID-19 deaths or deaths indirectly related to the pandemic. It is important that we focus on prevention of infection and test regularly to ensure that our statistics for deaths, specifically excess deaths, are accurate.

**Title:** Genomic evidence for reinfection with SARS-CoV-2: a case study

**Source:** The Lancet Infectious Diseases

**Publication Date:** October 12, 2020

**Link:** [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(20\)30764-7/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30764-7/fulltext)

**Study Period:** n/a

**Study Location:** Nevada, United States

**Sample Size:** n/a

**Summary:** A 25-year-old man from Nevada presented to health authorities on 2 occasions with symptoms of COVID-19, once at a community testing event in April, 2020, and a second time to primary care then hospital at the end of May and beginning of June, 2020. The patient had no history of clinically significant underlying conditions, and no indications of compromised immunity were identified. Nasopharyngeal swabs were obtained from the patient at each presentation and twice during follow-up. Nucleic acid amplification testing was done to confirm. Next-generation sequencing of SARS-CoV-2 extracted from nasopharyngeal swabs was performed. Sequence data were assessed by 2 different bioinformatic methodologies. A short tandem repeat marker was used for fragment analysis to confirm that samples from both infections came from the same individual. The two positive tests were separated by two negative tests done during

follow-up in May 2020. Genomic analysis of SARS-CoV-2 showed genetically significant differences between each variant associated with each instance of infection. The second infection was symptomatically more severe than the first. During isolation, the patient's symptoms resolved (reported on April 27, 2020) and he continued to feel well until May 28, 2020. On May 31, 2020, the patient sought care at urgent care with self-reported fever, headache, dizziness, cough, nausea, and diarrhea, at which time chest radiography was done and he was discharged home. 5 days later (on June 5, 2020), the patient presented to a primary care doctor and was found to be hypoxic with shortness of breath. He was instructed to go to the emergency department after provision of oxygen. Genetic discordance of the two SARS-CoV-2 specimens was greater than could be accounted for by short-term in vivo evolution. These findings suggest that the patient was infected by SARS-CoV-2 on two separate occasions by a genetically distinct virus. This means that previous exposure to SARS-CoV-2 might not guarantee total immunity in all cases. It is possible that this is a case of continuous infection entailing deactivation and reactivation. However, for such a hypothesis to be true, a mutational rate of SARS-CoV-2 would be required that has not yet been recorded.

**Relevance to Ohio's COVID-19 Response:** It is important that people stay alert and continue following CDC guidelines for COVID-19 regardless of whether they have already tested positive for COVID-19. It is also important to consider the possibility of reinfection when working to create an effective vaccine.

## COVID-19 Literature Review: Maternal/child health issues with COVID-19 (vertical infection, breastfeeding, neonatal outcomes, delay in prenatal care)

Prepared by Elena McGoey, The Ohio State University

October 21, 2020

**Title:** Coronavirus Disease 2019 in Neonates — What is Known and What Needs to Be Known

**Source:** LitCovid

**Publication:** October 8, 2020

**Link:** <https://www.ncbi.nlm.nih.gov/research/coronavirus/publication/33029451>

**Study Period:** N/A

**Study Location:** N/A

**Sample Size:** N/A

**Summary:** This review discussed the vertical and horizontal transmission, clinical features, diagnosis, management, and preventive strategies for neonates concerning COVID-19. Very few asymptomatic and symptomatic cases of COVID-19 are reported in neonates, with seemingly minimal risk of vertical transmission from SARS-CoV-2 positive mothers. The possibility and nature of in utero transmission is still unknown. Proper mask wearing and hand washing is effective in preventing horizontal transmission from SARS-CoV-2 mothers to neonates postpartum. There is currently not enough data to recommend either immediate or delayed cord clamping. While breastfeeding is established as safe, with SARS-CoV-2 not passing through breast milk, organizations do not agree on whether direct breastfeeding or feeding expressed milk should be recommended for the neonates of SARS-CoV-2 positive mothers. For neonates that did test positive for SARS-CoV-2, recovery was made with minimal treatment, and antiviral or hydroxychloroquine treatments are not recommended for positive neonates.

**Key findings most relevant to Ohio's response:** Healthcare systems within Ohio should note which treatments are not recommended for neonates, and facilities should develop clear protocol for management and monitoring of both asymptomatic and symptomatic neonates, setting standard infection control measures for both mother and neonate. Additionally, healthcare systems should establish consistent recommendations regarding breastfeeding and isolation for cases of SARS-CoV-2 positive mothers. Effort should be made to screen all pregnant women.

**Title:** Analysis of SARS-CoV-2 vertical transmission during pregnancy

**Source:** LitCovid

**Publication:** October 14, 2020

**Link:** <https://www.ncbi.nlm.nih.gov/research/coronavirus/publication/33046695>

**Study Period:** March 1, 2020-April 30, 2020

**Study Location:** 3 COVID-19 maternity hospitals of Lombardy, Italy

**Sample Size:** 31 pregnant women positive for SARS-CoV-2

**Summary:** Maternal and newborn nasopharyngeal swabs, vaginal swabs, maternal and umbilical cord plasma, placenta and umbilical cord biopsies, amniotic fluids, and breast milk (all taken from a sample of 31 SARS-CoV-2 positive mothers) were analyzed for the presence of the SARS-CoV-2 viral genome. SARS-CoV-2 genome was detected in one umbilical cord blood, two at-term placentas, one vaginal mucosa, and one breast milk sample. Additionally, placentas and maternal and umbilical cord plasma were tested, both for the presence of specific anti-SARS-CoV-2 IgM and IgG antibodies and for genes involved in inflammatory response. Anti-SARS-CoV-2 IgM and IgG antibodies were present in one umbilical cord blood and one milk sample. In cases of vertical transmission of SARS-CoV-2 to neonate, a strong maternal and fetal inflammatory response was present at the placental and systemic (blood circulation) levels. This data supports that risk of in utero SARS-CoV-2 vertical transmission is low, yet possible.

**Key findings most relevant to Ohio's response:** Further studies that can be completed by healthcare systems within Ohio are needed to determine the risk of vertical transmission in pregnant women infected during the first or second trimester, since all women included in this study became infected during their third trimesters. Since the data from this study supports the hypothesis that vertical transmission, while low, is possible, all healthcare providers need to emphasize to all pregnant women the importance of adherence to COVID-19 guidelines. This study also confirmed the

presence of anti-SARS-CoV-2 antibodies in breast milk, which should be further investigated, as this discovery can have a positive impact on healthcare facilities' likelihood to recommend breastfeeding and can aid facilities in their decision of breastfeeding guidelines during COVID-19.

**Title:** COVID-19 and first trimester spontaneous abortion: a case-control study of 225 pregnant patients

**Source:** LitCovid, American Journal of Obstetrics and Gynecology

**Publication:** October 11, 2020

**Link:** <https://www.ncbi.nlm.nih.gov/research/coronavirus/publication/33039396>

**Study Period:** February 22, 2020-May 21, 2020

**Study Location:** S. Anna Hospital, Turin (capital of Piedmont), Italy

**Sample Size:** 225 pregnant patients

**Summary:** The incidence of COVID-19 was compared between a case group of women who had a spontaneous first trimester abortion and a control group of women who had ongoing pregnancies. Twenty-three of the total 225 women tested positive for SARS-CoV-2, with a 11% (11/100) incidence of infection in the case group and 9.6% (12/125) incidence in the control group. Additionally, symptoms related to COVID-19 for women who tested positive did not differ in severity or incidence between the two study groups. Statistical analysis confirmed that COVID-19 was not an independent predictor of spontaneous abortion (early pregnancy loss) for pregnant women.

**Key findings most relevant to Ohio's response:** Healthcare providers, particularly obstetricians and those specialized in family planning, can use the data from this study to aid in reassurance of patients who may have heightened anxiety about the potential effects of COVID-19 on pregnancy loss. Risk of early loss of pregnancy is a large cause of concern in family planning that can be partially alleviated by educating families that COVID-19 infection itself will likely not worsen or complicate chance of pregnancy loss.