

# COVID-19 PANDEMIC

## RAEB'S Evidence Update

Highlights of health research synthesized by the Research, Analysis and Evaluation Branch

August 24, 2021

### Featured

[RAEB'S Rapid Responses for Ontario's Health Sector  
Research Evidence and Jurisdictional Experience  
Trusted Resources](#)

## RAEB's Rapid Responses for Ontario's Health Sector

Please contact [Evidence Synthesis Unit](#) for the full read of these rapid responses.

### Mandatory COVID-19 Vaccination Policies for Health Care Workers

**Government-Implemented COVID-19 Vaccine Mandates (Internationally):** Australia, England, Iceland, Italy, France, Greece, Hungary, Turkmenistan, Moscow, Quebec, Prince Edward Island, and some jurisdictions in the US have mandates.

- **Types of HCWs:** Ranges from all HCWs in any setting, LTC settings only, employees across different sectors (including health), and all adults.
- **Exemptions:** Some allow exemptions for religious or qualifying medical reasons.
- **Non-Compliance Consequences:** Staff have a set deadline to be fully vaccinated, or otherwise face fines, reassignment to other low-risk duties, suspension without pay, or termination in some jurisdictions, while others require masking or one to three COVID-19 tests per week.
- **Vaccination Rates:** Information was only identified about vaccination rates just before implementation of COVID-19 mandates in England, Italy, and Australia, where significant portions of the HCW population remain unvaccinated.
- **Unintended Consequences:** These include a petition against the mandate (England), several court challenges (Italy), and workplaces struggling to re-staff positions vacated by those who refused vaccination (Moscow).

**Employer-Implemented COVID-19 Vaccine Mandates (US):** Some health facilities in the US have mandates (e.g., Mayo Clinic Health System, Texas Houston Methodist, several nationwide LTC operators).

- Types of HCWs: All employees working at all the identified health facilities.
- Exemptions: Some allow exemptions for religious or qualifying medical reasons.
- Non-Compliance Consequences: Unvaccinated employees could face suspension without pay or termination at Houston Methodist, or must complete education modules, wear masks, and physically distance at Mayo Clinic Health System.
- Vaccination Rates: Vaccine mandates have increased vaccination rates among staff, ranging from 72% to 100%, in some of the identified health facilities, with few staff having quit or been terminated rather than being vaccinated. For example, a study from the University of Pennsylvania found that a mandatory COVID-19 vaccine policy, along with frequent and personalized outreach, resulted in 100% compliance and minimal staff turnover in one community nursing home.
- Unintended Consequences: At Houston Methodist, 117 employees sued the hospital over its mandate, but it was dismissed by a federal judge; it is currently being appealed.

## Research Evidence and Jurisdictional Experience

The research evidence profiled below was selected from highly esteemed academic journals and grey literature sources, based on date of publication and potential applicability or interest to the Ontario health sector.

### Transmission

***Nature:* High COVID-19 transmission potential associated with re-opening universities can be mitigated with layered interventions**

**August 17, 2021.** This study combined analysis of social contact data with a data-driven mathematical modelling approach to investigate the impact of re-opening a UK university on COVID-19 transmission. First year students are found to be the main drivers of transmission with the highest infection rates, largely due to communal residences. In isolation, reducing face-to-face teaching is the most effective intervention considered; however, layering multiple interventions could reduce infection rates by 75%. Fortnightly or more frequent mass testing is required to impact transmission and was not the most effective option considered. [Article](#).

***Journal of the American Medical Association (JAMA): Association of limited in-person attendance at US football games with county-level COVID-19 cases***

**August 17, 2021.** This study of US counties that hosted National Football League (NFL) and National Collegiate Athletic Association (NCAA) football games found no association between higher county-level COVID-19 cases and hosting football games with limited in-person attendance. Many NFL and NCAA football stadiums are outdoors or have a retractable roof, which could have had an impact on mitigating spread. However, newly emerging variants of SARS-CoV-2 have less predictable implications at this point and might lead to more disruptive interruptions in the future. Further research is needed to account for potential spillover to counties adjacent to the those hosting games. [Article](#).

***JAMA: Association of age and pediatric household transmission of SARS-CoV-2 infection***

**August 16, 2021.** This study found that younger children may be more likely to transmit SARS-CoV-2 infection compared with older children, and the highest odds of transmission was observed for children aged zero to three years. Differential infectivity of pediatric age groups has implications for infection prevention within households, as well as schools/childcare, to minimize risk of household secondary transmission. [Article](#).

***The Lancet: Serial intervals in SARS-CoV-2 B.1.617.2 (Delta) variant cases***

**August 10, 2021.** This study investigated possible drivers of Delta variant growth by studying the serial intervals (i.e., symptom onset-to-onset delay, a proxy for the generation interval) between pairs of a primary case and a secondary case occurring among household members. There was no evidence to support a large difference (i.e., greater than one day) in serial intervals among the samples studied, suggesting that the recent rapid growth of COVID-19 cases is potentially driven by an increase in the effective reproductive number (average number of secondary cases generated by an infection case) with the Delta variant. Studies with proper control of confounding factors are crucial to tease out the key epidemiological factors that facilitate the increased transmissibility of the Delta variant. [Article](#).

## Case Testing and Screening

***JAMA: Change in saliva RT-PCR sensitivity over the course of SARS-CoV-2 infection***

**August 13, 2021.** This study found that saliva was sensitive for detecting SARS-CoV-2 in symptomatic individuals during initial weeks of infection, but sensitivity in asymptomatic SARS-CoV-2 carriers was less than 60% at all time points. As COVID-19 testing strategies in workplaces, schools, and other shared spaces are optimized, low saliva sensitivity in

asymptomatic infections must be considered. The findings suggest saliva-based RT-PCR should not be used for asymptomatic COVID-19 screening. [Article](#).

## Understanding the Disease

### ***Nature: Analysis of antibody decay in convalescent COVID-19 patients***

**August 18, 2021.** This study quantified the antibody decay rates among the varying levels of anti-nucleocapsid (anti-N) and Immunoglobulin G (IgG) in 943 convalescent COVID-19 patients. On average, antibodies reach constant levels by 16 to 30 days post symptom onset. The rate of anti-N IgG reduction was relatively higher at the beginning, then gradually decreased to a steady state after four months, at which point the fluctuation of IgG levels exhibited random variation across all recovered patients. For a majority of the donors, naturally occurring anti-N antibodies were detected above the threshold for only four months after infection with SARS-CoV-2. [Article](#).

### ***PLoS One: COVID-19 and cause of pregnancy loss during the pandemic***

**August 11, 2021.** This systematic review of 11 articles found that there is an increased risk of miscarriage in mothers with a positive test result of SARS-CoV-2. In addition, placental inflammation during the viral infection may result in fetal growth retardation and induce abortion. There has not been any consistent evidence of vertical transmission of the virus from mother to fetus, which requires further investigation. [Article](#).

## Health System Impacts

### ***Prehospital Emergency Care: Impact of COVID-19 pandemic on out-of-hospital cardiac arrest system-of-care***

**August 12, 2021.** This Italian review of 24 studies found that the COVID-19 pandemic affected the system-of-care of out-of-hospital cardiac arrest (e.g., ambulance response times were slower), and patients had lower survival and return of spontaneous circulation compared with non-pandemic periods. It was also noted that advanced airway management strategies shifted from endotracheal intubation to supraglottic airway devices. [Article](#).

## Disease Management

### ***JAMA: Short-term reactions among pregnant and lactating individuals in the first wave of vaccine rollout***

**August 17, 2021.** This study found that COVID-19 vaccines were well-tolerated among individuals who were pregnant, lactating, or planning pregnancy. Reactions on day one after

vaccination were similar among groups and comparable with findings among pregnant individuals previously reported. All groups reported increased reactions following dose two of Pfizer or Moderna vaccines. [Article](#).

### ***The New England Journal of Medicine (NEJM): Effectiveness of COVID-19 vaccines against the Delta variant***

**August 12, 2021.** This study evaluated the effectiveness of the Pfizer and AstraZeneca vaccines against the Delta variant and, after the receipt of two vaccine doses, reported only modest differences in vaccine effectiveness as compared with the Alpha variant. Effectiveness of two doses of the Pfizer vaccine was 93.7% among persons with the Alpha variant and 88.0% with the Delta variant. Effectiveness of two doses of the AstraZeneca vaccine was 74.5% among persons with the Alpha variant and 67.0% with the Delta variant. [Article](#).

### ***NEJM: Evaluation of Moderna vaccine in adolescents***

**August 11, 2021.** This randomized controlled trial involved 2,700 adolescents aged 12-17 years receiving either Moderna or placebo. Two doses of the Moderna vaccine stimulated high levels of neutralizing antibodies, with side-effects comparable to those seen in other age groups with no occurrence of severe adverse events. The incidence of COVID-19 in the unvaccinated group was too low to gauge protection, but COVID-19 did not develop in any vaccinated participants. [Article](#).

## Infection, Prevention and Control in Specific Settings

### ***JAMA: Mask-wearing behaviour at men's basketball tournaments in the US***

**August 16, 2021.** This study found that the proportion of spectators who wore masks correctly at five national men's basketball games was 74%, varying by sex and location within the venue, and was below the 80% threshold suggested as necessary to reduce the spread of COVID-19. This study occurred before widespread vaccination availability and many COVID-19 restrictions were in place owing to high community spread. When vaccinations are not available or coverage is low, ensuring adherence to key transmission mitigation strategies, such as mask wearing during mass events, is critical during the current and any future pandemic. [Article](#).

### ***The Lancet: Hospital-acquired SARS-CoV-2 infection in the UK's first COVID-19 pandemic wave***

**August 12, 2021.** This study estimated that 11.3% of patients with COVID-19 in 314 UK hospitals became infected after hospital admission, increasing to at least 15.8% of patients with COVID-19 by the middle of May 2020. These findings highlight the importance of using lessons learned so far in the pandemic to minimize the burden of hospital-acquired infections and break chains

of transmission through regular patient, resident, and staff testing, coupled with robust hospital infection prevention and control policies. [Article](#).

## Health Equity and Vulnerable Populations

### ***British Journal of Cancer: Risk of COVID-19 death in cancer patients***

**August 17, 2021.** This UK study analyzed data on cancer patients with COVID-19 at two hospitals and found an increased risk of COVID-19 mortality for male and Asian cancer patients, and those with haematological malignancies or a cancer diagnosis greater than two years. These factors should be accounted for when making clinical decisions for cancer patients. [Article](#).

### ***International Journal for Equity in Health: Determinants of access to the SARS-CoV-2 vaccine***

**August 14, 2021.** This study analyzed the determinants of access to the SARS-CoV-2 vaccine by different countries. Until February 19, 2021, 80 of 198 countries (42.1%) had received a batch of immunizers against COVID-19. High income countries and countries most affected by COVID (e.g., deaths, cases) gained priority access in receiving immunizers earlier and in greater volumes, while countries experiencing extreme poverty had reduced access to vaccines. Findings also suggest that socioeconomic indicators such as income, poverty, and human development influence vaccine access, thus global initiatives for the equitable distribution of COVID-19 vaccines need to be discussed and encouraged. [Article](#).

### ***International LTC Policy Network: Impact of COVID-19 second-wave lockdowns on older adults in Australia***

**August 11, 2021.** A national survey of community-dwelling older adults in Australia during lockdown (July to September 2020) found that, overall, being female, having lower educational attainment, receiving government benefits, having small social networks, and self-reported physical chronic health conditions were all independent predictors of lower quality of life. [Article](#).

## Frontline Workers

### ***JAMA: Association of vaccine type and prior SARS-CoV-2 infection with symptoms and antibody measurements following vaccination among health care workers (HCWs)***

**August 16, 2021.** This study evaluated symptoms following vaccination and serum spike antibody levels in a cohort of HCWs who received either mRNA vaccine and had a known status of prior SARS-CoV-2 infection to identify differences in symptoms and serum immunoglobulin G

(IgG) antibodies against the S1 spike protein. Nearly 100% of the HCWs mounted a strong antibody response to the spike protein after the second dose of the SARS-CoV-2 mRNA vaccine independent of vaccine-induced reactions. These findings suggest that regardless of vaccine reactions or prior SARS-CoV-2 infection, either spike mRNA vaccine will provide a robust spike antibody response. However, the role of higher antibody levels in preventing COVID-19 and providing lasting immunity remains unknown. [Article](#).

### **JAMA: Efficacy and safety of cannabidiol (CBD) for the treatment of emotional exhaustion and burnout among frontline HCWs during the pandemic**

**August 13, 2021.** This randomized clinical trial of 120 frontline HCWs found that emotional exhaustion scores were reduced among participants receiving CBD plus standard care when compared to those receiving standard care alone. Five participants who received CBD plus standard care experienced serious adverse events, with full recovery after discontinuation of CBD treatment. These findings suggest that CBD may act as an effective agent for the reduction of emotional exhaustion and burnout symptoms among frontline HCWs, although it is necessary to balance the benefits with potential undesired effects when making decisions regarding the use of CBD. [Article](#).

## Trusted Resources

The Evidence Synthesis Network (ESN) is a collaborative COVID-19 response initiative by Ontario's research and knowledge production community. The [ESN website](#) is a portal where research evidence requests can be made and includes previously completed ESN briefing notes.

The [Ontario COVID-19 Science Advisory Table](#) is a group of scientific experts and health system leaders who evaluate and report on emerging evidence relevant to the COVID-19 pandemic, to inform Ontario's response to the pandemic.

COVID-19 Evidence Network to support decision-making (COVID-END) in Canada:

- COVID-END is a time-limited network that brings together more than 50 of the world's leading evidence-synthesis, technology-assessment, and guideline development groups to support decision-making. In addition to Living Evidence Profiles, COVID-END hosts an inventory of best COVID-19 evidence syntheses from around the world. An up-to-date and comprehensive list of sources, organized by type of research evidence, is available on McMaster Health Forum's COVID-END [website](#).
- The COVID-19 Evidence Spotlights from COVID-END provide updated information on COVID-19 responses with three types of products from COVID-END in Canada: 1) Canadian spotlights; 2) global spotlights; and 3) horizon scans. To receive an email containing hyperlinks to these products twice a month, [subscribe here](#).

- During the first half of August, there were 13 newly added evidence syntheses and one update to a living evidence synthesis that is already included in the public health measures parts of the COVID-END inventory of ‘best’ evidence syntheses. Please visit [Canadian Spotlight 8.1](#) to view the evidence, or browse past [Canadian evidence spotlights](#). A complete list of the products is available [here](#).

## About RAEB

Through research funding, brokering, translating, and sharing, we promote an enhanced evidence use capacity that supports all aspects of health policy, programming, and investment decision-making. Services include:

- Literature reviews
- Jurisdictional scans
- Economic analysis
- Evaluation planning
- Research fund management
- Knowledge translation services

## Contact RAEB

[Anne Hayes](#), RAEB Director

[Andrea Proctor](#), Evidence Synthesis

[Emre Yurga](#), Economic Analysis and Evaluation

[Hadi Karsoho](#), Research Planning and Management