

COVID-19 PANDEMIC

RAEB'S Evidence Update

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

September 27, 2021

Featured

[Evidence Products Produced with Our Partners](#)
[Research Evidence and Jurisdictional Experience](#)
[Trusted Resources](#)

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.

Sensitivity and Use of Rapid Antigen Diagnostic Tests (RADTs)

(Produced in collaboration with SPOR Evidence Alliance, Canadian Agency for Drugs and Technologies in Health (CADTH), McMaster Health Forum, and Ontario Health)

- Many antigen and molecular rapid tests show high positive predictive values (PPV) and negative predictive values, reflecting a higher likelihood that a positive test result is a 'true' positive and a negative test result is a 'true' negative; however, these values are affected by the prevalence of the virus where the tests are conducted. For example, people who test negative for COVID-19 may still be infected with SARS-CoV-2. Typically, the sensitivity of antigen tests is 30% to 40% lower than of reverse transcription-polymerase chain reaction (RT-PCR) tests, depending on whether tested subjects were symptomatic or asymptomatic. The lower sensitivity of RADTs is affected by several factors, such as specimen type, the timing of sampling, assay type, and viral load.
- In terms of variants, a study of the RADT BinaxNOW found this assay detected the highly infectious variants including the Delta variant, but test sensitivity decreased with decreasing viral loads.
- In people with COVID-19 symptoms, including children, test sensitivities are highest in the first week of illness when viral loads are higher.

- RADTs that meet appropriate criteria (e.g., from the World Health Organization) are best used when urgent decisions about patient care must be made, or where RT-PCR cannot be delivered in a timely manner. If RADTs are used to screen asymptomatic cases in low-prevalence scenarios (e.g., in an area without an outbreak), a lower PPV may be the result.
- A jurisdictional scan revealed that Australia, Italy, the UK, and the US support the use of RADTs. For example, in the UK, individuals are encouraged to do a rapid test twice a week; tests are available at test sites, pharmacies, schools, universities, and employer sites, and available for at-home use.

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.

Disease Management

Nature: External validation of the 4C mortality score among COVID-19 patients admitted to hospital in Ontario, Canada

September 20, 2021. This study validated a risk prediction score tool from the United Kingdom (4C) to prognosticate mortality from COVID-19 in Canadian hospitals. The 4C score incorporates such factors as age, sex, comorbidities, respiratory rate, peripheral oxygen saturation, blood urea nitrogen, and C-reactive protein. The 4C score can be used to prioritize care and resources for patients at the greatest risk of death. [Article](#).

Nature: The antibody response to SARS-CoV-2 infection persists over at least eight months in symptomatic patients

September 17, 2021. This study analyzed SARS-CoV-2 antibody levels in individuals with asymptomatic, mild symptomatic, and symptomatic disease in relation to the type of symptoms, finding that the antibody response is higher in people with symptoms, particularly in individuals with loss of smell or taste. In all people with SARS-CoV-2 antibodies at the start of the study, levels in the blood lasted for at least eight to 10 months. The SARS-CoV-2 infection is therefore characterized by a long-lasting antibody response, which may protect from subsequent infections. [Article](#).

The New England Journal of Medicine (NEJM): Protection of Pfizer vaccine booster against COVID-19 in Israel

September 15, 2021. This study found that the rates of confirmed COVID-19 and severe illness were substantially lower among those who received a booster (third) dose of the Pfizer vaccine.

Participants were 60 years of age or older and had received two doses of the BNT162b2 vaccine at least five months earlier. [Article](#).

Health Systems Impact

Journal of the American Medical Association (JAMA): Physician practice interruptions in the treatment of Medicare patients during the COVID-19 pandemic

September 20, 2021. This study analyzed data from 547,849 physicians billing Medicare from January 2019 to December 2020 and found that practice interruption rates were similar before and during the COVID-19 pandemic, except for a spike in April 2020, when 34,653 (6.93%) physicians billing Medicare experienced a practice interruption, relative to 1.43% in 2019. Practice interruptions were defined as a month in which a physician (who had previously billed Medicare) billed no Medicare claims. [Article](#).

Nature: Lessons from Italy on COVID-19 vaccination and unemployment risk

September 17, 2021. This study analyzed the impact of mobility contraction on employee absence and excess deaths in Italy during the COVID-19 crisis. Results showed the first countrywide lockdown effectively curtailed the COVID-19 epidemics restricting it mainly to the northern part of the country, with the drawback of a countrywide increase in unemployment risk. A mobility contraction of 1% led to a mortality reduction of 0.6%, but it induced an increase of 10% in Wage Guarantee Funds (in terms of allowed working hours). The study also discussed return-to-work policies and prioritizing policies for administering COVID-19 vaccines in the most advanced stage of a vaccination campaign when the healthy active population is left to be vaccinated. [Article](#).

Public Health Measures

JAMA: Assessment of allergic and anaphylactic reactions to mRNA COVID-19 vaccines with confirmatory testing in a United States (US) regional health system

September 17, 2021. In this study of 22 patients with suspected vaccine allergy, no patients exhibited immunoglobulin (Ig) E-mediated allergy to components via clinical skin prick testing. However, most had positive basophil activation testing (BAT) results to polyethylene glycol (PEG) and all had positive BAT results to their administered mRNA vaccine, with no patient sample having detectable PEG Ig. These findings suggest that non-Ig E-mediated allergic reactions to PEG may be responsible for many documented cases of allergy to mRNA vaccines. [Article](#).

BMC Public Health: Assessment of health equity in masking/personal protection equipment (PPE) policies to contain COVID-19

September 16, 2021. This systematic review assessed global COVID-19 policy documents related to masks/PPE using the Cochrane PROGRESS-Plus equity framework, which defines characteristics (e.g., race/ethnicity, occupation, gender/sex) that stratify health opportunities and outcomes that can mark inequalities. The equity assessment analysis revealed that most of the policy documents included only one equity component and did not account for the determinants of health or health equity-related factors. These findings highlight the need for population-wide policies to be carefully designed and implemented after identifying relevant equity related barriers to produce better outcomes for the whole society. [Article](#).

Health Equity and Vulnerable Populations

World Health Organization (WHO): Considerations for COVID-19 surveillance for vulnerable populations

September 17, 2021. This interim guidance outlines COVID-19 surveillance considerations for: people experiencing homelessness; people living in overcrowded housing, collective sites and slums; refugees and migrants; people with disabilities; people living in closed facilities (e.g., prisons); people living in remote locations (e.g., highlands and island provinces); and people living in poverty and extreme poverty. The recommendations are guided by four key principles: country-led inclusive action; evidence-informed decision-making; coordination, collaboration, and partnerships; and engagement and empowerment of vulnerable populations. [Article](#).

Nature: Cellular and humoral immune responses following SARS-CoV-2 mRNA vaccination in patients with multiple sclerosis on anti-CD20 therapy

September 14, 2021. This study found that after BNT162b2 (Pfizer) or mRNA-1273 (Moderna) vaccination, treatment with anti-CD20 significantly reduced spike-specific and receptor-binding domain-specific antibody and memory B cell responses in most patients, an effect ameliorated with longer duration from last anti-CD20 treatment and extent of B cell reconstitution. These findings have implications for clinical decision-making and public health policy for immunosuppressed patients including those treated with anti-CD20. [Article](#).

Illness, Crisis & Loss: The many faces of grief: A systematic literature review of grief during the COVID-19 pandemic

August 16, 2021. This study that examined how grief is understood and discussed in the existing literature (i.e., 33 articles) during the COVID pandemic reports that grief can be manifested at various levels such as grief for self, relational grief, collective grief, and ecological

grief. A second theme emphasizes some of the stressors (e.g., social distancing) that can intensify the severity of grief, leading to prolonged grief disorder. Active community programs through online modes are recommended to deal with the mental health impact of both COVID and the associated grief. [Article](#).

Case Testing and Screening

The Lancet: Daily testing for contacts of individuals with SARS-CoV-2 infection and attendance and SARS-CoV-2 transmission in English secondary schools and colleges

September 14, 2021. This randomized trial found that daily contact testing of school-based contacts was non-inferior to self-isolation for control of COVID-19 transmission, with similar rates of symptomatic infections among students and staff with both approaches. Infection rates in school-based contacts were low, with very few school contacts testing positive. Daily contact testing should be considered for implementation as a safe alternative to home isolation following school-based exposures. [Article](#).

Understanding the Disease

Nature: Biological and clinical significance of emerging SARS-CoV-2 variants

September 17, 2021. This review notes that the past several months have witnessed the emergence of four SARS-CoV-2 variants of concern (Alpha, Beta, Gamma, and Delta) associated with increased transmissibility, increased risk of reinfection, and/or reduced vaccine efficacy. Many additional SARS-CoV-2 variants sharing mutations and biological features with these variants are also increasingly being identified. The increasing number of SARS-CoV-2 variants share a repertoire of mutations that is enabling the virus to spread despite rising population immunity while maintaining or increasing its replication fitness. Whereas most emerging mutations reduce the protective effects of neutralizing antibodies generated by infection and vaccination, several recently identified mutations appear to antagonize the innate immune response to initial infection. The emergence of SARS-CoV-2 variants requires an expanded research agenda to improve our understanding of emerging SARS-CoV-2 mutations and the correlates of protective immunity against variants with these mutations. [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 September, there were 11 newly added evidence syntheses. Two of these syntheses provide insights across all domains of the COVID-END taxonomy (public health measures, clinical management, health-system arrangements, and economic and social response) and the remaining focus on public health measures (n=7), and clinical management (n=4). Please visit [Canadian Spotlight 9.1](#) 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

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