COVID-19 PANDEMIC – RAEB'S EVIDENCE UPDATE

Highlights of health research evidence synthesized by the Research, Analysis and Evaluation Branch (RAEB)

• May 17, 2021 •

FEATURED

- Evidence products produced with our partners
- Evidence products from our Evidence Synthesis Network partners
- Research evidence and jurisdictional experience
- Trusted resources

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

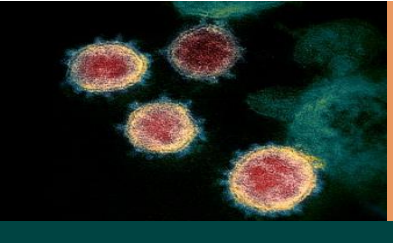
Anne Hayes, RAEB Director
Andrea Proctor, Evidence Synthesis
Emre Yurga, Economic Analysis and Evaluation
Research Planning and Management

Please help us understand who reads the Evidence Update and how to improve it! Click here to take our 2-minute survey

EVIDENCE PRODUCTS PRODUCED WITH OUR PARTNERS

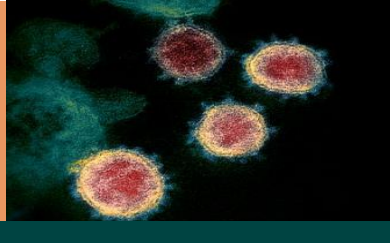
The COVID-19 Evidence Synthesis Network is comprised of groups specializing in evidence synthesis and knowledge translation. The group has committed to provide their expertise to provide high-quality, relevant, and timely synthesized research evidence about COVID-19 to inform decision makers as the pandemic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

- The Impact of Reopening and the Lifting of COVID-19 Restrictions
  (Produced in collaboration with the McMaster Health Forum, Ontario Health, Public Health Ontario)
  - How Restrictions are Lifted: Scientific evidence based on modelling studies suggest that reopening or lifting of COVD-19 restrictions are dependent on COVID-19 case rates, hospitalization rates, and the progress of vaccination programs. It is generally reported that gradual release strategies (i.e., ending lockdowns through multiple staggered releases) are effective in avoiding the resurgence of future COVID-19 waves. Guidance from jurisdictions is consistent in suggesting that low number and isolated cases, robust public health capacity and monitoring systems (i.e., test, trace, and isolate cases), adequate health system capacity, education and empowerment of members of society to participate in pandemic control, and preventing importation of cases are all necessary criteria for lifting COVID-19 restrictions and avoiding unintentional negative impacts.
  - The Order of Lifting Restrictions: Most countries have not indicated how they will lift public health measures for vaccinated individuals or once specific proportions of their populations are vaccinated.
  - The Impact of Lifting Restrictions: Modelling studies suggest that if public health measures (physical distancing, isolation, contact tracing, testing/screening) are not maintained and gradual release strategies are not implemented, case numbers and the resurgence of future waves are likely to occur.
  - Implications for Ontario: Ontario demonstrated rapid and uncontrolled case growth, ICU hospitalization, and the re-introduction of stricter public health measures or postponement of reopening after COVID-19 restrictions were lifted.



COVID-19 PANDEMIC – RAEB'S EVIDENCE UPDATE
Highlights of health research evidence synthesized by the
Research, Analysis and Evaluation Branch (RAEB)

• May 17, 2021 •



EVIDENCE PRODUCTS FROM OUR EVIDENCE SYNTHESIS NETWORK PARTNERS

Ministry research partners are actively working with leading agencies and organizations on COVID-19 topics and tools. The following tools have been developed to provide risk assessments based on users' occupations, activities, location, and other relevant factors. COVID-END in Canada, through the McMaster Health Forum, recently completed a COVID-19 living evidence profile:

- What Is Known About How Schools and Post-Secondary Institutions Adjust COVID-19 Transmission-Mitigation Measures as Infection Rates Change and Vaccination Rates Increase
  This living evidence profile is designed to complement two existing living evidence syntheses that address COVID-19 transmission in daycares and schools (kindergarten to grade 12) and in post-secondary institutions (colleges and universities), which provide comprehensive syntheses of empirical evidence. The syntheses are complemented by profiling guidelines, which are not included in these existing syntheses, and describing experiences from seven other countries and from all Canadian provinces and territories.

RESEARCH EVIDENCE/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.

HEALTH EQUITY AND VULNERABLE POPULATIONS

- *NEJM:* COVID-19 vaccine acceptance in California state prisons
  May 12, 2021. Between December 22, 2020 and March 4, 2021, the BNT162b2 or mRNA-1273 vaccine (commonly known as the Pfizer vaccine) was offered to two-thirds of prisoners in California, and 66.5% of those offered a vaccine accepted at least one dose. Acceptance was highest among Hispanic residents (72.6%) and White residents (72.1%), slightly lower among American Indian or Alaska Native residents (67.7%) and Asian or Pacific Islander residents (67.7%), and was lowest among Black residents (54.9%). Even when COVID-19 vaccines become widely available in correctional institutions, achievement and maintenance of sufficient population-level immunity to avoid large outbreaks will be challenging. High and equitable vaccination uptake is crucial and attaining it may depend on successful efforts to build trust and vaccine confidence and on regular reoffers to those who decline initially. *Read*.

* Figures in the header: Transmission electron microscope image shows SARS-CoV-2, the virus that causes COVID-19, isolated from a patient in the United States. Virus particles are emerging from the surface of cells cultured in the lab. The spikes on the outer edge of the virus particles give coronaviruses their name, crown-like. *National Institutes of Health's National Institute of Allergy and Infectious Diseases – Rocky Mountain Laboratories*

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

HEALTH EQUITY AND VULNERBALE POPULATIONS

- *Nature:* Impact of active cancer on COVID-19 survival in Lombardy, Italy
  May 11, 2021. This study analyzed clinical data from 557 consecutive COVID-19 patients, of whom 46 had active cancer (8%). The analysis, which accounted for various factors, including comorbidities such as diabetes (*n*=137, 25%), hypertension (*n*=284, 51%), and coronary artery disease (*n*=114, 20%), found the death rate nearly doubled for cancer compared to non-cancer COVID-19 patients. Findings suggest that active cancer has a negative impact on clinical outcomes regardless of pre-existing clinical comorbidities. *Read*.
- *CMAJ:* Risk factors for outbreaks of SARS-CoV-2 infection at retirement homes
  May 10, 2021. This study examined the association between home-and community-level characteristics and the risk of outbreaks of SARS-CoV-2 infection in retirement homes since the beginning of the first wave of the COVID-19 pandemic (Mar 1 to Dec 18, 2020) in Ontario, Canada. Of the 770 licensed retirement homes included, 273 (35.5%) had one or more outbreaks of SARS-CoV-2 infection, involving 1,944 (3.5%) residents and 1,101 staff (3.0%). Cases of SARS-CoV-2 infection were distributed unevenly across retirement homes, with 2,487 (81.7%) resident and staff cases occurring in 77 (10%) homes. The adjusted hazard of an outbreak of SARS-CoV-2 infection in a retirement home was positively associated with homes that had a large resident capacity, were co-located with a long-term care facility, were part of larger chains, offered many services onsite, saw increases in regional incidence of SARS-CoV-2 infection, and were located in a region with a higher community-level ethnic concentration. *Read*.
- *The Lancet:* Mental health responses to the COVID-19 pandemic
  May 6, 2021. This UK study tracked mental health among 19,763 adults to characterize mental health trajectories among the UK population during the pandemic. Between April and October 2020, mean population mental health deteriorated with the onset of the pandemic and did not begin improving until July 2020, after which the mental health of most UK adults remained resilient or returned to pre-pandemic levels. Around one in nine individuals had deteriorating or consistently poor mental health. People who are living in areas affected by lockdown are struggling financially, have pre-existing conditions, or are infected with SARS-CoV-2 may benefit most from early interventions. *Read*.
- *NEJM:* Efficacy of NVX-CoV2373 COVID-19 vaccine against the B.1.351 variant
  May 5, 2021. This South African study evaluated the efficacy of the NVX-CoV2373 COVID-19 vaccine against the B.1.351 variant in a setting of ongoing SARS-CoV-2 transmission. Adults who were HIV-negative and HIV-positive were randomly assigned in a 1:1 ratio to receive two doses of either the NVX-CoV2373 vaccine or placebo. Among 2,684 participants (94% HIV-negative, 6% HIV-positive), mild-to-moderate COVID-19 developed in 15 participants in the vaccine group and in 29 in the placebo group (vaccine efficacy, 49.4%). The NVX-CoV2373 vaccine was efficacious in preventing COVID-19, with higher vaccine efficacy observed among HIV-negative participants. *Read*.

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

DATA ANALYTICS, MODELLING AND MEASUREMENT

- *Nature:* Predictive performance of international COVID-19 mortality forecasting models
  May 10, 2021. This study assessed the predictive performance of seven global forecasting models released in October 2020 demonstrating a median absolute percent error of 7%-13% at six weeks, which reflects good performance despite the complexities of modelling human behavioural responses and government interventions. The framework and public codebase can be used to compare predictions and evaluate predictive performance going forward. *Read*.

PUBLIC HEALTH MEASURES

- *Nature:* Feasibility of large-scale population testing for SARS-CoV-2 detection by self-testing at home
  May 10, 2021. This study assessed the feasibility and applicability of a rapid self-testing system for SARS-CoV-2 infection among a random sample of 1,022 people living in Cantabria, Spain. Findings showed 96.2% of participants were able to achieve a valid test result without health care support, and 91.3% were able to achieve a valid test result on the first test kit delivered (6.9% of participants required a second kit). There was no significant difference between the seroprevalence results of the rapid self-test and the seroprevalence results for the Cantabria region of a nationwide study involving point-of-care tests conducted over the same period. The self-testing system assessed in this study relies on antibody detection in blood samples; further study of alternative testing methods (e.g., saliva-based tests) is required. *Read*.
- *Lancet:* The future of the National Health Service (NHS): Re-laying the foundations for an equitable and efficient health and care service after COVID-19
  May 6, 2021. The response to COVID-19 highlights some of the weaknesses and strengths of the UK's health and care systems and real challenges in society to health. Failures in leadership, an absence of transparency, poor integration between the NHS and social care, chronic underfunding of social care, a fragmented and disempowered public health service, ongoing staffing shortfalls, and challenges in getting data to flow in real time were all important barriers to coordinating a comprehensive and effective response to the pandemic. More positively, the high amount of financial protection that was provided by the NHS and an allocation of resources that explicitly accounted for differing geographical needs have, to some extent, mitigated the already substantial effect of the pandemic on health inequalities. *Read*.

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

PUBLIC HEALTH MEASURES

- *Nature:* Perceived economic risk has a stronger association with support for COVID-19 preventive measures than perceived health risk
  May 6, 2021. This study reviewed survey data from 24 countries, including Canada, to determine how perceived health and economic risks of the COVID-19 pandemic are associated with compliance with preventive health behaviours (e.g., hand washing, social isolation) and support for containment policies (e.g., mandatory quarantine, mandatory vaccination). The study found that perceived economic risk is positively associated with, and the best predictor of, both preventive health behaviour and support for containment policies. Some preventive health measures, such as wearing facemasks and social distancing, however, were not included in this study. *Read*.

DISEASE MANAGEMENT

- *Nature:* A global database of COVID-19 vaccinations
  May 10, 2021. Our World in Data COVID-19 vaccination dataset is a global public dataset that tracks the scale and rate of the vaccine rollout across the world. This dataset is updated regularly and includes data on the total number of vaccinations administered, first and second doses administered, daily vaccination rates, and population-adjusted coverage for all countries for which data are available (169 countries as of April 7, 2021). It will be maintained as the global vaccination campaign continues to progress. This resource aids policymakers and researchers in understanding the rate of current and potential vaccine rollout; the interactions with non-vaccination policy responses; the potential impact of vaccinations on pandemic outcomes such as transmission, morbidity, and mortality; and global inequalities in vaccine access. *Read*.

UNDERSTANDING THE DISEASE

- *Lancet:* Post-acute effects of SARS-CoV-2 infection in individuals not requiring hospital admission
  May 10, 2021. This Danish study examined prescription drug and health care use after SARS-CoV-2 infection on participants not requiring hospital admission between Feb 27 and May 31, 2020. Compared with SARS-CoV-2-negative individuals, SARS-CoV-2-positive individuals who were not admitted to the hospital had a slightly increased risk of venous thromboembolism (i.e., a blood clot in the vein), receiving a hospital diagnosis of shortness of breath, and initiating bronchodilator therapy (specifically triptans). Moreover, SARS-CoV-2-positive individuals visited their general practitioner and outpatient hospital clinics more often after the primary infection than those who tested negative, which could indicate persistent symptoms that do not lead to specific drug treatment or hospital admission. *Read*.

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

UNDERSTANDING THE DISEASE

- *WHO:* COVID-19 natural immunity
  May 10, 2021. This WHO scientific brief found that within four weeks following infection, 90-99% of individuals infected with the SARS-CoV-2 virus develop detectable neutralizing antibodies. The strength and duration of the immune responses to SARS-CoV-2 are not completely understood and currently available data suggests that it varies by age and the severity of symptoms. Available scientific data suggests that in most people immune responses remain robust and protective against reinfection for at least six-eight months after infection (the longest follow up with strong scientific evidence is currently approximately eight months). Some variant SARS-CoV-2 viruses with key changes in the spike protein have a reduced susceptibility to neutralization by antibodies in the blood. While neutralizing antibodies mainly target the spike protein, cellular immunity elicited by natural infection also target other viral proteins, which tend to be more conserved across variants than the spike protein. There are many available serologic assays that measure the antibody response to SARS-CoV-2 infection, but at the present time, the correlates of protection are not well understood. *Read*
- *Lancet:* Non-steroidal anti-inflammatory drug use and outcomes of COVID-19
  May 7, 2021. This UK study assessed the safety of non-steroidal anti-inflammatory drugs (NSAIDs) and identified whether pre-existing NSAID use was associated with increased severity of COVID-19 disease. At hospital admission, there were no significant differences in severity between NSAID users and non-users. NSAID use was not associated with worse in-hospital mortality, critical care admission, requirement for invasive ventilation, non-invasive ventilation, or oxygen, or occurrence of acute kidney injury. Overall, NSAID use is not associated with higher mortality or increased severity of COVID-19. *Read*.

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

TRUSTED RESOURCES cont'd

- 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 produces Canadian and global spotlights and horizon scans on emerging issues, as well as hosting 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. COVID-19 responses can include the full spectrum of public health measures, clinical management, health system arrangements, and economic and social responses. During the first half of May, contributing evidence-synthesis teams in Canada shared 17 completed evidence syntheses and four questions that they have newly taken on, and globally, there are a number of emergent issues related to COVID-19 for which evidence syntheses are or will be needed (see here). To receive an email containing hyperlinks to these products twice a month, subscribe here.

Call for Participation in a COVID-19 Cohort Study in Ontario

Drs. Allison McGeer, Brenda Coleman, Robert Manunder, Sharon Straus, and Susan Bondy (Sinai Health, Unity Health and the University of Toronto) are conducting the *Study of the epidemiology of COVID-19 in teachers and education workers in elementary and secondary schools in Ontario*. The study is investigating how many education workers develop COVID-19 infection; what workplace, community, and household factors are associated with infection; the effectiveness of vaccines against COVID-19 (including the variants); and the psychological impact of working during a pandemic.

- Eligibility Criteria: Teachers and other school personnel who: are 18-74 years of age; work for an Ontario elementary or secondary school for eight or more hours per week and are not planning to retire, go on leave, etc. for at least three months. Previous COVID-19 infection or vaccination does not make a person ineligible.
- Requirements: Questionnaires upon joining and then bi-weekly (online); and when (if) tested for or vaccinated against COVID-19 and self-collect finger-prick blood samples at various times throughout the study
- Participation is voluntary and participants may leave the study at any time. Participants will be provided with a small token of appreciation for taking part in the study
- Contact information: For more information about the study, please visit http://www.tibdn.ca/covid-19/education. If you have any questions about the study, please email the study office at ccs.2@sinaihealth.ca or call the office at 416-294-6383