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## Preparedness for Pandemic Influenza in Nursing Homes: A 2-State Survey

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**To the Editor:** An influenza pandemic would be expected to have major social and economic consequences. Hospital bed capacity may be quickly overwhelmed in an influenza pandemic,<sup>1</sup> and government plans are looking at alternate care sites.<sup>2</sup> Nursing homes care for a very vulnerable population and may be expected to help with hospital patient overflow.<sup>3,4</sup> The extent of influenza pandemic preparedness in nursing homes is largely unknown.<sup>5</sup>

### Methods

All 656 state health department–registered nursing homes were identified in 2 states chosen as a convenience sample: Nebraska (n=231) and Michigan (n=425). A questionnaire to assess their pandemic preparedness was developed with input from various stakeholders and mailed to the directors of nursing in June 2007 with a follow-up mailing in July 2007. The questionnaire was designed to gather demographic data and information on aspects of

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**Author Contributions:** Dr P. W. Smith had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

*Study concept and design:* P. W. Smith, Mody.

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influenza preparedness. Data on antiviral medications and ownership status were collected only from Michigan nursing homes. Categorical data were compared between groups with a  $\chi^2$  test using SAS/STAT software (version 9.1.3; SAS Inc, Cary, North Carolina). A 2-sided *P* value of .05 was considered significant. The study was approved by the University of Nebraska Medical Center institutional review board.

## Results

The overall response rate was 69% (Nebraska, 171/231 [74%]; Michigan, 280/425 [66%]), and the mean reported occupancy rate was 88% (Table 1). Michigan nursing homes were larger and had higher occupancy rates. For Michigan nursing homes, 167 (61%) of the responders were proprietary, 93 (33%) were nonprofit, and 20 (6%) were government-funded. This was similar to the national distribution: 9900 (61%) proprietary, 5000 (31%) nonprofit, and 1200 (8%) government-funded.<sup>6</sup>

Of the nursing home respondents, 97 (23%) had a separate pandemic plan (Table 2). One hundred ten (26%) had incorporated pandemic response within their general disaster response plan, and 221 (52%) did not have any pandemic plan. A large majority (345, 77%) of responding nursing homes had a designated person in charge of pandemic planning. The staff positions with this responsibility included infection control professionals (154, 45%), executive directors or administrators (72, 21%), directors of nursing (48, 14%), or safety coordinators (47, 14%). Half (216) of the nursing homes stock-piled some supplies: gloves (170, 38%), alcohol rub (156, 35%), surgical masks (152, 34%), linen (95, 21%), food (81, 18%), N95 masks (50, 11%), and antiviral medications (18 [6%] for Michigan nursing homes).

Regarding surge capacity, 168 (37%) of the respondents reported they would have beds available to take hospital overflow, and few (32, 7%) would consider discharging residents to make room for patients (Table 2). Facilities were more likely to accept noninfluenza patients than influenza patients requiring low levels of care (263 [58%] vs 170 [38%]).

In general, Michigan and Nebraska nursing home respondents did not differ greatly in their reported levels of pandemic planning; however, Nebraska nursing homes were more likely to have given staff introductory pandemic education while Michigan nursing homes were more likely to have stockpiled supplies, have mental health services available, and have undertaken other planning activities (Table 2).

## Comment

In these 2 states, we found that although many nursing homes have undertaken some pandemic influenza preparedness planning, only 23% have a specific pandemic response plan. Many nursing homes have staff training plans, adequate laboratory access, available mental health services, and procedures for handling family and visitors during a pandemic. However, about half had not established lines of communication with state and local public health officials or with nearby hospitals, suggesting the potential for improved community-wide coordination.

Study limitations included that the survey was from only 2 states and we did not perform any qualitative assessments. In addition, this was a self-administered questionnaire with a potential for reporter bias. There were no data to compare rural vs urban nursing homes. Nevertheless, these results may be useful to national public health planners to better define the role of nursing homes in an influenza pandemic.

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**Table 1**

Facility Demographics and Response Rates

	No. (%) of Nursing Homes				P Value <sup>a</sup>
	Nebraska		Michigan		
	Surveyed (n = 231)	Responding (n = 171)	Surveyed (n = 25)	Responding (n = 280)	
Total No. of licensed beds					
1–50	85 (37)	45 (26)	52 (12)	30 (11)	
51–75	74 (32)	65 (38)	62 (15)	35 (13)	] <.001
76–100	28 (12)	22 (13)	71 (17)	51 (18)	
101–150	30 (13)	29 (17)	161 (38)	103 (37)	
>150	14 (6)	10 (6)	79 (18)	61 (21)	
Occupancy over the past quarter, %					
0–82	NA	61 (37)	NA	43 (16)	
83–90	NA	63 (38)	NA	89 (34)	] <.001
91–95	NA	29 (18)	NA	58 (22)	
>95	NA	11 (7)	NA	72 (27)	

Abbreviation: NA, not applicable.

<sup>a</sup>Comparison of Nebraska vs Michigan responding nursing homes by  $\chi^2$  test.

Table 2

Planning Components for Pandemic Influenza in Nursing Homes<sup>a</sup>

	Respondents, No./Total (%)			P Value <sup>b</sup>
	Nebraska (n = 171)	Michigan (n = 280)	Total (n = 451)	
Pandemic influenza plan				
Separate plan	36/167 (22)	61/261 (23)	97/428 (23)	
Part of current plan	42/167 (25)	68/261 (26)	110/428 (26)	.85
Does not yet have a plan	89/167 (53)	132/261 (51)	221/428 (52)	
Staff position responsible for pandemic or disaster preparedness	122/167 (73)	223/279 (80)	345/446 (77)	.09
Referred to the CDC nursing home pandemic preparedness checklist	105/170 (62)	171/276 (62)	276/446 (62)	.97
Stockpiling supplies	66/167 (40)	150/264 (57)	216/431 (50)	<.001
Plans to provide pandemic training	70/148 (47)	131/241 (54)	201/389 (52)	.18
Staff given introductory pandemic education	87/167 (52)	104/248 (42)	191/415 (46)	.04
Access to laboratory facilities for influenza detection	118/147 (80)	215/248 (87)	333/395 (84)	.09
Plans to prioritize staff and residents for vaccine and antiviral distribution	75/152 (49)	156/249 (63)	231/401 (58)	.009
Plans to brief family members, visitors, vendors, and consultants	66/147 (45)	141/247 (57)	207/394 (53)	.02
Communication lines established with nearby hospitals	53/138 (38)	112/227 (49)	165/365 (45)	.04
Communication lines with state and local public health officials	65/136 (48)	121/217 (56)	186/353 (53)	.14
Conducted pandemic influenza outbreak exercises	8/168 (5)	20/264 (8)	28/432 (6)	.25
Mental health and faith-based services available	94/154 (61)	185/239 (77)	279/393 (71)	<.001
Nursing homes being counted on as alternative care sites for hospital overflow	112/165 (68)	137/272 (50)	249/437 (57)	<.001
Additional beds could be made available	79/171 (46)	89/280 (32)	168/451 (37)	.002

	Respondents, No./Total (%)			P Value <sup>b</sup>
	Nebraska (n = 171)	Michigan (n = 280)	Total (n = 451)	
Will accept hospital overflow influenza patients requiring low level of care	60/171 (35)	110/280 (39)	170/451 (38)	.37
Will accept hospital overflow noninfluenza patients requiring low level of care	115/171 (67)	148/280 (53)	263/451 (58)	.003
Will discharge residents to open up beds	7/171 (4)	25/280 (9)	32/451 (7)	.05
Will accept patients on ventilators	8/171 (5)	11/280 (4)	19/451 (4)	.70
Will provide community care and services such as vaccination clinics	62/171 (36)	85/280 (30)	147/451 (33)	.19

Abbreviation: CDC, Centers for Disease Control and Prevention.

<sup>a</sup> Responses of “do not know” were treated as missing data.

<sup>b</sup> Comparison of Nebraska vs Michigan responding nursing homes using  $\chi^2$  test.