COVID-19 PANDEMIC – RAEB'S EVIDENCE UPDATE
Highlights of health research evidence synthesized by the Research, Analysis and Evaluation Branch (RAEB)
• April 12, 2021 •

FEATURED

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

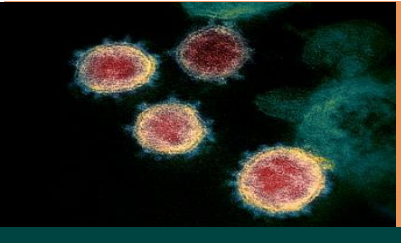
- Anne Hayes, RAEB Director
- Andrea Proctor, Evidence Synthesis
- Emre Yurga, Economic Analysis and Evaluation
- Research Planning and Management

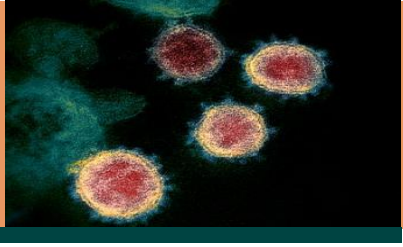
RAEB'S RAPID RESPONSES FOR ONTARIO'S HEALTH SECTOR

Please contact Evidence Synthesis Unit for the full read of these rapid responses.

- Understanding Long COVID
  - The limited evidence base currently precludes a precise definition of long COVID-19 symptoms and prevalence. Commonly, long COVID is characterized as the persistence of any COVID signs and symptoms that continue or develop between four to 12 weeks after acute COVID-19, including both ongoing symptomatic COVID-19 and post-COVID-19 syndrome.
  - The most common symptoms reported are: fatigue, dyspnea (i.e., shortness of breath), headache, and chest, joint, or muscle pain; however, persistent symptoms have also been described for the cognitive, musculoskeletal, respiratory, gastrointestinal, cardiac, and psychological systems.
  - The following risk factors may increase the risk for long COVID: a higher acuity of COVID-19 infection or presence of many acute COVID-19 symptoms, older age, female sex, obesity, pre-existing comorbidities, psychiatric disorders, and being a health care worker.
  - There is a need for robust, controlled, prospective cohort studies on the topic.

- The Wellbeing of Residents in Long-Term Care Homes (LTCHs) during COVID-19
  - Physical isolation and quarantining in LTCHs are commonly identified IPC practices contributing to the deteriorated wellbeing of residents. Seven identified wellbeing domains are negatively affected by physically isolating/quarantining in LTCHs during the pandemic: decline in mental health (i.e., depression, delirium, loneliness, and mood/behavioural problems); multiple wellbeing domains declining simultaneously (i.e., decline in physical, functional, cognitive, and mental health; weight loss; and urinary incontinence); increase in medication use; decline in cognition; increase in social isolation; increase in loneliness; and increase in care dependency.
  - Increasing the social interaction, communication, and socialization of LTCH residents are commonly identified recommendations addressing their deteriorated wellbeing. Recommendations include: technological innovation (i.e., interRAI, video chat, iPads, telehealth); increasing visitor time and frequency in accordance with public health measures (i.e., physical distancing, face masking); LTCH staff training on common mental health disorders; using different therapies and interventions to address social isolation (e.g., music therapy, cognitive and behavioural therapy, mindfulness-based stress reduction, meditation); prioritizing vaccination for resident family caregivers and LTCH staff; and continuing daytime activities.





EVIDENCE PRODUCTS PRODUCED WITH OUR PARTNERS

- Infection Control and Public Health Measures in Long-Term Care and Retirement Homes Following COVID-19 Vaccination of Residents
  (Produced in collaboration with Ontario Health [Quality])

  - Jurisdictions (Canada [Ontario, British Columbia, Prince Edward Island, Yukon], Netherlands, Republic of Ireland, the United Kingdom, and the United States [Washington State, Arizona]) report that LTCHs should have a range of protections against COVID-19 following vaccination such as: continuing to follow IPC measures (i.e., masking, physical distancing, and hand washing for residents and visitors); testing and screening of visitors, staff, and residents where available; encouraging COVID-19 vaccinations for residents and visitors; prioritizing outdoor visits over indoor visits; increasing the number of visitors per day for residents who are fully vaccinated (e.g., two instead of one); and permitting communal and group dining in conjunction with public health measures (e.g., sitting six feet apart, masking unless eating).
  - Guidance from the United States focuses on two factors: the quality of IPC measures in LTCHs, and the community spread in the area based on percent positivity. For example:
    - Indoor visitation is permitted when there is <10% positivity in the area and >70% vaccine rate of residents in the LTCH. Fully vaccinated residents can choose to have close contact (including touch) with their visitor while wearing a well-fitting source control (i.e., mask or respirator) and performing hand-hygiene.
    - Absences from LTCHs for non-medical reasons, communal dining, and social activities can occur with appropriate IPC measures (e.g., physical distancing, hand hygiene, and masking), where there is minimal to moderate community spread and >70% vaccine rate of residents.
  - Implications for Ontario: In addition to routine practices for COVID-19 immunization clinics, IPC measures should be implemented in accordance to the LTCH outbreak status. Resident and staff cohorting should remain in place, including LTCH staff cohorting for those providing the vaccine to residents. As of January 18, 2021, there is no change to case, contact, and outbreak management if a new confirmed infection is identified in a previously vaccinated individual. There is also no change to contact management if a contact has been vaccinated.

* 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

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

- *JAMA:* Assessment of pediatric admissions for Kawasaki disease (KD) or infectious disease in Japan
  Apr 6, 2021. In this study of 17,235 pediatric patients, the number of admissions for KD showed no significant change (27.4% decrease) during quarantine owing to the COVID-19 pandemic, whereas there were significant decreases in numbers of hospital admissions for droplet-transmitted or contact-transmitted respiratory tract infections (75.3% decrease), and gastrointestinal infections (86.3% decrease). Thus, the ratio of KD admissions to admissions for these infections increased. These findings suggest that contact or droplet transmission is not a major route for KD development and that KD may be associated with airborne disease. *Read*.
- *Lancet:* Six-month neurological and psychiatric outcomes in survivors of COVID-19
  Apr 6, 2021. Using electronic health records, this study examined incidence rates and relative risks of neurological and psychiatric diagnoses in patients in the six months following a COVID-19 diagnosis. Among 236,379 patients diagnosed with COVID-19, the estimated incidence of a neurological or psychiatric diagnosis in the following six months was 33.62%, with 12.84% receiving their first such diagnosis. Findings indicate substantial neurological and psychiatric morbidity in the six months after COVID-19 infection. Risks were greatest in, but not limited to, patients who had severe COVID-19. *Read*.
- *Lancet:* Association between pre-existing respiratory disease and its treatment, and severe COVID-19
  Apr 1, 2021. This UK study assessed whether chronic lung disease or use of inhaled corticosteroids affects the risk of contracting severe COVID-19 among 8,256,161 people. The risk of severe COVID-19 in people with asthma was relatively small. People with chronic obstructive pulmonary disease (COPD) and interstitial lung disease appear to have a modestly increased risk of severe disease, but their risk of death from COVID-19 at the height of the epidemic was mostly far lower than the ordinary risk of death from any cause. Use of inhaled steroids might be associated with a modestly increased risk of severe COVID-19. *Read*.
- *BMJ:* Post-COVID syndrome in individuals admitted to hospital with COVID-19
  Mar 31, 2021. Drawing on personal and clinical data from 47,780 individuals hospitalized with acute COVID-19, this study quantified rates of organ-specific dysfunction in participants after discharge from NHS hospitals in England before August 31, 2020. Nearly a third of individuals who had been discharged were readmitted and more than one in 10 died after discharge, with these events occurring at rates four and eight times greater, respectively, than in the general population. Rates of respiratory disease, diabetes, and cardiovascular disease were significantly raised in patients with COVID-19. The diagnosis, treatment, and prevention of post-COVID syndrome requires integrated rather than organ or disease-specific approaches, and urgent research is needed to establish the risk factors. *Read*.

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

DISEASE MANAGEMENT

- *NEJM:* Thrombotic thrombocytopenia after ChAdOx1 nCov-19 vaccination (Oxford/AstraZeneca vaccine)
  Apr 9, 2021. This study assessed the clinical and laboratory features of 11 patients in Germany and Austria in whom thrombosis or thrombocytopenia had developed after vaccination with ChAdOx1 nCov-19. It was concluded that vaccination with ChAdOx1 nCov-19 can result in the rare development of immune thrombotic thrombocytopenia mediated by platelet-activating antibodies against platelet factor 4, which clinically mimics autoimmune heparin-induced thrombocytopenia. *Read*.
- *NEJM:* Thrombosis and thrombocytopenia after ChAdOx1 nCoV-19 vaccination
  Apr 9, 2021. This study examined five patients who presented with venous thrombosis and thrombocytopenia seven to 10 days after receiving the first dose of the ChAdOx1 nCoV-19 vaccine. The patients were health care workers who were 32-54 years of age. All the patients had high levels of antibodies to platelet factor 4-polyanion complexes; however, they had had no previous exposure to heparin. Because the five cases occurred in a population of more than 130,000 vaccinated persons, the study proposes that they represent a rare vaccine-related variant of spontaneous heparin-induced thrombocytopenia that is referred to as vaccine-induced immune thrombotic thrombocytopenia. *Read*.
- *Nature:* Clinical features and predictors of severity in COVID-19 patients with critical illness in Singapore
  Apr 5, 2021. This study of critically and non-critically ill COVID-19 patients in Singapore provides details for 50 uncomplicated COVID-19 patients and 10 who required mechanical ventilation. Ventilated patients were significantly older, reported more dyspnea, and had elevated C-reactive protein and lactate dehydrogenase. On admission, independent predictors of intubation were respiratory rate and neutrophil count. Median duration of ventilation was 6.5 days and was without fatalities. *Read*.
- *Nature:* Antibody responses to the Pfizer-BioNTech vaccine in individuals previously infected with SARS-CoV-2
  Apr 1, 2021. In a cohort of Pfizer-BioNTech vaccine recipients (n=1,090), it was observed that Immunoglobulin G (IgG) antibody levels and antibody binding inhibition responses elicited by a single vaccine dose in individuals with prior SARS-CoV-2 infection (n=35) were similar to those seen after two doses of vaccine in individuals without prior infection (n=228). Post-vaccine symptoms were more prominent for those with prior infection after the first dose, but symptoms were similar between groups after the second dose. *Read*.

DATA ANALYTICS, MODELLING AND MEASUREMENT

- *JAMA:* Excess deaths from COVID-19 and other causes in the US
  Apr 2, 2021. This study updates the US mortality analysis for the period between March 1, 2020 to January 2, 2021. In this period, the US experienced 2,801,439 deaths, 22.9% more than expected, representing 522,368 excess deaths. The excess death rate was higher among non-Hispanic Black (208.4 deaths per 100,000) than non-Hispanic White or Hispanic populations (157.0 and 139.8 deaths per 100,000, respectively); these groups accounted for 16.9%, 61.1%, and 16.7% of excess deaths, respectively. *Read*.

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

DATA ANALYTICS, MODELLING AND MEASUREMENT

- *Nature:* Reorganization of nurse scheduling reduces the risk of health care associated infections (HAI)
  Apr 1, 2021. This modelling study used contact data from wearable sensors at a short-stay geriatric ward in a hospital in France. Findings indicated that reorganizing nurse schedules reduced HAI risk by 27% while preserving timeliness, number, and duration of contacts. More than 30% nurse-nurse contacts (as compared with patient-nurse) should be avoided to achieve an equivalent reduction through simple contact removal. Optimization of nurse scheduling practices should be included in hospital programs for infection control. *Read*.
- *Journal of the American College of Emergency Physicians:* Scoring system and model to detect risk of hospital admission due to COVID-19
  Apr 2021. Based on observational study data from 6,485 COVID-19 patients across a six-hospital network in northeastern Pennsylvania, researchers designed a predictive model and scoring tool to anticipate which COVID-19 patients are likely to be admitted to hospital. The biggest predictors of patient hospitalization included age, a history of hypertension, diabetes, chronic heart disease, gender, tobacco use, and chronic kidney disease. Using the scoring tool, low-, intermediate-, and high-risk patients were deemed to have a 3.5%, 26%, and 38% chance of hospitalization, respectively. The best predictors of hospitalization included age, diabetes, hypertension, chronic heart disease, and male gender. *Read*.

TRANSMISSION

- *CMAJ:* Estimating mobility thresholds required to control SARS-CoV-2
  Apr 7, 2021. This Canadian study used anonymized smartphone mobility measures to quantify the mobility level needed to control SARS-CoV-2 (i.e., mobility threshold) and the difference relative to the observed mobility level (i.e., mobility gap) among 888,751 people infected with SARS-CoV-2 from Mar 15, 2020 to Mar 6, 2021. Each 10% increase in the mobility gap was associated with a 25% increase in the SARS-CoV-2 weekly case growth rate. Compared to the pre-pandemic baseline mobility of 100%, the mobility threshold was highest in the summer (69%) and dropped to 54% in winter 2021. Mobility strongly and consistently predicts weekly case growth, and low levels of mobility are needed to control SARS-CoV-2 through spring 2021. *Read*.

PUBLIC HEALTH MEASURES

- *JAMA:* Effectiveness of case-based and population-based interventions on COVID-19 containment in Taiwan
  Apr 6, 2021. In this study, the combination of case-based (i.e., contact tracing and quarantine) and population-based interventions with wide adherence (i.e., social distancing and facial masking) may explain the success of COVID-19 control in Taiwan in 2020. Either category of interventions alone would have been insufficient, even in a country with an effective public health system and comprehensive contact tracing program. These findings suggest that mitigating the COVID-19 pandemic requires the collaborative effort of public health professionals and the general public. *Read*.

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

FRONTLINE WORKERS

- *Journal of Medical Virology:* Adverse effects of COVID-19 mRNA-1273 vaccine in health care workers (HCWs)
  Apr 6, 2021. This randomized cross-sectional study investigated the side effects of the mRNA-1273 vaccine among HCWs in the US. A total of 432 respondents received the mRNA-1273 vaccine, of which 425 reported at least one or more symptoms. Among all the symptoms reported, localized pain, generalized weakness, headache, muscle pain, chills, fever, nausea, joint pains, sweating, localized swelling at the injection site, dizziness, itching, rash, decreased appetite, muscle spasm, decreased sleep quality, and brain fog are the most commonly reported symptoms (in descending order of occurrence). Despite the wide range of self-reported symptoms, 97.02% of HCWs did not intend to skip the second dose. *Read*.

HEALTH EQUITY AND VULNERABLE POPULATIONS

- *JAMA:* Association of human mobility restrictions and race/ethnicity-based, sex-based, and income-based factors with inequities in well-being during the COVID-19 pandemic in the US
  Apr 7, 2021. In this study of 1,088,314 US adults, African American individuals with low income, Hispanic individuals, and women of all racial/ethnic groups had higher risks of experiencing unemployment, class cancellations, food insufficiency, and mental health problems during the first wave of the COVID-19 pandemic. These findings suggest that public health policies that ignore existing distributions of risks to well-being may be intrinsically regressive if they fail to target necessary relief measures to individuals who have historically experienced the most marginalization. *Read*.
- *JAMA:* Experiences of a health system's faculty, staff, and trainees' career development, work culture, and childcare needs during the COVID-19 pandemic in Utah, US
  Apr 2, 2021. In this study, most participants with children did not have childcare fully available and many considered leaving the workforce and were worried about their career. Being female with children or having a clinical job role was associated with consideration for leaving the workforce and reducing hours. These findings suggest that a substantial number of employees and trainees experienced major stress and work disruptions because of the COVID-19 pandemic. *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
- 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.
  - COVID-END in Canada, through the McMaster Health Forum, has recently released an updated version of their Living Evidence Profile #2: What is known about preventing and managing COVID-19 outbreaks and about supporting renewal in long-term care homes? The Living Evidence Profile on managing COVID-19 in long-term care homes is updated each month, adding new highly relevant information; this update identified an additional 37 highly relevant guidelines, systematic reviews, and other evidence, and contains an updated jurisdictional scan.
  - 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 second half of March, contributing evidence-synthesis teams in Canada shared 14 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.