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Review

Health Care Implications of the COVID-19 Pandemic for the Cardiovascular Practitioner

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ABSTRACT

There has been substantial excess morbidity and mortality during the COVID-19 pandemic, not all of which was directly attributable to SARS-CoV-2 infection, and many non-COVID-19 deaths were cardiovascular. The indirect effects of the pandemic have been profound, resulting in a substantial increase in the burden of cardiovascular disease and cardiovascular risk factors, both in individuals who survived SARS-CoV-2 infection and in people never infected. In this report, we review the direct effect of SARS-CoV-2 infection on cardiovascular and cardiometabolic disease burden in COVID-19 survivors as well as the indirect effects of the COVID-19 pandemic on the cardiovascular health

RÉSUMÉ

Durant la pandémie de COVID-19, les taux de surmorbidity et de surmortalité étaient considérables, mais pas toujours directement attribuables à l'infection par le SRAS-CoV-2, et de nombreux décès non liés à la COVID-19 étaient d'origine cardiovasculaire. La pandémie a eu de graves effets indirects qui ont augmenté sensiblement le fardeau des maladies vasculaires et les facteurs de risque cardiovasculaire, aussi bien chez les personnes qui ont survécu à une infection par le SRAS-CoV-2 que chez celles qui n'ont jamais contracté le virus. Nous examinons ici l'effet direct de l'infection par le SRAS-CoV-2 sur le fardeau des maladies cardiovasculaires et cardiométaboliques chez

Although the official death toll from SARS-CoV-2 infection was approximately 6 million by the summer of 2022, studies of all-cause mortality rate trends over time suggest that more than 18 million people died prematurely during the first 2 years of the pandemic.¹ Many of these deaths were cardiovascular,¹ and although the absolute number of in-hospital cardiovascular deaths decreased during the pandemic, cardiovascular deaths at home and in long-term care (LTC) facilities substantially increased.² In fact, deaths attributed to cardiac events or strokes have increased more than deaths for any other non-COVID-19 diagnosis during the pandemic.^{3,4}

Despite assumptions that excess mortality during the COVID-19 pandemic was largely among older individuals, even in developed nations more than 50% of quality-adjusted

life years lost have been in people younger than 65 years.⁵ Moreover, less than half of those who died had evidence of SARS-CoV-2 infection.^{1,6,7} Fortunately, the Omicron variant, although far more transmissible than earlier variants, causes less severe disease than previous variants of concern.⁸ Thus, we appear to have entered an endemic phase with SARS-CoV-2, but we will have to continue to factor the numerous effects of the COVID-19 pandemic into health care projections and planning for many years to come. In this report, we examine the direct, secondary, and tertiary effects of the COVID-19 pandemic on health care systems (Table 1), highlight some of the care deficits that have arisen, and discuss the broader implications for cardiovascular health and cardiovascular practitioners as we move forward.

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See page 722 for disclosure information.

Direct Effect of SARS-CoV-2 Infection on Future Cardiovascular Disease Burden

Early in the COVID-19 pandemic it became apparent that SARS-CoV2 infection was associated with a wide range of acute cardiovascular complications, including myocarditis,

of people who were never infected with SARS-CoV-2. We also examine the pandemic effects on health care systems and particularly the care deficits caused (or exacerbated) by health care delayed or foregone during the COVID-19 pandemic. We review the consequences of: (1) deferred/delayed acute care for urgent conditions; (2) the shift to virtual provision of outpatient care; (3) shortages of drugs and devices, and reduced access to: (4) diagnostic testing, (5) cardiac rehabilitation, and (6) homecare services. We discuss the broader implications of the COVID-19 pandemic for cardiovascular health and cardiovascular practitioners as we move forward into the next phase of the pandemic.

acute coronary syndromes, microvascular thromboses, arrhythmias, and pericarditis.⁹ In addition, a number of the therapies used to treat COVID-19 have cardiovascular side effects and/or potentially interact with cardiovascular medications.⁹ Further, there is now increasing recognition of elevated long-term risks for a variety of chronic cardiovascular conditions (ischemic and nonischemic) in survivors of SARS-CoV-2 infection, even in those with no previous cardiovascular disease or comparatively mild COVID-19 symptoms.⁹

The relative risks of chronic cardiovascular conditions developing in COVID-19 survivors are similar across patient subgroups defined by baseline characteristics (absolute risks are obviously higher in those with higher baseline risk); however, relative risks are higher in patients who had more severe COVID-19 disease.¹⁰⁻¹² The current best estimate is that those who survive their acute SARS-CoV-2 infection exhibit an approximately 55% relative increase in the risk of major adverse cardiovascular events in the next year: an extra 23.5 deaths, myocardial infarcts, or strokes per 1000 COVID-19 survivors.¹⁰ As well, there are subsequent increases in atrial fibrillation (71% relative increase, or 11 more cases per 1000 survivors), ventricular arrhythmias (84% relative increase, 4 extra events per 1000), and heart failure (72% increase, 12 additional cases per 1000 patients) after SARS-CoV-2 infection of any severity.¹⁰ Notably, the risks are even higher in patients who survive a COVID-19 hospitalization, even after adjusting for demographic characteristics, cardiovascular risk factors, and established cardiovascular disease (45% increase in heart failure with 23 additional cases per 1000 patients in the US National COVID Cohort Collaborative study). Of course, this is undoubtedly an underestimate of myocardial damage because ongoing myocardial inflammation on cardiac magnetic resonance imaging is commonly reported after COVID-19 infection.¹³ It has been estimated that there have been an additional 30,000 extra strokes and up to 110,000 extra acute myocardial infarctions in the United States in COVID survivors in 2020 and 2021.¹¹

SARS-CoV-2 targets multiple cells that express angiotensin converting enzyme 2, including pulmonary alveolar epithelial cells, nasal goblet secretory cells, pancreatic β -cells, gastrointestinal epithelial cells, astrocytes in the brain, and renal proximal tubules and podocytes. Many of these noncardiac targets are important in cardiometabolic health, and organ

les survivants de la COVID-19, ainsi que les effets indirects de la pandémie sur la santé cardiovasculaire des personnes n'ayant jamais été infectées par le SRAS-CoV-2. Nous traitons aussi des effets de la pandémie sur les systèmes de soins de santé, en particulier des problèmes causés (ou exacerbés) par le report des soins ou le renoncement aux soins durant la pandémie. Nous passons en revue les conséquences : 1) du report ou du retard des soins dans les cas urgents; 2) de la transition vers la virtualisation des soins externes; 3) des pénuries de médicaments et d'appareils médicaux; ainsi que des difficultés d'accès : 4) aux tests diagnostiques, 5) aux services de réadaptation cardiaque et 6) aux soins à domicile. Nous présentons par ailleurs les conséquences globales de la pandémie de COVID-19 sur la santé cardiovasculaire et sur les praticiens en santé cardiovasculaire au moment où commence une nouvelle phase de la pandémie.

dysfunction induced by SARS-CoV-2 does result in an increased frequency of cardiometabolic diseases in survivors.¹⁴ For example, new diabetes (mostly type 2) has been documented in 0.8% of nonhospitalized COVID-19 survivors, 5.7% of hospitalized patients, and 8.9% of those with COVID-19 who survived intensive care unit stays.¹⁵ Of the numerous other manifestations of postacute COVID syndrome that have been described so far, the increased frequency of chronic kidney disease due to direct renal injury from SARS-CoV-2 infection in survivors is also of particular relevance to cardiovascular practitioners.¹⁶

Thus, health care systems around the world must be prepared to deal with a substantial increase in the burden of cardiovascular disease in individuals who survived SARS-CoV-2 infection.

Indirect Effects of the COVID-19 Pandemic on Future Cardiovascular Disease Burden

We are likely to see higher than normal rates of influenza and other respiratory viruses in the coming seasons (assuming universal masking and social distancing protocols remain discontinued) due to the “immunity debt” accrued over the past 2 seasons (ie, low exposure rates in the general population to these other viral pathogens leading to a paucity of protective immunity). Because we already know that influenza or respiratory virus outbreaks are associated with upswings in cardiovascular hospitalizations and deaths, this immunity debt is likely to further exacerbate the increasing burden from cardiovascular disease in the near future.¹⁷

Furthermore, we must also prepare for an increased burden of cardiovascular disease even in those who never had COVID-19 due to pandemic-related stressors (a systematic review of 58 studies confirmed that natural disasters were often followed by upswings in cardiometabolic risks and events)¹⁸ and the numerous unintended consequences of the pandemic public health restrictions.¹⁹ These unintended consequences included socioeconomic upheaval, increased social isolation and mental health issues, decreased physical activity but increased caloric and alcohol consumption resulting in exacerbation of the obesity epidemic,²⁰ and care deficits caused (or exacerbated) by the pandemic.

Table 1. The effects of the COVID-19 pandemic for cardiovascular patients and practitioners

Direct (primary) effect of SARS-CoV-2 infection on cardiovascular disease burden in COVID-19 survivors	<ul style="list-style-type: none"> • Acute cardiovascular complications from COVID-19 (myocarditis, acute coronary syndromes, microvascular thromboses, arrhythmias, pericarditis) • Therapies for COVID-19 with cardiovascular side effects and/or potentially interact with cardiovascular medications • Increased long-term risks for various chronic cardiovascular conditions (heart failure, scar-related arrhythmias, myocardial fibrosis, accelerated atherosclerosis) • Increased frequency of cardiometabolic diseases (such as diabetes mellitus) and chronic kidney disease
Secondary effects: care deficits caused (or exacerbated) by health care delayed or foregone during the COVID-19 pandemic	<ul style="list-style-type: none"> • Reduced outpatient care and shift to virtual care resulting in: • Deferred/delayed cardiovascular risk factor optimization • Suboptimal chronic disease management • Deferred/delayed acute care for urgent conditions resulting in: • Increased out-of-hospital events • Worsened in-hospital outcomes • Reduced rates of diagnostic testing resulting in: • Shrinking procedural waiting lists but poorer outcomes • Reduced access to home care and long-term care services resulting in system backlogs • Reduced access to cardiac rehabilitation services resulting in deferred/delayed secondary prevention • Shortages of drugs and devices resulting in suboptimal treatment
Indirect (tertiary) effects: increased future cardiovascular disease burden in people who did not have COVID-19	<ul style="list-style-type: none"> • Pandemic-related stressors • Socioeconomic upheaval • Increased social isolation and mental health issues • Worsened physical activity profiles • Increased alcohol consumption • Exacerbation of existing deficiencies and inequities in health care • Exacerbation of health human resource shortages • More cases of influenza and respiratory syncytial virus infections in coming seasons because of immunity debt

As a result of public health advice to reduce contacts, patient fear of exposure, and restricted access to health care providers, there was also a substantial decrease in health care interactions during the COVID-19 pandemic, especially in the first year. Although volumes have returned to (and in some cases now exceed) prepandemic levels, there are a myriad of consequences arising from the health care delayed or forgone during the COVID-19 pandemic. An analysis of data from the US Coronavirus Tracking Survey showed that 33% of American adults with 1 chronic health condition and 46% of those with multiple chronic conditions reported delayed or forgone health care during the first year of the pandemic.¹⁹ Of

those who reported delayed/forgone care, 23% believed it had worsened their health condition(s), 15% believed it caused new limitations in their ability to work, and 21% described new limitations in their ability to do other daily activities (Fig. 1).¹⁹ In an earlier report in the *Canadian Journal of Cardiology*,²¹ we argued that these secondary and tertiary effects of the pandemic on cardiovascular health were likely to far exceed the primary effects directly related to SARS-CoV-2 infection (Fig. 2) and in the remainder of this report we explore the emerging evidence on pandemic-induced care deficits relevant to the cardiovascular practitioner.

Effect of the COVID-19 pandemic on outpatient care: deferred/delayed cardiovascular risk factor optimization and suboptimal chronic disease management

In addition to the initial reduction in volume, outpatient care shifted from an almost exclusively in-person model pre-pandemic to a mixed model very rapidly after the onset of the COVID-19 pandemic,²²⁻³¹ and the implications of this shift are still being investigated. Although 2 studies^{26,29} reported that virtual visits for patients with a variety of cardiovascular diagnoses were associated with fewer subsequent emergency department visits and hospitalizations, another³⁰ showed higher rates of emergency department visits, hospitalization, or death for heart failure patients after virtual visits compared with in-person visits. All 3 of those studies were observational and thus could only show association and not causation, and without randomized trial evidence it is impossible to declare one type of outpatient encounter superior to another. However, it does seem clear that virtual visits are associated with less risk factor screening, diagnostic testing, or medication intensification than in-person visits.²⁶⁻³¹

Delayed detection or deferred management of cardiovascular risk factors (such as hypertension or dyslipidemia) and the economic and psychosocial upheaval associated with the pandemic and public health responses has undoubtedly led to poorer cardiovascular risk factor control, which will cause future increases in the frequency of cardiovascular events. Although early evidence has shown a marked reduction in cardiovascular risk factor screening and management, as well as medication intensification for chronic conditions such as hypertension or heart failure during the pandemic,²⁶⁻³⁰ outcome differences resulting from these care patterns are yet to fully manifest. Of course, this problem is not unique to cardiovascular medicine and many other preventative services (such as vaccinations or cancer screening) were deferred during the pandemic, and evidence is already beginning to emerge of adverse clinical outcomes as a result.³²⁻³⁴

It should be noted that training future cardiovascular health care professionals to use telehealth technologies, although of paramount importance, poses unique challenges because of variations among institutions in communication platforms that need to be addressed.³⁵

Effect of the COVID-19 pandemic on acute care: deferred/delayed acute care for urgent conditions and worsened in-hospital outcomes

A number of studies in other jurisdictions confirm reports from the Canadian Institute for Health Information³⁶ that total emergency department visits,³⁷ even those for acute

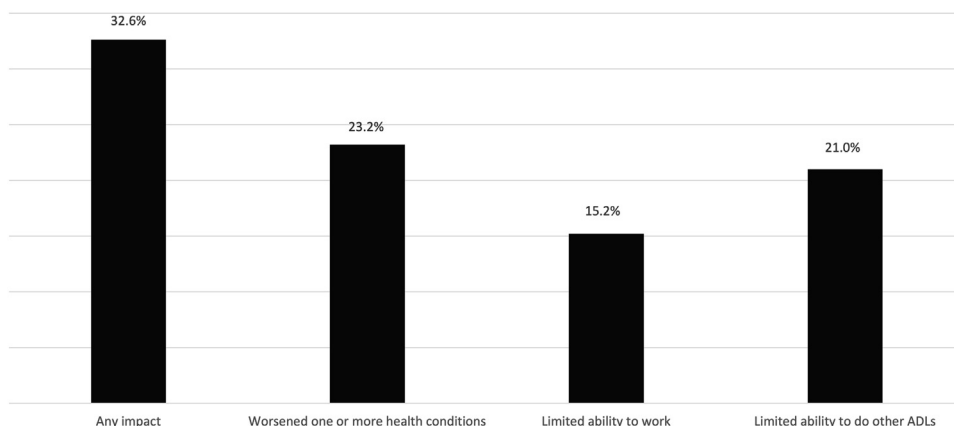


Figure 1. Effect of delayed or foregone health care during the COVID-19 pandemic, as reported by American adults in September 2020. ADL, activity of daily living. Modified from Gonzalez et al.¹⁹ with permission from Urban Institute.

cardiovascular diagnoses,³⁸ and hospitalizations for non-COVID conditions and surgeries decreased markedly during the pandemic.^{37,39-41} The median decrease in cardiovascular service utilization in a systematic review of 33 studies (64 services) was 29% in the first 2 quarters after onset of the pandemic.⁴⁰ Concerningly, the hesitation to seek care was not limited to elective care; Czeisler and colleagues estimated that approximately 41% of US adults avoided medical care during the pandemic because of concerns about COVID-19, including 12% who avoided urgent or emergency care.⁴² There was substantial inequity in terms of this care deficit, with a disproportionate burden on women, ethnic minorities, those in lower socioeconomic strata specifically without health insurance, and those with greater medical comorbidity and disability.⁴²

Multiple lines of evidence suggest that outcomes in patients with cardiovascular disease have worsened during the pandemic due to this reluctance to go to acute care centres. For example, studies have shown a twofold increase in the

proportion of patients with acute myocardial infarction or ischemic stroke who refuse emergency service transportation to the hospital,^{43,44} and the most alarming upstream consequence are rates of out-of-hospital cardiac arrest that have increased by almost 50%, indicative of patients ignoring even very severe symptoms.⁴⁵⁻⁴⁷ Although data from multiple jurisdictions, including Canada, have shown a decrease in cardiovascular hospitalization volumes during the pandemic, outcomes have also been worse for patients who are hospitalized, with in-hospital mortality increases of > 50%, even independent of possible COVID-19 coinfection.⁴⁸⁻⁵⁰

Effect of the COVID-19 pandemic on diagnostic testing: shrinking procedural waiting lists but poorer outcomes

Above and beyond acute conditions, the delays in ambulatory care as well as reduced access to diagnostic testing have also affected chronic cardiovascular conditions such as heart failure. In the National Health System in the United

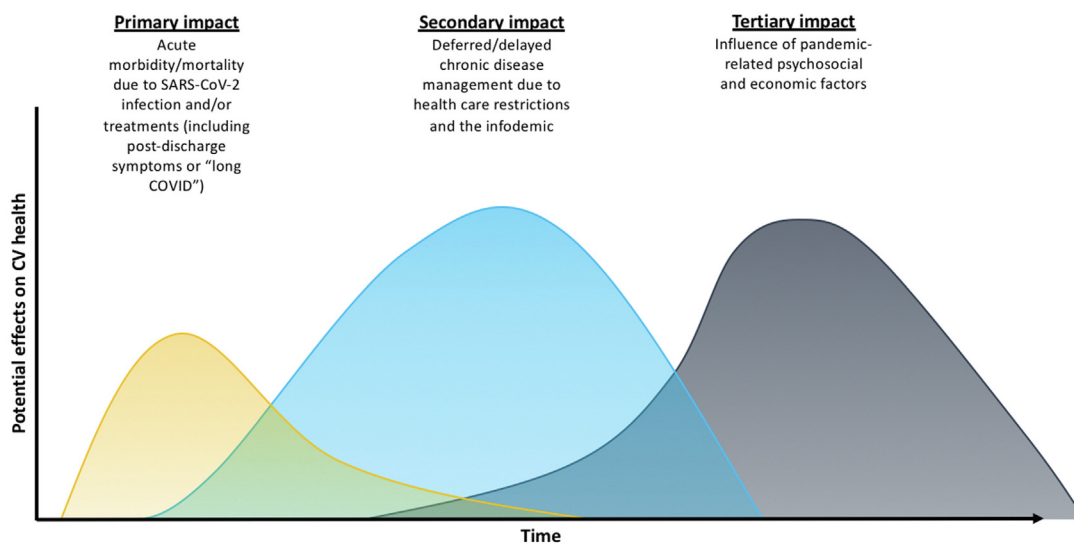


Figure 2. Effects of the COVID-19 pandemic on cardiovascular (CV) morbidity and mortality. Modified from Lau and McAlister²¹ with permission from Elsevier.

Kingdom, approximately one-third of heart failure patients reported subjective deterioration during the pandemic.⁵¹ The magnitude of the reductions in cardiovascular diagnostic capacity has been substantial—a study of 909 institutions across 108 counties showed a > 60% decrease in all noninvasive cardiac studies (such as stress electrocardiogram, echocardiography, and single-photon emission computed tomography).⁵²

However, these upstream barriers have had a counterintuitive effect on procedural wait lists for percutaneous coronary intervention or coronary artery bypass grafting.⁵³ Although volumes of procedures performed were low in the early part of the pandemic, because of closure of facilities from redeployment of health human resources or reallocation of beds for COVID-19 patients, even when cardiovascular capacity was restored, the actual wait lists were surprisingly shorter.⁵³ These patients were “missing” because of the upstream care deficit. For example, a patient who has not been diagnosed by their family physician/cardiologist, nor completed testing because of barriers at those stops of care, cannot get on the procedural wait list. This has implications for how to address the decrease in procedure volumes from the pre-pandemic era because measures to increase procedural capacity without similar efforts to address upstream barriers in diagnostic testing and access to ambulatory care will not be successful.⁵⁴ This is an important contradistinction to the strategies currently being proposed by the Canadian Medical Association and policy makers to address wait lists for orthopaedic, cancer, or cataract surgeries.⁵⁵

The cumulative effect of each of these care deficits is excess cardiovascular mortality and morbidity, particularly among our frailest and sickest patients.⁵⁶ Because of the poor outcomes for untreated or partially treated cardiovascular disease, the estimates of excess mortality from delays in treatment are sobering. For example, estimates for England suggest between 49,932 and 99,865 excess cardiovascular deaths just in the first year of the pandemic due to indirect pandemic effects from reductions in referrals, diagnostic testing, and treatment services.⁵⁷ The substantial magnitude of these indirect effects is reinforced when temporal trends of overall excess mortality and that of COVID-related deaths are evaluated, which show persistent excess mortality during the periods in between pandemic waves, even when direct COVID-19 deaths were comparatively low.⁵⁶

Effect of the COVID-19 pandemic on home care and LTC services: reduced access leading to system backlogs

Deaths from SARS-CoV-2 infection disproportionately affected residents of LTC homes, especially early in the pandemic. In Canada, LTC residents accounted for 3% of all COVID-19 cases but 43% of COVID-19 deaths (Fig. 3),³⁶ although vaccinations have significantly helped reduce these numbers. This population is at high risk because of their advanced age and multiple comorbidities, but also socioeconomic factors including lack of access to testing, less personal protective equipment, difficulty maintaining social distancing, and a precariously employed workforce that can transmit the virus across LTC sites.^{58,59} Additionally, these nursing home residents were at even greater risk of delayed/deferred acute care than community-dwelling elderly: transfers from LTC to

hospitals were substantially reduced for chronic obstructive pulmonary disease (by 58%), pneumonia (by 52%), and heart failure (by 41%), compared with prepandemic rates (Fig. 4).³⁶ Despite this, the wait times for LTC beds and home care services, which were problems well before the pandemic, have worsened and the number of patients who require altered level of care in-hospital has increased.⁶⁰ Moreover, because of the negative effect of COVID-19 on LTC facilities, an increasing proportion of Canadians are expressing the wish to avoid LTC for themselves and their loved ones, which will exacerbate this issue further.⁶¹ The resulting shortage in acute care beds will undoubtedly have negative consequences for patients with cardiovascular disease who require hospitalization for evaluation or management in the future.

With regard to home care services, the volume of home care assessments plummeted early in the pandemic, with more than 60,000 deferred new assessments (44% decline) between March and June 2020.⁵⁵ Correcting for this backlog and other negative effects of the pandemic on the frequency and intensity of home care service provision will likely take years to address and in the meantime frail cardiovascular patients will exhibit poorer outcomes and our ability to manage them in their home setting will be impaired.

Effect of the COVID-19 pandemic on cardiac rehabilitation services: deferred/delayed secondary prevention

Despite the well established benefits of cardiac rehabilitation for secondary prevention in patients with coronary disease or heart failure,⁶³ at the start of the COVID-19 pandemic many cardiovascular rehabilitation programs were closed, which resulted in negative outcomes for the vulnerable population.^{64,65} Although in-person rehabilitation is the gold standard, even pre-COVID the European Society of Cardiology guidelines raised the possibility of home-based rehabilitation with or without telemonitoring.⁶³ Systematic reviews have proven that telerehabilitation is superior to no rehabilitation and noninferior to in-person rehabilitation for improving functional capacity and quality of life for all patients, including those with heart failure and coronary disease.^{66,67}

Although some have enthusiastically advocated for that option during the pandemic,⁶⁸ it should still be acknowledged that there are no definitive data on the effectiveness of home-based rehabilitation programs vs centre-based ones, and this is a clear research need that the COVID-19 pandemic has highlighted.⁶⁹

Effect of the COVID-19 pandemic on shortages of drugs and devices: undertreatment

Although drug shortages were common around the world even before 2019, the COVID-19 pandemic exacerbated many of these concerns because of increased demand for drugs used for COVID-19 therapies (such as steroids, hydroxychloroquine, antivirals) and drugs for supportive care (especially anaesthetics such as propofol, midazolam, fentanyl, rocuronium), as well as decreased supply as drug-supplying countries decreased their exports to prioritize their citizens, and pharmacies and hospitals began stockpiling medications.⁷⁰ Each of these factors contributed to the scarcity of

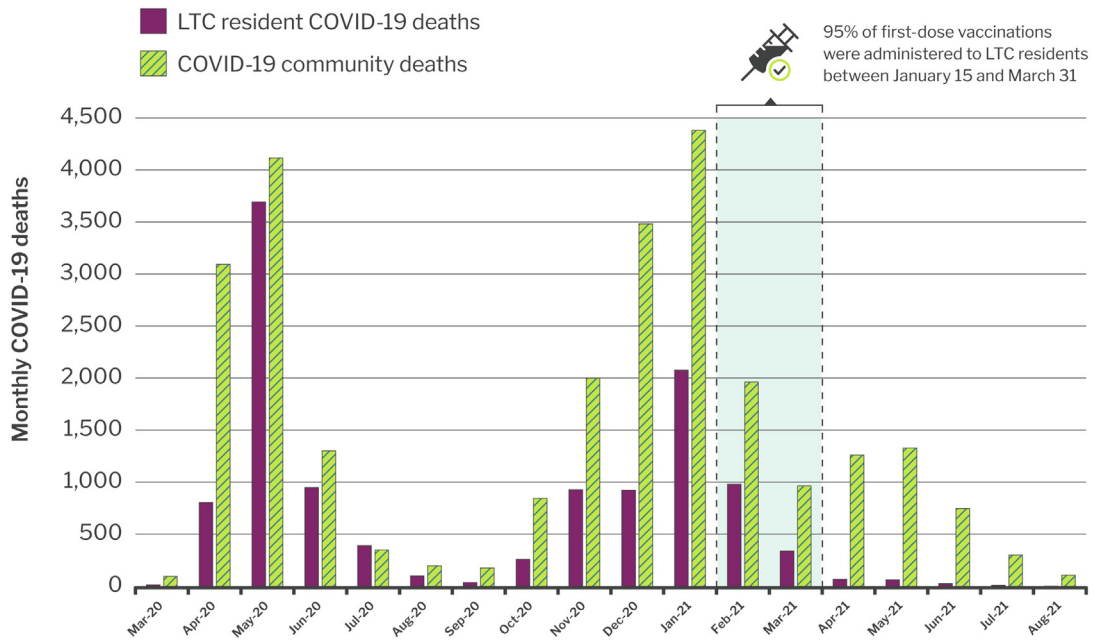


Figure 3. Canadian long-term care (LTC) resident COVID-19 deaths vs COVID-19 community deaths to August 15, 2021. Reproduced from the Canadian Institute for Health Information⁶² with permission.

essential, lifesaving medications, which affected many countries around the world, but especially low-income countries in Africa and Asia.^{71,72} Thankfully, with massive global collaboration efforts including the 4-level mitigation strategy established by the World Health Organization, as well as local efforts at government and pharmacy levels, many of these shortages have been addressed.^{73,74}

As a result of decreased supply, increased financial constraints, increased stress, decreased outpatient visits, and

misinformation (the infodemic), adherence to many chronic medications has significantly decreased since the start of the pandemic.⁷⁵ As health care providers, it would behoove us to inquire about adherence disruptions and provide prompt, nonjudgemental, reinitiation of medications where necessary.⁷⁵

In addition to drugs, the COVID-19 pandemic also caused a shortage in devices including personal protective equipment, ventilators, COVID-19 testing supplies, and even blood

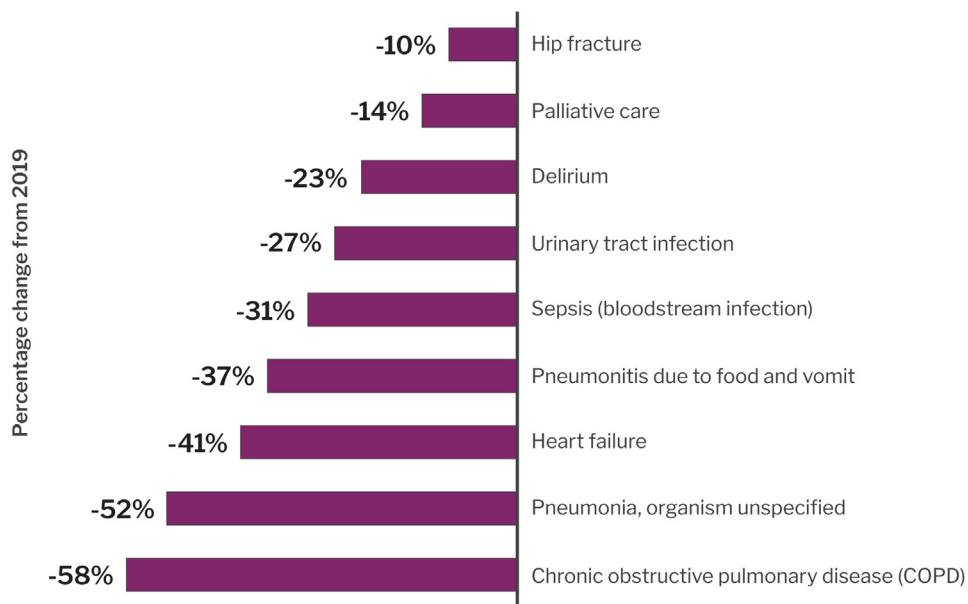


Figure 4. Changes in transfers of long-term care residents to hospital during the pandemic, according to reason for transfer, March 2020 to June 2021. Reproduced from the Canadian Institute for Health Information⁶² with permission.

collection tubes.^{76,77} This was because of increased demand as well as decreased supply from major global suppliers such as China due to factory shutdowns. Many countries around the globe were particularly affected by this, especially Italy, Spain, and parts of the United States.^{76,78} Although the device shortage issue has abated to a large degree, it did trigger the need for international cooperation in the trade of medical supplies, a proactive backup approach at first signs of shortages, and innovative approaches such as 3D printing of medical supplies, all of which are likely to stay for the long term.⁷⁹

Effect of the COVID-19 pandemic on exacerbating existing deficiencies in health care and health human services

The COVID-19 pandemic also highlighted the inequities in health care access, particularly with respect to primary care for disadvantaged communities, and the structural deficits in the health care workforce that already existed pre-pandemic.⁸⁰ Indeed, all of the care deficits outlined previously are more pronounced in disadvantaged groups. Several recent studies have shown the negative effects of the pandemic on health care workers and have raised concerns about further increases in shortages of physicians and nurses. The Canadian Medical Association's 2021 National Physician Health Survey⁸¹ indicated that physician burnout nearly doubled (up to 53%) during the pandemic and nearly half of physicians are planning to reduce their workload in the near future, mirroring reports from the Canadian Nurses Association⁸² and the Association of American Medical Colleges.⁸³

Concluding Thoughts and Looking Forward

During the pandemic, COVID-19 was the third leading cause of death in Canada, behind only cancer and cardiovascular disease. Although much attention has been focused on COVID-19 entering an "endemic phase," as recently pointed out by Professor Katzourakis in *Nature*: "a disease can be endemic and both widespread and deadly" (he cited the example of 2 endemic infectious diseases—malaria and tuberculosis—that killed more than 2 million people in 2020).⁸⁴ In addition to the direct morbidity and mortality attributable to SARS-CoV-2 infection, the indirect effects of the pandemic have been profound, and cardiovascular conditions are one of the early bellweathers for these effects. The background incidence of cardiovascular disease has at the very least been constant over this period, but has more likely increased because of the increased burden of cardiovascular risk factors in COVID-19 survivors and pandemic-related stressors. Although Canada performed better than most other countries in the first 2 years of the pandemic on metrics such as number of infections, number of deaths, or proportion fully vaccinated,⁸⁵ our ability to address the care deficits described in this article will determine how we fare in the next phase of the pandemic. To do so, we need to learn from the natural experiment of reduced care induced by the pandemic to identify which elements of deferred care proved unnecessary and prioritize only interventions of proven efficacy and cost effectiveness.^{86,87} As pointed out by Abraham Maslow, "to a man with a hammer, everything looks like a nail," and thus choosing which services to prioritize will require input

from a broader constituency than just physicians. Indeed, the need for timely and explicit communication between health care providers, government and other policy makers, industry, and the public cannot be understated.

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