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.

JAMDA 23 (2022) 1109–1113

JAMDA

journal homepage: www.jamda.com

Original Study - Brief Report

Impact of COVID-19 on Structure and Function of Program of All-Inclusive Care for the Elderly (PACE) Sites in North Carolina

Neha Aggarwal BSPH [a], Philip D. Sloane MD, MPH [b,*], Sheryl Zimmerman PhD [c], Kimberly Ward MPH [d], Christina Horsford MSW, MPA [e]

[a] School of Medicine, Vanderbilt University, Nashville TN, USA
[b] Cecil G. Sheps Center for Health Services Research and Departments of Family Medicine and Internal Medicine, School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA
[c] Cecil G. Sheps Center for Health Services Research and Schools of Social Work and Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA
[d] Duke University Health System, Durham NC, USA
[e] School of Social Work, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

Keywords:
COVID-19

A B S T R A C T

Objectives: The novel coronavirus disease 2019 (COVID-19) deeply affected all forms of long-term care for older adults, highlighting infection control issues, provider and staff shortages, and other challenges. As a comparatively new, community-based long-term care option, the Program of All-Inclusive Care for the Elderly (PACE) faced unique challenges. This project investigated the impact of COVID-19 on operations in all PACE programs in one US state.
Design: Qualitative study.
Setting and Participants: Structured interviews with administrators of all 12 PACE programs in North Carolina.
Methods: Interviews were conducted December 2020 to January 2021 by trained interviewers over Zoom; they were transcribed, coded, and qualitatively analyzed using thematic analysis.
Results: Reported COVID-19 infection rates among PACE participants for 2020 averaged 12.3 cases, 4.6 hospitalizations, and 1.9 deaths per 100 enrollees. Six themes emerged from analyses: new, unprecedented administrative challenges; insufficient access to and integration with other health care providers; reevaluation of the core PACE model, resulting in a transition to home-based care; reorientation to be more family-focused in care provision; implementation of new, creative strategies to address participant and family psychological and social well-being in the home; and major reconfiguration of staffing, including transitions to new and different roles and a concomitant effort to provide support and relief to staff.
Conclusions and Implications: While facing many challenges that required major changes in care provision, PACE was successful in mounting a COVID-19 response that upheld safety, promoted the physical and mental well-being of participants, and responded to the needs of family caregivers. Administrators felt that, after the pandemic, the PACE service model is likely to remain more home-based and less reliant on the day center than in the past. As a result, PACE may have changed for the better and be well-positioned to play an expanded role in our evolving long-term care system.

Early spread of the novel coronavirus disease 2019 (COVID-19) was particularly devastating among long-term care settings, in which multiple caregivers serve multiple people who are older, physically and/or cognitively impaired, and have underlying medical conditions—all of which increase the risk of contracting COVID-19 and becoming seriously ill from the disease.[1–3] The population of North Carolina (NC) typified those at risk: in 2018, 84% of older adults had at least 1 chronic disease and 55% had multiple chronic diseases.[4] Because of these and other factors, COVID-19 incidence and mortality in NC long-term care settings were striking; in 2020, depending on

This project was supported by the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant Award Number UL1TR002489. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.
* Address correspondence to Philip D. Sloane, MD, MPH, Cecil G. Sheps Center for Health Services Research and Departments of Family Medicine and Internal Medicine, School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA.
E-mail address: Philip_Sloane@med.unc.edu (P.D. Sloane).

https://doi.org/10.1016/j.jamda.2022.05.002
1525-8610/

when the statistics were computed, long-term care residents comprised between 35% and 62% of the state's COVID-19–related deaths.[5,6]

Much has been written about COVID-19 in nursing homes,[7–10] and literature has been emerging about COVID-19 in assisted living,[11–14] but very little has been written about COVID-19 in the Program of All-Inclusive Care for the Elderly (PACE). PACE is intended for persons who qualify for nursing home care but prefer to remain at home. It is a capitated program financed largely by Medicare and Medicaid that covers all care needs and related costs.[15] The average participant has 8 medical conditions, the most common being diabetes, dementia, coronary artery disease, cerebrovascular disease, depression, bipolar disorder, and paranoid disorders.[16,17] PACE is both a health provider and a health plan, with the model designed to not only provide medical services but also offer meals, socialization, and personal care. Services in the PACE model were designed to revolve around a day center, to which all (or nearly all) participants were transported at least once a week, and that included a clinic, rehabilitation services, social and behavioral services, a pharmacy, and an adult day program.[15,17] Since federal funding was approved in 1997, PACE has grown to include 144 programs operating 272 centers in 30 states, with the average center serving 202 participants[18]; NC has 11 programs operating in 12 locations.[19]

Given the evolving role of PACE in the U.S. long-term care system, and to address the lack of information on the impact of COVID-19 on PACE, this project studied all PACE programs in the state of NC. The aim was to identify the extent to which PACE was affected by COVID-19, the responses the programs initiated, and the potential impact of these events on the future role of PACE in the post-COVID-19 long-term care environment.

Methods

Data were obtained from interviews with administrators of PACE programs across NC; if the director was not available, an alternate suitable representative was interviewed. All 12 sites in the state participated. Interviews were conducted during December 2020 and January 2021 using a secure Zoom link after respondents provided informed consent. Each participant was given a $50 gift card for their time. Procedures and materials were approved by the Institutional Review Board of the University of North Carolina at Chapel Hill.

Measures and Data Collection

The interview included primarily open-ended questions, but also some close-ended descriptive questions regarding population served, services provided, and COVID morbidity and mortality. COVID-19 questions were based on domains from a Centers for Medicare and Medicaid Services Toolkit,[20] expanded to include items of additional relevance to PACE. Domains queried included personal protective equipment, screening, testing, reporting, transfers and admissions, resources, workforce, visitation, socialization, and isolation; additional domains related to training, external health care providers, psychosocial support, and advance care planning. Additional questions asked about challenges, barriers, and facilitators to care provision; successes; and recommendations for the future regarding medical, mental, and psychosocial care. Supplementary Material 1 contains our interview guide.

Interviews were conducted between December of 2020 and January of 2021 by 1 of 2 experienced interviewers. In each interview, respondents were asked to reflect on the entirety of their COVID-19–related experiences up to the date of the interview. Narrative responses were transcribed using the Zoom transcript feature and edited by the interviewer for accuracy.

Analysis

Quantitative data were analyzed by computing descriptive statistics using Stata. Qualitative data were stored, coded, and analyzed using ATLAS.ti. The data were analyzed using standard principles of thematic analysis.[21,22] First, the 5 authors separately reviewed the transcripts and then met to discuss and identify emerging codes, using an iterative process in which multiple meetings were separated by additional review of the transcripts and draft codes. Supplementary Material 2 provides a list of the codes that were developed, with short descriptions of each. During these discussions, the number of codes, the categories used to define them, and selection of illustrative quotes were reconsidered until consensus was achieved, as standard in qualitative research.[23]

Results

Most respondents were women (58%), White (67%), and had a graduate degree (83%). On average, they had worked as administrators for 13.4 years and at their PACE site for 8.7 years. PACE participants were described as largely between the ages of 65 and 84 years (70%), White (55%), and beneficiaries of both Medicaid and Medicare (97%).

Table 1 displays the reported COVID-19 infection rates and census changes during 2020 in the 12 PACE sites. On average, 12.3 participants and 3.9 staff contracted the infection, 4.6 participants were hospitalized, and 1.9 participants died. Participant (enrollee) census dropped by 9% between March and December 2020; day center participation rates dropped by 82%, and participant residence in nursing homes and assisted living settings also declined.

Themes From Qualitative Analysis

Interviews indicated that the impact of the COVID-19 pandemic on each PACE organization was enormous. Staffing patterns changed, care practices were transformed, and new services were developed. During analyses, 6 themes emerged. Each is discussed and illustrated with representative quotes as follows.

Theme 1: new, unprecedented administrative challenges associated with the pandemic

Administrators' attention had to be directed toward emergency preparedness and infection control; as one respondent said, the experience "*has opened our eyes and also given us more opportunity to create more policies and procedures and update our emergency preparedness plans*." Reported challenges included confusing guidelines, financial changes, and a heightened awareness of the need to institute emergency preparedness and infection control protocols. Programs were inundated with information, conflicting guidelines, and misinformation from multiple sources, and leadership spent hours each week making sense of them. Financial changes included increased cost in some areas (eg, personal protective equipment) but savings in others (eg, fewer meals prepared, less transportation). Interviewees also noted that, because PACE is capitated, they had a steady funding source throughout the pandemic, as compared with fee-for-service settings, such as hospitals and medical practices, whose revenues declined sharply when elective procedures were canceled and patient visits declined.

Theme 2: insufficient access to and integration with long-term care providers and medical and mental health clinicians

PACE programs rely on services from medical and mental health consultants and from hospitals, nursing homes, and assisted living settings. These services were often difficult to access, especially early in the pandemic. Many medical consultants closed their offices for weeks to months; nursing homes would not allow PACE staff entry to

Table 1
COVID-19 Rates and Census in North Carolina Program of All-Inclusive Care for the Elderly (PACE) (N = 12)

Type of Individual	Reported COVID-19 Rate		
	Cases Mean (SD) per 100	Hospitalizations Mean (SD) per 100	Deaths Mean (SD) per 100
Participant	12.3 (2.9)	4.6 (1.6)	1.9 (1.4)
Staff	3.9 (2.2)	Not asked	Not asked
Category	**Reported Census**		
	March 2020 Mean (SD)	December 2020 Mean (SD)	Percent Change
Number of participants	182.3 (NA)	165.9 (49.8)	−9.0
Number attending day center	95.2 (14.3)	17.1 (11.2)	−82.0
Number residing in a nursing home	17.1 (NA)	12.3 (6.9)	−28.1
Number residing in assisted living	3.5 (NA)	1.5 (1.9)	−57.1

NA, not applicable.
Note: Data were collected from December 3, 2020 to December 31, 2020; number of cases referred to during the entirety of the pandemic.

provide needed services; telemedicine capability and accessibility were limited, especially in participant homes; and nursing homes increased their rates by 300% or more. These challenges created stress for and required creative approaches by PACE programs. One administrator reported, *"I had a lady [in a nursing home] that needed a lot of therapy. We wanted to get her out of the facility and back home…[but] the facility wouldn't let her come out and come to our location for our type of therapy. And so I finally just had my people call the Ombudsman and get involved at the state level, and then they allowed her to come out and come to therapy."*

Theme 3: inability to provide care in the day center, with resulting reevaluation of the core PACE model and a transition to home-based care

Most PACE day centers closed for a period of time and later reopened in a limited capacity. This change required an increased reliance on home-based care. In response to this need, PACE programs applied to the state for a homecare license, which had previously been unobtainable but during the circumstances surrounding COVID was granted. This was a major change in the care model. As one respondent summarized, *"Most PACE programs (were) center-centric, which means that probably 85% of all services are provided in the adult day health center. With COVID, that has completely switched to 75% provided in the home, with 25% in the day center."* Opinions regarding the long-term impact of this change were mixed, but most favored a persistent shift to more home-based care with greater emphasis on family, although not without some wistfulness for the "comfortable and familiar" day center focus. Indeed, this change prompted reflection on the core tenets of PACE and whether it can operate as successfully without its heart and soul being the day center.

Theme 4: necessity to attend to caregiving needs of family members and resulting reorientation to be more family-focused in providing support and care

The reorientation toward home-based care included a greater focus on participants' families, on whom the switch to home-based care placed new demands. Although a challenging development, this was seen by most respondents as a much-needed change. Families saw more services brought into the home and received far more communication than before, and these changes made PACE leaders feel more engaged and partnered with families than in the past. One respondent noted, *"We had the highest customer satisfaction score that we've ever had. Our families felt the reassurance and the support of a full interdisciplinary team, medical team, and health care professionals that were still engaged in managing their loved ones' care and well-being."*

Theme 5: increased psychosocial needs of participants and families, with implementation of creative strategies to address psychological and social well-being in the home

The PACE day centers historically had provided numerous opportunities for social interaction. When this high-touch experience proved difficult to replicate during the pandemic, PACE sites implemented a broad range of services such as activity packets; regular telephone calls from staff; online chaplain, town hall, and activity channels; virtual town meetings; deliveries by PACE drivers and staff; and home visits by staff. Previously, such activities had been largely center-based. "*We risk-stratified our patients early on,"* one respondent said. *"We allocated resources accordingly. So, if there was a high risk of caregiver burnout, that was a participant who we were going to try and bring in more frequently…or figure out homecare [to] allocate resources.*"

Theme 6: significant change in staff responsibilities, including transition of many to new roles, and a concomitant effort to provide support and relief

The COVID-19 pandemic was stressful for staff, and the reconfiguring of care required redeployment of staff and attention to this stress. "*Team members from the beginning of COVID were asked to perform tasks that they weren't hired for,"* one respondent noted. *"There were aides that were working in the center, and when we transitioned all of our care to the home, those aides, as well as nurses, providers, therapists, social workers, were asked to do home visits or deliver care in the home."* The transition was not easy, but caregiver satisfaction remained high and staff turnover was limited, demonstrating that PACE programs were able to adapt to this challenge effectively. As part of this process, administrative leadership teams grew stronger, coalescing during the frequent meetings and shared decision-making required by the pandemic and its associated care reorientation.

Discussion

The COVID-19 pandemic challenged NC PACE programs to rapidly pivot their model of care in response to changes in the practices of other health care providers, mandates to avoid group gatherings and enhance infection control, new administrative challenges, and the need to transform staffing and service provision. They were additionally challenged to address the mental health consequences of social isolation experienced by participants and their family caregivers. In response, they focused more on home-based care, reoriented care to attend more to families' needs, implemented new and creative strategies to address participant and family psychosocial needs, carried out major staffing reorientation, and drew together as administrative teams and program staff. The capitated, all-inclusive financial

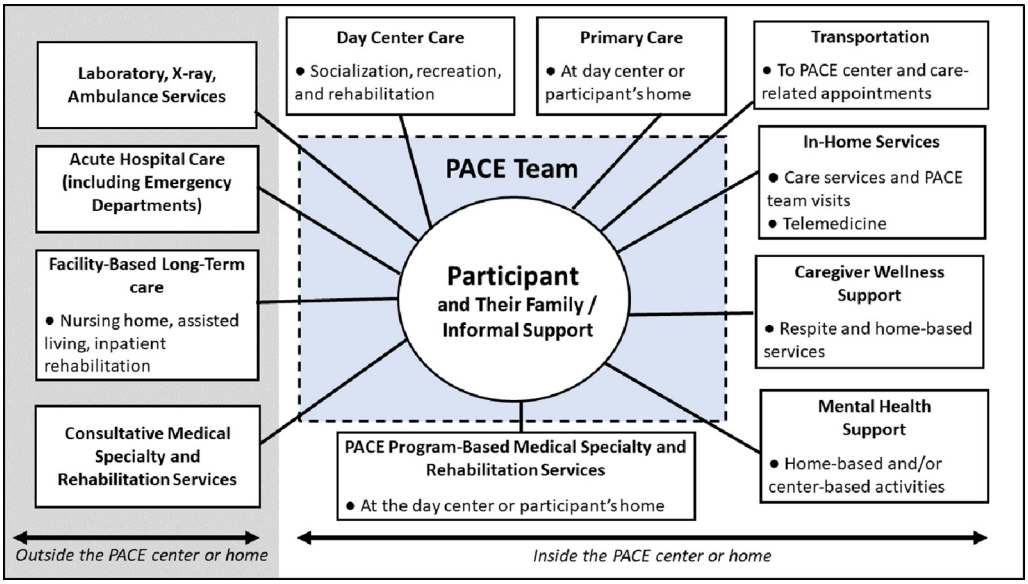

Fig. 1. The modified model of care in PACE that emerged during COVID-19. Key changes reflected in this model, compared with that of Eng et al,[29] are the inclusion of the participant's family and informal support in the center of the model and the expansion of the number and type of services that can be provided in the home to include virtually all PACE-based services.

structure of PACE created additional challenges but also provided stability of funding and savings in certain areas, such as reduced medical expenditures.[24] These and other findings from our analyses pointed to major changes in the structure and function of the programs studied; furthermore, because all PACE programs operate under federal regulations, we would anticipate that our results should generalize to programs in other states.

Perhaps the most significant change was shifting the epicenter of care from the PACE day center to participants' homes. The emerging post-COVID model (Figure 1) places participants and their support system, rather than just the participant, at the center of care; identifies the home and PACE center as equivalent potential sites for all types of program-provided care; and maintains a role for contracted services, although in some cases (eg, nursing homes and assisted living settings) diminishing their use based on COVID-19 experiences (Table 1). What began as a mandated closure of the day center became an opportunity for care to be even more person-centered and family-oriented—a change that, although radical, is consistent with PACE's history of "*meeting participants where they are*."[25]

The documented success of PACE in this area allowed it to successfully continue to provide care to nursing home–eligible older adults with complex comorbid conditions in a homecare-focused care model.[15,26] In doing so, the practice style came closer, although still with structural differences, to resembling home-based primary care practices. Indeed, many of the issues identified by our interviewees were echoed in the literature on COVID-19 challenges of home-based primary care; examples of these parallels include providing and using personal protective equipment in the home; adapting telemedicine to the home setting; addressing issues of isolation and loneliness and depression; and the need to provide emotional support to care teams.[27,28] Although administrators' opinions about the change in the care model were not unanimous, 10 of the 12 persons interviewed expressed confidence that the new care model will last. Concerns persist, however, such as that the state-granted temporary homecare licenses received during the pandemic may be rescinded, or that PACE will have trouble differentiating itself from a home health agency in the future.

Conclusions and Implications

During the pandemic, NC PACE sites demonstrated resilience, largely maintained their census, and received high participant and caregiver satisfaction scores. Care focus shifted from center-based care to a blended center-based/home-based model, thereby creating an attractive alternative to high-density congregate settings such as nursing homes. Therefore, PACE may have changed for the better and be well-positioned to play an expanded role in our evolving system of long-term care. Much additional study is needed, including research that addresses such issues as variation between programs; potential inequities arising from socioeconomic and educational variation between families; long-term impact of the changes documented here; and family caregiver experiences, including burnout.

Acknowledgments

The authors thank Christopher Wretman, PhD, for his role in analyzing the quantitative data, and all PACE administrators who provided data to help inform the future of PACE and long-term care.

References

1. D'Adamo H, Yoshikawa T, Ouslander JG. Coronavirus disease 2019 in geriatrics and long-term care: the ABCDs of COVID-19. *J Am Geriatr Soc*. 2020;68:912–917.
2. Wang H, Li T, Barbarino P, et al. Dementia care during COVID-19. *Lancet*. 2020;395:1190–1191.
3. Centers for Disease Control and Prevention. Older adults and COVID-19. 2021. Accessed October 3, 2020. https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/older-adults.html
4. Reddy S. North Carolina is aging! North Carolina Department of Health and Human Services. 2017. Accessed October 7, 2020. https://files.nc.gov/ncdhhs/documents/files/NC%20State%20Aging%20Profile%202016.pdf
5. Brosseau C. Coronavirus deaths keep rising at Triangle nursing homes, assisted living facilities. *The News & Observer*. Accessed May 30, 2020. https://account.newsobserver.com/paywall/subscriber-only?resume=243099646&intcid=ab_archive
6. Israelsen-Hartley S. COVID-19: why nursing homes are taking the brunt of the impact. *DeseretNews*. 2020. Accessed October 27, 2020. https://www.deseret.

com/indepth/2020/6/7/21258676/coronavirus-utah-nursing-homes-long-term-care-pandemic-covid-19-assisted-living-death-cna-nurses
7. Ouslander JG, Grabowski DC. COVID-19 in nursing homes: calming the perfect storm. *J Am Geriatr Soc*. 2020;68:2153–2162.
8. Quigley DD, Dick A, Agarwal M, Jones KM, Mody L, Stone PW. COVID-19 preparedness in nursing homes in the midst of the pandemic. *J Am Geriatr Soc*. 2020;68:1164–1166.
9. Abrams HR, Loomer L, Gandhi A, Grabowski DC. Characteristics of U.S. nursing homes with COVID-19 cases. *J Am Geriatr Soc*. 2020;68:1653–1656.
10. Aitken G, Ibrahim JE. A proactive nursing home risk stratification model for disaster response: lessons learned from COVID19 to optimize resource allocation. *J Am Med Dir Assoc*. 2021;22:1831–1839.e1.
11. Kyler-Yano JZ, Tunalilar O, Hasworth S, et al. "What keeps me awake at night": assisted living administrator responses to COVID-19. *Gerontologist*. 2022;62:190–199.
12. Vipperman A, Zimmerman S, Sloane PD. COVID-19 recommendations for assisted living: implications for the future. *J Am Med Dir Assoc*. 2021;22:933–938.e5.
13. Zimmerman S, Sloane PD, Katz PR, Kunze M, O'Neil K, Resnick B. The need to include assisted living in responding to the COVID-19 pandemic. *J Am Med Dir Assoc*. 2020;21:572–575.
14. Thomas KS, Zhang W, Dosa DM, Carder P, Sloane P, Zimmerman S. Estimation of excess mortality rates among US assisted living residents during the COVID-19 pandemic. *JAMA Netw Open*. 2021;4:e2113411.
15. Hirth V, Baskins J, Dever-Bumba M. Program of all-inclusive care (PACE): past, present, and future. *J Am Med Dir Assoc*. 2009;10:155–160.
16. National PACE Association. PACE fact sheet. 2021. Accessed April 6, 2021. https://www.npaonline.org/start-pace-program/enrollment-operations/fact-sheet
17. Kwiatkowski J. Program of All-Inclusive Care for the Elderly (PACE): integrating health and social care since 1973. *R I Med J (2013)*. 2019;102:30–32.
18. National PACE Association. PACE: frequently asked questions. 2021. Accessed April 7, 2021. https://www.npaonline.org/sites/default/files/PACE%20FAQs%20Oct%202019.pdf
19. NCDHHS. NC Medicaid. Division of Health Benefits. Program of All-Inclusive Care for the Elderly (PACE). Accessed January 23, 2022. https://medicaid.ncdhhs.gov/providers/programs-and-services/long-term-care/program-all-inclusive-care-elderly-pace
20. Centers for Medicare & Medicaid Services. *Toolkit on State Actions to Mitigate COVID-19 Prevalence in Nursing Homes*. 1st ed. Centers for Medicare & Medicaid Services; 2020.
21. Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: striving to meet the trustworthiness criteria. *Int J Qual Methods*. 2017;16:1–13.
22. Green J, Thorogood N. *Qualitative methods for health research*. 3rd ed. SAGE Publications Ltd; 2014.
23. Zimmerman S, Dobbs D, Roth EG, Goldman S, Peeples AD, Wallace B. Promoting and protecting against stigma in assisted living and nursing homes. *Gerontologist*. 2016;56:535–547.
24. Stefanacci R, Buffa A. Full-risk population health programs for older adults like PACE benefit from COVID-19. *Popul Health Manag*. 2021;24:307–309.
25. National PACE Association. Quality health care, PACE and the medical home model. Accessed December 31, 2021. https://www.pace4you.org/sites/default/files/PDFs/Medical%20Home%20Issue%20Brief%20FINAL3.1.10.pdf
26. Cacchione PZ, Eible L, Gill LL, Huege SF. Person-centered care for older adults with serious mental illness and substance misuse within a program of all-inclusive care for the elderly. *J Gerontol Nurs*. 2016;42:11–17.
27. Ritchie CS, Gallopyn N, Sheehan OC, et al. COVID challenges and adaptations among home-based primary care practices: lessons for an ongoing pandemic from a national survey. *J Am Med Dir Assoc*. 2021;22:1338–1344.
28. Franzosa E, Gorbenko K, Brody AA, et al. "At home, with care": lessons from New York City home-based primary care practices managing COVID-19. *J Am Geriatr Soc*. 2021;69:300–306.
29. Eng C, Pedulla J, Eleazer GP, et al. Program of All-inclusive Care for the Elderly (PACE): an innovative model of integrated geriatric care and financing. *J Am Geriatr Soc*. 1997;45:223–232.

Supplementary Material 1. Interview Guide

Analyses for this article used responses to all open-ended questions.

North Carolina COVID-19 Project (NC TraCS)
PACE/Nursing Home/Assisted Living Interview

Site ID:

Interviewer ID:

Date:
M M D D Y Y Y Y

The experiences you've had throughout the COVID pandemic have implications for the future of infection prevention. The topics we're going to discuss are intended to inform the future, so that (*PACE organizations, assisted living communities, nursing homes*) are better able to prevent and respond to future health crises—regardless what those crises might be.

I. Participant Information

So that we can describe our participants, let's begin with a few basic questions about you.

1.	What's your gender?	☐1	Male
		☐2	Female
		☐3	Other: _____
2.	How do you describe your racial background? *(May select more than one)*	☐1	White
		☐2	Black/African American
		☐3	American Indian or Alaska Native
		☐4	Asian
		☐5	Native Hawaiian or Pacific Islander
		☐6	Other: _____
3.	Are you Hispanic or Latino(a)?	☐0	No
		☐1	Yes
4.	What's the highest schooling that you completed?	☐1	Completed high school (or GED)
		☐2	Technical or Trade School
		☐3	Some college/Associate's degree
		☐4	Bachelor's degree
		☐5	Graduate degree
5.	What's your job title at (*name*)?	_____	
6.	Which of the following licenses or certifications do you have? Are you licensed or certified as a …	No Yes	a. CNA (certified nursing assistant)
		☐0 ☐1	
		☐0 ☐1	b. Medication technician
		☐0 ☐1	c. LPN/LVN (licensed practical/vocational nurse)
		☐0 ☐1	d. RN (registered nurse)
		☐0 ☐1	e. Administrator license, nursing home (NH) or assisted living (AL)
		☐0 ☐1	f. Other: _____
7.	How long have you been in your position here?		__ __ years OR __ __ months (if < 1 year)
8.	How long have you worked here, in total?		__ __ years OR __ __ months (if < 1 year)
9.	How long have you worked as an administrator in total, including elsewhere?		__ __ years OR __ __ months (if < 1 year)

II. Organizational Information

And now I have a few basic descriptive questions about (*name*). (*Ask EITHER A or B depending on type of organization.*)

A. NH or AL Characteristics			
1.	Is your organization's ownership for profit, nonprofit, or government?	☐1	Profit
		☐2	Nonprofit
		☐3	Government
2.	How many beds does *(name)* have overall, and how many are occupied today?	**(1) Total**	**(2) Occupied**
		___ ___ ___	___ ___ ___
3.	Are any of your beds specified for persons with dementia?	☐0	No (Skip to Q 4)
		☐1	Yes
	If yes: a. How many beds are specified for persons with dementia, and how many are occupied today?	**(1) Total**	**(2) Occupied**
		___ ___ ___	___ ___ ___
4.	Has your census stayed the same, or increased or decreased, since March 2020?	☐0	Same (Skip to C)
		☐1	Increased
		☐2	Decreased
	If change: a. By how much has your census (*increased/decreased*) since March 2020?	_____ residents	
5.	*AL and NH only: Are you a COVID referral site?*	☐0	No
		☐1	Yes
	If yes: a. How did this come about and how does it work?		
B. PACE Characteristics			
1.	As of today, what is your total enrollment?	_____ participants	
2.	Has your enrollment stayed the same, or increased or decreased, since March 2020?	☐0	Same (Skip to Q 3)
		☐1	Increased
		☐2	Decreased
	If change: a. By how much has your enrollment (*increased/decreased*) since March 2020?	_____ participants	
3.	Prior to COVID, on average how many participants attended the day center per day?	_____ participants	
4.	As of today, on average how many participants attend the day center per day?	_____ participants	
5.	As of today, how many participants are in a nursing home?	_____ participants	
6.	Have the number of participants in a nursing home stayed the same, or increased or decreased, since March 2020?	☐0	Same (Skip to Q 7)
		☐1	Increased
		☐2	Decreased
	If change: a. By how much has the number (*increased/decreased*) since March 2020?	_____ participants	
7.	As of today, how many participants are in assisted living?	_____ participants	
8.	Has the number of participants in assisted living stayed the same, or increased or decreased, since March 2020?	☐0	Same (Skip to C)
		☐1	Increased
		☐2	Decreased
	If change: a. By how much has the number (*increased/decreased*) since March 2020?	_____ participants	
C. Resident/Participant Information			
	The next few questions ask for numbers of (*residents/participants*) in certain categories. Please provide your best estimate; it's not necessary for you to review records for this information.		
	What percent of your current (*residents/participants*) are…		
1.	Age *(total should equal 100%)*	1. <65 years old	___ ___ ___ %
		2. 65–74 years old	___ ___ ___ %
		3. 75–84 years old	___ ___ ___ %
		4. 85–94 years old	___ ___ ___ %
		5. 95 years old and older	___ ___ ___ %
2.	Gender	Male	___ ___ ___ %
3.	Race *(total should equal 100%)*	1. Black	___ ___ ___ %
		2. White	___ ___ ___ %
		3. Other	___ ___ ___ %
4.	Ethnicity	Of Hispanic Origin	___ ___ ___ %
5.	Use a wheelchair as their primary mode of locomotion?		___ ___ ___ %
6.	Have a diagnosis of Alzheimer disease or a different type of dementia?		___ ___ ___ %
7.	Are currently receiving state financial assistance or Medicaid?		___ ___ ___ %
8.	NH only: Are currently receiving post-acute rehabilitation under Medicare Part A or from another payer?		___ ___ ___ %

III. Primary Thought Regarding COVID

Thanks for providing those numbers. Now, we're ready to launch into questions related to COVID.

1. Before I start asking specific questions, I'd like to hear what's most on your mind related to the entire COVID experience. So, please finish this sentence: The most important thing I'd like to say about COVID in the context of (*name*) is… *(Prompt as needed to be sure the reply is complete.)*

IV. COVID Testing and Cases

I have a few questions about COVID testing and cases, some of which ask for numbers. If you'd prefer to not to provide numbers, that's fine, but please keep in mind that everything you tell me will be confidential, and we'll never provide information that can be identified with you or (*name*).

1.	At the present time, are you routinely testing (*residents/participants*) for COVID?	☐0	No (Skip to Q 2)
		☐1	Yes
	If yes: a. How often are you routinely testing?	_____	
	b. What percent of (*residents/participants*) do you test?	___ ___ ___ %	
2.	At the present time, are you routinely testing staff for COVID?	☐0	No (Skip to Q 3)
		☐1	Yes
	If yes: a. How often are you routinely testing?	_____	
	b. What percent of staff do you test?	___ ___ ___ %	
3.	Do you use a molecular RNA/PCR test, or a rapid antigen test?	☐1	Molecular RNA/PCR
		☐2	Rapid antigen test
		☐3	Both tests are used
	If RNA/PCR is used: a. On average, how long does it take to get a result back?	_____ days	
	If rapid antigen is used: b. Is the test done on-site?	☐0	No
		☐1	Yes
4.	How many positive (*resident/participant*) cases have you had?	_____ people	
	If any: a. How many were hospitalized due to COVID?	_____ people	
	b. How many died due to COVID?	_____ people	
5.	How many positive staff cases have you had?	_____ staff	

V. Recommendations and Support

1. COVID has placed many demands on long-term care providers. I'm going to name 12 different areas, and for each one I'd like to know to what extent you need additional assistance to effectively manage that issue. The answers can be no additional assistance, some assistance, a moderate amount of assistance, and a great deal of assistance.

Note: Items adapted from Centers for Medicare and Medicaid Services Toolkit on State Actions; omitted "communication" due to numerous stakeholder groups with whom communication occurs.	No additional assistance	Some assistance	A moderate amount of assistance	A great deal of assistance
(1) Obtaining and using personal protective equipment/personal protective equipment	1	2	3	4
(2) Conducting screening for COVID	1	2	3	4
(3) Conducting testing for COVID	1	2	3	4
(4) Reporting suspected or known cases of COVID	1	2	3	4
(5) Implementing other infection control practices, such as disinfecting and sanitization	1	2	3	4
(6) Training staff on infection control practices	1	2	3	4
(7) Addressing socialization and isolation	1	2	3	4
(8) Responding to requests for new admissions or readmissions	1	2	3	4
(9) Handling staffing problems	1	2	3	4
(10) Working with health care providers	1	2	3	4
(11) Conducting advance care planning because of COVID	1	2	3	4
(12) *NH/AL only*: Addressing visitation of families or close others	1	2	3	4

2.	What 3 resources, either documents or organizations (*if needed clarify they can be government, nongovernment, public, and private*), best helped (*name*) respond to COVID-19, and in what way? a. Document/organization: a1. In what way: b. Document/organization: b1. In what way: c. Document/organization: c1. In what way:		
3.	To what extent did you receive support from your local health department during COVID?	☐1 ☐2 ☐3 ☐4	Not at all/a little Somewhat Moderately Very much
	a. What could have improved the support you received?		
4.	To what extent did federal financial relief help you during COVID?	☐1 ☐2 ☐3 ☐4	Not at all/a little Somewhat Moderately Very much
	a. What could have made the relief more helpful?		
	b. *If not already addressed*: Has your Medicaid reimbursement rate increased since COVID began?	☐0 ☐1 ☐2	No Yes Not applicable (don't accept Medicaid)

VI. Medical and Mental Health Care Providers

1.	During COVID, did you experience challenges having medical providers visit patients face-to-face?	☐0 ☐1	No (Skip to Q 2) Yes
	If yes: a. What were the challenges?		
	b. How were the challenges addressed or solved?		
2.	During COVID, did you experience challenges having mental health care providers visit patients face-to-face?	☐0 ☐1	No (Skip to Q 3) Yes
	If yes: a. What were the challenges?		
	b. How were the challenges addressed or solved?		
3.	What percent of medical visits in the past month were by telemedicine, meaning video conferencing?		___ ___ ___ %
	If > 0%: a. How satisfied are you with this service?	☐1 ☐2 ☐3 ☐4	Not at all/a little Somewhat Moderately Very
4.	What percent of mental health care visits in the past month were by telemedicine, meaning video conferencing?		___ ___ ___ %
	If > 0%: a. How satisfied are you with this service?	☐1 ☐2 ☐3 ☐4	Not at all/a little Somewhat Moderately Very

VII. Experiences in Select Areas

Now I'll ask about your thoughts in 4 different areas: organization leadership, staffing, resident psychological and social well-being, and family relations. For each area, I'll ask what needs or challenges you had, how (*name*) responded to the need or challenge, what worked well, and what you recommend for the future.

---

1. I'll begin with the topic of organizational leadership. Regarding your organization's leadership in relation to COVID…
   a. What needs or challenges did you have?

   b. How did your organization respond to those needs and challenges?

   c. In general, what worked well related to your organization's leadership?

   d. Related to your organization's leadership, what do you recommend for the future, so (*name*) is better able to prevent and respond to future health crises?

2. Regarding the staff you employ, and your experiences related to COVID…

   a. What needs or challenges did you have?

   b. How did your organization respond to those needs and challenges?

   c. In general, what worked well related to staffing?

   d. Related to staffing, what do you recommend for the future, so (*name*) is better able to prevent and respond to future health crises?

3. Regarding providing care for your (*residents'/participants'*) psychological and social well-being in relation to COVID …
   a. What needs or challenges did you have?

   b. How did your organization respond to those needs and challenges?

   c. In general, what worked well related to psychological and social well-being?

   d. Related to psychological and social well-being, what do you recommend for the future, so (*name*) is better able to prevent and respond to future health crises?

4. Regarding the family of your (*residents'/participants'*), in relation to COVID …
   a. What needs or challenges did you have?

b. How did your organization respond to those needs and challenges?

c. In general, what worked well in relation to families?

d. Related to families, what do you recommend for the future, so (*name*) is better able to prevent and respond to future health crises?

5. Has the financial health of (*name*) been affected by COVID? ☐0 No (Skip to Q 6) ☐1 Yes
If yes: a. How has it been affected?

6. Have you had to change your business model due to COVID? *By this I mean have you changed….types of people served; staffing and services provided; charges, payment, reimbursement;* or other things ☐0 No (Skip to Q 7) ☐1 Yes
If yes: a. How has it been affected?

7. Other than the topics we discussed, did anything else create a barrier in relation to (*name*) preventing or managing COVID?

8. Other than the topics we discussed, did anything else facilitate your effort to prevent or manage COVID?

9. Other than what you've mentioned previously, did (*name*) do anything especially innovative to prevent or manage COVID?

VIII. Relative Importance

We've talked about potential needs and challenges in many different areas. I'll name each area, and ask to what extent it's necessary to address that challenge and put remedies in place before the next crisis occurs, regardless of what that next crisis might be.

Note: The original 8 areas were changed to 7, because external providers overlapped with medical and mental health care.	Not at all necessary	Somewhat necessary	Moderately necessary	Very necessary
1. Regarding organizational leadership … to what extent is it necessary to put remedies in place before the next crisis occurs, regardless of what that particular crisis might be? Would you say it's….	**1**	**2**	**3**	**4**
2. Regarding staffing issues … to what extent is it necessary to put remedies in place before the next crisis occurs, regardless of what that particular crisis might be? Would you say it's….	**1**	**2**	**3**	**4**
3. Regarding (*residents'/participants'*) psychological and social well-being … to what extent is it necessary to put remedies in place before the next crisis occurs, regardless of what that particular crisis might be? Would you say it's….	**1**	**2**	**3**	**4**
4. Regarding (*residents'/participants'*) family relations … to what extent is it necessary to put remedies in place before the next crisis occurs, regardless of what that particular crisis might be? Would you say it's….	**1**	**2**	**3**	**4**
5. Regarding regulations and recommendations … to what extent is it necessary to put remedies in place before the next crisis occurs, regardless of what that particular crisis might be? Would you say it's….	**1**	**2**	**3**	**4**
6. Regarding (*resident/participant*) medical and mental health care … to what extent is it necessary to put remedies in place before the next crisis occurs, regardless of what that particular crisis might be? Would you say it's….	**1**	**2**	**3**	**4**
7. Regarding monetary issues … to what extent is it necessary to put remedies in place before the next crisis occurs, regardless of what that particular crisis might be? Would you say it's….	**1**	**2**	**3**	**4**

IX. Impact on Future Care Delivery

We're almost finished. I have 1 last question to ask related to COVD.

1.	Do you think the pandemic has permanently changed how (*name*) will deliver care in the future?	□0 □1	No (end interview) Yes
	If yes: a. How do you think it will change?		

Supplementary Material 2. Codes Developed During the Qualitative Analyses

DOMAIN CODES	
ABBREVIATION	DESCRIPTION
CHALL	Challenges, needs, struggles, barriers
COMM	Communication (group [not 1:1], written, electronic, social media; not telehealth); do not co-code with GUIDE
DEI	Diversity, equity, and inclusion; includes reference to race/racism/disparities; often co-coded with PEOPLE codes
FUTURE	Future impact on/change in care delivery expected for own organization or other long-term care setting(s)
GUIDE	Guidelines/regulations/restrictions/requirements; expressly references something told to do; may be co-coded with source, such as federal, state, provider organizations
INITIAL	Initial impression ("what's most on your mind" question beginning of interview)
QUOTE	Quote (especially descriptive/impactful; can include emotional reactions/feelings)
RECOM	Respondent's recommendations/suggestions (whether or not in practice; need not use word "recommend")
SUCCESS	Comments about success around response to pandemic

TOPIC CODES	
ABBREVIATION	**DESCRIPTION**
CHANGE	
DECISION	Decision-making (explicit comment about decision-making/weighing options, pros and cons); includes regarding making a choice; another key word may be voluntary
FAC	**Enacted** facilitator, support (makes it easier to do/achieve something; precursor to success); often co-coded
FLEX	Flexibility (eg, **specific comments** about being flexible, nimble, able to adapt; not simply creativity or change)
EXTERNAL ENTITY *Note: during analysis, be mindful that Department of Health and Human Services (DHHS) may not assuredly be state*	
FED	Federal (eg, Centers for Disease Control and Prevention, Centers for Medicare and Medicaid Services)
HOSP	Hospitals/health systems
LOCAL	Local/County (includes health departments)
LTC	Long-term care settings (other PACE, NH, AL) – can include any reference to another LTC setting
PROVIDE	Provider organizations (excluding of own personal setting)
STATE	State (NCDHHS, DHHS, NC Statewide Program for Infection Control and Epidemiology [SPICE]); includes reference to state regulators
VEND	Vendors – can include temporary workers
INFECTION	
COVID	COVID cases/outbreaks in the setting/organization
EDUCATE	Education/training related to COVID
INF PRACT	Infection prevention/control practices (includes social distancing, isolation)
INF RES	Resources to prevent infection, or lack thereof (eg, personal protective equipment); resources can be physical or personnel
SCR/TEST	Screening, testing
TRACE	Contact tracing
MEDICAL and MENTAL HEALTH	
MED	Medical care or medical care providers
MED STATE	Medical and functional status (health, function)
MENT CARE	Mental health care (includes recreation, social engagement)
MENT PRO	Mental health providers
MENT STATE	Mental health (includes psychological well-being)
OPERATIONS	
CARE	Overall care or business model (eg, differentiating self from other care settings)
CENSUS	Census/occupancy (includes narrative about family taking care recipient out of the setting)
FINAN	Finances/funding (includes staff salaries, insurance)
PHYSIC	Physical/built environment and outdoors (can refer to building, rooms, offices, use of physical space)
TECH	Technology; includes telehealth
VISIT	Family visits; non-staff visits
PEOPLE (use only if direct, substantive reference made) *Note: during analysis, look for "resident/participant" deductively*	
FAM	Families; often co-coded
LEADER	Leadership (clearly refers to or expressly refers to leadership); often co-coded