Ontario ☰

COVID-19 PANDEMIC

RAEB'S Evidence Update

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

May 10, 2021

Featured

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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.

Disease Management

The Lancet: Pfizer-BioNTech vaccine against SARS-CoV-2 infections and COVID-19 cases, hospitalizations, and deaths following a nationwide vaccination campaign in Israel

May 5, 2021. This study reported that two doses of BNT162b2 are highly effective across all age groups (≥16 years, including older adults aged ≥85 years) in preventing symptomatic and asymptomatic SARS-CoV-2 infections and COVID-19-related hospitalizations, severe disease, and death, including those caused by the B.1.1.7 SARS-CoV-2 variant. There were marked and sustained declines in SARS-CoV-2 incidence corresponding to increasing vaccine coverage. Article.

British Medical Journal (BMJ): Arterial events, venous thromboembolism, thrombocytopenia, and bleeding after vaccination with Oxford-AstraZeneca ChAdOx1-S in Denmark and Norway

May 5, 2021. This study assessed the rates of cardiovascular and haemostatic events in the first 28 days after vaccination with the Oxford-AstraZeneca vaccine among 148,792 people in Denmark (median age 45 years, 80% women) and 132,472 in Norway (median age 44 years, 78% women). Increased rates of venous thromboembolic events, including cerebral venous thrombosis, were observed. For the remaining safety outcomes, results were largely reassuring, with slightly higher rates of thrombocytopenia/coagulation disorders and bleeding, which could be influenced by increased surveillance of vaccine recipients. The study found that the absolute risks of venous thromboembolic events were small, and the findings should be interpreted in

the light of the proven beneficial effects of the vaccine, the context of the given country, and the limitations to the generalizability of the study findings. Article.

PLoS One: Clinical determinants of the severity of COVID-19

May 3, 2021. This systematic review of 41 studies including 21,060 patients with COVID-19 found that patients who were male, with advanced age, obesity, a history of smoking, hypertension, diabetes, malignancy, coronary heart disease, hypertension, chronic liver disease, chronic obstructive pulmonary disease, or chronic kidney disease are more likely to develop severe COVID-19 symptoms. Acute Respiratory Distress Syndrome, shock, and acute kidney injury were thought to be the main hinderances to recovery. Article.

Understanding the Disease

Journal of the American Medical Association (JAMA): Clinical characteristics and transmission of COVID-19 in children and youths during three waves of outbreaks in Hong Kong

May 3, 2021. This cross-sectional study found that nearly all children and youths with COVID-19 in Hong Kong had mild illness. These findings suggest that household transmission was the main source of infection for children and youths with domestic infections and that the risk of being infected at school was small. Article.

Transmission

Mayo Clinic: Effects of vaporized hydrogen peroxide (VHP) reprocessing on quantitative fit performance of N95 filtering facepiece respirators (FFRs)

April 30, 2021. This study reported that the quantitative fit testing data provided by the Mayo Clinic (N=13,000) demonstrated that a variety of facepiece respirators (either the N95 FFR model 1870+ or the Moldex 1500 series) can be reprocessed up to 22 times using VHP without negatively affecting the integrity and fit of the N95 FFR. Physical wear from repeated donning and doffing of the N95 FFR during fit testing occurred, but this can be readily identified by the user through a visual inspection and seal check before use of the reprocessed N95 FFR. Article.

Data Analytics, Modelling and Measurement

Nature: Neighbourhood characteristics associated with COVID-19 burden

May 4, 2021. This neighbourhood-wide analysis study was conducted in Illinois using data from the Department of Public Health (May 23 to June 17, 2020) to systematically examine associations between neighbourhood characteristics and COVID-19 incidence among different age groups. The results demonstrated that at the zip code level, neighbourhood socioeconomic

status was a more important risk factor of COVID-19 incidence in children and working-age adults than in seniors. Social demographics and housing conditions were important risk factors of COVID-19 incidence in older age groups. The study concluded that age modified the association between neighbourhood characteristics and COVID-19 incidence. Article.

Nature: The COVID-19 lab score: A tool to predict in-hospital outcomes in COVID-19 patients

April 30, 2021. This study established laboratory predictors of mortality in COVID-19 disease to help to identify high-risk patients. A COVID-19 Lab score ranging from zero to 30 points was calculated on the basis of a multivariate logistic regression model in order to predict mortality and was found to be effective in predicting the risk of mortality among a sample of 893 patients with COVID-19, and may be useful in identifying patients at risk of deterioration. Further study is required to confirm the predictive value of the COVID-19 lab score, in part because of this study's limited sample. Article.

Health Equity and Vulnerable Populations

International Long-Term Care Policy Network: COVID-19 outbreaks during or shortly after vaccination of care home residents

May 5, 2021. Three small studies from the US and Germany reported outbreaks in care homes following the administration of one to two doses of the Pfizer/BioNTech vaccine, highlighting the continued risk for this population in the period immediately following the start of vaccination programs. This suggests the potential for widespread infection affecting up to one-third of the vaccinated population of a care home until the vaccine has developed its protective effect, and that administering both doses should be the priority amongst vulnerable populations. Article.

medRxiv: COVID-19 vaccine perceptions and differences by sex, age, and education among 1,367 community adults in Ontario

May 4, 2021. In this sample of community adults, under one in five individuals were unwilling to receive a COVID-19 vaccine, but with higher rates in population subgroups. Targeting public health messaging to females and individuals with less than Bachelor's degree, and addressing concerns about long-term and immediate side effects may increase vaccine uptake. Article.

JAMA: Association between income inequality and county-level COVID-19 cases and deaths in the US

May 3, 2021 This study reported that income inequality within US counties was associated with more cases and deaths due to COVID-19 in the summer months of 2020. The COVID-19 pandemic has highlighted the vast disparities that exist in health outcomes owing to income inequality in the US. The study suggests that targeted interventions should be focused on areas

of income inequality to both flatten the curve and lessen the burden of inequality. Article.

JAMA: Adolescents' substance use and physical activity before and during the COVID-19 pandemic in California

May 3, 2021. In this study, a reduction in e-cigarette use occurred independently of COVID-19 stay-at-home restrictions, but persistent cannabis and alcohol use suggest continued need for youth substance use prevention and cessation support. The study suggests that declining physical activity during the pandemic is a health concern. Article.

Psychiatry Research: The psychological impact of the COVID-19 pandemic on pregnant women

April 30, 2021. This study examined the pandemic's psychological impact on pregnant women (N=200) and demonstrated that the pandemic increased psychopathological symptomatology and stress, potentially negatively affecting pregnant women's mental health. Compared to women evaluated prior to the pandemic (N=100), the Pandemic Group (N=100) scored significantly higher on the measures of depression and anxiety, and they scored higher in the Perceived Stress Scale. Insomnia, along with having recently suffered the loss of a loved one, explained 25% of the score variance in depression, and insomnia also explained 13% of the variance found in the Perceived Stress Scale. Article.

Canadian Medical Association Journal (CMAJ): Individual and social determinants of SARS-CoV-2 testing and positivity in Ontario, Canada

April 27, 2021. This study explored the potential for collider bias in a large study of disease determinants and evaluated individual, environmental, and social determinants associated with SARS-CoV-2 testing and diagnosis among residents of Ontario, Canada between March 1 and June 20, 2020. Collider bias may be introduced into epidemiologic studies of COVID-19 risk factors if the factors under investigation are related both to developing an infection and to the likelihood of being tested. Of 14,695,579 people, 758,691 were tested for SARS-CoV-2, of whom 25,030 (3.3%) had a positive test result. The study found that while some demographic and health-related risk factors are subject to such bias, some social determinants of health – including essential worker status, number of people living in household, and educational attainment – were associated with increased odds of a positive test across all analytic designs. Future study is required to determine how determinants of positive tests change over time. Article.

Frontline Workers

JAMA: Vaccination with BNT162b2 and incidence of symptomatic and asymptomatic SARS-CoV-2 infections among health care workers

May 4, 2021. In this study conducted in Tel Aviv, Israel, that included 6,710 health care workers who underwent periodic testing for SARS-CoV-2 infection, vaccination with the BNT162b2 vaccine (colloquially known as the Pfizer vaccine) was associated with an adjusted incidence rate ratio of 0.03 for symptomatic infection and 0.14 for asymptomatic infection more than seven days after the second dose. Both incidence rate ratios were statistically significant. Overall, receipt of the BNT162b2 vaccine was significantly associated with lower incidence of symptomatic and asymptomatic SARS-CoV-2 infection among health care workers. [Article](#).

BMJ: Frontline interdisciplinary clinician perspectives on caring for patients with COVID-19

May 4, 2021. This study conducted semi-structured interviews to describe the drivers of distress and motivations faced by interdisciplinary clinicians (32 women and 18 men) who were on the frontline caring for patients with COVID-19 in Denver, Colorado. Frontline clinicians reported distress due to the challenges of personal protective equipment, uncertainty and powerlessness, new responsibilities at work and home, losing control of their schedules, grief from witnessing patients suffer in isolation, and witnessing health care disparities exacerbated by the pandemic. Clinicians felt supported by their colleagues, families, and community and were driven by a sense of moral duty. [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:
o   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](#).

- o 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 April, contributing evidence-synthesis teams in Canada shared 12 completed evidence syntheses, 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.

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