

COVID-19 PANDEMIC

RAEB'S Evidence Update

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

February 22, 2022

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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.

Understanding the Disease

Annals of Rheumatic Diseases: Risk and prognosis of SARS-CoV-2 infection and vaccination against SARS-CoV-2 in rheumatic and musculoskeletal diseases (RMDs)

February 14, 2022. This systematic review informed the 2022 update of the European Alliance of Associations for Rheumatology recommendations for the management of RMDs in the context of SARS-CoV-2. Patients with RMDs do not face more risk of contracting SARS-CoV-2 or worse prognosis of COVID-19 than individuals without RMDs. No consistent differences in risk of developing severe COVID-19 were found between different RMDs. Disease activity is associated with worse COVID-19 prognosis, possibly explaining the increased risk seen for glucocorticoid use. Rituximab is associated with worse COVID-19 prognosis and possibly Janus kinase inhibitors. Vaccination is generally immunogenic, though antibody responses are lower than in controls. Vaccine immunogenicity is negatively associated with older age, rituximab, and mycophenolate. [Article](#).

Disease Management

Nature: Population antibody responses following COVID-19 vaccination

February 16, 2022. This study of 212,102 individuals vaccinated with either Pfizer/BioNTech or AstraZeneca in England found that antibody positivity peaks four and five weeks after first dose and then declines. At least 21 days after the second dose of Pfizer/BioNTech, close to 100% of respondents tested positive, while for AstraZeneca, this was significantly reduced, particularly in the oldest age groups. For both vaccines, antibody positivity decreased with age, and was higher in females and those with previous infection. Furthermore, antibody positivity was lower in transplant recipients, obese individuals, smokers, and those with specific comorbidities.

[Article.](#)

Annals of Internal Medicine: The incidence of SARS-CoV-2 re-infection in persons with naturally acquired immunity with/without subsequent receipt of a single dose of Pfizer vaccine

February 15, 2022. This Israeli study found that persons previously infected with SARS-CoV-2 gained additional protection against reinfection and from a subsequent single dose of the Pfizer vaccine. Nonetheless, even without a subsequent vaccination, reinfection appeared relatively rare. [Article.](#)

Nutrition in Clinical Practice: Intravenous vitamin C use and risk of severity and mortality in COVID-19

February 11, 2022. This systematic review and meta-analysis demonstrated that the short-term administration of intravenous vitamin C treatment did not reduce the risk of severity and mortality in patients with COVID-19 as compared with a placebo treatment or usual care.

[Article.](#)

Nature: Mortality and readmission rates among hospitalized COVID-19 patients with varying stages of chronic kidney disease (CKD)

February 10, 2022. This study in the Netherlands included 4,151 hospitalized COVID-19 patients (March 2020 to July 2022) of whom 389 had a history of CKD before admission. In patients with CKD at varying stages of severity and kidney transplant patients, odds ratios of death and readmission compared to patients without CKD ranged from 1.96 to 8.94. This suggests that clinicians should be aware of more severe COVID-19 outcomes and increased vulnerability in CKD patients including kidney transplant patients. [Article.](#)

UK Health Security Agency: The effectiveness of vaccination against long COVID

February 2022. This rapid evidence brief suggests that there is evidence vaccinated people who are subsequently infected with COVID-19 are less likely to report symptoms of long COVID than unvaccinated people, in the short-term (four weeks after infection), medium term (12 to 20 weeks after infection), and long-term (six months after infection). This is in addition to any benefit of vaccination in preventing COVID-19 infection. There is also evidence that unvaccinated people with long COVID who were subsequently vaccinated had, on average, reduced long COVID symptoms (though some people reported worsened symptoms after vaccination). Unvaccinated people with long COVID, who were subsequently vaccinated, reported fewer long COVID symptoms than those who remained unvaccinated. However, there is a risk of bias across all studies due to differences in people who were vaccinated and unvaccinated, the measurement of outcomes, and in the selection of participants. [Article](#).

Case Testing and Screening

***medRxiv*: Performance of three rapid antigen detection tests (RADTs) against the Omicron variant**

February 19, 2022. This preprint study noted that the nucleocapsid protein is the target for the majority of RADTs and the SARS-CoV-2 Omicron variant has several nucleocapsid protein mutations that are previously uncharacterized. The study assessed the impact of these mutations by testing 30 Omicron variant samples across a wide range of viral loads on three widely used RADTs: the iHealth COVID-19 Antigen Rapid Test, the ACON Laboratories FlowFlex COVID-19 Antigen Home Test, and the Abbott BinaxNOW COVID-19 Antigen Card, using 30 Delta variant samples as a comparator. There was no change in the analytic sensitivity of all three RADTs for detection of Omicron versus Delta, but there were differences in performance between assays. [Article](#).

***medRxiv*: Accuracy of rapid point-of-care antigen rapid diagnostic tests (Ag-RDTs) for SARS-CoV-2**

February 15, 2022. This preprint systematic review and meta-analysis showed that Ag-RDTs detect most of the individuals infected with SARS-CoV-2, and almost all when high viral loads are present (>90%). With viral load (as estimated by RT-PCR cycle threshold [Ct] values) being the most influential factor on their sensitivity, Ag-RDTs are especially useful to detect persons with high viral load who are most likely to transmit the virus. To further quantify the effects of other factors influencing test sensitivity, standardization of clinical accuracy studies and access to patient level Ct-values and duration of symptoms are needed. [Article](#).

medRxiv: Combined oropharyngeal/nares (OPN) and nasopharyngeal (NP) swab sampling remain effective for molecular detection of SARS-CoV-2 Omicron variant

February 15, 2022. This Canadian preprint study demonstrated that both NP and combined OPN swabs from 392 participants detected the Omicron variant with similar sensitivity by nucleic acid amplification testing, supporting the continued use of either swab collection for SARS-CoV-2 molecular detection. [Article](#).

Health Equity and Vulnerable Populations

The Lancet: The effect of social deprivation on the dynamic of SARS-CoV-2 infection in France

February 14, 2022. The results from this study highlight a positive social gradient between deprivation and the risk of testing positive for SARS-CoV-2, with the highest risk among individuals living in the most deprived areas and a negative social gradient for testing rate. These findings might reflect structural barriers to health care access in France and lower capacity of deprived populations to benefit from protective measures. [Article](#).

Canadian Medical Association Journal: Geographic concentration of SARS-CoV-2 cases by social determinants of health in metropolitan areas in Canada

February 14, 2022. This study quantified the social determinants of geographic concentration of SARS-CoV-2 cases across 16 census metropolitan areas in four Canadian provinces (British Columbia [BC], Manitoba [MB], Ontario [ON], Quebec [QC]). Drawing on surveillance data on confirmed SARS-CoV-2 cases and census data for social determinants at the level of the dissemination area, the results suggest that geographic concentration of SARS-CoV-2 cases were identified in cities with the greatest geographic heterogeneity in Ontario cities, followed by BC, MB, and QC. Cases were disproportionately concentrated in areas with lower income and educational attainment, and in areas with a higher proportion of visible minorities, recent immigrants, high-density housing, and essential workers. Geographically prioritized allocation of resources and services should be tailored to the local drivers of inequalities in transmission in response to the resurgence of SARS-CoV-2. [Article](#).

Nature: The effects of the COVID-19 pandemic on neuropsychiatric symptoms in dementia and carer mental health

February 14, 2022. This study surveyed carers of people with dementia in Australia, Germany, Spain, and the Netherlands finding that: 1) people with dementia experienced worsened neuropsychiatric symptoms since the outbreak of COVID-19 (i.e., depression, apathy, delusions, anxiety, irritability, and agitation); and 2) carers reported a decline in their own mental health,

increased stress, and reduced social networks as a result of COVID-19 and related restrictions.

[Article](#).

The Lancet: Time varying association between deprivation, ethnicity, and SARS-CoV-2 infections in England

February 13, 2022. The study found that deprivation and proportion of non-white populations are both associated with an increased COVID-19 burden in terms of disease spread and monitoring, but the strength of association varies over the course of the pandemic and for different ethnic subgroups. The consistency of results across the two outcomes suggests that deprivation and ethnicity have a differential impact on disease exposure or susceptibility rather than testing access and habits. [Article](#).

Research Square: Determinants of SARS-CoV-2 infection in the older adult population

February 11, 2022. This preprint study examined the determinants of SARS-CoV-2 infection among 4,400 older adults (aged ≥ 65 years) living in the Lombardy, Italy in November 2020. Overall, 4.9% of participants reported a history of SARS-CoV-2 infection. SARS-CoV-2 infection was less frequently reported in subjects aged ≥ 70 compared to 65-69 years, and no trend was observed after 70 years of age. Those with at least one chronic condition reported a lower infection rate compared to healthy subjects. Separated/divorced participants less frequently reported infection than married/cohabiting ones. Results suggest that, in Italy, the oldest subjects and those having chronic conditions less frequently exposed themselves to SARS-CoV-2 infection during the pandemic. [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 first half of February 2022, contributing Canadian evidence-synthesis teams have produced nine newly completed evidence syntheses. From the COVID-END taxonomy, these syntheses focus on public health measures (n=6) and clinical management (n=3). Please visit [Canadian Spotlight 14.1](#) 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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