

A summary of reported infection prevention and control assessments conducted in long-term care and retirement homes during COVID-19 pandemic in Ontario, Canada

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ABSTRACT

Background: Public Health Ontario (PHO) infection prevention and control (IPAC) specialists provided field support during the COVID-19 pandemic by conducting on-site and virtual IPAC assessments to long-term care **and retirement homes** (LTC/RHs) between April 2020 and June 2021. Reports from these IPAC assessments were analyzed and the most common challenges were identified.

Methods: IPAC specialists in collaboration with local public health units (PHU) conducted 139 on-site and 33 virtual visits to LTC/RHs in Ontario, using an assessment tool developed by PHO. Following each assessment, a report with findings and recommendations for enhancing IPAC practices in the LTC/RHs were shared with the home and PHU. A thematic analysis of the reports found common challenges in several areas.

Results: Analysis of 172 assessment reports identified challenges and gaps in several areas resulting in a total of 415 recommendations made to LTC/RHs. Recommendation areas addressed included: personal protective equipment (PPE) use – 115 (28%), screening process – 89 (21%), physical distancing – 66 (16%), environmental cleaning – 66 (16%), hand hygiene – 44 (11%), cohorting – 26 (6%), and other areas – 9 (2%). Inappropriate use and reuse of PPE, such as universal wearing of full droplet and contact PPE regardless of resident COVID-19 status and double masking were observed. Other common themes included incorrect screening and physical distancing practices, and improper use of the disinfecting wipes and cleaning products. Often, there was no defined process for cleaning high-touch surfaces or tracking when cleaning had occurred and deficiencies in the auditing process were noted.

Conclusion: These findings highlight pre-existing IPAC challenges as well as new issues in LTC/RHs infection prevention and control efforts. The data in this report may be useful in identifying additional actions to support the needs of IPAC leads in these settings. Comprehensive support through coaching/mentorship, and the creation of resources to implement IPAC programs and capacity-building interventions with LTC/RH IPAC leads are needed.

INTRODUCTION

The COVID-19 pandemic disproportionately affected residents and staff at long-term care homes (LTCs) and retirement homes (RHs) in Canada. Overall, the COVID-19 mortality rate in Canada was relatively low compared with the rates in other countries within the Organization for Economic Cooperation and Development (OECD). However, residents in LTCs accounted for 81% of all reported COVID-19 deaths in Canada, compared with an average of 38% in other OECD countries (CIHI, 2020; Hsu *et al.*, 2020). The case-mortality rate increased vastly by age group. For those aged 70-79, mortality rates were 20.1% but climbed to 34.4% for those aged 80 years and older (PHAC, 2020). Insufficient infection prevention and control (IPAC) training related to physical distancing, lack of physical space, and health and human resources predisposed the system to the devastating COVID-19 outbreaks witnessed in Canadian

LTCs and RHs (Gardner, 2020; Fisman *et al.*, 2020).

Prior to the COVID-19 pandemic, a study from the United States revealed pre-existing gaps in IPAC capacity in LTCs such as: limited expertise; lack of formal IPAC training; inadequate executive support; insufficient data on healthcare-associated infections (HAIs); and staffing concerns (Herzig, 2016). Recommendations were made for one full-time equivalent (FTE) IPAC specialist per 150-250 beds (Morrison, 2004), but many LTCs in Ontario did not achieve this prior to the pandemic (Stall *et al.*, 2021). Another American study found that LTCs that followed and implemented the recommended Centers for Disease Control and Prevention (CDC) infection control guidelines had lower COVID-19 infection rates among residents than those that had lesser adherence to recommended guidelines. Also important is that decreasing infection rates of respiratory disease requires compliance with physical distancing and proper

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use of personal protective equipment (PPE) (Telford *et al.*, 2020).

In response to the high rate of infection in LTC settings in Ontario, the Public Health Ontario (PHO) IPAC team designed a process to support local public health units and LTCs and RHs to assess possible gaps in IPAC practice. This was intended to provide IPAC expertise to prevent, mitigate, and manage outbreaks of COVID-19.

This paper provides a summary of the recommendations and most common IPAC themes collated from the post-visit reports.

METHODS

PHO IPAC specialists worked in collaboration with local PHUs to conduct IPAC assessments of LTC/RHs across Ontario – 139 (81%) on site, and 33 (19%) virtually – between April 21, 2020 and June 16, 2021. At the time of the visits, 64 LTC/RHs were in the midst of an outbreak, while three had recently resolved outbreaks. These voluntary assessments used resources developed by PHO to evaluate IPAC measures, provide real-time feedback, and identify potential contributors to viral transmission. Documentation for these assessments included a pre-visit questionnaire, a standard IPAC checklist to be completed during the assessment, and a post-visit report. Each post-visit report included a list of recommendations for the LTC/RHs to consider when implementing IPAC improvements in the home.

A total of 172 IPAC assessments were conducted in LTC/RHs across the province grouped according to Ontario health regions. The Eastern Health Region serves communities from Scarborough to Deep River to Hawkesbury. The Central Health Region serves communities from Mississauga to Huntsville and Orangeville to Markham. The Northern Health Region from Parry South to Kenora, to the coasts of James and Hudson's Bay. The Western Health Region serves Waterloo to Windsor, to Tobermory to Niagara Falls, while the Toronto region services 73 urban neighbourhoods across Toronto (Ontario Health, 2024).

The LTC/RHs selected for visits were identified by PHUs as having historical IPAC challenges, or were currently

experiencing outbreaks affecting residents and staff. In most cases, a pre-visit questionnaire was completed prior to conducting onsite visits; the purpose of which was to provide PHO IPAC specialists with an overview of the LTC/RH's preparedness for COVID-19. The pre-visit call using the questionnaire was conducted jointly by the PHU, PHO IPAC specialist and LTC/RH staff responsible for IPAC. Based on this initial assessment, a decision was undertaken to conduct further assessment virtually or in person. The homes visited represented a diversity of LTC/RHs, including corporate, not-for-profit, and municipally run homes.

The IPAC assessment was conducted using a version of the PHO COVID-19 Infection Prevention and Control Checklist for Long-Term Care and Retirement Homes (PHO, 2023). A thorough IPAC assessment in all areas included the following: review of entrance-screening stations, visitors policies, personal care services, universal masking practices, PPE use practices, hand hygiene, physical distancing, planning and outbreak management, occupational health and safety, management of COVID-19 cases, as well as environmental cleaning and auditing. During the onsite visit, the sites were toured by a PHO IPAC specialist, a public health investigator/public health nurse (PHI/PHN) and the LTC/RH staff responsible for IPAC. For virtual visits, a call with the LTC/RH staff member responsible for IPAC in the home was conducted to complete the checklist. A post-visit report was drafted by the PHO IPAC specialist to document their observations and list recommendations for the LTC/RH's consideration. Observed issues and associated recommendations were extracted from these reports into an Excel document and then grouped into themes.

RESULTS

Out of the 172 IPAC assessments conducted, the Eastern region accounted for 60 (34.9%) of assessments, while 48 (27.9%), 37 (21.5%), 22 (12.8%) and 5 (2.9%) assessments were completed in the Central, North, West and Toronto regions, respectively.

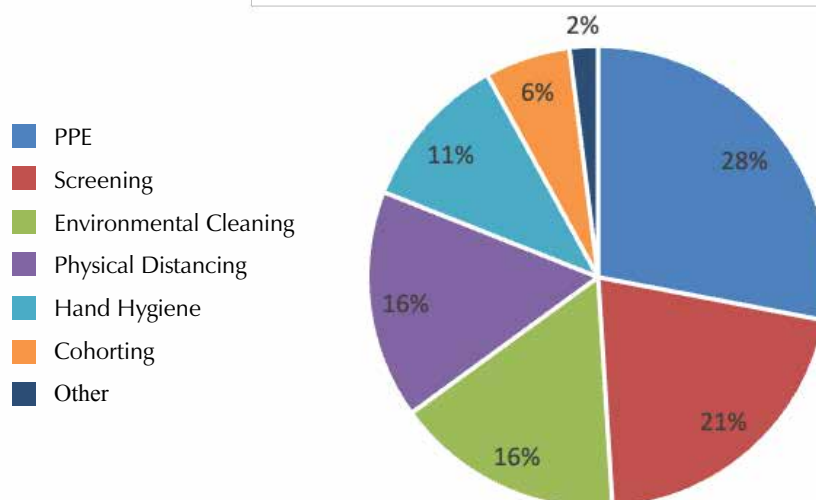


Figure 1: Percentage of total recommendations identified in LTC/RH visits by theme.

Table 1: Themes and sub-themes as identified by LTC/RH visits

IPAC Key Theme	Sub-theme	Examples of observed issues from visits to LTC/RH
PPE Use	Improper use of indicated PPE	Wearing PPE longer than indicated, i.e., keeping gloves on between residents
		Using Droplet and Contact PPE for residents not requiring Additional Precautions
		Reusing PPE
		Homemade cloth gowns being used for Droplet/Contact Precautions
	Excessive PPE use	Double-masking
		Wearing unnecessary PPE such as boot or hair covers
		Wearing full PPE items for Droplet/Contact Precautions for all residents and not just for those on Additional Precautions as per provincial guidance at the time
Screening Process	Lack of clear screening processes	Incorrect screening questions frequently asked
		Absence of screening signage at the main entrance to alert visitors who may have symptoms
	Improper screening area set up	PPE not worn by screener
		Lack of physical distancing between staff when awaiting screening
Physical Distancing	Challenges with physical distancing	Lack of separation between PPE doffing stations and screening stations
		Difficulty practicing physical distancing in common areas for staff and residents
		Limited space in break areas and meeting rooms
		Lack of knowledge/awareness of distancing
Environmental Cleaning	Lacking formal processes	Lack of formal auditing processes
		Undefined frequency of cleaning high touch surfaces
	Incorrect use of cleaning products	One wipe or cloth being used on multiple surfaces with insufficient contact time
		Some of the environmental products used were not healthcare grade
	Staffing	Insufficient number of housekeeping staff
		Staff lacked sufficient training
Cohorting	Clear communication and documentation	Concise plan for cohorting residents was often not available
	Room cleaning delays	Insufficient staff were available, there was improper allocation of staff and flow for resident care
Hand Hygiene	Insufficient quantity and inappropriate alcohol-based hand-rub (ABHR) product	Availability of ABHR at key points should be increased
		ABHR was not always between 70-90%
	Inappropriate technique	Lack of hand hygiene and removal of gloves between resident rooms

The most frequent issues and recommendations made with regards to key IPAC categories and associated practice improvements are described in Figure 1.

Further analysis was performed on the report content to extract common examples under each category. The following sections outline the main themes of the identified issues (Table 1) and associated recommendations made in the post-visit reports. For each theme, multiple sub-themes are described along with some common examples observed in different LTC/RHs. A narrative description of common challenges follows.

Personal protective equipment (PPE)

Issues related to PPE use were the most common finding from the assessment visits (Figure 1). Observations were made of LTC/RH staff using PPE inappropriately. This included inappropriate glove, gown, and mask use and going from room to room without changing gloves, wearing gloves where use was not indicated, wearing gowns between rooms, the use of cloth masks (due to PPE conservation or lack of supplies) and inappropriate mask use observed during breaks (e.g., wearing masks around chin). Excessive PPE use was also observed in some cases, such as double masking, wearing both a procedure and cloth mask, or procedure mask and an N95 respirator, wearing boot or hair covers, and wearing full droplet/contact precautions PPE for all residents. In addition, PPE reuse was also observed as well as wearing contaminated PPE in clean areas such as the nursing station.

Screening and screening area set up

Gaps in the screening process and set up of screening areas were also documented. Staff were often observed waiting to be screened without masks on and not physically distanced. PPE donning areas lacked visual reminders of how to perform hand hygiene and instructions on how to don and doff PPE. Frequently, improper PPE was worn by the screener, there was no clear separation between PPE doffing and screening stations, and exits had no access to garbage receptacles. Screening stations were often lacking, or had inadequate supplies of alcohol-based hand-rub (ABHR), disinfectant wipes and masks. Many LTC/RHs had no formal screening process in place, and gaps were noted with missed or incorrect screening questions asked, screeners not referring to the up-to-date list of symptoms as provided by the Ministry of Health, and signage at the main entrance to alert visitors with potential symptoms was absent in many LTC/RHs.

Physical distancing

Challenges with physical distancing in common areas, activity rooms and dining rooms were observed. Barriers to practicing effective physical distancing included limited space in break areas and meeting rooms. Gaps in education of staff regarding physical distancing was another issue identified.

Environmental cleaning

Most of the assessed homes did not have a formal auditing process to monitor environmental cleaning (EC) practices. In many LTC/RHs, incorrect use of wipes and cleaning products was observed, including, one wipe or cloth being used on

multiple surfaces, and inadequate product contact time when disinfecting surfaces and/or equipment. Some cleaning products used were not healthcare-grade cleaner/disinfectants with a Drug Identification Number (DIN); and LTC/RHs were lacking processes to check disinfectant concentration with test strips. Many of the LTC/RHs assessed did not have documented processes for cleaning high-touch surfaces, and in many instances, there were insufficient staff and training to properly carry out environmental cleaning.

Cohorting

Clear communication and documentation of a concise plan for cohorting residents and staff within the homes according to its layout were often not available in the assessed LTC/RHs. If plans were available, barriers to implementing those plans included a lack of understanding on the part of LTC/RH staff on how to provide care to cohorts, lack of clear guidance to inform this measure, insufficient staff available for homes to implement cohorting guidance, and room cleaning delays impacting the movement of residents (in most instances, environmental services staff were not dedicated to outbreak units).

Hand hygiene

In most of the assessed LTC/RHs, observed challenges related to hand hygiene included; insufficient quantity and inappropriate ABHR products, lack of auditing of hand hygiene compliance, and lack of training for staff on hand hygiene and appropriate use of gloves. In many homes, ABHR was not available or contained an insufficient alcohol concentration, (i.e., lower than the 70-90% recommended concentration). There was a lack of ABHR dispensers available at points of care and at other key locations, such as common areas.

DISCUSSION

In response to the IPAC practice gaps observed during these visits, PHO developed resources and held communities of practices (CoP) to address the issues identified. A series of webinars to provide education on common PPE issues (including PPE for screeners), cohorting, and environmental cleaning were conducted by PHO with more than 1,300 participants during 2020-2021. Subsequent webinar sessions held in 2022 on orientation for IPAC leads and respiratory virus preparedness in LTC were attended by more than 2,200 participants. The analysis of data from the LTC/RH assessment reports informed the content for these webinar sessions.

Particularly important in decreasing respiratory infection rates is compliance with physical distancing and proper use of PPE (Telford *et al.*, 2020). Observations of inappropriate PPE use can be corrected by supporting staff through ongoing education in choosing the correct PPE with point-of-care risk assessment skills, and regular audits of PPE donning and doffing, including on-the-spot PPE training. Recommendations for screening processes included how to set up the screening area at the entrance, improvements to the process for screening, and clarification of PPE needed by the screener. In response to this finding, items related to PPE usage for screeners was added to the PHO COVID-19 IPAC Checklist for LTC/RHs (PHO, 2023).

Further guidance on environmental cleaning best practices seemed to be a common need observed at many LTC/RHs. Recommendations included developing processes on cleaning practices and procedures, as well as improved auditing and staff training on EC best practices to correct observed issues. Support with respect to selection of the correct disinfecting wipes and cleaning products was also identified as a gap. Specifically, education is needed about requirements for healthcare-grade cleaner/disinfectants with a DIN, disinfectant concentrations, proper application of products and contact time. Homes would benefit from the development of a process tracking system, as well as regular review of EC processes, including on-the-spot training. In many of the LTC/RHs, there was no defined process for cleaning high-touch surfaces or tracking when cleaning had occurred. Many of the LTC/RH environmental services departments did not have a formal process in place to audit environmental services staff on room cleaning and work practices, however, results of cleaning audits would be useful for training, providing positive and constructive feedback to staff, and help to maintain their environmental services programs. Many homes would benefit from the use of at least one measure that directly assesses cleaning (e.g., environmental marking or adenosine triphosphate, ATP bioluminescence), in addition to observational assessments (e.g., performance observation, visual assessment).

In some of the LTC/RH visited, there was a lack of process to monitor or audit hand hygiene compliance and homes may benefit from assistance with establishing hand hygiene auditing programs. Hand hygiene is an important prevention measure, as such, audit results need to be shared with observed staff, internally with IPAC committees, and front-line staff generally as an important indicator that informs the home's hand hygiene program.

Guidance on planning for contingency staffing and resources on how to provide care to cohorts (i.e., cohorting of staff) may also be valuable. Additionally, LTC/RHs will need ongoing guidance on how to approach physical distancing measures in their home that work for their set-up and staff, as overcrowding is an important risk factor in the magnitude of an outbreak and the number of resulting resident deaths (Stall *et al.*, 2021; Liu *et al.*, 2020; Brown *et al.*, 2021). Actions such as reconfiguring common resident and staff areas in order to meet distance requirements, and incorporating distancing audits with other audits such as hand hygiene and PPE audits could provide opportunities to mitigate the effects of crowding.

Successful control of COVID-19 in LTC homes have been associated with homes that were well managed with strong leadership, effective communication, adequate staffing complements, limiting staff from working in multiple sites, proper screening of residents and employees, prompt isolation and testing, on site management, availability and proper use of PPE, IPAC policies and setting specific guidance (Lavoie-Tremblay, 2022; Baumann *et al.*, 2022; Rios *et al.*, 2020; Rebmann *et al.*, 2021). These success factors align with observations made during PHO's assessments.

Controlling outbreaks in LTC is multifactorial. It involves adherence to IPAC practice, early implementation of IPAC policy, but also observing community prevalence rates of COVID-19, sound public health policy, and access to PPE (Konetzka *et al.*, 2021; Abrams *et al.*, 2021; Rochon *et al.*, 2022). In an American study, it was determined that policy mandates and greater national attention are likely important factors in improving long-term care IPAC practices (Agarwal *et al.*, 2020). The data collected through these assessment reports informed PHO's response to support during the COVID-19 pandemic and can be useful for designing future IPAC supports for outbreak control. IPAC considerations should be tailored in consideration of national guidance (CSA, 2022) and ethical framework for LTC/RHs to provide balance between IPAC measures and the need for a home-like atmosphere. Additionally, collaboration with families and residents to inform and educate them regarding the need to balance IPAC measures with an ethical framework should be sought. The availability of IPAC resources in languages other than French and English for both staff and residents was also identified as an opportunity to strengthen the understanding of IPAC measures. Other control strategies include adequate outbreak contingency and preparedness plans, statutory sick pay, sufficient staff-to-bed ratios, greater funding of LTC/RHs and fewer shared rooms (Fernandes *et al.*, 2021; Viray *et al.*, 2021; Stall *et al.*, 2021). Aside from outbreak management, ongoing efforts to prevent infections such as antibiotic-resistant organisms (AROs), *C.difficile*, and urinary tract infections (UTIs), should be a critical part of LTC/RH quality improvement plans.

CONCLUSION

The results in this report may be useful in determining additional actions for supporting LTC/RHs during outbreaks. Recognizing that assessments were done during the height of the COVID-19 pandemic, the observations may not be reflective of practices pre-COVID-19, and further assessment of LTC/RHs after action on this report's findings could better assess current state. This report highlights the importance of implementing strategies to ensure effective communication and use of existing IPAC knowledge and processes. LTC/RHs also require comprehensive, ongoing IPAC support to apply and sustain best practices learned from the COVID-19 response. Such support could include on-site coaching and mentorship to implement key elements of an IPAC program, and capacity-building interventions with LTC/RH IPAC leads at the center. Targeted interventions should include adequate resourcing to support the role of ICP-designated staff to lead the implementation of best practices and evidence-based decision-making in the LTC/RH sector.

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