COVID-19 research update

May 15, 2020

Masks and airborne virus transmission

An **analysis of droplets emitted by those infected with COVID-19** (Proceedings of the National Academy of Sciences of the United States of America, May 13) used laser light to visually capture the droplets generated by regular speech. The researchers found that loud speech can emit thousands of droplets. The authors conclude "that there is a substantial probability that normal speaking causes airborne virus transmission in confined environments."

A **new report on universal masking** (Independently published report from a consortium of researchers, April 24) recommends the practice as a strategy to reduce the spread of infection. It includes six specific recommendations: (1) Masking should be mandatory or strongly recommended for the general public when in public transport and public spaces, for the duration of the pandemic; (2) Masking should be mandatory for individuals in essential functions (e.g. health care workers, social and family workers, the police and the military, the service sector, construction workers, etc.) and medical masks and gloves or equally safe protection should be provided to them by employers. Cloth masks should be used if medical masks are unavailable; (3) Countries should aim to eventually secure mass production and availability of appropriate medical masks (without exploratory valves) for the entire population during the pandemic; (4) Until supplies are sufficient, members of the general public should wear nonmedical fabric face masks when going out in public and medical masks should be reserved for essential functions; (5) Authorities should issue masking guidelines to residents and companies regarding the correct and optimal ways to make, wear and disinfect masks; (6) The introduction of mandatory masking will benefit from being rolled out together with campaigns, citizen initiatives, the media, NGOs, and influencers in order to avoid a public backlash in societies not culturally accustomed to masking. Public awareness is needed that "masking protects your community, not just you."

School reopening

An **editorial in the Journal of the American Medical Associations on school closures** (JAMA Pediatrics, May 13) argues for greater attention from policymakers on the challenges of closing schools. The author asserts that "the risks posed by delaying school openings are real and sizeable, particularly for students from low-income families." The authors cite the phenomenon of summer learning loss and estimate that there will be a 9 to 12-month learning loss when children return to school in the fall. The editorial calls for the creation of an expert task force on school closures at the national level. Given this information, Ohio policymakers should consider education equity when

making decisions about reopening schools. Learning loss is a serious challenge that requires considerable policy attention.

A **commentary on COVID-19 infections of children** (JAMA Pediatrics, May 13) briefly reviews emerging research on SARS-CoV-2 transmission dynamics and prevalence among children, as well as the impact of school closures. The authors conclude that the efficacy of school closures to reduce COVID-19 mortality is debatable and that the potential negative consequences of school closures cannot be ignored. The commentary also describes considerations for reopening schools, including use of face masks, hygiene measures and screening.

A **World Health Organization document school reopening** (WHO, May 10) provides considerations for decision-makers and educators on how or when to reopen or close schools in the context of COVID-19. It includes a list of considerations for the reopening process as well as recommended strategies and adaptations to make when reopening schools. According to the authors, policymakers should consider the following when deciding whether to open or close schools: Current understanding about COVID-19 transmission and severity in children, local situation and epidemiology of COVID-19 where the school(s) are located and school setting and ability to maintain COVID-19 prevention and control measures. Additional factors to consider include assessing what harm might occur due to school closure and the need to maintain schools at least partially open for children whose caregivers are 'key workers' for the country.

Others to consider…

Pandemic response in correctional and detention facilities

A **study of COVID-19 in the Louisiana prison system** (MMWR, May 8) found that physical, logistical and security constraints inherent to correctional facilities make it difficult to fully implement public health recommendations related to the pandemic. The reported inability of some facilities to individually quarantine close contacts of incarcerated or detained persons with COVID-19 could result in spread among persons within the quarantine units. A COVID-19 Management Assessment and Response (CMAR) tool could be used to assess COVID-19 management practices and guide strategies to address gaps. Response to COVID-19 in correctional and detention facilities should account for the inherent limitations these facilities face in acting upon public health guidance.

A **World Health Organization document providing guidance to assist correctional and detention facilities in developing a response to the COVID-19** (WHO, March 15) outbreak highlights that people in prisons and other places of detention are likely to be more vulnerable to the COVID-19 outbreak than the general population because of the confined conditions in which they live together for prolonged periods of time. Moreover, experience shows that prisons, jails and similar settings where people are gathered in close proximity may act as a source of infection, amplification and spread of infectious diseases within and beyond prisons. Controlling the spread of COVID-19

infection in prisons and other places of detention is essential to protecting the health of all those who live and work in them and those who visit them and protecting the outside community. The WHO also created a companion **checklist** for use by policymakers and prison administrators to evaluate their level of preparedness to prevent and control COVID-19 in prisons and other places of detention.

Effectiveness of non-pharmaceutical interventions

A **study of non-pharmacuetical interventions** (National Bureau of Economic Research (NBER), May 2020) provides evidence for the effectiveness of NPIs to "flatten the curve" in infectious disease pandemics. It also provides cautionary lessons about the importance of maintaining NPIs in place for long enough to sustain positive impacts on total mortality. The study analyzed historic data on implementation of strategies such as school closings, prohibitions on public gatherings and quarantine/isolation and mortality rates in U.S. cities during the second wave of the Great Influenza Pandemic of 1918-1919. The analysis finds that although an increase in NPIs reduced the relative peak death rate ("flattened the curve"), the estimated effect on overall deaths over time was small and statistically insignificant. The relatively short duration of NPI implementation was cited as the likely reason for NPIs not being more successful in curtailing total mortality. The average duration of school closings and prohibitions of public gatherings was only 36 days. The author concludes that NPI implementation of 12 weeks would likely have been more effective at reducing total deaths.

A **study of non-pharmaceutical interventions on infection rates and population immunity** (Science, May 13) used models applied to hospital and death data in France to show the massive impact that the French lockdown had on SARS-CoV-2 transmission and can inform exit strategies for the stay-at-home order in Ohio. By May 11, the authors project 3,900 daily infections across France, down from between 150,000–390,000 immediately prior to the lockdown. They also find that the basic reproductive number (R_0) prior to the implementation of the lockdown was 2.90, and that the lockdown resulted in a 77% reduction in transmission, dropping the R to 0.67. Population immunity appears insufficient to avoid a second wave if all control measures are released at the end of the lockdown.

Antibody testing

A **study of COVID-19 infection in a pediatric dialysis unit** (JAMA, May 14) analyzed SARS-CoV-2 antibody levels of 13 patients and 25 staff. The authors observed that more healthcare workers may be antibody-positive than expected. One week before the study began, one patient developed symptoms and tested positive for the virus. By the end of the study period, 44% of the health care workers and 23% of the patients tested positive for antibodies. No other patients developed symptoms; two patients tested IgM positive and three tested IgG positive. One of the health care workers who had symptoms tested negative three times using PCR and then seroconverted. Four out of seven of the health care workers who were IgM positive had not had symptoms. A table displays the study results.

Clinical risk score modeling

An **article assessing COVID-19 risk** (JAMA, May 12) describes the development and validation of a risk score (COVID-GRAM) to predict the development of critical illness in patients with COVID-19. Risk score predictors include: Chest radiography abnormality, age, hemoptysis, dyspnea, unconsciousness, number of comorbidities, cancer history, neutrophil-to-lymphocyte ratio, lactate dehydrogenase, and direct bilirubin. The article includes a **link** to a risk score calculator from the Guangzhou Institute of Respiratory Health. This risk scoring tool could be evaluated for use in Ohio and shared with healthcare providers.

Potential treatment for mild and moderate cases of COVID-19

A **study of a potential treatment of COVID-19** (The Lancet, May 8) found that a combination of three drugs showed promising results for reducing the duration of the virus. The study's authors found that early treatment with the triple combination of antiviral therapy with interferon beta-1b, lopinavir–ritonavir and ribavirin is safe and highly effective in shortening the duration of virus shedding, decreasing cytokine responses, alleviating symptoms and facilitating the discharge of patients with mild to moderate COVID-19. Furthermore, the triple antiviral therapy rapidly rendered viral load negative in all specimens, thereby reducing infectiousness of the patient.