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What's New in Long-Term Care? Types of Innovations Implemented and Inclusion in Innovation Processes in Massachusetts

RESEARCH

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ABSTRACT

Context: The COVID-19 pandemic caused a crisis in long-term care (LTC), spurring various new practices and innovations, including LTC 'lockdowns' that socially isolated residents for their safety.

Objectives: This study sought to describe the innovations adopted in LTC following the onset of the COVID-19 pandemic, to describe the processes of innovation and the engagement of LTC stakeholders in innovation processes, and to examine stakeholders' perspectives of LTC innovation.

Methods: A qualitative descriptive study was conducted, including 15 one-on-one interviews with LTC subject matter experts (n = 7), residents (n = 3), staff (n = 2), and administrators (n = 3) in Massachusetts. Transcripts were analysed using a hybrid deductive–inductive approach.

Findings: Four types of innovations implemented in LTC since COVID-19 were described: product innovations, process innovations, workforce innovations, and organisational innovations. Innovation processes were commonly top-down, with some attention to identifying the root cause of problems to decide what innovations to introduce, and limited engagement of LTC residents and staff in innovation processes. Motivations for innovation were centred on meeting residents' needs. Challenges to innovation included financial resource limitations and workforce shortages.

Limitations: This study focused on LTC in Massachusetts (findings could differ in other settings), and interviews were conducted with multiple LTC stakeholders but not family members of LTC residents.

Implications: During the COVID-19 public health emergency, LTC experienced unprecedented challenges. This study shows that in addition to the quarantining of residents, residents were commonly excluded from LTC innovation processes, even despite the recognition of experts and administrators that their engagement would be beneficial for innovation effectiveness.

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BACKGROUND AND OBJECTIVES

In the United States, long-term care communities (LTCs) provide a range of services, from comprehensive medical and nursing care to assistance with daily activities. In 2020, the COVID-19 pandemic began profoundly affecting LTCs, resulting in high national rates of morbidity and mortality among LTC residents (Lau-Ng, Caruso and Perls, 2020) and heightened rates of LTC staff turnover (Dean *et al.*, 2023).

While impacts of COVID-19 were experienced in LTCs nationally, responses to the pandemic were shaped by state policies and implemented locally in individual LTCs (Van Houtven *et al.*, 2021). In Massachusetts, where this study was conducted, the residential LTC sector comprised more than 380 nursing homes, approximately 250 assisted living residences, and 62 rest homes at the onset of the pandemic (Commonwealth of Massachusetts, 2020). Nursing facilities provide short-term rehabilitation and LTC for people requiring continuous nursing and supportive services. Assisted living residences provide housing, meals, and personal care but do not directly provide medical or nursing services, whereas rest homes offer 24-hour supervision and supportive services for individuals who do not routinely require nursing or medical care. Nursing and rest homes are regulated by the Massachusetts Department of Public Health (DPH), while assisted living residences are certified by the Executive Office of Elder Affairs.

In March 2020, the Department of Public Health (DPH) implemented mandatory screening tests and visitor restrictions to promote social distancing and curb the spread of the virus (Bishop, 2021). Despite these efforts, between May 2020 and March 2021, COVID-19 accounted for thousands of LTC resident deaths statewide (Bishop, 2021). These unprecedented challenges prompted substantial changes to policies, care practices, and administrative operations within LTCs (Bishop, 2021). New innovations emerged rapidly in response to urgent needs during the pandemic (Johs-Artisensi, Hawes and Creapeau, 2023).

INNOVATION AND THE SOCIAL EXCLUSION OF LTC RESIDENTS

Visitor restrictions during the COVID-19 pandemic were broadly implemented, bringing attention to exclusions experienced by LTC residents, including social isolation, unequal access to services, and digital exclusion (Boamah *et al.*, 2021; Seifert, Cotton and Xie, 2021). These exclusions reflect a broader social exclusion of LTC residents and other older adults, where 'individuals are unable to participate fully in economic, social, political, and cultural life, as well as the processes leading to and sustaining such a state' (Yang *et al.*, 2016). The pandemic amplified LTC residents' social exclusion. In Massachusetts, policy established years prior to the pandemic supports LTCs to involve residents and their families as active members in project teams (Division of Quality Improvement, n.d.). However, LTC leaders may have viewed such inclusivity as impractical during the pandemic emergency.

While past studies have explored innovations implemented during the pandemic (Johs-Artisensi, Hawes and Creapeau, 2023; Bowers *et al.*, 2021), few have investigated whether residents or staff were included in innovation processes. The present study begins to address this gap by examining the types of innovations implemented in LTCs and the inclusion of stakeholders in innovation processes.

RESEARCH DESIGN AND METHODS

This qualitative descriptive study describes innovations adopted in LTCs from 2020 to 2024 in Massachusetts, approaches to innovation, including the engagement of LTC residents and staff in innovation processes, and stakeholder perspectives toward LTC innovations. This study followed Standards for Reporting Qualitative Research (O'Brien *et al.*, 2014). The study included fifteen semi-structured interviews. The study protocol was approved by the university Institutional Review Board (approval number: 5113).

REFLEXIVITY STATEMENT

The researcher characteristics and reflexivity of the first author were as a research assistant at the time of the study, while the second and third authors were faculty members at the University of Massachusetts, one with a speciality in sociology and the other with a speciality in nursing, both with considerable experience in LTC in research and practice. No member of the research team had a prior relationship with the participants. Though some professional networks may be shared, given this study took place in Massachusetts, where the third researcher has practised clinically, among stakeholders in LTC. Following each interview, the interviewer reflected on how their professional background, assumptions, and interactions with participants might have influenced data collection and the interpretation of participants' responses.

Participants were selected using a purposive, stratified convenience sampling method. Purposive sampling was used to select individuals with experience in innovation in Massachusetts LTCs since 2020, and stratification was used to ensure representation across four positions/roles: LTC residents, staff, administrators, and experts. Within these four categories, participants were selected

by prioritising their years of experience. We included residents who had lived in the LTC, administrators and staff who had worked in the LTC, and experts who had actively engaged in LTC research, policy, and practice, all since before 2020. Stratification ensured representation across the four categories of participants (residents, staff, administrators, experts), spanning for-profit and not-for-profit LTC settings, and expertise across LTC regulation, practice, and research.

DATA COLLECTION

The study included three LTC residents, two staff, three administrators, and seven experts. Interviews with residents and staff were conducted in person in a private room at their respective LTCs, and interviews with experts were conducted on an online meeting platform. Interviews were conducted by ML, a professor in nursing with extensive experience in qualitative research in LTC; the first author accompanied ML during the in-person interviews and facilitated informed consent and audio recording. Neither researcher had a prior relationship with the participants or the LTC facilities. Participants were informed of the researchers' affiliations and the study's purpose during informed consent. Each interview lasted approximately 20 to 75 minutes (resident interviews were shorter, and expert interviews were commonly longer). The semi-structured interview guide focused on innovation in LTC. All interviews were conducted in English and recorded for audio transcription. Interview recordings were transcribed in a multiphase process, using the videoconferencing platform to first generate draft transcripts, which were iteratively reviewed and revised by junior and senior researchers.

DATA ANALYSIS

Data were analysed using a hybrid deductive-inductive thematic analysis informed by the Consolidated Framework for Implementation Research (CFIR) and guided by Braun and Clarke's six-phase method (Braun and Clarke, 2006; Braun and Clarke, 2020). After familiarisation (phase 1), the first author coded the interviews (phase 2). The CFIR constructs and two context subcategories were integrated into the coding scheme after data collection but before transcript coding. The three constructs—Contexts, Design, and Processes—from the Implementation Process domain of the CFIR were applied deductively (Safaeinili *et al.*, 2020; Damschroder *et al.*, 2022), while additional codes were generated inductively from the data. Using this framework, we coded for two types of context: 'Inner Context', which encompassed factors within LTCs, including ownership, leadership, infrastructure and resources, relationships among leaders, staff, and residents, as well as organisational culture; and 'Outer Context' included external factors influencing LTCs, such as state regulations, funding from external sources, demographic changes, and societal disruptions. The first author conducted all transcript coding. The second and third authors reviewed and refined the codes and their definitions and contributed to the development and review of themes.

Coded data were grouped into categories or themes (phase 3) in relation to the three research aims, which describe types of innovation, innovation processes, and perspectives on innovation. Repeated reading of the interview data by the research team and ongoing discussion among the project team in biweekly meetings informed review (phase 4) and definition (phase 5) of the categories and themes. Biweekly meetings with a broader international team of scholars conducting parallel interviews in three other countries—Brazil, Canada, and Switzerland (Chu, Melo and Bowers, 2024)—supported summarisation of the themes (phase 6), with United States-based researchers describing nuances of internal and external LTC contexts that are unique to the United States (e.g., the role of Medicaid in US-based LTC). Microsoft Word macros were used to code the transcripts, and Microsoft Excel was used to organise, refine, and revise the categories. Saturation was reached when new interviews repeated information pertinent to the study aims that were already expressed in previous interviews without contributing substantial new information or perspectives (Hennink, Kaiser and Marconi, 2017). Transcripts and preliminary findings were not returned to participants for member checking because participant follow-up was not incorporated into the study procedures. Credibility was instead supported through data-source triangulation across stakeholder groups and peer debriefing, during which the second and third authors reviewed and refined the codes, categories, and themes. The interviewer also reflected on the interview process and their potential influence on data collection and interpretation. The culmination of this approach resulted in categories and themes addressing the three research aims.

RESULTS

A total of 15 individuals participated in study interviews, including seven LTC subject matter experts (e.g., researchers, provider association leaders, quality improvement advisors), three LTC residents, two LTC staff, and three LTC administrators from three different LTCs. Participant characteristics are summarised in Table 1.

PARTICIPANT ID	ROLE/POSITION	GENDER	RACE/ETHNICITY	YEARS IN ROLE/POSITION
R1	Resident	Female	White/non-Hispanic	Around 5 years
R2	Resident	Female	White/non-Hispanic	Around 5 years
R3	Resident	Female	White/non-Hispanic	5 years
S1	Staff	Female	White/non-Hispanic	Over 6 years
S2	Staff	Female	White/non-Hispanic	37 years
A1	Administrator	Female	White/non-Hispanic	35 years
A2	Administrator	Female	White/non-Hispanic	27 years
A3	Administrator	Male	White/non-Hispanic	30 years
E1	Expert	Male	White/non-Hispanic	Around 5 years
E2	Expert	Female	White/non-Hispanic	26 years
E3	Expert	Female	White/non-Hispanic	Over 20 years
E4	Expert	Female	White/non-Hispanic	40 years
E5	Expert	Female	White/non-Hispanic	20 years
E6	Expert	Male	White/non-Hispanic	Over 16 years
E7	Expert	Female	White/non-Hispanic	Over 35 years

Table 1 Participant characteristics (N = 15).

TYPES OF INNOVATIONS IMPLEMENTED IN LTCS SINCE COVID-19

Four categories of innovations implemented in LTC since COVID-19 were described: (1) product innovations, (2) process innovations, (3) workforce innovations, and (4) organisational innovations. Within each category, participants depicted multiple types of innovation (Table 2).

Product innovations: Technology adoption

Several technologies and products were adopted or became more extensively used. Participants described adopting video conferencing platforms to facilitate interactions between LTC residents and their family members, telehealth systems to enable communication among healthcare providers, LTC staff, and residents, sensor systems for fall prevention, voice-activated systems for nursing assessments, robotics for serving food to residents, mass communications technology for sending emails to large groups simultaneously, as well as electronic health records and artificial intelligence. In some cases, the successful adoption of new technologies was viewed as requiring costly technical assistance, as one administrator explained, 'I think that company could have embedded a nurse assistant on the floor 7 days a week just to be the technology liaison' (A3).

Process innovations: Infection control and healthcare delivery

Process innovations involved new practices aimed at infection control and healthcare delivery to prevent and control the spread of COVID-19. Participants described adopting processes for screening of COVID-19 symptoms, wearing personal protective equipment (PPE), cohorting residents together based on COVID-19 status, vaccinating residents and staff, and facilitating safe social interactions and visitation (e.g., for family visits) such as creating outdoor pavilions.

Workforce innovations: Training and support, new roles, and housing

Participants described three types of workforce innovations, focused on (a) workforce training and support, (b) new staff roles, and (c) workforce housing. Training and support innovations included enhanced orientation processes, shortened education and training programs, online courses, opportunities for staff to pursue nursing degrees, and specialised programs for community health workers. New and expanded staff roles included introducing new full-time nursing recruiters and infection preventionists, as well as expanded roles for hospitality aides to support CNAs in providing resident care. Some LTCs created on-site housing for staff.

Organizational innovations: Models of care

Organisational innovations advanced alternative models of LTC, including the small house model of LTC, the community-based LTC home model, and the growth of the Program of All-Inclusive Care for the Elderly (PACE). As one expert explained, 'I think there's been increasing interest in models of long-term care, such as the Green House and Small House nursing homes' (E4). Additionally, the establishment of speciality units for mental and behavioural health was described.

INNOVATION CATEGORY AND EXAMPLES	SAMPLE QUOTES
Technology Adoption - Video conferencing platforms, laptops - Telehealth - Remote sensor system for fall prevention - Voice-activated systems for nursing assessment - Robotics for meal service - Mass communications - Electronic health records - Artificial Intelligence (AI)	'The idea of Zoom and having quick access to Zoom was incredibly beneficial during COVID, when families couldn't visit. That was a technological innovation' (A2). 'We are starting to see some members utilizing robotics—for example, robots serving in the dining room or clearing tables... There's been an increase in exploring robotics. I wouldn't say it's widespread yet, but there are more than a handful of places starting to use it, and others are expressing interest in similar innovations' (E2).
Infection Control and Healthcare Delivery - Infection control: PPE, screening, cohorting - Vaccination of residents and staff - Build physical space that is safe for family visits	'How do we implement infectious disease control. How do we implement ensuring that we understand the requirements of PPE? How do we understand the importance associated with fit testing of respirators? This was a tremendous learning curve we were meeting, and again, we did this, and kudos to the Department of Public Health' (E6).
Workforce Training and Support - Enhanced orientation and preceptor programme for nurses - Training programme for community health workers - Support for staff education, degrees - State-funded workforce and scholarship programmes - Shorter training programmes	'People have the opportunity to go to college for free as long as they don't have a prior degree. So, you can have people go directly to get their RN or people who are LPN to get their RN. The State is funding that. So, we're seeing a lot of our LPNs becoming RNs, or certified nursing assistants (CNAs) or even people who work in different departments want to become an RN. And they're taking advantage of those two programs, right now, currently. And it's really increasing the skill base in our nursing home. It's even increasing our workforce a little bit. We are able to get people to come to work for us' (E7).
New Staff Roles - Full-time nursing recruiter - New infection preventionist position	'We've never had a separate, full-time recruiter. We're a little independent building. We now have a full-time nursing recruiter' (A2).
Workforce Housing - Make housing available for staff - Develop or acquire housing for staff	'One nursing home in Massachusetts on the Cape... actually went ahead and developed or acquired housing for staff' (E2).
Models of Care - Small house and Green House models - Disability model - Assisted living and independent living - Speciality units for mental and behavioural health - Expansion and growth of PACE* - Community-based home model	'I think there's been increasing interest in models of long-term care, such as the Green House and Small House nursing homes' (E4). 'Part of the problem with our current system is the medical model. How does that change when you're more of a supporter or an enabler, using a disability model instead of a care model, which is more of a "do for" model?' (E3). 'The nursing home industry is looking to continue moving away from the institutional model and presenting themselves differently' (E6) 'Over the last 25 years, independent living has grown significantly. Then assisted living started getting regulated, and independent living expanded further. Innovation like that wouldn't have happened under CMS Medicare restrictions' (A3).

Table 2 Categories of innovations in LTC since COVID-19.

*PACE: Program of All-Inclusive Care for the Elderly.

APPROACHES TO INNOVATION IN LTC SINCE COVID-19

Three themes depict approaches to innovation in LTC since COVID-19: (1) top-down approaches to innovation, (2) formal and informal approaches to innovation, (3) engagement of LTC residents in innovation, and (4) engagement of LTC staff in innovation. Each theme is described below, and select participant quotes are presented in Table 3.

Top-down approaches to innovation

Approaches to innovation in LTC were described by most participants as top-down. Participants often noted that the top-down approach served as a response to COVID-19. Organisations relied heavily on directives from internal leadership and external regulations to guide their innovation decisions. Policy was depicted as key to driving changes. As an administrator explained, "Because we're such a highly regulated industry, a lot of our innovations are in reaction to changes that CMS [Centers for Medicaid and Medicare Services] is making" (A2).

Participants described guidance and regulations issued by federal and state authorities that left local organisations to figure out their implementation approaches, and these approaches commonly did not incorporate input from primary stakeholders such as residents and staff. An LTC staff member described this approach: 'I don't think we really get to say. We just are going to be told, "Okay, this is what we're doing now"' (S1).

THEME	EXAMPLE QUOTES
Top-down approaches to innovation	'My sense around COVID is, it was run pretty militaristically, and so it was pretty top-down, and it was an emergency setting, the death was just astounding at that time, and so it was really run more like a command center. But I do think that that's easing, and there's opportunity for other things' (A3).
	'Because we're such a highly regulated industry, a lot of our innovations are in reaction to changes that CMS is making' (A2).
	'It was never effective if you had it, top down like this, and without the frontline, if it's not being supported by the leadership. But again, it was those cultures, those organizations that valued and allowed for those voices of the frontline to really influence how things would be done' (E2).
	'I think you really need like a structured implementation program and the support to really make these changes. And it really has to start at the top…' (E3).
	'Once COVID hit, the State stepped in and increased the level of communication, first on a daily basis, with intense education conversations. They gave us room to share concerns and fears. They gave us guidance, they gave us protocol; Mass Senior Care did a ton of advocating for us along the way, and it made us better as far as in-the-moment, quick education and being able to pivot on a dime' (E7).
Formal and informal approaches to innovation	'We did a fishbone diagram, kind of laid out all the problems, all the possible sources of the problem. And then we focused on one or two. But sometimes it's just somebody throwing out an idea—"Well, why don't we try this?" So, it could be a variety of differences. Certainly, if we have, the bigger problem, the more formal the solution, the more likely, the more chances that we'll have data, and we'll really kind of dig into it' (E2).
	'A really negative resident event 2–3 years ago, and it was human error—not checking on a patient who's an otherwise independent living type of elder—and kind of going through the root cause analysis of that incident just really clear' (A3).
Engagement of LTC residents in innovation	'We went to family members first; beyond that, we formed a resident technology committee… we used them first to meet the partners we picked in the Massachusetts Digital Sandbox. So, as different pitches came to us, we used the Resident Tech Committee to give us some encouragement or discouragement about who we would partner with' (A3).
	'Certainly, if a resident or a group of residents complains or has concerns about things and has an idea of how they'd like to have that problem solved, we would certainly bring that forward to the administration of the facility' (E1).
	'They really involved the residents in this process of understanding what was important to them and helping them to kind of get to this decision' (E2).
	'I think it's more important if something is good to let them know. Yeah. But if you don't like it, you don't like it. And you're going to let them know that. Yeah, and I do' (R3).
	'What do we need to do differently in their home to support them? I think resident participation is the next step for us. And I think it's critical to every facility being able to move forward' (A1).
Engagement of LTC staff in innovation	'…we have the managers talking to the staff about what's working and what's not. And that's just a very simple question to them, and they'll tell you very clearly what's not working. For managers, for leaders in the building, we just have to turn up our hearing aids and listen' (A1).
	'…We do, I think, a good job of not just wholesale making a change but trying to implement a change in one area, see how it goes, get their feedback, and then adjust it in another' (A2).
	'You've got to build on what they're already doing. You've got to acknowledge that [staff] are already doing great things. You're there to learn from them, and you're not adding a huge new burden… You can't have them doing an extra hour of documentation a day like that's just not going to fly. So, figuring out how to make it part of and sort of aligned within the workflows that they have' (E4).
	'I think for like management, yes, but just like a floor nurse or CNA, we're not really asked our opinion or what we think could be better or be changed or anything like that. But management talks about that kind of stuff together' (S1).

Table 3 Themes: Approaches to innovation in LTC since COVID-19.

Formal and informal approaches to innovation

Both formal and informal approaches to innovation were described. Although innovation was often depicted by LTC experts and administrators as a formal process that involved identifying problems and analysing their root causes, the formality of the approach taken depended on the complexity and scale of the problem. For larger issues or significant negative resident events, formal solutions with thorough root cause analysis were prioritised, whereas for smaller or less critical problems, more informal and spontaneous approaches were common.

Engagement of primary LTC stakeholders in innovation

Several participants emphasised the importance of engaging residents and staff in planning and implementing innovations, especially if the innovation could impact

staff workflows or resident care. Organisational leaders sometimes sought staff perspectives to identify challenges and potential solutions through discussions and storytelling, and some piloted innovations on a small scale and considered staff feedback before broader implementation. However, the perspectives of LTC residents and staff were not commonly incorporated into innovation planning. Rather, residents' feedback often was sought after innovations were implemented. The potential role of resident and staff input in shaping innovations was commonly acknowledged but sometimes viewed as aspirational, as one administrator explained: 'I think resident participation is the next step for us. And I think it's critical to every facility being able to move forward' (A1).

Similar to LTC residents being excluded from innovation processes, administrators and experts reflected that LTCs were often treated as end-users of innovations, particularly product innovations, and were commonly uninvolved in product design. While LTC experts and administrators emphasised the importance of identifying and analysing problems before implementing changes or innovations, staff members shared that they were commonly excluded from innovation planning when considering what needed to be improved; as an LTC staff explained, 'We're not really asked our opinion' (S1).

PERSPECTIVES ON INNOVATIONS IN LTC SINCE COVID-19

Three themes depict participant perspectives toward innovations in LTC since COVID-19. These themes address motivations for innovation (to support the meeting of residents' needs) and challenges to innovation (financial resource limitations and staffing challenges). These themes are described below, and select participant quotes are exhibited in Table 4.

Innovations emerging to support the meeting of resident needs in the face of challenges

Although innovations were commonly introduced from above, resident needs played a key role in shaping some LTC innovations, such as the adoption of technologies to support residents in maintaining contact with people outside LTC during COVID-19 lockdowns. Participants described innovations aimed at enhancing residents' experiences, such as improving transportation for medical appointments. However, resident interviews indicated that their needs were not always fully addressed, and some suggested that more accessible communication with residents is needed, e.g., 'I think there should be a new added [staff] person to put these things out to us [residents] and give us choices that we can just check off. A lot of people [residents] would rather be talked to than have to look at something because they have a hard time seeing' (R1).

Financial resource limitations constrain innovation

Participants across roles/positions highlighted challenges to innovation related to LTC financial resource limitations constraining innovation. These constraints, including limited budget and reimbursement, impacted regular operations and posed difficulties in implementing innovations. Several participants specified that financial challenges, particularly limited Medicaid funding and low reimbursement rates, serve as barriers to organisational innovations. LTC staff also noted the financial strain, with participants sometimes mentioning the closure of LTCs due to budgetary constraints. One resident described how financial resources being skimmed from the top affected basic care, such as lacking essential supplies: 'I think it's the big Kahunas putting a lot of money in their pockets and we aren't getting the things on the floors that we need' (R1).

Staffing challenges make it hard to innovate

Workforce shortages and staff turnover were commonly identified as posing challenges to innovation and meeting the basic care needs of residents. Staffing challenges were depicted as long-standing but also as worsened by COVID-19. Organisational attention to staffing issues was depicted as pulling attention away from innovation (e.g., 'We can't even think about innovation right now because we are literally trying to keep doors open' (E4)), and maintaining ample and stable staffing was viewed as a prerequisite for successful innovation.

DISCUSSION

This study examined innovations adopted in LTC in Massachusetts following the onset of the COVID-19 pandemic and LTC stakeholder perspectives toward innovation processes and the engagement of LTC stakeholders in innovation. Four types of innovations—product, process, workforce, and oganisational—were described by study participants, and the different types of innovations were implemented for different reasons using various processes.

Product and process innovations were commonly adopted to ensure resident health and safety while maintaining social connections amid social distancing mandates. As other studies have found, common innovations included LTCs following infection control protocols, including vaccination and PPE (Chen, Ryskina and Jung, 2020), to prevent virus transmission (Johs-Artisensi, Hawes and Creapeau, 2023), and adopting technologies for residents to stay connected with friends and family (Bowers *et al.*, 2021; Beogo *et al.*, 2023; Melo *et al.*, 2024). State regulations spurred some product and process responses, as also observed in other studies (Lipsitz *et al.*, 2020), which might have constrained other product and process innovations as LTC resources

THEME	SAMPLE QUOTES
Innovations emerging to support the meeting of resident needs in the face of challenges	'Can we set up an area which will be safe for visitation? Can we build a pavilion or put a screen around something we already had? The use of computers to provide those connections—those are some of the things I would point to. Over the past number of years, certainly, the use of technology and innovation has addressed a very, very important part of an overall care plan for individuals' (E6). 'If somebody needs to go and get dialysis, they can't. Transportation—they can't get them there. And so, this was just an innovation that's met a lot of different needs. This is an organization that's really embraced that mentality of, "We've got to do more. We're going to be better"' (E2). 'I think that most of the facilities were coming up with that on their own if they did not, and residents were complaining about lack of contact with people' (E1). 'I think there should be a new added person to put these things out to us and give us choices that we can just check off. A lot of people would rather be talked to than have to look at something because they have a hard time seeing' (R1).
Financial resource limitations constrain innovation	'Funding definitely helps...Because we don't get reimbursed enough in a nursing home, so it makes it very, very challenging to be able to sustain and incorporate and develop innovative programs' (E7). 'So, when you say obstacles, I'm just going to say, financially, it's a financial component in the development model. It's just an obstacle' (A3). 'Since COVID we've had quite a few close. It all comes down to the financial part of it. I wish there was a way to give back to the owners to help them financially and get everything that needs to be done for our residents for the proper care. So, it's giving back to the companies that rebuild and make it through' (S2). 'It's just been so hard, especially when you're talking about nursing homes that have so many regulatory requirements, and insufficient resources to do what they need to do on a day-to-day basis' (E2).
Staffing challenges make it hard to innovate	'There has been an absolutely significant turnover, with lots of people leaving aging programs and services. That has driven staffing to be such a huge issue that a lot of organizations have said, "We can't even think about innovation right now because we are literally trying to keep doors open"' (E4). 'The headline these days in skilled nursing facilities is all staffing, staffing, staffing. There's just been a staffing crisis that started before COVID and has only gotten worse' (E5). 'The pandemic hits, and people are leaving for good. Leaving temporarily, people died, staff died...the best situation for innovation is that you've got your basics down pat. And then you're like, well, how can we expand on this, and how can we move forward and do something even better' (E1). 'That is because of the staffing and people out being sick we did not have enough help to take care of the patients and the COVID was starting to become more and more positive residents' (S2). 'They see nursing homes don't have enough staff. They're all horrible. So, that's a challenge for us and I think that will continue to be a challenge' (A2).

Table 4 Themes: Perspectives on innovations in LTC since COVID-19.

were focused on regulatory compliance (McGarry and Grabowski, 2021). In contrast, internal LTC-level policies and external regulations often motivated workforce and organisational innovations. Workforce shortages and turnover within LTCs were identified as limiting the capacity of LTCs to innovate, but staffing challenges were also recognised as motivating workforce innovations, including the development of new staff roles and workforce housing. Other studies also have found LTCs restructuring staff roles, strengthening teamwork, and promoting flexibility in staff scheduling, and more generally adopting workforce-supportive innovations reflecting local and site-specific workplace cultures (Johs-Artisensi, Hawes and Creapeau, 2023; Lyng, Ree *et al.*, 2021; Lyng, Macrae *et al.*, 2021). The catastrophic death toll experienced in LTC during COVID-19 was also characterised as contributing motivation for LTC organisational innovations, such as promoting the small-house model of LTC and integrated models that link healthcare and social care.

Approaches to LTC innovation were commonly top-down, decided upon by LTC leaders and sometimes based on state mandates, with little bottom-up input from LTC residents or staff. Such a centralised, command-and-control approach can be effective for emergency response in LTC. A longitudinal study of 360 Massachusetts nursing homes showed that establishing a central command team and using checklists, incentives, and consultations helped reduce infection rates (Lipsitz *et al.*, 2020). Despite the commonness of top-down approaches to innovation, the approaches taken differed based on problem severity and complexity, with bigger and more complex challenges often spurring formalised data-driven innovation approaches, and smaller or simpler problems spurring more informal and spontaneous innovation efforts. While top-down approaches to innovation may be common, bottom-up approaches, particularly the active involvement of staff and residents, were consistently identified as fostering meaningful innovation. These findings highlight the mix of approaches to innovation in LTC, including the commonly observed top-down approach and less common bottom-up approaches that engage key

stakeholders. Research on innovation readiness in LTC has also emphasised the importance of both top-down managerial support for innovation and the bottom-up participation of older adult residents and frontline staff (van den Hoed *et al.*, 2024).

Consistent with other studies that examined LTC innovations during the pandemic, we found concerns about meeting residents' needs as motivating innovations, yet also an exclusion of resident input from innovation planning (Johs-Artisensi, Hawes and Creapeau, 2023; Seifert, Cotten and Xie, 2021; Bowers *et al.*, 2021). We found that LTC residents were largely excluded from innovation processes, even though they were affected by the external contexts driving these innovations, such as the pandemic, as well as by the innovations implemented in LTCs; similar instances of resident exclusion from innovation processes have also been observed internationally (Santos *et al.*, 2024). These findings reflect a long-standing concern about social exclusion in later life (Johs-Artisensi, Hawes and Creapeau, 2023; Boamah *et al.*, 2021; Seifert, Cotten and Xie, 2021; Yang *et al.*, 2016). Despite not being common practice, we also found broad-based agreement with the importance of resident participation in LTC innovation processes (Yang *et al.*, 2016; Division of Quality Improvement, n.d.).

Study limitations highlight opportunities for future research. First, this study focuses solely on LTCs in Massachusetts during the 2020–2024 period. Research in other states and countries and during other periods could reveal different types of LTC innovations, different approaches to innovation, and different levels of resident engagement in innovation. Second, we conducted one-on-one interviews with various LTC stakeholders, but not family members of LTC residents, and inclusion of family members could bring to light additional perspectives toward LTC innovation. Furthermore, other methods—e.g., group interviews or focus groups—could be valuable for identifying different perspectives toward innovation. Third, only two staff members participated. Although their accounts were consistent with those of several administrators, findings concerning staff experiences and their exclusion from innovation processes should be interpreted cautiously. Fourth, the sample was racially and ethnically homogenous, and recruitment was not stratified by race or ethnicity. The homogeneity may limit the transferability of the findings and the extent to which the study captures differences in experiences of exclusion among diverse LTC stakeholders.

CONCLUSION

This study described the types of innovations implemented in LTC in Massachusetts during the COVID-19 pandemic, stakeholder engagement in innovation processes, and stakeholder perspectives on innovations. Most innovations were initiated through a top-down approach and motivated by regulations or protocols set by LTC governing or regulatory organisations. Findings reinforce the theoretical perspective of social exclusion in later life by showing the limited involvement of LTC residents. More effort appears to be needed to involve LTC residents and staff earlier in innovation processes.

DATA ACCESSIBILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author, ML, upon reasonable request. They are not publicly accessible because the confidentiality requirements specified in the study's ethical approval are intended to protect participants' privacy.

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COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR CONTRIBUTIONS

ML, RGL, and SG conceptualised and designed the study. ML and SG led the data acquisition. SG, ML, and RGL analysed and interpreted the data. SG and RGL drafted the original manuscript. ML and RGL critically revised the manuscript for important intellectual content. All authors read and approved the final manuscript.

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