



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Contents lists available at ScienceDirect

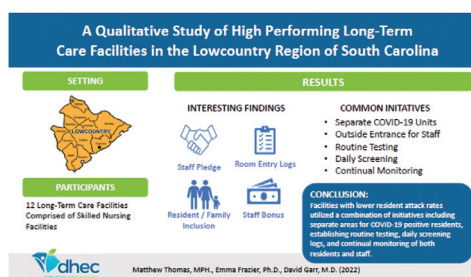
American Journal of Infection Control

journal homepage: www.ajicjournal.org

Brief Report

Managing COVID-19 transmission in long-term care: A qualitative study of high performing facilities

 Matthew Thomas MPH ^{a,b,*}, Emma Frazier PhD ^a, David Garr MD ^{a,b}
^a Lowcountry Department of Health and Environmental Control, Columbia, SC

^b College of Medicine, Department of Public Health, Medical University of South Carolina, Charleston, SC


Key words:

 Pandemic response
 Vulnerable Populations
 Infection prevention
 South Carolina

Ever since its emergence, COVID-19 has posed a serious threat to members of the population who are older and have underlying health conditions, with those residing in Long-Term Care Facilities being particularly susceptible. The purpose of this study was to explore initiatives implemented by Long-Term Care Facilities which had lower COVID-19 transmission compared to their regional counterparts. Of the facilities interviewed, the majority implemented a routine testing schedule for residents utilizing both PCR and Rapid Antigen nasal tests, while also separately housing residents who may be at an increased risk. The results of this study could serve as a guidance for other facilities.

© 2022 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.

While the COVID-19 pandemic has posed a health risk to everyone, multiple studies have shown that older individuals and those with underlying health conditions are at a greater risk of developing a severe illness.^{1–4} Most residents in Long Term Care Facilities (LTCFs) are older and have underlying conditions, making them among the most susceptible to severe COVID-19 illness.^{5,6} However, interventions such as routine testing and resident cohorting has been proposed as an effective way to mitigate adverse outcomes from COVID-19. This study examined LTCFs which had lower COVID-19 transmission compared to their regional counterparts in the eleven counties constituting the South Carolina Lowcountry region and focused on transmission of COVID-19 infections that occurred in 2020. The primary purpose of this study was to identify measures taken by LTCFs which may have resulted in a lower transmission rate of COVID-19 among their residents and staff.

METHODS

This qualitative study was based on semi-structured interviews with representatives from LTCFs located in the Lowcountry region of South Carolina. To conduct this study, the researchers partnered with the regional Lowcountry South Carolina Department of Health and Environmental Control's (SCDHEC) Infection Prevention and Control (IPC) Team. A list of LTCFs within the Lowcountry region of South Carolina was obtained and utilized as a starting point for data collection. Information regarding the number and trend of COVID-19 infections that occurred among residents and staff between March 6, 2020, and December 31, 2020, was then examined for each LTCF. These dates were chosen as they represent the first identified case in South Carolina and the end of the 2020 year, which was prior to the widespread availability of the COVID-19 vaccine.

Each facility's resident attack proportion was assessed by comparing the facility's Infection Control Assessment and Response questionnaire to recorded lists of residents confirmed positives (line lists). The Infection Control Assessment and Response was used to document the number of residents within a facility, while the line list was used to evaluate the number of cases within a facility. The resident attack proportion was recalculated monthly until the conclusion of

* Address correspondence to Matthew Thomas, MPH, South Carolina Department of Health and Environmental Control, 8105 Panshire Court, North Charleston, SC 29418.

E-mail address: mat253@musc.edu (M. Thomas).

Conflicts of interest: None to report.

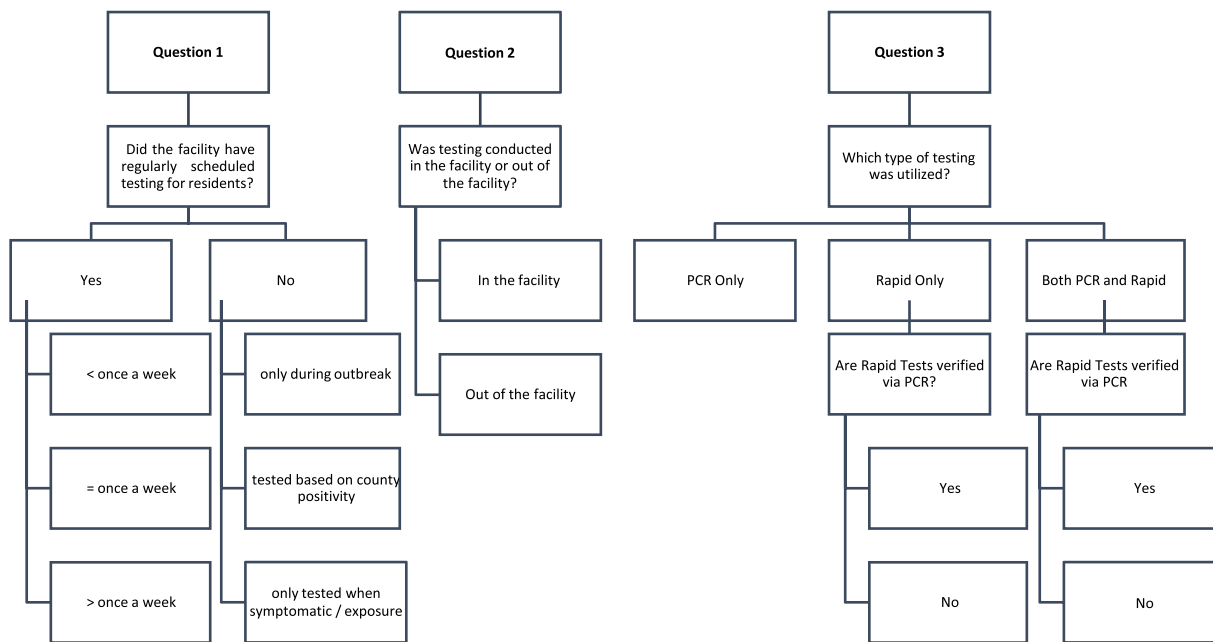


Fig 1. Facility testing policies coding tree.

the 2020 year. Facilities were invited to participate in the study if they had a proportion of residents who tested positive at or below 25%, with a buffer of 5%, totaling 30%. A buffer was included to account for any resident proportion fluctuation that may have occurred due to new resident admissions/discharges, as well as ensuring all selected facilities exhibited a resident attack proportion below the lowcountry LTCF average of 32%. Based on the inclusion criterion, a total of 16 facilities out of the 37 identified were contacted, and 12 of the 16 agreed to participate in the study, while the other 4 declined to participate or did not respond when contacted.

A point of contact was identified by the SCDHEC ICP team in each facility, and an introductory meeting was scheduled between the facility contact, the ICP team member, and the researcher assigned to the facility. Facility representatives who agreed to participate were given an interview date and asked to complete an informed consent form. During the telephone interview, a modified version of the SCDHEC “Infection Control Assessment During COVID-19 Outbreak” questionnaire was utilized to collect information regarding each facility’s implemented initiatives. To enhance the validity of our study, more than 1 member of the research team listened to or participated in several of the interviews.

Once the interviews were completed, the responses were summarized and recorded in 7 categories – COVID unit characteristics, facility testing characteristics, resident testing characteristics, staff testing characteristics, resident characteristics, staff characteristics, and open-ended responses. The responses were coded utilizing a coding tree specific to each of the 6 categories, as seen in the tree for “Facility Testing Policies” (Fig 1). Results from the coding process were compared to identify potential patterns among initiatives implemented that may have been associated with lower infection rates within the facilities (Table 1). Sources of the responses to the open-ended section were redacted to eliminate identifying information and then included in the study results.

RESULTS

When asked about COVID unit characteristics, all 12 facility respondents noted that residents who tested positive for COVID-19

were isolated for a period of 10-14 days. Of those 12 facilities, 11 reported having a dedicated unit for COVID-19 positive residents. When needed, facilities relied on improvised barriers such as zip walls and/or STARC walls to physically separate COVID-19 positive residents. When asked about facility testing procedures, a majority (64%) of facilities reported requiring regularly scheduled testing for residents, which most often was done once each week. All 12 facilities reported isolating residents until test results were available.

Most facilities reported having staff members who worked at other facilities, and 2 facilities subjected those staff members to an increased frequency of COVID-19 testing. Additionally, 8 of the 12 facilities noted that they had residents who were required to leave the facility for additional care. The 3 most common ways these facilities managed those residents were housing them in a separate area, requiring additional testing, and/or screening them for symptoms more often.

Table 1
Questionnaire responses

Initiatives implemented by LTCF's	Yes		No		Total n
	n	%	n	%	
Covid unit information					
Exterior doors	8	73%	3	27%	11
Separate interior	7	64%	4	36%	11
Improvised barriers	4	36%	7	64%	11
Facility testing procedures					
Both PCR / rapid	7	64%	4	36%	11
Rapid only	2	18%	9	82%	11
PCR only	2	18%	9	82%	11
Staff characteristics					
Staff working at other facilities	10	83%	2	17%	12
Required additional testing	2	17%	10	83%	12
Staff dedicated to specific units	11	92%	1	8%	12
Staff assigned to different units between shifts	5	42%	7	58%	12
Residents requiring outside care characteristics					
Housed separately	6	75%	2	25%	8
Tested more frequently	5	63%	3	37%	8
Screened more frequently	2	25%	6	75%	8

The 2 most common challenges cited were difficulty maintaining sufficient staffing and hesitancy of existing staff to care for COVID-19 positive residents. Facilities addressed these challenges by providing frequent infection control seminars, making sure an adequate supply of personal protective equipment was available, and educating staff how to properly use the protective equipment. Additionally, multiple facilities cited paying staff for time off, utilizing either additional vacation or paid sick leave days. One facility implemented bonuses with the goal of retaining staff and reducing their need to work elsewhere.

Other challenges mentioned included making sure dementia patients had sufficient help to adhere to COVID prevention measures, which was addressed by hiring a full-time monitor for that unit. Additionally, the physical layout of the building posed challenges for some facilities when needing to isolate residents. They addressed this by installing barriers to separate these residents from others.

DISCUSSION

Several potentially valuable insights emerged from the open-ended portion of the interview process. One facility indicated that both their care team and management team adopted a pledge on how to conduct themselves when not working which would reduce their risk for contracting and transmitting COVID-19. Room entry logs were used to record all personnel who entered and exited patients' rooms, which made contact tracing more efficient and effective. Also, multiple facilities cited that including residents and family members in all facility updates increased support and allowed them to better perform their duties inside the facility. One facility used their intercom system to provide daily progress updates for the residents and staff. Another recurring theme was limiting nonessential incoming and outgoing traffic within the facility. Multiple facilities cited utilizing telehealth for their residents, and one facility cited testing all new resident admissions regardless of previous testing.

One facility mentioned utilizing only disposable dinnerware to reduce the risk for transmission within the facility. Additionally, morale among staff was reported to improve when members of the facility's administration were involved, understood and acknowledged the challenges the pandemic posed, and solicited the staff members' input and concerns.

The major overarching themes cited by the interviewees that they believed contributed to the low transmission rate among their residents / staff were the regularly scheduled use of testing, symptom screening, and infection control education. When examining similar studies regarding COVID-19 management in long-term care, the use of universal COVID-19 testing was repeatedly cited, which aligns with the opinions provided by our interviewees.⁷ Additionally, numerous facilities credited their success to the cooperation from governmental agencies, specifically the support they received from their local health department.

When comparing the initiatives mentioned by interviewed facilities to current understanding of infection control literature, similar themes emerged. The main strategies found during our literature review included establishing surveillance and monitoring, mandating the use of PPE, and isolation/cohorting measures for infected residents.⁸ Those interviewed for this study appeared to address these priorities using routine testing and continuous infection contact tracing, establishing and sustaining a series of checks to ensure proper PPE use among staff, and by utilizing dedicated spaces for suspected and confirmed COVID-19 positive residents.⁸ One initiative cited from the interviews that had not been seen previously in the literature was the use of pay bonuses to deter facility staff from seeking outside employment, which facility members believe reduced the risk of transmission acquired from the outside community.

While it is reassuring to have seen similar themes emerge during our interviews, it is important to mention that some of the implemented practices are only successful when conducted properly. For example, cohorting is known as an effective mitigation strategy. It takes skill and experience, however, to be effective and should involve as little resident movement as possible.^{1 8,9} When not conducted properly, it can expose COVID-suspected residents to known positive residents, ultimately increasing transmission.

LIMITATIONS

Due to the retrospective nature of this study, information given by interviewees may have been subject to recall bias. This study only looked at facilities which exhibited a resident proportion of positive COVID tests below the lowcountry average, so there was no comparison group of facilities with higher COVID infection rates. Additionally, because inclusion criteria was based solely on the resident attack proportion, LTCFs that tested more frequently may have reported a higher positive case rate, which ultimately excluded them from participation in this study despite strong infection control protocols. Lastly, facilities often reported modifying their protocols based on the most up-to-date recommendations from local, regional, and national entities. This resulted in changes to protocols as new information became available during the pandemic. Reported changes include testing policies, recommendations for quarantine duration, and criteria for discontinuing isolation. While the data collected during this study was not subject to statistical analysis and significance testing, it provides insight into policies and procedures implemented during the 2020 year of the COVID-19 pandemic that were designed to reduce the incidence of COVID-19 in LTCFs.

CONCLUSION

This study was conducted to document infection prevention methods utilized by High Performing LTCFs. In addition to examining already established methods of infection control, this study identified newly implemented policies, including the use of room entry logs and daily progress updates for the entire LTCF. Information and insights acquired from this study could be used to enhance infection control protocols to help them prepare for the next epidemic or pandemic.

Acknowledgments

We would like to thank the members of the Lowcountry SCDHEC who contributed their expertise and insights to this project: Dr Katherine Richardson, Dr Tracy Gilliard, Jennifer Reynolds, Debra Sarvis, Lynne Sanders, Erin Holbrook, Mary Finley, and Elizabeth Teague. We would also like to thank the LTCF's administrative and clinical staff who took time to provide valuable information about their experiences with the COVID-19 pandemic and their initiatives to address the challenges COVID-19 posed.

References

- Centers for Disease Control and Prevention. (n.d.). People with certain medical conditions. Centers Dis Control Prev. Retrieved December 7, 2021, from <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>.
- Gao YD, Ding M, Dong X, et al. (n.d.). Risk factors for severe and critically ill COVID-19 patients: a review. Allergy. Retrieved December 7, 2021, from <https://pubmed.ncbi.nlm.nih.gov/33185910/>.

¹ Cohorting is an infection prevention method which groups together residents who have a history of COVID-19 infection, and those with no history of infection.¹⁰

3. Shrader CD, Assadzandi S, Pilkerton CS, Ashcraft AM. Responding to a COVID-19 outbreak at a long-term care facility. *J Appl Gerontol*. Jan;40:14–17. Epub 2020 Sep 17. PMID: 32940123; PMCID: PMC7769895.
4. Yi SH, See I, Kent AG, et al. Characterization of COVID-19 in assisted living facilities — 39 States, October 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69:1730–1735.
5. Halek M, Reuther S, Schmidt J. Herausforderungen für die pflegerische versorgung in der stationären altenhilfe: corona-pandemie 2020 [Challenges of COVID-19 for nursing care in nursing homes]. *MMW Fortschr Med*. May;162:51–54. German. PMID: 32405838; PMCID: PMC7218703.
6. Ochieng N, Chidambaram P., Garfield R., Neuman T., Factors associated with COVID-19 cases and deaths in long-term care facilities: findings from a literature review, (KFF. Jan 14, 2021) <https://www.kff.org/coronavirus-covid-19/issue-brief/factors-associated-with-covid-19-cases-and-deaths-in-long-term-care-facilities-findings-from-a-literature-review/> Accessed July 28, 2022.
7. Dykgraaf SH, Matenge S, Desborough J, et al. Protecting nursing homes and long-term care facilities from COVID-19: a rapid review of international evidence. *J Am Med Direct Assoc*. 2021;22:1969–1988.
8. Rios P, Radhakrishnan A, Williams C, et al. Preventing the transmission of COVID-19 and other coronaviruses in older adults aged 60 years and above living in long-term care: a rapid review. *Syst Rev*. 2020;9:218.
9. Centers for Medicare and Medicaid Services. (2020, April 2). COVID-19 long-term care facility guidance. Retrieved from <https://scdhec.gov/sites/default/files/media/document/Updated%20CMS%20Guidance%20for%20Long-Term%20Care%20Facilities.pdf> Accessed July 28, 2022.
10. Washington State Department of Health. (2022). Recommendations for cohorting in long-term care facilities during a COVID-19 outbreak. <https://doh.wa.gov/sites/default/files/2022-02/420-368-LTCFCohorting.pdf> Accessed July 28, 2022.