

The Newfoundland & Labrador Centre for Applied Health Research (NLCADR) sends this COVID-19 e-bulletin to health system stakeholders on a bi-weekly basis. This e-bulletin includes results from recent searches of health evidence and grey literature on the pandemic under specific subject headings, highlighting those findings considered to be of particular relevance to you.

We welcome your [feedback and suggestions](#). To subscribe to this e-bulletin, please email: Rochelle.Baker@med.mun.ca

You will find all NLCADR e-bulletins and COVID-19 *Quick Response Reports* [online here](#).

CLINICAL PRESENTATION & BIOLOGY

BBC: [COVID: Blood clot risk higher for six months after having virus](#) (April 6, 2022)

"After a COVID infection, there is an increased risk of developing a serious blood clot for the next six months, a study from Sweden suggests. The research found people with severe COVID, and those infected during the first wave, had the highest clot risk. This highlights the importance of being vaccinated against the virus, the researchers say." [LINK](#)

See also:

- BMJ: [Risks of deep vein thrombosis, pulmonary embolism, and bleeding after COVID-19: nationwide self-controlled cases series and matched cohort study](#) (February 22, 2022)

CDC Morbidity and Mortality Weekly Report (MMWR): [Cardiac Complications after SARS-CoV-2 Infection and mRNA COVID-19 Vaccination — PCORnet, United States, January 2021–January 2022](#) (April 1, 2022)

"Cardiac complications were rare after SARS-CoV-2 infection or mRNA COVID-19 vaccination. However, the risks for these complications were higher after infection than after vaccination among males and females in all age groups. These findings provide important context for balancing risks and benefits of mRNA COVID-19 vaccination among eligible persons ≥5 years." [LINK](#)

MedRxiv: [Cardiovascular diseases worsen the maternal prognosis of COVID-19](#) (April 5, 2022)

"Obstetric patients with CVD and COVID-19 who are hospitalized are more symptomatic. They require ICU hospitalization and ventilatory support. Moreover, they have higher mortality rate than COVID-19 patients without CVD. Mortality in this group may be a consequence of the association between the severity of COVID-19 infection in pregnant women associated with the presence of CVD (which are, by themselves, are recognized risk factor for ICU admission, orotracheal intubation, and death during pregnancy and puerperium). Further studies are needed in this group of patients." [LINK](#)

MedRxiv: [SARS-CoV-2 positivity in offspring and timing of mother-to-child transmission: living systematic review and meta-analysis](#) (March 16, 2022)

"SARS-CoV-2 positivity rates were found to be low in babies born to mothers with SARS-CoV-2 infection. Evidence suggests confirmed vertical transmission of SARS-CoV-2, although this is likely to be rare. Severity of maternal COVID-19 appears to be associated with SARS-CoV-2 positivity in offspring." [LINK](#)

JAMA Pediatrics: [Incidence Rates and Clinical Outcomes of SARS-CoV-2 Infection with the Omicron and Delta Variants in Children Younger Than 5 Years in the US](#) (April 1, 2022)

"Results of this cohort study suggest that the incidence rate of SARS-CoV-2 infection with Omicron variant was 6 to 8 times that of Delta variant in children younger than 5 years, but severe clinical outcomes were less frequent than with Delta variant. Study findings may inform risk-benefit considerations about in-person school attendance, mask use, and vaccination implementation for young children." [LINK](#)

MedRxiv: [Predictors for Reactogenicity and Humoral Immunity to SARS-CoV-2 Following Infection and mRNA Vaccination: A Regularized Mixed-Effects Modelling Approach](#) (April 6, 2022)

"Vaccination in COVID+ individuals ensures a more robust immune response. Experiencing systemic and local symptoms post-vaccine is suggestive of higher AB, which may confer greater protection. Age and Hispanic ethnicity are predictive of higher antibodies." [LINK](#)

Scientific Communications: [Course of post COVID-19 disease symptoms over time in the ComPaRe long COVID prospective e-cohort](#) (April 5, 2022)

"This study shows that most patients with post COVID-19 disease have symptoms evolving in different patterns but persisting through 1 year. Recovery from the acute infection is a slow process, and the prevalence for most symptoms decreased over time before plateauing 6–8 months after onset. Our results are of importance to understand the natural history of this disease and should help physicians to inform their patients about the potential course of this disease." [LINK](#)

Eurosurveillance: [Impact of the Omicron variant on SARS-CoV-2 reinfections in France, March 2021 to February 2022](#) (March 31, 2022)

"Since the first reports in summer 2020, SARS-CoV-2 reinfections have raised concerns about the immunogenicity of the virus, which will affect SARS-CoV-2 epidemiology and possibly the burden of COVID-19 on our societies in the future. This study provides data on the frequency and characteristics of possible reinfections, using the French national COVID-19 testing database. The Omicron variant had a large impact on the frequency of possible reinfections in France, which represented 3.8% of all confirmed COVID-19 cases since December 2021." [LINK](#)

Epic Research: [Which Comorbidities Increase the Risk of a COVID-19 Breakthrough Infection?](#) (March 31, 2022)

"The authors found that many of the comorbidity groups are at a higher risk of a breakthrough infection. Notably, pregnant individuals are 1.91 times as likely to have a breakthrough infection, individuals with a solid organ transplant are 1.83 times as likely, and individuals with an immune system deficiency are 1.63 times as likely. However, the authors did not find that cancer or Down syndrome increased the risk of a breakthrough infection. These findings support the CDC's recommendation that patients with a high-risk comorbidity may need to use enhanced infection prevention control beyond vaccination to minimize the risk of a COVID-19 breakthrough infection." [LINK](#)

HEALTH EQUITY AND ETHICS

Journal of Women’s Health: [Sex-Related Differences in Long-COVID-19 Syndrome](#) (March 25, 2022)

“Sex differences have been demonstrated in the acute phase of COVID-19. Women (F) were found to be less prone to develop a severe disease than men (M), but few studies have assessed sex-differences in Long-COVID-19 syndrome. The aim of this prospective/retrospective study was to characterize the long-term consequences of this infection based on sex. We demonstrated that F were more symptomatic than M not only in the acute phase but also at follow-up. Sex was found to be an important determinant of Long-COVID-19 syndrome because it is a significant predictor of persistent symptoms in F, such as dyspnea, fatigue, chest pain, and palpitations. Our results suggest the need for long-term follow-up of these patients from a sex perspective to implement early preventive and personalized therapeutic strategies.” [LINK](#)

Breast Cancer: [Racial and socioeconomic inequities in breast cancer screening before and during the COVID-19 pandemic: analysis of two cohorts of women 50 years](#) (April 2, 2022)

“Routine screening mammography at two-year intervals is widely recommended for the prevention and early detection of breast cancer for women who are 50 years + . Racial and other sociodemographic inequities in routine cancer screening are well-documented, but less is known about how these long-standing inequities were impacted by the disruption in health services during the COVID-19 pandemic. Early in the pandemic, cancer screening and other prevention services were suspended or delayed, and these disruptions may have had to disproportionate impact on some sociodemographic groups. We tested the hypothesis that inequities in screening mammography widened during the pandemic. Our findings confirm inequities for screening mammograms during the first year of the COVID-19 pandemic and provide evidence that these largely reflect the inequities in screening that were present before the pandemic. Policies and interventions to tackle long-standing inequities in use of preventive services may help ensure continuity of care for all, but especially for racial and ethnic minorities and the socioeconomically disadvantaged.” [LINK](#)

Reviews in Endocrine and Metabolic Disorders: [Polycystic ovary syndrome and risks for COVID-19 infection: A comprehensive review](#) (February 26, 2022)

“This comprehensive review aimed to evaluate the relationship between SARS-CoV-2 infection (the cause of coronavirus disease 2019, or COVID-19) and the metabolic and endocrine characteristics frequently found in women with polycystic ovary syndrome (PCOS). In the general population, COVID-19 is more severe in subjects with dyslipidemia, obesity, diabetes mellitus, and arterial hypertension. Because these conditions are comorbidities commonly associated with PCOS, it was hypothesized that women with PCOS would be at higher risk for acquiring COVID-19 and developing more severe clinical presentations. This hypothesis was confirmed in several epidemiological studies. The present review shows that women with PCOS are at 28%–50% higher risk of being infected with the SARS-CoV-2 virus at all ages and that, in these women, COVID-19 is associated with increased rates of hospitalization, morbidity, and mortality. We summarize the mechanisms of the higher risk of COVID-19 infection in women with PCOS, particularly in those with carbohydrate and lipid abnormal metabolism, hyperandrogenism, and central obesity.” [LINK](#)

Journal of Endocrine Society: [Pediatric Diabetes on the Rise: Trends in Incident Diabetes during the COVID-19 Pandemic](#) (February 16, 2022)

“The objectives of this retrospective study were to compare the rates of diagnosis of new-onset pediatric T1D and T2D cases and to compare the severity of clinical presentation among patients seen at a single academic medical center during the COVID-19 pandemic with those in the 2 years preceding the pandemic. These are discussed while considering demographic and anthropometric changes in the overall clinic patient cohort. There were more incident pediatric T1D and T2D cases as well as an increase in DKA severity in T2D at presentation during the

COVID-19 pandemic. More importantly, incident T2D cases were higher than the incident T1D during the pandemic. This clearly suggests a disruption and change in the pediatric diabetes trends with profound individual and community health consequences.” [LINK](#)

Journal of Diabetes and its Complications: [Newly diagnosed diabetes vs. pre-existing diabetes upon admission for COVID-19: Associated factors, short-term outcomes, and long-term glycemic phenotypes](#) (March 12, 2022)

“High rates of newly diagnosed diabetes mellitus (NDDM) have been reported in association with coronavirus disease-2019 (COVID-19). Factors associated with NDDM and long-term glycemic outcomes are not known. Here we report on 594 individuals admitted with COVID-19 and diabetes, describing the characteristics and long-term follow-up of 77 individuals with newly diagnosed diabetes at the time of admission for COVID-19. Diabetes diagnosed at COVID-19 presentation is associated with lower glucose but higher inflammatory markers and ICU admission, suggesting stress hyperglycemia as a major physiologic mechanism. Approximately half of such individuals experience regression of DM.” [LINK](#)

Clinical Obesity: [Change in weight category among youth early in the COVID-19 pandemic](#) (April 6, 2022)

“Remote learning and shelter-in-place orders during the COVID-19 pandemic are associated with obesity risk factors such as decreased physical activity, altered routines and sleep schedules, increased screen time, and non-nutritious food choices. The objective of this brief report is to describe change in weight category 3–6 months after the onset of the pandemic in a cohort of 4509 low-income youth. The proportion of youth with overweight or obesity increased from 37.8% to 44.6%; and declined by 5.6% in the healthy weight category. Over the 3–6 month period, 23.1% of youth gained ≥ 5 kg, 4.3% gained ≥ 10 kg, and 17.8% increased their BMI by ≥ 2 units. Among underweight youth, 45.3% switched to the healthy weight category, with a median weight gain of 2.1 kg (interquartile range [IQR] = 2.1 kg). Median weight gain was highest among those youth with severe obesity (5.8 kg, IQR = 5.2 kg). Younger age (2–9 years), female and ethnic-minority youth were more likely to change to a higher/worse weight category. Significant weight gain occurred in the first 3–6 months of the pandemic among low-income youth, reflecting the short-term effects of the pandemic.” [LINK](#)

Infection: [Obesity and lipid metabolism disorders determine the risk for development of long COVID syndrome: a cross-sectional study from 50,402 COVID-19 patients](#) (March 30, 2022)

“Metabolic disorders have been identified as major risk factors for severe acute courses of COVID-19. With decreasing numbers of infections in many countries, the long COVID syndrome (LCS) represents the next major challenge in pandemic management, warranting the precise definition of risk factors for LCS development. We identified 50,402 COVID-19 patients in the Disease Analyzer database (IQVIA) featuring data from 1056 general practices in Germany. Multivariate logistic regression analysis was used to identify risk factors for the development of LCS. Lipid metabolism disorders and obesity represent age-independent risk factors for the development of LCS, suggesting that metabolic alterations determine the risk for unfavorable disease courses along all phases of COVID-19.” [LINK](#)

Nutrition in Clinical Practice: [Increased nutrition risk at admission is associated with longer hospitalization in children and adolescents with COVID-19](#) (February 28, 2022)

“We investigated the association of nutritional risk and inflammatory marker level with length of stay (LOS) in children and adolescents hospitalized for COVID-19 infection in two pediatric teaching hospitals in a developing country. Among children and adolescents with COVID-19, a STRONGkids score ≥ 4 at admission, lower values of albumin, lymphocytes, and hemoglobin, and higher CRP values were associated with longer LOS.” [LINK](#)

Clinical and Experimental Medicine: [Comorbidities and clinical complications associated with SARS-CoV-2 infection: an overview](#) (April 1, 2022)

“The novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) causes major challenges to the healthcare system. SARS-CoV-2 infection leads to millions of deaths worldwide and the mortality rate is found to be greatly associated with pre-existing clinical conditions. The existing dataset strongly suggests that cardiometabolic diseases including hypertension, coronary artery disease, diabetes and obesity serve as strong comorbidities in coronavirus disease (COVID-19). Studies have also shown the poor outcome of COVID-19 in patients associated with angiotensin-converting enzyme-2 polymorphism, cancer chemotherapy, chronic kidney disease, thyroid disorder, or coagulation dysfunction. A severe complication of COVID-19 is mostly seen in people with compromised medical history. SARS-CoV-2 appears to attack the respiratory system causing pneumonia, acute respiratory distress syndrome, which lead to induction of severe systemic inflammation, multi-organ dysfunction, and death mostly in the patients who are associated with pre-existing comorbidity factors. In this article, we highlighted the key comorbidities and a variety of clinical complications associated with COVID-19 for a better understanding of the etiopathogenesis of COVID-19.” [LINK](#)

European Respiratory Journal: [Tuberculosis and COVID-19 co-infection: description of the global cohort](#) (March 24, 2022)

“Information on tuberculosis (TB) and coronavirus disease 2019 (COVID-19) is still limited. The aim of this study was to describe the features of the TB/COVID-19 co-infected individuals from a prospective, anonymized, multicountry register-based cohort with special focus on the determinants of mortality and other outcomes. We enrolled all patients of any age with either active TB or previous TB and COVID-19. 172 centres from 34 countries provided individual data on 767 TB-COVID-19 co-infected patients, (>50% population-based). The data suggest that TB and COVID-19 are a “cursed duet” and need immediate attention. TB should be considered a risk factor for severe COVID disease and patients with TB should be prioritized for COVID-19 preventative efforts, including vaccination.” [LINK](#)

The Lancet: [The intersecting pandemics of tuberculosis and COVID-19: population-level and patient-level impact, clinical presentation, and corrective interventions](#) (March 30, 2022)

“We review the impact of COVID-19 at the population level on tuberculosis case detection, morbidity and mortality, and the patient-level impact, including susceptibility to disease, clinical presentation, diagnosis, management, and prognosis. We propose strategies to reverse or mitigate the deleterious effects of COVID-19 and restore tuberculosis services.”

Journal of Medical Ethics: [Canadian perspective on ageism and selective lockdown: a response to Savulescu and Cameron](#) (March 11, 2022)

“In a recent article, ‘Why lockdown of the elderly is not ageist and why levelling down equality is wrong’, Savulescu and Cameron argue that a selective lockdown of older people is not ageist because it would treat people unequally based on morally relevant differences. This response argues that a selective lockdown of older people living in long-term care homes would be unjust because it would allow the expansive liberties of the general public to undermine the basic liberties of older people, and because it would discriminate on the basis of extrinsic disadvantages.” [LINK](#)

See also:

- Journal of Medical Ethics: [Why lockdown of the elderly is not ageist and why levelling down equality is wrong](#) (October 28, 2020)

British Medical Journal Open: [Understanding national trends in COVID-19 vaccine hesitancy in Canada: results from five sequential cross-sectional representative surveys spanning April 2020–March 2021](#) (April 5, 2022)

“We examined rates of vaccine hesitancy and their correlates among Canadians by analyzing data from five cross-sectional age, sex and province-weighted population-based samples who completed online surveys between April 2020 and March 2021. In order to explore the factors associated with vaccine hesitancy over time, data across all surveys were examined as a function of key sociodemographics, clinical characteristics and psychological factors known to be important for vaccine behaviour. Results highlight the importance of targeting vaccine efforts to specific groups by emphasizing the outsized health benefits compared with risks of vaccination. Future research should monitor changes in vaccine intentions and behaviour to better understand underlying factors.” [LINK](#)

National Institutes of Health: [Video] [The contagion next time: underlying socioeconomic and racial divides and our risk from COVID and future pandemics](#) (December 16, 2020)

“The COVID-19 pandemic showed how longstanding underinvestment in these conditions affected our overall health during a time of crisis and widened health gaps between racial/ethnic and socioeconomic groups. COVID-19 illustrates how our extraordinary achievement in biomedical science—evidenced by remarkable advances to a COVID-19 vaccine in record time—is not matched by commensurate achievement in creating the conditions that can generate health in populations.”

International Journal for Equity in Health: [Social accountability and health systems’ change, beyond the shock of COVID-19: drawing on histories of technical and activist approaches to rethink a shared code of practice](#) (March 25, 2022)

“Recognition of the value of “social accountability” to improve health systems performance and to address health inequities, has increased over the last decades, with different schools of thought engaging in robust dialogue. This article explores the tensions between health policy and systems research and practice on the one hand, and health equity-focused activism on the other, as distinct yet interacting processes that have both been impacted by the shock effects of the COVID-19 pandemic. This extended commentary brings multidisciplinary voices seeking to look back at health systems history and fundamental social-institutional systems’ behaviors in order to contextualize these current debates over how best to push social accountability efforts forward. We argue that social accountability, much like all efforts to strengthen health systems, is “everybody’s business” and that we must understand better the historical processes that have shaped the field of practice over time to move forward. These differences of perspective, knowledge-base and positioning vis-a-vis interventions or longer-term political commitment should not drive a conflict of legitimacy but instead be named, subsequently enabling the development of a shared code of conduct that applies to the breadth of actors involved in social accountability work. If we are concerned about the state of/status of social accountability within the context of “building back better” we must approach collaboration with a willingness to create dialogue across distinct disciplinary, technical and politically-informed ways of working.” [LINK](#)

HEALTH SYSTEM ADMINISTRATION

Public Health Reaching Across Sectors: [Strategic Storytelling for Public Health Messengers. A Research-Based Toolkit](#) (July 30, 2020)

“This toolkit synthesizes several bodies of research to offer practical lessons for public health storytelling, including Insights from Psychology and Cognitive Science; In-Depth Interviews with Public Health Messengers; Focus Groups; Research with Other Sectors. This toolkit will empower you to confidently tell Strategic Stories about public health.

These stories can raise awareness of public health initiatives among key audiences and inspire those audiences to take action to help achieve your goals.” [LINK](#)

Journal of American Medical Association: [Projecting COVID-19 Mortality as States Relax Nonpharmacological Interventions](#) (April 01, 2022)

“With the high transmissibility of current circulating SARS-CoV-2 variants, the simulated lifting of NPIs in March 2022 was associated with resurgences of COVID-19 deaths in nearly every state. In comparison, delaying by even 1 month to lift NPIs in April 2022 was estimated to mitigate the amplitude of the surge. For most states, however, no amount of delay was estimated to be sufficient to prevent a surge in deaths completely.” [LINK](#)

Canadian Medical Association Journal: [The CCEDRRN COVID-19 Mortality Score to predict death among nonpalliative patients with COVID-19 presenting to emergency departments: a derivation and validation study](#) (March 31, 2022)

“We derived and validated a parsimonious, simple score to predict in-hospital mortality among nonpalliative patients with COVID-19 presenting to emergency departments: the CCEDRRN COVID-19 Mortality Score. We found that 8 readily available clinical variables that can be ascertained at the bedside without any diagnostic testing predicted mortality accurately. The score had excellent calibration and discrimination in a geographically distinct cohort of patients who presented to other sites.” [LINK](#)

Journal of American Medical Association: [Pushed to Their Limits, 1 in 5 Physicians Intends to Leave Practice](#) (March 30, 2022)

“Over the past 2 years, more than 36 000 survey responses from clinicians across the country have painted an alarming picture of a workforce that’s increasingly burned out, traumatized, anxious, and depressed. As Green Center codirector Rebecca S. Etz, PhD, summed up her survey’s findings in a recent interview with JAMA, “It’s been bad for primary care over the pandemic and it’s getting worse.” [LINK](#)

Insight Plus: [Health workforce: not normal, not safe, but it can be fixed](#) (March 28, 2022)

“The staffing crisis is self-perpetuating, creating a vicious cycle. The worse it gets, the more remaining staff are under pressure. There are no appropriate or effective systemic or structural responses to the issue, so health care workers are forced to self-manage the shortfalls.” [LINK](#)

The Conversation: [Cancer treatment and diagnosis backlogs during COVID-19 may affect cancer survival](#) (April 04, 2022)

“For people with cancer, the direct consequences of the pandemic include a potentially greater risk of severe COVID-19 infection. The indirect consequences include delayed diagnosis of cancer, deferred tests and treatment delay. For example, we observed a seven-fold drop in biopsies required for skin cancer diagnosis in Ontario early in the pandemic, with a backlog of over 45,000 cases remaining six months later.” [LINK](#)

See also:

The British Medical Journal: [Counting the invisible costs of COVID-19: the cancer pandemic](#)

British Medical Journal Open: [Primary care and cancer: an analysis of the impact and inequalities of the COVID-19 pandemic on patient pathways](#) (March 24, 2022)

“We explore the routes to cancer diagnosis to further understanding of the inequality in the reduction in detection of new cancers since the start of the pandemic. We use different data sets to assess stages in the cancer pathway: primary care data for primary care consultations, routine and urgent referrals and published analysis of cancer registry data for appointments and first treatments. Our results further evidence the strain on primary care and the presence of the inverse care law, and the dire need to address the inequalities so sharply brought into focus by

the pandemic. We need to address the disconnect between the importance we place on the role of primary care and the resources we devote to it.” [LINK](#)

MedRxiv: [The modified COVID-19 Yorkshire Rehabilitation Scale \(C19-YRSm\) patient-reported outcome measure for Long COVID or Post-COVID syndrome](#) (March 24, 2022)

“The digital format of the scale (available on ELAROS smartphone application) allows users to track their condition in time and provides them with a visual quantitative assessment of improvement or deterioration of LC which is crucial in the management given less frequent human contact during the pandemic. Clinicians are able to monitor the patient’s progress using the web-based clinical portal of the ELAROS system. Healthcare services can evaluate their treatment programmes using the digital system. National and international comparison of LC data (using the paper or digital format of the scale) can be undertaken while assessing the influence of individual demographics and illness characteristics on LC symptoms.” [LINK](#)

The Los Angeles Times: [Column: Did Sweden beat the pandemic by refusing to lock down? No, its record is disastrous](#) (March 31, 2022)

“Swedish residents were able to enjoy themselves at bars and restaurants, their schools remained open, and somehow their economy thrived, and they remained healthy. So say their fans, especially on the anti-lockdown right. A new study by European scientific researchers buries all those claims in the ground. Published in Nature, the study paints a devastating picture of Swedish policies and their effects.” [LINK](#)

See also:

Nature: [Evaluation of science advice during the COVID-19 pandemic in Sweden](#)

The Los Angeles Times: [How many COVID deaths are ‘acceptable’? Answer is key to moving to a post-pandemic world](#) (July 30, 2020)

“Declaring an end to the pandemic is about deciding how much illness, death and disruption is “accepted and acceptable as a part of normal life,” said Erica Charters, a historian with Oxford University’s “How Epidemics End” project... Implicit in a decision to drop the last remaining safety rules is a willingness to abide the current mortality rate. Over the last week, COVID-19 has claimed an average of 626 lives in the U.S. each day. That’s fewer than the roughly 1,900 who die of heart disease and the 1,650 who die of cancer each day, on average, but well above the 147 lost to influenza and pneumonia combined.” [LINK](#)

INFECTION PREVENTION AND CONTROL

The Conversation: [What’s next with face masks? Keep wearing them in public, wear the best mask available and pay attention to fit](#) (March 29, 2022)

“Although most provinces are lifting official mask mandates, we agree with public health authorities in recommending that people wear the best mask available. We have been working to improve and test reusable masks for community use.” [LINK](#)

The Guardian: [Why is the UK seeing near-record COVID cases? We still believe the three big myths about Omicron](#) (March 30, 2022)

“The pandemic has changed, but the idea that it is over is false. Omicron represents a major variant, taking over in the UK in a similar way to Delta last summer and Alpha last winter. The ubiquitous narrative that the pandemic is over exists because most people (including the government) now believe at least one of the three big myths of the Omicron age. We need to move past these myths to firstly anticipate the future, and secondly do something to prepare for it.” [LINK](#)

The British Medical Journal: [COVID-19: What do we know about the delta omicron recombinant variant?](#) (March 24, 2022)

“Recombinants can emerge when multiple variants infect the same person at the same time, allowing the variants to interact during replication, mix up their genetic material, and form new combinations. These events become more likely when cases are higher—an important consideration, as COVID-19 cases worldwide have once again started to rise after several weeks of decline.” [LINK](#)

Nature: [Modeling of waning immunity after SARS-CoV-2 vaccination and influencing factors](#) (March 28, 2022)

“Here, we report a complete overview of the humoral responses based on IgM, IgG, and IgA analyses and the neutralizing antibodies from health care professionals since the first vaccine dose and up to 230 days after. From a smaller group of the participants, we show the T-cell response to vaccination at approximately 6 months after vaccination. We have developed a non-linear model using a generalized mixed model with natural cubic splines, which considers the age, previous infection, sex, the vaccine administered, and the day after the first SARS-CoV-2 vaccine dose.” [LINK](#)

The British Medical Journal: [SARS-CoV-2 positivity in offspring and timing of mother-to-child transmission: living systematic review and meta-analysis](#) (March 16, 2022)

“This living systematic review and meta-analysis found that less than 2% of babies born to mothers seeking hospital care for any reason and with a diagnosis of SARS-CoV-2 infection also test positive for SARS-CoV-2; the rates are lower (1%) when limited to babies with antenatal or intrapartum exposure to the virus. We found evidence for confirmed mother-to-child-transmission through in utero, intrapartum, and early postnatal exposure; but the overall risk is likely to be low. Severity of maternal COVID-19 and postnatal maternal infection seem to be associated with SARS-CoV-2 positivity in offspring, and not trimester of maternal infection, gestation at birth, mode of delivery, breastfeeding, or mother-baby separation at birth.” [LINK](#)

Journal of American Medical Association: [Incidence Rates and Clinical Outcomes of SARS-CoV-2 Infection with the Omicron and Delta Variants in Children Younger Than 5 Years in the US](#) (March 29, 2022)

“Results of this cohort study suggest that the incidence rate of SARS-CoV-2 infection with Omicron variant was 6 to 8 times that of Delta variant in children younger than 5 years, but severe clinical outcomes were less frequent than with Delta variant.” [LINK](#)

Nature: [The influence of risk perceptions on close contact frequency during the SARS-CoV-2 pandemic](#) (March 25, 2022)

“Our findings highlight the importance of aligning the public’s COVID-19 related perceptions with reality. That is, people who perceive COVID-19 to be more severe, will be more inclined to engage in preventive behaviours (here measured as the number of social contacts). Based on our results, we can suggest that public health communication and targeted messaging could yield more impact if tailored to messages emphasizing the severity of COVID-19. Thus, it is important to stress the severity of COVID-19—e.g. in terms of excess mortality or long-term effects post COVID-19 infection.” [LINK](#)

Nature: [Perceptions of behaviour efficacy, not perceptions of threat, are drivers of COVID-19 protective behaviour in Germany](#) (March 24, 2022)

“Based on our findings, we propose that communication aimed at improving behavioural compliance with COVID-19 protective measures should emphasize the efficacy and effectiveness of proposed measures as well as imposed rules and restrictions. Furthermore, appeals should aim to activate normative moral beliefs and foster a sense of

empowerment concerning one's ability to protect others. Concerning the role of fear, it might be necessary to examine whether people tend to underestimate their own risk for an infection or severe consequences of an infection. If so, communication should aim to illustrate the actual risk for different sections of the population." [LINK](#)

Columbia University Irving Medical Center: [New Type of Ultraviolet Light Makes Indoor Air as Safe as Outdoors](#) (March 25, 2022)

"A new type of ultraviolet light that may be safe for people took less than five minutes to reduce the level of indoor airborne microbes by more than 98%, a joint study by scientists at Columbia University Vagelos College of Physicians and Surgeons and in the U.K. has found. Even as microbes continued to be sprayed into the room, the level remained very low as long as the lights were on." [LINK](#)

Original Research article:

Nature Scientific Reports: [Far-UVC \(222 nm\) efficiently inactivates an airborne pathogen in a room-sized chamber](#)

TREATMENT

Nature: [COVID vaccines: head-to-head comparison reveals how they stack up](#) (March 29, 2022)

"A rare head-to-head comparison shows that the COVID-19 vaccines made by Pfizer and Moderna outperform those from Johnson & Johnson and Novavax. The data also provide a finely detailed picture of the immune protection that each vaccine offers — information that could be useful for designing future vaccines. Antibody levels induced by two doses of Pfizer's or Moderna's mRNA vaccine tended to wane substantially over six months. By contrast, antibody levels from J&J's one-shot vaccine were stable or even increased over time. But antibody levels measured six months after vaccination with the J&J jab were still lower than those observed six months after vaccination with an mRNA vaccine. Novavax's two-shot regimen induced antibody responses on a par with those to the mRNA vaccines. However, after the Novavax jab, levels of CD8+ T cells, which destroy infected cells, were low to undetectable, whereas the other three vaccines performed well in this metric." [LINK](#)

See also [here](#).

Eurosurveillance: [Immediate side effects of Comirnaty COVID-19 vaccine: A nationwide survey of vaccinated people in Israel, December 2020 to March 2021](#) (March 31, 2022)

"The authors found further support for the short-term safety of the vaccine. Systemic side effects after vaccination were less common in a real-world community setting than reported in phase III trial, but notably higher than reported by the Israeli MOH. They also found that women had twice the probability of reporting side effects compared with men and the rate of reporting increased inversely with age. Pregnant women reported side effect less frequently than their matched controls. These findings present valuable information for individuals considering vaccination and for healthcare professionals and can contribute to increasing vaccine confidence." [LINK](#)

The New England Journal of Medicine: [Protection by a Fourth Dose of BNT162b2 against Omicron in Israel](#) (April 5, 2022)

"Rates of confirmed SARS-CoV-2 infection and severe COVID-19 were lower after a fourth dose of BNT162b2 vaccine than after only three doses. Protection against confirmed infection appeared short-lived, whereas protection against severe illness did not wane during the study period." [LINK](#)

CBC: [Do you need a 4th dose of a COVID-19 vaccine? There's no one-size-fits-all answer](#) (March 30, 2022)

"That's part of the reason there's no one-size-fits-all answer to getting a fourth dose — since your age is a major factor in how well your immune system responds to the training provided through vaccination. For anyone who's at a high risk of getting severe COVID — including older adults, those with comorbidities, and people who are immunocompromised — a fourth shot is likely a "very good idea" and does provide significant additional protection, said Angela Rasmussen, a virologist and researcher with the University of Saskatchewan's Vaccine and Infectious Disease Organization. "However, for many people who don't fit into those categories, it's hard to say that the fourth shot's going to provide much of a benefit, especially long-term, over a third shot," she said." [LINK](#)

The New England Journal of Medicine: [BNT162b2 Protection against the Omicron Variant in Children and Adolescents](#) (March 30, 2022)

"BNT162b2 vaccination reduced the risk of omicron-associated hospitalization by two thirds among children 5 to 11 years of age. Although two doses provided lower protection against omicron-associated hospitalization than against delta-associated hospitalization among adolescents 12 to 18 years of age, vaccination prevented critical illness caused by either variant." [LINK](#)

JAMA Pediatrics: [Association of COVID-19 Vaccination during Early Pregnancy with Risk of Congenital Fetal Anomalies](#) (April 4, 2022)

"The authors' findings suggest that COVID-19 vaccination during early pregnancy is not associated with an increased risk of fetal structural anomalies identified with ultrasonography." [LINK](#)

Scientific Reports: [Imatinib inhibits SARS-CoV-2 infection by an off-target-mechanism](#) (April 6, 2022)

"The authors' data suggest that imatinib inhibits Spike mediated viral entry by an off-target mechanism. These findings mark imatinib as a promising therapeutic drug in inhibiting the early steps of SARS-CoV-2 infection." [LINK](#)

Scientific Reports: [Efficacy and safety of the sofosbuvir/velpatasvir combination for the treatment of patients with early mild to moderate COVID-19](#) (April 6, 2022)

"The result of this study indicate that early treatment of patients with mild to moderate COVID-19 may be safe and effective for faster elimination of SARS-CoV-2 and in the prevention of progression and outcomes of COVID-19. Furthermore, it must be emphasized that SOF/VEL as oral drug can be used in early infection in the outpatient setting, which may be important in helping to reduce the spread of infection, and hospitalization and avoid disease progression." [LINK](#)

JAMA: [Effect of Sotrovimab on Hospitalization or Death Among High-risk Patients With Mild to Moderate COVID-19: A Randomized Clinical Trial](#) (March 14, 2022)

"In this randomized clinical trial of 1057 participants, treatment with a single intravenous dose of sotrovimab, compared with placebo, resulted in a statistically significant reduction in the proportion of patients who experienced a composite outcome of all-cause hospitalization lasting longer than 24 hours or death through day 29 (1% vs 6%, respectively; adjusted relative risk, 0.21).

Findings support sotrovimab as a treatment option for nonhospitalized, high-risk patients with mild to moderate COVID-19, although efficacy against SARS-CoV-2 variants that have emerged since the study was completed is unknown." [LINK](#)

JAMA Network Open: [Fluvoxamine for Outpatient Management of COVID-19 to Prevent Hospitalization: A Systematic Review and Meta-analysis](#) (April 6, 2022)

"In this systematic review and Bayesian meta-analysis of 3 clinical trials, which accounted for varying prior probabilities coupled with a frequentist sensitivity analysis, there was a high probability (94.1%-98.6%) that

fluvoxamine was associated with a reduced risk for hospitalization, with a frequentist risk ratio of 0.75 (95% CI, 0.58-0.97).” [LINK](#)

The New England Journal of Medicine: [Effect of Early Treatment with Ivermectin among Patients with COVID-19](#) (March 30, 2022)

"The authors did not find a significantly or clinically meaningful lower risk of medical admission to a hospital or prolonged emergency department observation (primary composite outcome) with ivermectin administered for 3 days at a dose of 400 µg per kilogram per day than with placebo.” [LINK](#)

Stat News: [Officials limit an antibody therapy, saying it’s ineffective against BA.2 variant of Omicron](#) (March 25, 2022)

"U.S. health officials on Friday stopped the further deployment of the COVID-19 treatment sotrovimab to places where the BA.2 coronavirus variant is now causing the majority of infections, given laboratory studies showing the treatment likely doesn’t work against the variant. Notably, sotrovimab maintained its effectiveness against the first form of Omicron that became dominant, the BA.1 lineage. But several lab studies in recent weeks have indicated the therapy loses much of its ability to neutralize the BA.2 lineage.” [LINK](#)

See also [here](#).

MENTAL HEALTH & WELLNESS

International Psychogeriatrics: [Prevalence of loneliness and social isolation among older adults during the COVID-19 pandemic: A systematic review and meta-analysis](#) (March 31, 2022)

“Pandemics and their public health control measures have generally substantially increased the level of loneliness and social isolation in the general population. Because of the circumstances of aging, older adults are more likely to experience social isolation and loneliness during pandemics. However, no systematic review has been conducted or published on the prevalence of loneliness and/or social isolation among the older population. This systematic review and meta-analysis aims to provide up-to-date pooled estimates of the prevalence of social isolation and loneliness among older adults during the COVID-19 pandemic and other pandemics in the last two decades. This review identifies the need for good quality longitudinal studies to examine the long-term impact of pandemics on loneliness and social isolation among older populations. Health policymaking and healthcare systems should proactively address the rising demand for appropriate psychological services among older adults.” [LINK](#)

The American Journal of Geriatric Psychiatry: [Psychological and Functional Impact of COVID-19 in Long-Term Care Facilities: The COVID-A Study](#) (January 21, 2022)

“This study investigated the psychological and functional sequelae of the COVID-19 pandemic in older adults living in long term care facilities. The COVID-19 pandemic was associated with high 3-month rates of clinically significant symptoms of depression anxiety, posttraumatic stress disorder (PTSD), and sleep complaints in older LTCF residents. Those who tested positive for COVID-19 at baseline endorsed greater symptoms of (PTSD) and anxiety. Residents presented functional decline, regardless of COVID-19 status at baseline—possibly related to social isolation. These results suggest that scheduled assessments and interventions aimed at reducing psychological impact and functional consequences may be a priority in older LTCF residents during a pandemic.” [LINK](#)

BioMed Central Public Health: [“Like before, but not exactly”: the Qualy-REACT qualitative inquiry into the lived experience of long COVID](#) (March 28, 2022)

“Post-acute sequelae of SARS-CoV-2 infection (PASC) affect millions of individuals worldwide. Rehabilitation interventions could support individuals during the recovery phase of COVID-19, but a comprehensive understanding of this new disease and its associated needs is crucial. This qualitative study investigated the experience of individuals who had been hospitalized for COVID-19, focusing on those needs and difficulties they perceived as most urgent. Persistent symptoms, feelings of isolation, fear and stigma, emotional distress, a fatalistic attitude, and return to (adapted) life course were the key themes that characterized the participants’ experience after hospital discharge. The experience as narrated by the participants in this study confirms the persistence of symptoms described in PASC and highlights the sense of isolation and psychological distress. These phenomena may trigger a vicious circle, but the participants also reported adaptation processes that allowed them to gradually return to their life course. Whether all individuals are able to rapidly activate these mechanisms and whether rehabilitation can help to break this vicious circle by improving residual symptoms remain to be seen.”

[LINK](#)

Influenza and Other Respiratory Viruses: [Associations between persistent symptoms after mild COVID-19 and long-term health status, quality of life, and psychological distress](#) (March 28, 2022)

“We sought to assess whether persistent COVID-19 symptoms beyond 6 months (Long-COVID) among patients with mild COVID-19 is associated with poorer health status, quality of life, and psychological distress. In participants with mild acute COVID-19, the burden of persistent symptoms was significantly associated with poorer long-term health status, poorer quality of life, and psychological distress.” [LINK](#)

Child and Adolescent Psychiatry and Mental Health: [Socioemotional development in infants of pregnant women during the COVID-19 pandemic: the role of prenatal and postnatal maternal distress](#) (March 31, 2022)

“An upsurge in psychological distress was documented in pregnant women during the COVID-19 pandemic. We investigated with a longitudinal design whether prenatal and postnatal maternal distress during the COVID-19 pandemic was associated with lower infant socioemotional development. Higher maternal prenatal distress significantly contributed to poorer infant socioemotional development. A mediation model showed that postnatal distress significantly mediated the association between prenatal distress and infant socioemotional development, whereas the direct effect of prenatal distress was no longer significant. Prenatal and postnatal maternal distress accounted for 13.7% of the variance in infant socioemotional development. Our results call for special means of clinical surveillance in mothers and for innovative (online) interventions aiming to support maternal mental health during pregnancy and after delivery.” [LINK](#)

See also:

- BioMed Central Pregnancy and Childbirth: [The ‘new normal’ includes online prenatal exercise: exploring pregnant women’s experiences during the pandemic and the role of virtual group fitness on maternal mental health](#) (March 25, 2022)

SAGE Open Medicine: [Effects of COVID-19 pandemic on mental health of children and adolescents: A systematic review of survey studies](#) (March 30, 2022)

“Mental health problems among children and adolescents are increasingly observed during the outbreak of COVID-19, leading to significant healthcare concerns. Survey studies provide unique opportunities for research during this pandemic, while there are no existing systematic reviews in this setting. The objective was to summarize existing survey studies addressing the effects of the current COVID-19 pandemic on the mental health of children and adolescents. The impact of the COVID-19 pandemic on mental health of children and adolescents is multifaceted and substantial. Survey studies regarding child and adolescent mental health amid COVID-19 indicated that anxiety, depression, loneliness, stress, and tension are the most observed symptoms. Positive coping strategies

with family and social support may be important to achieving better outcomes. Due to limited available evidence, more well-designed studies in this area are urgently needed.” [LINK](#)

Journal of Korean Medical Science: [Sedentary Time and Fast-Food Consumption Associated With Weight Gain during COVID-19 Lockdown in Children and Adolescents with Overweight or Obesity](#) (March 23, 2022)

“The coronavirus disease pandemic is predicted to have adverse health effects on children and adolescents who are overweight or obese due to restricted school activity and stay-at-home orders. The purpose of this observational study was to determine the factors associated with weight gain in children and adolescents with overweight and obesity during the COVID-19 lockdown. Changes in lifestyle behaviors including fast-food consumption and sedentary time during the COVID-19 pandemic may be associated with weight gain. In order to prevent health-related risks in children and adolescents with obesity during the pandemic, it is important to maintain the level of physical activity and healthy dietary habits.” [LINK](#)

Journal of Affective Disorders: [School staff and teachers during the second year of COVID-19: Higher anxiety symptoms, higher psychological distress, and poorer mental health compared to the general population](#) (March 26, 2022)

“The aim of this study was to: 1) assess mental health symptoms in Canadian school staff during the second year of the pandemic (Spring 2021) and compare these same outcomes to national representative samples, and 2: examine whether the number of hours of direct contact with students was a significant predictor of anxiety symptoms. School staff reported significantly higher anxiety symptoms than a national representative survey in Spring 2021 and higher exposure contact time with students was significantly associated with anxiety symptoms, in addition to sex and age, but not level of education and ethnicity. School staff also reported poorer mental health and higher levels of psychological distress compared to pre-pandemic population measures. These results show that priorities to reduce mental health challenges are critical during a public health crisis, not only at the beginning, but also one year later. Ongoing proactive prevention and intervention strategies for school staff are warranted.” [LINK](#)

Journal of Affective Disorders: [Effects of COVID-19 pandemic on anxiety and depression in primary care: A retrospective cohort study](#) (February 17, 2022)

“Population-based surveys indicate that many people experienced increased psychological distress during the COVID-19 pandemic. We aimed to determine if there was a corresponding increase in patients receiving services for anxiety and depression from their family physicians. The number of patients presenting with anxiety/depression symptoms in primary care varied across age groups, sex, and time since pandemic onset. Among the youngest patients (ages 10–18 years), there were fewer patients than pre-pandemic visiting for new episodes of anxiety/depression and being prescribed antidepressants in April 2020, but by the end of 2020 this trend had reversed such that incidence rates for anxiety/depression related visits were higher than pre-pandemic levels. Among older adults, incidence rates of anxiety/depression related visits increased in April 2020 with the onset of the pandemic, and remained higher than expected throughout 2020. Demand for mental health services from family physicians varied by patient age and sex and changed with the onset of the COVID-19 pandemic. By the end of 2020, more patients were seeking treatment for anxiety/depression related concerns.” [LINK](#)

Preventive Medicine Reports: [Changes in college students’ health behaviors and substance use after a brief wellness intervention during COVID-19](#) (March 2, 2022)

“College students exhibit low levels of physical activity, high levels of sedentary behavior, poor dietary behaviors, sleep problems, high stress, and increased substance use. On-campus resources offering programs to improve college students’ health have been limited during the pandemic. The purpose of this study was to test a brief

intervention to improve multiple health behaviors among United States college students. The intervention was a single arm repeated measures study conducted over 12 weeks, utilizing the Behavior Image Model. The intervention involved three components: a survey, a 25-minute wellness specialist consult with a peer health coach, and a 15-minute goal planning session. Follow-up measures were completed at 2-, 6-, and 12-weeks post session to assess changes in wellness behaviors. A total of 121 participants enrolled in the study and 90 (74.4%) completed the health coach session (71% female). At first follow-up, statistically significant increases were observed in vigorous physical activity days/week (coef. = 0.5, 95%CI: 0.2, 0.9), moderate physical activity days/week (coef. = 0.7, 95%CI: 0.2, 1.1), general health (coef. = 4.8, 95%CI: 2.1, 7.5), and emotional wellness (coef. = 8.6, 95%CI: 5.8, 11.3). Statistically significant decreases in cannabis use (coef. = -2.3, 95%CI: -4.1, -0.5) and alcohol consumption (coef. = -2.5, 95%CI: -3.7, -1.3) were observed. Many of these changes were sustained at second and third follow-up. This brief wellness intervention shows promise to positively influence multiple health behaviors in college students.” [LINK](#)

International Journal of Eating Disorders: [The impact of the COVID-19 pandemic on eating disorders: A systematic review](#) (April 5, 2022)

“A growing body of evidence suggests that individuals with eating disorders (EDs) have experienced deteriorating symptoms, increased isolation, and an increase in hospital admissions as a result of the COVID-19 pandemic. Despite this, no systematic reviews have been conducted examining the COVID-19 and ED peer-reviewed literature. Therefore, this systematic review aimed to synthesize the impact of the COVID-19 pandemic on individuals with EDs. We found a large increase in the number of hospitalizations and an increase in ED symptoms, anxiety, depression, and changes to BMI in ED patients during the pandemic. However, these changes appeared to be diagnostic and timing specific. Many qualitative studies described deterioration in ED symptomatology due to decreased access to care and treatment, changes to routine and loss of structure, negative influence of the media, and social isolation. Future studies are needed to focus on pediatric populations, new ED diagnoses, and severity of illness at presentation.” [LINK](#)

Journal of Community Psychology: [Weathering the storm alone or together: Examining the impact of COVID-19 on sole and partnered working mothers](#) (March 30, 2022)

“Sole employed mothers and their families face numerous challenges. Yet, the unprecedented circumstances of the COVID-19 pandemic may be adding additional risk to the already precarious day-to-day reality of this population. Thus, we examine the implications of this crisis for the mental health and job-related well-being of both sole and partnered working mothers. Participants were 206 mothers who continued to work during the pandemic. A moderated mediation model was analyzed. Work-family conflict (WFC) during the pandemic differentially related to mothers’ parenting stress, based on romantic partnership status; when mothers were sole parents, the relationship between WFC and parenting stress was exacerbated. Moreover, this stress mediated the relationship between WFC and both poor mental health and decreased work engagement for sole employed mothers. Findings broaden our understanding of the implications of the COVID-19 pandemic for sole and partnered employed mothers, and how this crisis may be increasing disparities between working sole-parent and dual-partner families.” [LINK](#)

Academic Pediatrics: [Supporting children experiencing family violence during the COVID-19 pandemic: IPV and CPS provider perspectives](#) (March 24, 2022)

“Children experiencing family violence (child abuse and neglect and exposure to intimate partner violence) are at a particularly elevated risk for compounding challenges during the COVID-19 pandemic. In this study, we interviewed intimate partner violence (IPV) advocates, child protective services (CPS) caseworkers, and IPV and CPS administrators on the needs of children experiencing family violence during the pandemic. Fifty-nine IPV advocates, 35 IPV administrators, 21 CPS workers and 16 CPS administrators participated in this study. Four themes emerged from this work. Participants discussed the role of social isolation, school closures, and distance

learning on children experiencing family violence. They also noted child custody and visitation challenges, particularly in the context of abusive partners using custody to control IPV survivors and limitations to virtual visitation more broadly. Compounding challenges were described for children from marginalized communities due to structural-level inequities. Collaboration was discussed by participants from both IPV and CPS sectors. This study is one of the first to describe the way the COVID-19 pandemic has impacted children experiencing family violence. Future studies should triangulate these results with children, families, and other child-serving providers” [LINK](#)

Journal of Family Violence: [Prevalence & Correlates of Intimate Partner Violence During COVID-19: A Rapid Review](#) (March 29, 2022)

“In response to the COVID-19 pandemic, governments enacted a range of public health measures aimed at preventing the spread of the virus. These measures resulted in school closures, social isolation, and job loss, which all contributed to increased psychosocial stress, particularly among families with pre-existing vulnerability factors. Given the relationship between increased psychosocial stress and intimate partner violence (IPV), this rapid review investigated change in the prevalence and correlates of IPV victimization during the first six months of the pandemic. There were 19 studies that examined changes in the rate of IPV from before the COVID-19 pandemic to during the pandemic. Of the studies examining changes in the rate of IPV, 11 found a significant increase. Key vulnerability factors contributing to the increase include low socioeconomic status, unemployment, a personal or familial COVID-19 diagnosis, family mental illness, or overcrowding. Six studies examined whether the presence of children in the home was associated with IPV, but the direction of this relationship was inconsistent. This review finds preliminary evidence of a relationship between COVID-19 induced stressors, pre-existing vulnerabilities, and increased IPV, which present important implications for policy and practice.” [LINK](#)

The Atlantic: [Why People Are Acting So Weird?](#) (March 30, 2022).

“Crime, “unruly passenger” incidents, and other types of strange behavior have all soared recently. Why? Everyone is acting so weird! The most obvious recent weirdness was when Will Smith smacked Chris Rock at the Oscars. But if you look closely, people have been behaving badly on smaller stages for months now. What on earth is happening? How did Americans go from clapping for health-care workers to threatening to kill them? More than a dozen experts on crime, psychology, and social norms recently walked me through a few possible explanations.” [LINK](#)

This **COVID-19 e-bulletin** was prepared by researchers at the Newfoundland & Labrador Centre for Applied Health Research (Kazeem Adefemi, Waseem Abu Ashour, Wendy Lasisi, and Pablo Navarro) to summarize research evidence and grey literature produced by a variety of sources that were accessed online in March and April, 2022.

Given the rapidly changing nature of the coronavirus pandemic, some of the references included in this e-bulletin may quickly become out-of-date.

We further caution readers that researchers at the Newfoundland & Labrador Centre for Applied Health Research are not experts on infectious diseases and are relaying work produced by others.

This report has been produced quickly and it is not exhaustive, nor have the included studies been critically appraised.

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