

## RESEARCH

## COVID-19 PREPAREDNESS IN MICHIGAN NURSING HOMES

The coronavirus disease 2019 (COVID-19) pandemic has disproportionately high mortality among older adults, particularly those with comorbidities.<sup>1-3</sup> Nursing homes (NHs) are particularly vulnerable to widespread transmission and poor outcomes.<sup>4-6</sup>

The objectives of this study were (1) to understand preparedness among Michigan NHs in the midst of an ongoing pandemic and (2) to compare with a 2007 survey on pandemic influenza preparedness in Michigan NHs.<sup>4</sup>

## METHODS

State health department-registered NHs in Michigan were identified in 2007 and 2020. We adapted a 2007 pandemic

preparedness survey to assess COVID-19 preparedness.<sup>4</sup> Michigan's first case of COVID-19 was reported on March 10, 2020. The COVID preparedness survey was prepared online using Qualtrics survey software and sent to NHs on March 11, 2020, with a reminder email on March 13. The main objective was to assess changes in pandemic preparedness in the state of Michigan early in the epidemic. Categorical data were compared between groups with  $\chi^2$  test. A two-sided  $P = .05$  was considered significant.

## RESULTS

Of the 426 Michigan NHs surveyed, 130 (31%) responded within 1 week of first contact. An additional 27 NHs opened the survey but did not provide any responses. The distribution of reported bed capacity among facilities was unchanged, with 70% reporting 51 to 150 beds in 2020 vs 68% in 2007.

An overwhelming majority of respondents in 2020 had a separate pandemic response plan, and only 3 (2%) of NHs reported having no response plan in 2020 compared to

**Table 1. Planning Components for COVID-19 in Michigan Nursing Homes (2007 vs 2020)**

Variable	No./Total (%) of Nursing Homes		P Value <sup>a</sup>
	2007 (N = 280)	2020 (N = 130)	
Which category most accurately represents your facility's pandemic response plan for?			
Part of current preparedness plan	68/261 (26)	50/127 (39)	<.001
Separate plan	61/261 (23)	74/127 (58)	
Does not yet have a plan	132/261 (51)	3/127 (2)	
Staff position responsible	223/279 (80)	120/128 (94)	<.001
Nursing homes being counted on as alternative care sites for hospital overflow	137/272 (50)	46/94 (49)	.811
Stockpiling supplies	150/264 (57)	107/126 (85)	<.001
Plans to provide COVID-19 training	131/241 (54)	121/122 (99)	<.001
Staff already given COVID-19 education	104/248 (42)	119/122 (98)	<.001
Policy regarding ill employees returning to work?		119/120 (99)	
Access to laboratory facilities	215/248 (87)	79/104 (76)	.013
In the midst of COVID-19 pandemic, facility could:			
Accept hospital overflow of COVID-19 patients	110/280 (39)	35/114 (31)	.109
Accept hospital overflow non COVID-19 patients	148/280 (53)	94/114 (82)	<.001
Discharge residents to open up beds	25/280 (9)	20/114 (18)	.015
Provide community care and services, such as vaccination clinic	85/280		
Communication lines established with nearby hospitals	112/227 (49)	67/107 (63)	.0232
Communication lines with state and local public health officials	121/217 (56)	99/115 (86)	<.001
Conducted pandemic outbreak exercises?	20/264 (8)	43/119 (36)	<.001
Mental health and faith-based services available	185/239 (77)	92/114 (81)	.481

Note. Blank responses were treated as missing data.

Abbreviation: COVID-19, coronavirus disease 2019.

<sup>a</sup>Comparison of 2007 vs 2020 responding nursing homes using  $\chi^2$  test.

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**Table 2. Detailed Responses of 2020 Pandemic Preparedness Survey Participants**

Response	No./Total (%) of Nursing Homes
Question: For COVID-19, please indicate which guidance documents on outbreak response from your facility uses	
CDC	126/128 (98)
State and/or local health department	109/128 (85)
Corporate	71/128 (55)
Local hospital/healthcare organization	55/128 (43)
WHO	49/128 (38)
AMDA	28/128 (22)
APIC	16/128 (13)
IDSA	15/128 (12)
SHEA	6/128 (5)
None	1/128 (1)
Other <sup>a</sup>	29/128 (23)
Question: What supplies has the facility begun to stockpile? <sup>b</sup>	
Masks (surgical)	85/101 (84)
Alcohol-based hand sanitizer	82/101 (81)
Gloves	82/101 (81)
Gowns	81/101 (80)
N-95 respirators	43/101 (43)
Other	20/101 (20)
Question: Who are you counting on to help with staff shortages? <sup>c</sup>	
Remaining staff volunteering to work extended hours	53/67 (79)
Nonclinical staff filling different roles	52/67 (78)
Remaining staff mandated to work extended hours	45/67 (67)
Agency/contracted staff	16/67 (24)
Volunteers from the community	11/67 (16)
Other <sup>d</sup>	7/67 (10)

Abbreviations: CDC, Centers for Disease Control and Prevention; COVID-19, coronavirus disease 2019; AMDA, American Medical Directors Association; APIC, Association for Professionals in Infection Control and Epidemiology; IDSA, Infectious Diseases Society of American; SHEA, Society for Healthcare Epidemiology of America; WHO, World Health Organization.

<sup>a</sup>Among "other" open text responses, Centers for Medicare and Medicaid Services was mentioned by 13 respondents; American Health Care Association was mentioned by 6 respondents; and Health Care Association of Michigan was mentioned by 5 respondents.

<sup>b</sup>A total of 107 nursing homes responded affirmatively to overarching question of stockpiling. Of these, 101 answered the follow-up question to provide further detail.

<sup>c</sup>A total of 67 nursing homes responded affirmatively to the overarching question, "Does your facility expect significant staff shortages due to absences and illness in the event of a COVID-19 outbreak?" and were asked this follow-up question to provide further detail.

<sup>d</sup>Of seven facilities reporting other plans, four mentioned expecting staffing help from corporate/sister facilities in their open text responses.

132 (51%) of 2007 respondents ( $P < .001$ ) (Table 1). Nearly all (94%) of 2020 respondents also reported having a staff person(s) responsible for preparedness, compared to 80% of 2007 respondents ( $P < .001$ ). Staff responsible for preparedness included infection control coordinators (69 [58%]), administrators (47 [40%]), directors of nursing (35 [29%]) and emergency

preparedness (8 [7%]), and others (27 [23%]). Most 2020 respondents referred to public health entities for guidance, including the Centers for Disease Control and Prevention (CDC) (126 [98%]); state and local health departments (109 [85%]); and the World Health Organization (49 [38%]). More than half (71 [55%]) received guidance from their parent corporations (Table 2).

A greater portion of NHs were willing to accept hospital overflow of non COVID-19 patients (82% vs 53% in 2007;  $P < .001$ ) or discharge patients to open up beds (18% vs 9% in 2007;  $P = .015$ ). NHs in 2020 were more likely to have communication lines established with nearby hospitals (63% vs 49% in 2007;  $P = .0232$ ) and public health officials (86% vs 56% in 2007;  $P < .001$ ), suggesting better integration within the healthcare system.

As Michigan reported its first case of COVID-19, facilities were most concerned about staffing and supplies. Asked to report their greatest concern regarding preparedness, 42% (35/84) of respondents mentioned lack of supplies (especially personal protective equipment [PPE]), and 32% (27/84) were concerned they would not be able to adequately staff their facility. Facilities were proactive, with more NHs reporting having stockpiled supplies in 2020 (85%) than in 2007 (57%;  $P < .001$ ). Most facilities reported stockpiling of PPE (Table 2). Staff shortages were anticipated by 79% (67/85) of 2020 respondents, with several facilities already making contingency plans (Table 2).

Most 2020 respondents had processes in place to restrict movement: by limiting family members and visitors (119 [98%]); by limiting outside vendors, researchers, and consultants (118 [98%]); and by screening visitors for symptoms (113 [93%]).

## DISCUSSION

Our results show that Michigan NHs may be better prepared for pandemics now than in 2007. In 2020, NHs were able to make policy and procedure changes within 1 week in response to urgent guidance from the Centers for Medicare and Medicaid Services and CDC,<sup>5,6</sup> which likely helped the facilities prepare for COVID-19 pandemic. Almost all NHs have a dedicated staff member responsible for preparedness and were willing to accept patients from hospitals to assist in their surge capacity planning, particularly for non-COVID patients. NHs did express concerns about staffing shortages and PPE supply constraints as cases rise.

Limitations of this study include: self-report bias, limited geographic representation, and likely lower response rate as survey was performed in the early stages of a global pandemic. Assessment of pandemic preparedness at the beginning of an outbreak is a strength. These data will serve as a baseline for future surveys and studies of NHs' experiences during this pandemic. In summary, while NHs in 2020 show greater pandemic preparedness than in 2007, they will face challenges due to limited PPE supplies and staffing shortages. NHs will need to refine their preparedness strategies as the COVID-19 pandemic evolves and is anticipated to have major consequences. For NHs to effectively prepare for a pandemic, real-time data and experiences should be readily available to help inform their response.

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## NOVEL CORONAVIRUS (COVID-19) EPIDEMIC: WHAT ARE THE RISKS FOR OLDER PATIENTS?

The World Health Organization confirmed 93,090 cases of novel coronavirus SARS-CoV-2 infections (COVID-19) worldwide on March 04, 2020. 3,198 deaths were declared (3%). In the United States, 108 cases were confirmed.<sup>1</sup> Coronavirus family members are known to be responsible for severe acute respiratory syndrome (SARS-CoV) and Middle East respiratory syndrome (MERS-CoV), associated with severe complications, such as acute respiratory distress syndrome, multiorgan failure, and death, especially in individuals with underlying comorbidities and old age.<sup>2,3</sup>

In a recently published large case series of 138 hospitalized patients with COVID-19 infected pneumonia, the 36 patients (26.1%) transferred to an intensive care unit were older and had more comorbidities (median age = 66 years; comorbidities in 72.2% of cases) than patients who did not receive intensive care unit care (median age = 51 years; comorbidities in 37.3% of cases).<sup>4</sup> Comorbidities associated with severe clinical features were hypertension, diabetes, cardiovascular disease, and cerebrovascular disease, which we know are highly prevalent in older adults. Previously, the China National Health Commission reported that death mainly affects older adults, since the median age of the first 17 deaths up to January 22, 2020, was 75 years (range = 48-89 years).<sup>5</sup> Moreover, people aged 70 years or older had shorter median days (11.5 days) from the first symptom to death than younger adults (20 days), suggesting a faster disease progression in older adults.<sup>5</sup>

Since COVID-19 seems to have a similar pathogenic potential as SARS-CoV and MERS-CoV,<sup>6</sup> older adults are likely to be at increased risk of severe infections, cascade of complications, disability, and death, as observed with influenza and respiratory syncytial virus infections.<sup>7,8</sup>

The consequences of possible epidemics in long-term care facilities could be severe on a population of older adults who are by definition frail and immunologically naive towards this virus, even if the risk is of course for the moment mainly theoretical. Therefore, it seems essential to

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