



Characteristics and Quality of US Nursing Homes Reporting Cases of Coronavirus Disease 2019 (COVID-19)

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Introduction

Coronavirus disease 2019 (COVID-19) has taken an enormous toll on US nursing homes, claiming the lives of at least 7000 residents and staff across 4100 facilities and accounting for nearly 20% of COVID-19 deaths in the United States.¹ On April 19, 2020, the Centers for Medicare & Medicaid Services began requiring nursing homes to report COVID-19 cases in their facilities.² Our objective was to describe the characteristics and quality of nursing homes with COVID-19 cases in states where public health departments have begun to publicly report their statuses.

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Methods

From April 22 to April 29, 2020, we obtained publicly available data from state governments and departments of public health that were reporting nursing homes with cases of COVID-19. This included the District of Columbia and the following 23 states: California, Colorado, Connecticut, Delaware, Florida, Georgia, Iowa, Illinois, Kentucky, Massachusetts, Maryland, Michigan, Minnesota, North Carolina, North Dakota, New Jersey, New Mexico, Nevada, New York, Ohio, Oklahoma, Oregon, and Tennessee. As states differed with respect to counting cases (ie, some included residents and staff while others only included residents), we did not collect data on the number of

Table. Characteristics of Nursing Homes With and Without COVID-19 Cases

Characteristic	Mean (SD)	
	Nursing homes not reporting COVID-19 cases (n = 5922)	Nursing homes reporting COVID-19 cases (n = 3021)
5-star ratings ^a		
Overall	3.2 (1.4)	3.2 (1.4)
Deficiency	2.8 (1.3)	2.7 (1.3)
Staffing	3.0 (3.0)	2.9 (2.8)
Quality	3.6 (1.2)	4.0 (1.1)
Deficiencies		
Total health deficiency score	56.2 (68.7)	67.0 (67.6)
Deficiencies on emergency preparedness, No.	3.2 (3.4)	3.9 (3.6)
Facility-reported incidents, No. ^b	1.1 (3.1)	2.4 (4.7)
Substantiated complaints, No. ^c	4.0 (7.4)	5.7 (9.5)
Staffing		
Total direct care staff hours per resident-day ^d	3.9 (0.9)	4.0 (0.9)
RN	0.7 (0.5)	0.7 (0.4)
LPN	0.8 (0.3)	1.0 (0.4)
Nurse aide	2.3 (0.6)	2.3 (0.5)
Characteristics		
For-profit ownership, No. (%)	4090 (69.1)	2383 (78.9)
Beds, No.	103.8 (62.9)	122.5 (70.9)
Residents insured by Medicaid, %	56.7 (24.1)	59.3 (25.5)
County-level infection rate		
Rate of COVID-19 per 100 000 population	231.3 (444.4)	428.2 (505.6)

Abbreviations: COVID-19, coronavirus disease 2019; LPN, licensed practical nurse; RN, registered nurse.

^a On a scale of 1 to 5, with 1 being lowest quality and 5 being highest quality.

^b Alleged violations that involve abuse or serious bodily injury, such as falls, which are observed by the facility, then documented and reported to state agencies.

^c Findings from complaint investigations in the past 3 years.

^d Direct care staff include RNs, LPNs, and nurse aides.

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cases. We then identified Medicare provider numbers for each facility and linked these to current data from Nursing Home Compare³ for facility characteristics and quality and to the Certification and Survey Provider Enhanced Reporting data for additional characteristics. We also linked these data to county-level rates of COVID-19 cases per 100 000 residents as of April 29, 2020, using a combination of publicly available case rates⁴ and data from the US Census. Per the Common Rule, this study was exempt from institutional review board review owing to the use of facility-level data with no patient-level identifiers. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline for cross-sectional studies.

We compared characteristics between nursing homes that did and did not report cases of COVID-19, including 5-star quality ratings (overall rating and ratings for deficiencies, staffing, and quality), deficiencies (total health deficiency score, number of deficiencies on emergency preparedness, reported incidents, and substantiated complaints), staffing hours per resident-day (for total direct care staff, registered nurses, licensed practical nurses, and nurse aides), facility characteristics (for-profit ownership, number of beds, and percentage of residents insured by Medicaid), and the county-level rate of COVID-19 in the general population. Tests of statistical significance were not performed given the purpose of description and the absence of formal hypothesis testing. All analyses were conducted with Stata version 15 (StataCorp).

Results

The sample included 8943 nursing homes in 23 states and the District of Columbia, with 3021 (33.8%) reporting COVID-19 cases by April 29, 2020. Facilities that reported COVID-19 cases had similar mean (SD) scores as those that did not on overall 5-star ratings (3.2 [1.4] vs 3.2 [1.4]) as well as star ratings on deficiencies (2.7 [1.3] vs 2.8 [1.3]) and staffing (2.9 [2.8] vs 3.0 [3.0]) (**Table**). Compared with facilities that did not report COVID-19 cases, those that did had more mean (SD) health deficiencies (56.2 [68.7] vs 67.0 [67.6]), emergency preparedness deficiencies (3.2 [3.4] vs 3.9 [3.6]), reported incidents (1.1 [3.1] vs 2.4 [4.7]), and substantiated complaints (4.0 [7.4] vs 5.7 [9.5]). There were also more for-profit facilities in the group that reported cases than in the group that did not (2383 [78.9%] vs 4090 [69.1%]), and facilities that reported cases had a higher mean (SD) percentage of Medicaid-insured residents than facilities that did not (59.3% [25.2%] vs 56.7% [24.1%]). Mean (SD) rates of COVID-19 were nearly twice as high in counties where facilities reported COVID-19 than in those without reported cases (428.2 [505.6] per 100 000 residents vs 231.3 [444.4] per 100 000 residents).

Discussion

We found that rates of deficiencies and complaints, defined as failures to meet or allegations of noncompliance with federal requirements, were higher in nursing homes that reported COVID-19 cases. The largest difference between nursing homes with and without COVID-19 cases was observed in county-level rates of COVID-19, suggesting that when the surrounding population case rate is high, area nursing homes are at a high risk of infections.

Nursing homes care for aging adults with chronic conditions and have experienced years of declining revenues and financial instability.^{5,6} These factors have made many facilities ill prepared for a pandemic, and stemming the spread of COVID-19 in nursing homes will not be easy. While our data only provide a snapshot during an evolving pandemic and states' reports of COVID-19 cases have not been validated, our findings are nonetheless important, providing real-time information regarding the risk of COVID-19 infections in nursing homes.

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Concept and design: Chatterjee, Werner.

Acquisition, analysis, or interpretation of data: All authors.

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