Issue Note

Interventions to improve infection prevention and control for COVID-19 in long-term care homes

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Executive Summary

The COVID-19 pandemic has exposed many pre-existing vulnerabilities in the long-term care (LTC) sector and has had a devastating impact on LTC residents, staff, caregivers, and families. Global research has sought to understand and address these challenges, by identifying the factors linked with risk, size, and deadliness of COVID-19 outbreaks in long-term care homes (LTCHs) and recommending various interventions to strengthen infection prevention and control (IPAC). This report summarizes these findings.

Future investments in Canada's LTC sector should consider the unique factors contributing to elevated cases, outbreaks, and mortality in LTCHs. Ownership status of LTCHs was highlighted as an important risk factor for COVID-19 outbreaks early in the pandemic and several other factors emerged as being important in the literature (e.g. facility design, community incidence of COVID-19, availability of personal protective equipment (PPE) and testing equipment, facility staffing, and resident characteristics). Each of these factors presents unique risks and challenges for IPAC in LTCHs and will need to be addressed to protect residents, staff, caregivers, and families from outbreaks in the future.

To address these risk factors, eight broad areas for investment were identified in the literature. These included: staffing, physical infrastructure, IPAC, vaccination, inspection and regulation, data monitoring and surveillance, and financing. Vulnerabilities in these core areas have contributed to the high prevalence of infection, outbreaks and mortality observed in Canada during the COVID-19 pandemic.

Question

What is the impact of the COVID-19 restrictive public health measures on the residents of long-term care homes, their family, and long-term care home staff, in terms of psychosocial, caregiving, and financial challenges?

Key considerations for long-term care investments:

1. Investments in several core areas may be required to adequately address the challenges facing Canada's LTC system and prepare for the future.
2. The value of some interventions is time-bound, therefore certain investments should be prioritized in the short term (e.g. strategies to increase COVID-19 vaccine uptake in residents and staff) for maximum utility.
3. A range of potential interventions is available to address common LTC challenges. These interventions can be selected and tailored to ensure effectiveness in the Canadian context.
4. Resident, caregiver, family, and staff needs should be prioritized for all investments in the LTC sector. All interventions considered must balance infection prevention and control, and stakeholder wellbeing.

As the Netherlands and Denmark are considered to be high performing in LTC infection prevention and control, in another report, CanCOVID identified several best practices through semi-structured interviews with experts in LTC and also from an evidence scan. The following are "best practices" for IPAC in LTC as identified by the Netherlands and Denmark, that allowed for adoption supports and compliance measures (reference to CanCOVID's report on OECD countries and LTC best practices):

- intelligent visitor "lockdown"
- investment in communications informed by behavioural science
- a well-funded LTC system
- relatively well-paid LTC staff
- cohort nursing (i.e. residents grouped and isolated together) and nurse cohorting (i.e. nurses designated to work with infected residents)
- centralized allocation of personal protective equipment (PPE) via new national consortium
- political attentiveness and broad public support for LTC sector
- de-institutionalized, home-based care for older adults

- individual “abodes” or home-like living spaces in all modern nursing homes
- professionalization and working conditions in LTC sector
- highly integrated social and health care systems
- high vaccination rates (without mandate due to high willingness)
- re-vaccination/boosters for nursing home residents
- sick pay for staff and health care professionals

This report has several limitations:

- Data may have been missed or excluded to meet rapid deadlines.
- There was often insufficient real-world evidence to determine the effectiveness and cost-effectiveness of the interventions.
- Across jurisdictions, multiple interventions were often in effect simultaneously or at one time, therefore the impacts of individual interventions are rarely presented.

Introduction

The COVID-19 pandemic has had a disproportionate impact on the long-term care (LTC) sector. Residents in LTCHs are particularly susceptible to SARS-CoV-2 infection because of their congregate living situation and risk of exposure to asymptomatic and pre-symptomatic staff. They are also vulnerable to adverse COVID-19 outcomes owing to their advanced age and multimorbidity. This vulnerability to SARS-CoV-2 infection has been further exacerbated by pre-existing challenges in the LTC sector related to funding, staffing, aging infrastructure, and inadequate infection prevention and control (IPAC) practices [1–4]. In many countries, more than 40% of COVID-19-related deaths have been connected with long-term care homes (LTCHs) [5,6]. In Canada, over 80,000 LTC residents and staff have been infected with SARS-CoV-2 since the start of the pandemic, and more than two-thirds of Canada's COVID-19-related deaths have been among the LTC population [7]. Global research has sought to understand and address these outcomes, by identifying the factors linked with COVID-19 outbreaks in LTCHs and recommending interventions to improve IPAC. This report is a summary of these findings.

Question

What is the impact of the COVID-19 restrictive public health measures on the residents of long-term care homes, their family, and long-term care home staff, in terms of psychosocial, caregiving, and financial challenges?

Methods

Data for this report was retrieved through multiple academic and grey literature databases. The selected databases focused on COVID-19-related research, published guidelines, evidence syntheses, and empirical research[1]. The search retrieved texts published in English up until June 16, 2021. Multiple variations of the term 'long-term care' were used to identify a breadth of data on the topic (e.g. assisted living, nursing home, old age home, aged care, residential care). Texts were included if they described either: a) factors that influenced outbreaks in LTCHs; b) interventions to mitigate the impact of COVID-19 in LTCHs; or c) short- or long-term investments to strengthen LTC systems. Due to the wide breadth of information retrieved in the searches, data extraction and analyses were largely focused on higher level evidence (i.e., reviews, government reports and guidelines).

An additional search was conducted on the International Long-Term Care Policy Network's LTC Responses to COVID-19 website. This resource includes a series of reports describing the status of LTC in various countries, and the policy interventions taken to mitigate the impact of COVID-19. International reports are also available on specific topics related to LTC (e.g. preventing COVID-19 outbreaks in LTCHs, guidelines for restricting LTCH visits). Due to time constraints, only a selection of country reports from this resource were included in the report[2].

Limitations

- Some relevant data may have been missed or excluded from analyses due to the rapid timeline for this report and extensive literature on the topic.
- Most texts in this report described experiential evidence and recommendations, and there was only limited data to support the effectiveness and cost-effectiveness of the different interventions described.

[1] Searched databases included: LitCovid; WHO COVID-19 Global Literature Database; Public Health Canada; CIHI COVID Collection; COVID-END; CPG Infobase; ECRI Institute; NICE Guidance; Epistemonikos; CADTH Evidence Bundles; Agency for Healthcare Research & Quality EPC Evidence-based Reports; Centre for Reviews and Dissemination; TRIP; LTCCovid; and Google Scholar
[2] Included country reports: Aotearoa New Zealand; Australia; Canada; China; England; Finland; Singapore; South Korea; United States of America.

- Most of the interventions described in the literature were implemented simultaneously by jurisdictions, therefore data on the impacts of individual interventions was often not available.

Factors that influenced COVID-19 outbreaks in LTCHs

Five reviews and two reports described the factors that influenced COVID-19 outbreaks and mortality in LTCHs. Many of these factors were related to the LTCHs' ownership and characteristics. Importantly, for-profit ownership was not associated with higher risk of an outbreak [8]; however, it was associated with a higher number of resident cases and higher mortality [8–12]. For-profit ownership status was also associated with other risk factors for infection, including crowding, client vulnerability at baseline, inferior quality ratings, and insufficient access to PPE [8,9]. Chain-affiliated homes were associated with a higher likelihood of outbreaks, but not a higher incidence of infection in one review [8,13,14]. Reports were mixed on the association between chain affiliation, the magnitude of outbreaks, and the number of resulting deaths [8,14]. Similarly, LTCHs with higher quality ratings were associated with lower rates of infection and mortality [9]. High community incidence of SARS-CoV-2, typically occurring in urban areas, were also associated with more outbreaks in LTCHs [11,12].

The design of the LTCH also had an important influence on the risk of SARS-CoV-2 cases and outbreaks. Specifically, LTCHs with higher crowding (i.e., number of residents per room and bathroom) were associated with larger and deadlier outbreaks [9,10,14]. However, this effect could potentially be mitigated by reducing the number of residents living in each room [10]. Larger homes with more beds also had a greater SARS-CoV-2 incidence rate, and larger outbreaks [10–12]. Finally, LTCHs with older designs, open layout designs (i.e., large rooms divided into bedrooms by screens), and inadequate ventilation were more likely to experience an outbreak [11,13].

Staffing and resident characteristics also influenced COVID-19 outbreaks in LTCHs. One review suggested that higher staffing levels contributed to fewer infections and lower mortality [9]. Conversely, another review indicated LTCHs "with a greater number of staff, staff who work in multiple facilities, and greater number of infected staff, were more likely to experience a COVID-19 outbreak" (10, p.34). The number of nursing hours per resident influenced SARS-CoV-2 cases, with lower nursing hours associated with increased rates of infection [12]. LTCHs with paid sick leave for staff had fewer positive SARS-CoV-2 cases [10]. Finally, certain resident characteristics (e.g. ethnic minority status) were associated with a higher risk of SARS-CoV-2 transmission in the homes [11,12].

Table 1. Risk factors associated with infection, outbreaks, and mortality

Risk factor	Risk of outbreak*	Incidence of SARS-CoV-2 infection	COVID-19 mortality
Availability of paid sick leave [10]		▼	
Chain affiliation [8,14]	▲	Mixed	Mixed
For-profit or private ownership [8–13]	Mixed	Mixed	▲
Higher community transmission [11–13]	▲	▲	
Higher crowding [9,10,14]		▲	▲
Higher number of beds and occupancy [9,11,13]		▲	▲
Higher number of transfers from hospital to LTCH [9]			▲
Higher number of ethnic minority residents [11]		▲	
Higher prevalence of comorbidities among residents [11]		▲	
Higher quality ratings [9,12]		▼	▼
Higher staffing levels [9]	▼	▼	▼
Inadequate indoor ventilation [11]	▲		

Larger facility size [10,12]		▲	
Lower nursing hours per resident [12]		▲	▲
Older design standards [11,13,14]	▲	▲	
Shortages of PPE [9,10]		▲	▲

* Most jurisdictions defined an outbreak as one or more resident or staff cases.

Strategies to improve infection prevention and control in LTCHs

In the following section, various interventions for improving IPAC in LTCHs are presented, grouped within eight broad areas for investment. All of the interventions presented were either implemented in LTCHs during the pandemic or recommended in LTCH-specific guidelines and reports. A comprehensive list of interventions identified in the literature is summarized in Table 2.

Staffing

Many of the interventions described in the literature were focused on ensuring a sufficient, adequately trained, remunerated, and supported health care workforce in the LTC sector. These interventions are critical as the pandemic has exacerbated LTC workforce challenges, which without policy intervention, may persist well into the future [15]. Common among these interventions were financial incentives (e.g. increasing staff wages; offering a bonus payment) to increase the recruitment and retention of LTC staff [4,5,14,16–20]. Several authors also described the importance of offering staff paid sick leave to support their wellbeing and reduce infection spread in pandemic situations [1,10,16,21–26]. In some cases, jurisdictions also planned, or recommended, recruitment campaigns to increase interest in working in LTCHs [4,5,23].

Other interventions focused on enhancing LTC working conditions, workplace stability, and opportunities for professional development for staff. These involved, for example, offering LTC staff the option for full-time employment or the opportunity to work in a single LTCH [1,14]. To encourage staff recruitment and retention, career ladders and other opportunities for professional advancement were recommended [14]. Educational reforms to create a specialization in LTC were also recommended in one report [1]. Finally, authors emphasized the importance of planning the healthcare workforce around current and future residents' needs. This could be achieved by developing and regularly reviewing standards for adequate staffing, or creating a jurisdictional staffing strategy aimed at addressing the root causes of staffing shortages [1,27,28].

Physical infrastructure

Improving the physical infrastructure of LTCHs will also be required to better support IPAC. Over time the design standards of LTCHs have evolved, therefore interventions to encourage LTC operators to renovate LTCHs within realistic timeframes may be needed [28]. Similarly, LTCHs must be built to meet both current and future population needs [28]. Many people in LTCHs live with dementia and can have difficulties with way-finding; therefore designing LTCHs with good lighting, colored hallways, and other visual cues can help prevent residents from wandering and spreading infections, and help to reduce staff workload [29]. As previously noted, during the COVID-19 pandemic, crowding has commonly been associated with outbreaks in LTCHs [8–12]. Therefore, interventions to reduce crowding by minimizing the number of residents per room and washroom and ensuring the availability of isolation spaces were described in the literature [14,22,30,31]. One report also highlighted the importance of ensuring adequate indoor ventilation throughout LTCHs [32]. Recently, the World Health Organization (WHO) published a guideline document for evaluating and addressing indoor ventilation in a variety of health care settings [33].

Jurisdictions may also wish to invest in exploring alternative models of care to reduce the risk of infectious disease transmission and better align care with the community's preferences and needs [18,21,26]. Specifically, two reports noted the opportunity to expand upon and strengthen options for home care alongside LTC services [18,26]. The Green House Model has also been associated with lower SARS-CoV-2 incidence and mortality when compared with traditional nursing homes [34]. Within the model, Green House homes house a smaller number of residences (i.e., 10-12 elders), have home-like features (e.g. private rooms and bathrooms with other communal living spaces), and universal caregivers who are responsible for a range of personal, clinical, and home care activities [35].

Infection prevention and control

Various interventions specific to IPAC could be useful for mitigating the effects of future pandemics in LTCHs. First, it is essential that all LTCHs are equipped with the knowledge and resources required to reduce and manage infection spread. Several reports underlined the need to ensure that LTCHs had sufficient access to personal protective equipment (PPE) and other resources (e.g. testing kits, laboratory supplies) throughout the pandemic [1,5,10,19–21,23,26,30,36–40], as the availability of PPE was associated with infection spread. This could be accomplished by maintaining a central stockpile of PPE and distributing supplies when LTCHs experience an outbreak [16,20,26,37]. Importantly, comprehensive IPAC guidelines should also be developed for all LTCHs, detailing recommendations for a variety of outbreak-related practices and policies [1,5,9,11,17,20–24,28,32,36–38,41]. For example, guidelines could be made available on resident transfers, social distancing, use of PPE, hygiene and cleaning practices, visitor access, and cohorting and isolation, among other topics. These guidelines can also be accompanied by rigorous training for staff, residents, and families in order to support understanding and compliance [1,5,9,19,21,22,25,27,28,36,38–40,42,43].

Interventions focused on restricting public access to LTCHs and staff mobility between LTCHs could also help to improve IPAC. Namely, many reports described the importance of robust screening and testing as a tool for preventing SARS-CoV-2 from entering and spreading in LTCHs [4,5,9–12,19–23,32,36,37,41,43–45]. However, while some research suggests that serially testing asymptomatic residents and staff in response to an outbreak can reduce rates of infection [46], further evidence is needed to confirm whether routine asymptomatic screen testing of LTC staff has the potential to reduce COVID-19 outbreaks in LTCHs [47]. Until this evidence becomes available, the potential harms and costs of this intervention likely outweigh the benefits [47]. Several reports also described limiting staff movement between different LTCHs in order to reduce the potential for SARS-CoV-2 spread [5,9,16,17,19,25,26], and preliminary evidence in Ontario suggests that single-workplace policies were effective for reducing mobility between LTCHs [48]. Similarly, many jurisdictions have implemented or recommended visitor restrictions as an intervention to prevent SARS-CoV-2 from entering LTCHs [4,9–12,17,19,22,24,25,30,39,43]. However, there is limited evidence to suggest that blanket visitor restrictions are effective in reducing COVID-19 outbreaks, and they lead to a range of harmful outcomes for both residents and families [49]. Finally, once a case has been identified within a LTCH, many reports described cohorting and isolation to mitigate spread [9,11,12,20,22,25,32,37,38,40,41,43]; however, further research on the effectiveness of cohorting is needed [50].

Various personnel could also be utilized to strengthen IPAC practices in LTCHs. Specifically, some reports described appointing a designated IPAC specialist to help ensure optimal practice [16,20,32,40]. In outbreak situations, rapid response teams could also be deployed to help curb infection spread and reduce staff burden [5,16,20,22,26].

Vaccination

Investments to ensure widespread vaccination of LTCH staff and residents will be required to support IPAC in the short-term and in future pandemics. Emerging evidence suggests that vaccination can reduce SARS-CoV-2 incidence and mortality in LTCHs [51]; however, some staff and residents may experience vaccine hesitancy and delay vaccination. Although some jurisdictions have mandated that health professionals must be vaccinated in order to work [52], this strategy may not be feasible in all contexts. Some interventions to reduce vaccine hesitancy among staff and residents have been recommended, including: developing targeted communications strategies focused on current evidence, increasing the convenience of being vaccinated, and ensuring sufficient time for individuals to discuss their concerns with trusted peers [52]. Additional interventions to increase vaccine uptake could include paid time off to get vaccinated, support with transportation and parking, bringing the vaccines directly to LTCHs, and paid time off in case of side effects requiring additional time off work.

Inspection and regulation

A variety of system-, facility-, and provider-directed regulatory interventions could be implemented to strengthen IPAC in LTCHs. Several reports recommended developing a jurisdictional plan or strategy for improving LTC services and establishing metrics to measure success [5,16,20,37]. Funding could be tied with these metrics to increase adherence among LTCHs [1,22]. These plans could outline, for example, changes

to staffing, licensing, and training of providers in pandemic situations. Some reports also recommended improving or increasing oversight for the LTC sector to set and enforce IPAC standards [5,16,28,30]. Similarly, task forces could be utilized to identify and address specific challenges facing the LTC sector [4,5,9,23,37]. Since the start of the pandemic, multiple LTC task forces have been formed in Canada to accomplish this objective. In Canada and in other jurisdictions, LTC services operate separately from health services, therefore some reports noted the importance of developing strong partnerships with health services and health authorities to share expertise and resources [26,28]. Importantly, many jurisdictions halted routine inspections of LTCHs before or during the pandemic in an effort to prioritize limited resources; however, routine inspections remain an important tool for strengthening IPAC [22,23,28,39].

Data, monitoring and surveillance

Data is an important element for the COVID-19 response as it can facilitate identification of outbreaks, decision support, coordination, communication, and technical support [53]. Several articles recommended that jurisdictions develop or strengthen their data systems to monitor IPAC in the community and in LTCHs [5,21–24,30,45]. These data systems could be used to help understand and identify community hotspots, ensure quicker support during outbreaks, and facilitate communication between providers and health authorities. All data collection should be evidence-based and up to date. Methods of surveillance (e.g. contact tracing, group testing, social media) were also commonly used or recommended in the reports [5,17,25,32,36,38,41,45], and preliminary evidence on active surveillance in China suggests that it may be effective for identifying SARS-CoV-2 cases and for controlling outbreaks in the community [54]. Many other types of surveillance (e.g. routine, syndromic, sentinel, etc.) can also be used and are critical for rapid case detection, containing spread, managing risk, and monitoring the longer-term trends of the virus [55]. Different surveillance strategies may be needed depending on the resources available to the LTCHs [56]. Surveillance tools can also incorporate documented risk factors for COVID-19 outbreaks and mortality to help identify and analyze higher risk LTCHs [14]. Finally, some reports recommended investing in research efforts to better understand the impact of COVID-19 in LTC and the outcomes associated with specific policy interventions [1,5].

Resident, family, and staff wellbeing

The COVID-19 pandemic has emphasized the importance of improving resident, caregiver, family, and staff wellbeing. Throughout the pandemic, many jurisdictions have implemented blanket visitor restrictions in LTCHs to mitigate the spread of infection; however, these restrictions caused substantial harms [57,58]. In particular, many LTCH residents have suffered severe and potentially irreversible declines in functional, emotional, and cognitive health throughout the pandemic [57]. Visitor restrictions can also cause significant distress for families and caregivers, while increasing staff workload and burden. Moving forward, it will be important to develop visitor policies and procedures that are designed to balance IPAC with stakeholder wellbeing, and create plans for visitor restrictions and re-opening focused on risk reduction [57,59]. The National Institute on Ageing has released multiple reports with recommendations for the safe reopening of LTCHs in Canada [57,60]. These reports emphasize a focus on resident- and family-centered care and include guidance in a range of areas, including general visitor policies, family caregiver policies, allowable frequency and length of time for visits, allowable access to residents during outbreaks, screening and testing, IPAC and PPE, as well as the safe reopening of communal dining, group social activities, and non-essential absences and outings.

Additional investments should be made to better recognize and enable the essential role of unpaid caregivers in providing LTC residents with regular and life-sustaining care. Visitor policies should clearly differentiate visitors from essential caregivers, so that caregivers can continue their responsibilities even during outbreak situations [57]. Regular, transparent, accessible, and evidence-based communication should be used to inform stakeholders of changes to LTC services and visitor policies [57]. Caregivers should also be educated and trained in IPAC processes to support the safety of all LTC stakeholders [57]. Finally, a mechanism for feedback and rapid appeals should be established to ensure consistency in how visitor restrictions are being applied across LTCHs and to help resolve disagreements [57].

Investments should also be made to reduce social isolation and support the mental and emotional wellbeing of residents, staff, caregivers, and families. Investing in communication technologies for LTCHs has also been recommended or used to reduce social isolation and loneliness among residents during

periods of lockdown [9,11,20,24,61]. These technologies may need to be tailored to the residents' needs and capacities and accompanied by additional support and training, as many older adults may lack familiarity with new technologies and can struggle with their vision and hearing [11]. Several reports recommended providing LTC stakeholders with enhanced access to mental health services and emotional support during and after the pandemic [1,16,26,30,37,39]. Similarly, developing an application or helpline may be useful for lowering anxiety among staff and families [5,23,24].

Financing

Improving funding to the LTC sector may also be a useful policy intervention for strengthening IPAC. Several reports commented on a general need to increase payments to LTCHs and improve funding models for the sector [4,5,16,17,20,22,23,26,62]. In the Canadian context this could involve, for example, increasing federal transfers to LTC systems, or increasing provincial and territorial payments to LTCHs. This increased funding could be tied with specific elements of IPAC, and used by the LTCHs to hire more staff, strengthen training, or purchase PPE and other equipment. Payments to LTCHs could also be adapted based on the facility's characteristics (e.g. increased payments to LTCHs serving marginalized populations) [21,63]. As LTC residents become increasingly medically complex, it will also be important to ensure that staff are adequately compensated for the new or additional services that they provide.

Table 2. List of interventions to improve IPAC for COVID-19 in LTCHs and support residents, staff, caregivers, and families

Area of Investment	Intervention
Staffing	Ensure that staff have access to paid leave and are encouraged to stay home when sick, isolating, or need to get vaccinated.
	Provide financial incentives to increase or retain staff in the LTC workforce (e.g. lump-sum payments, increased wages).
	Start a recruitment campaign to encourage people to work in LTC.
	Improve working conditions for staff.
	Develop and implement career ladders in LTC.
	Implement educational reforms that establish specializations in LTC.
	Ensure the availability of more full-time employment for LTC staff.
	Increase the number of hours of care per resident (i.e., minimum of 4 hours of direct care per resident).
Physical infrastructure	Design LTCHs with dedicated isolation spaces where newly admitted or symptomatic residents can be safely observed.
	Reduce crowding in LTCHs by minimizing the number of residents sharing a room and bathroom.
	Ensure that LTCHs are designed to enable cohorting and isolation of infected residents.
	Consider updating LTCHs with dementia-friendly designs to improve resident wellbeing, reduce infection, and support staff workloads.
	Ensure that all LTCHs have adequate indoor ventilation in compliance with WHO guidance.
	Explore new models of care that will support IPAC and better align with resident and family expectations.
	Consider investing in other non-traditional models of care like the Green House Model, where a smaller number of residents can be cared for in a more home-like environment.
Infection prevention and control	Ensure that all LTCHs have adequate access to PPE and testing kits.
	Create a central stockpile of PPE that can be distributed to LTCHs experiencing outbreaks.
	Establish comprehensive, evidence-based IPAC guidelines and protocols.
	Implement widespread screening of staff, residents, and visitors.
	Evaluate different testing strategies for staff, residents, and visitors to better understand the impacts of testing and potential cost-benefit of this intervention.

	Provide staff, residents, and families with IPAC training.
	Limit staff movement within and between LTCHs.
	Develop visitor restriction policies that balance IPAC with resident, caregiver, family, and staff wellbeing.
	Deploy or train an IPAC specialist for every 200 LTC residents.
	Ensure adequate staffing to manage increased workload and responsibilities during an outbreak.
	Isolate staff from the community by creating temporary living arrangements.
	Require masking in LTCHs after a case has been identified, or when community transmission is observed.
Vaccination	Develop targeted communication strategies to address vaccine hesitancy among the LTC workforce.
	Increase the convenience of vaccination for staff and residents (e.g. establish vaccine clinics in the LTCHs).
	Provide financial support to facilitate vaccination (e.g. paid time off for staff to get vaccinated and manage post-vaccination symptoms, support with transportation and parking costs).
	Administer vaccines directly in LTCHs for residents, staff, caregivers, and families.
	Ensure that staff and residents have sufficient time to discuss vaccination with trusted individuals.
	Provide incentives or disincentives to encourage vaccine uptake (e.g. continued testing of those who are unvaccinated).
	Mandate vaccination among staff.
Inspection and regulation	Develop a national plan to strengthen LTC and respond to future pandemics.
	Collaborate with residents and families in the development of new standards and strategies for LTC.
	Increase oversight of LTC through a national advisory body or steering committee.
	Reinstate and strengthen routine inspections in LTCHs.
	Develop national standards for IPAC practices in LTCHs.
	Establish metrics to measure adherence and success related to national standards.
	Tie IPAC outcomes in LTCHs with national funding.
	Conduct regulatory action against LTCHs that do not comply with national standards for IPAC.
	Develop policies for any changes to provider licensing, training, or responsibilities during pandemic situations.
	Develop evidence-based approaches to accreditation.
	Improve care coordination between different LTC stakeholders and consider better integrating health and social care.
Data, monitoring and surveillance	Create a national database to track, report, and model LTC characteristics and outcomes alongside other quality indicators.
	Invest in research to address the challenges facing the LTC sector and study the impact of various policy interventions.
	Establish a system for surveillance and monitoring of symptoms, illness, and outcomes among staff and residents.
	Make plans for a range of testing strategies to account for each LTCH's resources and capacity.
Resident, family, and staff wellbeing	Invest in resources and technologies to reduce social isolation among residents during outbreaks.
	Plan additional support and training for older adults, caregivers, and families in the use of communication technologies.

	Provide enhanced mental health services to residents, staff, caregivers, and families.
	Establish applications or helplines to distribute information and support resident, staff, caregiver, and family wellbeing.
	Offer increased financial support to residents, caregivers, and families.
	Design strategies to enable caregivers to continue their fundamental role in ensuring resident safety, health, and wellbeing in a pandemic.
	Provide caregivers and families with essential training and resources in proper IPAC processes.
	Establish mechanisms for feedback from residents, caregivers, and families.
	Provide regular, transparent, accessible, and evidence-based communication about LTCH policies.
	Ensure that caregivers have frequent access to LTC residents and can visit for as long as possible even in outbreak settings.
	Communicate the risk of SARS-CoV-2 infection in LTCHs to caregivers and families.
	Continue or create new group activities to reduce social isolation among residents.
Financing	Increase funding to LTCHs during future pandemics to offset the new costs incurred.
	Provide targeted funding to LTCHs serving high-risk populations (e.g. majority black, Indigenous, and people of colour).
	Provide a tax relief to LTCHs, staff, and caregivers for paid family leave and other resident-related expenses.
	Provide LTC staff with equal compensation to other institutional care staff for the same responsibilities.

This table is a compilation of the interventions described in the literature. Many of the interventions were not accompanied by supporting data on their utility or effectiveness.

Considerations for IPAC "best practices" in LTC: the Netherlands and Denmark

Given that the Netherlands and Denmark are considered to be high performing in LTC infection prevention and control, in another report, CanCOVID identified several best practices through semi-structured interviews with experts in LTC and also from an evidence scan. Key considerations for best practices for IPAC in LTC identified by these two countries, that allowed for adoption supports and compliance measures, include (reference to CanCOVID report on OECD countries and LTC best practices):

- intelligent visitor "lockdown"
- investment in communications informed by behavioural science
- well-funded LTC system
- relatively well-paid LTC staff
- cohort nursing and nurse cohorting
- centralized allocation of personal protective equipment (PPE) via new national consortium
- political attentiveness and broad public support for LTC sector
- de-institutionalized, home-based care for older adults
- individual "abodes" or home-like living spaces in all modern nursing homes
- professionalization and working conditions in LTC sector
- highly integrated social and health care systems
- high vaccination rates (without mandate due to high willingness)
- re-vaccination/boosters for nursing home residents
- sick pay for staff and health care professionals

Conclusion

This report summarizes existing knowledge on the factors that have influenced the risk, size, and deadliness of COVID-19 outbreaks in LTCHs, and interventions for improving IPAC. It draws evidence from multiple academic and grey literature databases, as well as the Long-Term Care Policy Network's LTC Responses to COVID-19 online resource.

Several factors were found to have a negative impact on SARS-CoV-2 incidence, outbreaks, or mortality in LTCHs. These included for-profit ownership, crowding, poor quality ratings, chain-affiliation, community spread of SARS-CoV-2, larger facility size and number of beds, older facility designs, certain resident characteristics (e.g. marginalized populations), and low resident-care hours. Interventions to address challenges in the LTC sector should take these factors into consideration.

Many interventions were used or recommended to improve IPAC in LTCHs; however, evidence of their effectiveness and cost-effectiveness was limited. Despite this, eight broad areas for future investment were identified: staffing, physical infrastructure, IPAC, vaccination, inspection and regulation, data monitoring and surveillance, and financing. Some of the interventions recommended within these areas may be more applicable in the short-term (e.g. strategies to increase vaccine uptake) while others will require longer-term planning and resources (e.g. updating LTCH infrastructure). Several of these broad areas of investment may need to be addressed to effectively strengthen Canada's LTC sector.

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