

COVID-19 PANDEMIC

RAEB'S Evidence Update

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

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Evidence Products Produced with Our Partners

The COVID-19 Evidence Synthesis Network is comprised of groups specializing in evidence synthesis and knowledge translation. The group has committed to provide their expertise to provide high-quality, relevant, and timely synthesized research evidence about COVID-19 to inform decision makers as the pandemic continues. Please contact [Evidence Synthesis Unit](#) for the full read of these evidence products.

Effectiveness, Use, and Re-Use Of Masks in Hospitals During the Omicron Wave

(Produced in collaboration with McMaster Health Forum and Ontario Health)

Most of the scientific evidence and jurisdictional practices identified were published prior to the emergence of the Omicron variant.

- **Mask Fit and Filtration Performance:** In comparing four different types of masks (i.e., N95 respirators, surgical masks, medical masks, non-medical masks), N95 masks (or equivalent: FFP2 and KN95) should be the primary choice whenever possible in health care or community settings. Given the high transmissibility of the Omicron variant and the potential increased contribution of aerosol transmission, it is important to select a mask that optimizes fit (e.g., length of facial hair can affect fit) and filtration.
- **Mask Processing and Re-Use:** Different sterilization processes result in different effects on filtration efficiencies of masks (including N95s, KN95s, and surgical masks). After

decontamination, the filtration efficiency and fit factor of the N95 mask was found to be higher than the KN95 mask. Ultraviolet germicidal irradiation and vaporized hydrogen peroxide damaged respirators the least. However, more research is needed on decontamination effectiveness for SARS-CoV-2, particularly for the Omicron variant.

- **Types of Masks and Their Use in Hospitals:** In the context of Omicron, the UK and the World Health Organization recommended universal mask use for all health care staff including doctors, nurses, midwives, medical attendants, cleaners, and community health workers. The Public Health Agency of Canada recommends masking in all health care settings for the full duration of shifts or visits during the COVID-19 pandemic. Depending on community transmission rates, the mask chosen can be a well-fitting medical mask or a respirator.
- **Mask Re-Use:** The decision to implement policies that permit extended use of N95 respirators should be made by the professionals who manage the institution's respiratory protection program, in consultation with public health and occupational health and infection control departments. Health care organizations can prioritize the use of N95 respirators and well-fitting facemasks by activity type when the supply of N95 respirators is limited. N95 respirators beyond their manufacturer-designated shelf life, when available, are preferable to use of well-fitting facemasks.

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.

Case Testing and Screening

Journal of the American Medical Association (JAMA): Outcomes of SARS-CoV-2-positive youths tested in emergency departments

January 11, 2022. Among 3,221 SARS-CoV-2-positive youths enrolled in a global study, 3.3% had severe outcomes within 14 days. Across a subgroup of 2,510 SARS-CoV-2-positive youths discharged home after testing, 0.5% had severe outcomes during the two-week follow-up period. These findings suggest that risk factors such as age, underlying chronic illness, and symptom duration may be useful for clinicians to consider when evaluating pediatric patients with SARS-CoV-2 infection. [Article](#).

JAMA: False-positive results in rapid antigen tests used to screen asymptomatic workers in Canada (Jan 11 to Oct 13, 2021)

January 7, 2022. This study found the overall rate of false-positive results among the total rapid antigen test screens for SARS-CoV-2 was very low, consistent with other smaller studies. The cluster of false-positive results from one batch was likely the result of manufacturing issues rather than implementation. The results demonstrate the importance of having a comprehensive data system to quickly identify potential issues. With the ability to identify batch issues within 24 hours, workers could return to work, problematic test batches could be discarded, and the public health authorities and manufacturer could be informed. Aside from issues with the batch, false-positives are possible due to the timing of the test (too early or too late in the infectious stage) or quality issues in how the self-test was completed. [Article](#).

Disease Management

Neurological Sciences: COVID-19 infection and severity with therapies approved to treat multiple sclerosis (MS)

January 10, 2022. This systematic review suggests that MS patients treated with anti-CD20 monoclonal antibodies may be at increased risk for severe COVID-19. Generally, studies did not identify increased risk for COVID-19 worsening with other MS therapies. A few studies have identified a potential reduced risk of COVID-19 and severity in MS patients being treated with interferons or glatiramer acetate. [Article](#).

medRxiv: Effectiveness of Moderna against SARS-CoV-2 Omicron and Delta variants in Southern California

January 8, 2022. This preprint study from Kaiser Permanente found vaccine effectiveness of three Moderna doses against infection with Delta was high and durable, but vaccine effectiveness against Omicron infection was lower. Vaccine effectiveness against Omicron infection was particularly low among immunocompromised individuals. No three-dose recipients were hospitalized for COVID-19. [Article](#).

British Medical Journal (BMJ): Atorvastatin versus placebo in patients with COVID-19 in intensive care in Iran

January 7, 2022. In adults with COVID-19 admitted to the ICU, this study found atorvastatin was not associated with a significant reduction in the composite of venous or arterial thrombosis, treatment with extracorporeal membrane oxygenation, or all-cause mortality compared with placebo. Treatment was, however, found to be safe. As the overall event rates were lower than expected, a clinically important treatment effect cannot be excluded. [Article](#).

medRxiv: Association between vaccination status and reported incidence of post-acute COVID-19 symptoms in Israel (March 2020 - November 2021)

January 6, 2022. This preprint study found vaccination with at least two doses of COVID-19 vaccine was associated with a substantial decrease in reporting the most common post-acute COVID-19 symptoms. These results suggest that, in addition to reducing the risk of acute illness, COVID-19 vaccination may have a protective effect against long COVID. [Article](#).

BMJ: Effect of COVID-19 vaccination on transmission of Alpha and Delta variants in England

January 5, 2022. This study found both the Pfizer and AstraZeneca vaccines were associated with reduced onward transmission of SARS-CoV-2 from index patients who became infected despite vaccination. However, in index patients who were vaccinated with Pfizer, and probably in those who were vaccinated with AstraZeneca, reductions in transmission of the Delta variant were smaller than reductions in transmission of the Alpha variant. [Article](#).

medRxiv: Fully vaccinated and boosted patients requiring hospitalization for COVID-19 in Michigan

January 5, 2022. This preprint study found fully vaccinated and boosted individuals requiring hospital-level care for breakthrough COVID-19 tended to have less severe outcomes despite appearing to be higher risk at baseline when compared to unvaccinated individuals during the same time period. Specifically, there was a trend that fully vaccinated and boosted individuals had lower rates of mechanical ventilation, use of vasopressors, and in-hospital mortality. [Article](#).

Public Health Measures

medRxiv: The epidemiological impact of the Canadian COVID Alert App

January 5, 2022. This preprint study found that the COVID Alert app, when adopted at sufficient levels, can be an effective public health tool for combatting a pandemic such as COVID-19. While the nationwide rates are low, provinces with widespread adoption of the app showed high ratios of averted cases and deaths (upper bound was greater than 60% of averted cases). [Article](#).

Health Equity and Vulnerable Populations

JAMA: Comparison of self-harm or overdose among adolescents and young adults before vs. during the COVID-19 pandemic in Ontario

January 12, 2022. In this study of 1,690,733 adolescents and young adults, the rate of self-harm or overdose was lower during (39.7 per 10,000 person-years) than before (51.0 per 10,000 person-years) the pandemic. The study suggests that at least up to mid-2021, the COVID-19 pandemic has not been associated with an excess of self-harm requiring health care among adolescents and young adults. [Article](#).

JAMA: Assessment of functional mobility after COVID-19 in adults aged 50 years or older in the Canadian longitudinal study on aging

January 12, 2022. This study of 24,114 participants found that community-living middle-aged and older adults with confirmed, probable, or suspected COVID-19 had nearly two-fold higher odds of worsening mobility and physical function compared with adults without COVID-19, although most participants with COVID-19 had mild to moderate disease and were not hospitalized. [Article](#).

Journal of Nephrology: COVID-19 and chronic kidney disease (CKD)

January 11, 2022. This systematic review highlighted evidence consistently demonstrated an increased risk of mortality and hospitalization in patients with CKD and COVID-19. The extent to which CKD increases the likelihood of the rate of infection, and other poor outcomes is not currently well understood, and the results are inconsistent among studies. The results shed some light on the significance of prioritizing patients with CKD for COVID-19 vaccination and critical care management. [Article](#).

European Journal of Pediatrics: SARS-CoV-2 in pediatric cancer

January 10, 2022. This systematic review analyzed 1,000 pediatric cancer patients (<18 years of age) with COVID-19 concluding that despite a favourable COVID-19 outcome in most pediatric cancer patients, the morbidity is reported higher than in children without comorbidities. No severe COVID-19 complications were associated with the continuation of chemotherapy, but the risk of cancer progress or relapse due to interruption of chemotherapy has to be carefully weighed against the risk of severe COVID-19 disease with potentially fatal outcome. [Article](#).

Frontline Workers

JAMA: SARS-CoV-2 reinfection rate and estimated effectiveness of the inactivated whole virion vaccine BBV152 against reinfection among health care workers (HCWs) in New Delhi, India

January 7, 2021. In this study of 4,978 HCWs who were infected with SARS-CoV-2 from March 3, 2020 to June 18, 2021, the incidence density of reinfection was 7.26 per 100 person-years. A protective association of 86% against reinfection was observed among HCWs who completed the two-dose schedule of BBV152 and for whom at least 15 days elapsed without reinfection after vaccination. The results of this study suggest that complete vaccination with BBV152 among HCWs in India is crucial, including in persons previously infected with SARS-CoV-2.

[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](#).
 - In the second half of December 2021, contributing Canadian evidence-synthesis teams produced nine newly completed evidence syntheses. From the COVID-END taxonomy, the syntheses focus on public health measures (n=8) and clinical management (n=1). Please visit [Canadian Spotlight 12](#) 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

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