asymptomatic and 10% were presymptomatic. The proportion of asymptomatic residents is higher than in previous smaller survey studies of long-term care facilities, which found percentages of 50% to 55%.[2-4]

The study limitations include sampling of selected NHs in 1 state and no staff testing. The high proportion of asymptomatic patients may be overestimated due to challenges in ascertaining symptoms in elderly individuals with atypical or mild presentations, exclusion of symptomatic patients who previously tested positive, or the possibility of symptom resolution before testing. In addition, COVID-19 rates in surrounding communities were not factored into NH prioritization and repeat testing was not performed.

NHs house particularly vulnerable populations because of their age, rates of comorbidities, and clustering.[5] Point prevalence surveys may be necessary to limit spread in NHs, with a prioritized rollout in situations with limited control and testing capacity. Repeated testing in NHs may also be useful.[4,6]

Sunil Parikh, MD, MPH
Kevin O'Laughlin, MD
Hanna Y. Ehrlich, MPhil
Lauren Campbell, BS
Adora Harizaj, MPH
Amanda Durante, PhD
Vivian Leung, MD

Author Affiliations: Department of Epidemiology of Microbial Diseases, Yale School of Public Health, New Haven, Connecticut (Parikh, Ehrlich, Campbell); Epidemic Intelligence Service, Centers for Disease Control and Prevention, Atlanta, Georgia (O'Laughlin); Connecticut Department of Public Health, Hartford (Harizaj, Durante, Leung).

Corresponding Author: Sunil Parikh, MD, MPH, Department of Epidemiology of Microbial Diseases, Yale School of Public Health, 60 College St, New Haven, CT 06520 (sunil.parikh@yale.edu).

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Association of Nursing Home Ratings on Health Inspections, Quality of Care, and Nurse Staffing With COVID-19 Cases

In the US, approximately 27% of deaths due to coronavirus disease 2019 (COVID-19) have occurred among residents of nursing homes (NHs).[1] However, why some facilities have been more successful at limiting the spread of infection than others is unclear. For example, those with greater staffing or higher performance on quality measures may be better at containing the spread of COVID-19 among staff and residents.

We evaluated whether NHs rated highly by the Centers for Medicare & Medicaid Services (CMS) across 3 unique domains—health inspections, quality measures, and nurse staffing—had lower COVID-19 cases than facilities with lower ratings.

Methods | We used data from 8 state health departments (California, Connecticut, Florida, Illinois, Maryland, Massachusetts, New Jersey, and Pennsylvania) to determine the total number of COVID-19 cases occurring in NHs between January 1, 2020, and June 30, 2020. We linked these data with CMS *Nursing Home Compare*, which includes star ratings (range, 1 [low] to 5 [high]) that characterize performance across the 3 domains.[2] The health inspection rating is based on the number of deficiencies identified in the 3 most recent state surveys across several areas, including staff-resident interactions and adequate infection control protocols. The quality measures rating is based on the weighted mean of performance across 15 quality measures (eg, avoidable hospitalizations, pressure ulcers, urinary tract infections). The nurse staffing domain is based on the mean staffing hours per resident by qualified nursing staff.

Given how COVID-19 data are publicly reported across some states, we were limited to grouping NHs into 3 categories: those with 10 or fewer, 11 to 30, or more than 30 COVID-19 cases. We performed 3 separate ordinal logistic regression models to assess the odds of high-performing facilities (4- or 5-star facilities) having more than 30 cases vs 11 to 30 cases vs 10 cases

Table 1. Characteristics of High-Performing vs Low-Performing Nursing Homes Across 3 CMS Performance Domains[a]

Nursing home characteristics	All	Nursing homes with ratings					
		Health inspection[b]		Quality measures[c]		Nurse staffing[d]	
		High performing	Low performing	High performing	Low performing	High performing	Low performing
No. of nursing homes[e]	4254	1451	2803	2974	1267	1517	2708
COVID-19 cases, No. (%)							
≤10	2712 (63.8)	1013 (69.8)	1699 (60.6)	1900 (63.9)	801 (63.2)	1024 (67.5)	1668 (61.6)
11-30	246 (5.8)	90 (6.2)	156 (5.6)	177 (6.0)	69 (5.4)	111 (7.3)	133 (4.9)
>30	1296 (30.5)	348 (24.0)	948 (33.8)	897 (30.2)	397 (31.3)	382 (25.2)	907 (33.5)
Certified beds, median No.	116	91	120	111	120	100	120
States, %							
California	23.4	22.8	23.7	27.8	13.2	17.9	26.6
Connecticut	5.0	5.2	4.9	5.3	4.4	6.2	4.4
Florida	16.1	16.3	16.1	16.4	15.2	23.6	11.8
Illinois	16.7	16.3	16.9	12.3	27.0	13.5	18.1
Maryland	5.3	5.1	5.4	5.9	3.9	5.5	5.1
Massachusetts	8.8	8.4	9.0	7.2	12.5	10.3	8.0
New Jersey	8.5	9.4	8.0	10.3	4.3	10.0	7.8
Pennsylvania	16.2	16.4	16.1	14.9	19.5	13.1	18.2
County characteristics							
<High school education, %	60.6	58.3	61.8	63.1	54.4	55.2	63.6
Median income, $	58 212	59 296	57 650	59 135	56 142	60 673	56 841
White population, %	72.8	73.2	72.6	71.0	77.0	72.6	73.0

Abbreviations: CMS, Centers for Medicare & Medicaid Services; COVID-19, coronavirus disease 2019.

[a] CMS ratings are based on each domain. Higher-performing facilities rank 4 or 5 stars; lower-performing facilities, 1 to 3 stars.[2]

[b] Based on the number of deficiencies from 3 most recent standard surveys (or any complaint-triggered inspection) and assess such areas as staff-resident interactions, protection of residents from abuse, infection control, and food and medication storage and management.

[c] Rates for 15 equally weighted measures based on the percentage of long-stay patients whose need for help with activities of daily living has increased, whose ability to move independently worsened, who have pressure ulcers, who had a catheter inserted and left in their bladder, who have a urinary tract infection, who have had 1 or more falls with major injury, and who received an antipsychotic medication and on the number of hospitalizations and outpatient emergency department visits per 1000 resident-days; and the percentage of short-stay residents whose function improved, who have new

or worsened pressure ulcers, who newly received an antipsychotic medication, who were rehospitalized after nursing home admission, and who have had an outpatient emergency department visit and on the rate of successful return to home and community.

[d] Based on 2 case mix–adjusted measures: total nursing hours per resident day and registered nurse hours per resident day. Overall nurse staffing rating is the arithmetic average of the registered nurse and total nurse staffing rating.

[e] See the Results section of text for the overall No. (%) of star ratings among sample nursing homes. Across the 8 states, the sample included the following proportion of CMS-certified nursing homes in each state: 99.2% in Massachusetts, 99.4% in New Jersey, 99.5% in Connecticut, 83.3% in California, 99.3% in Pennsylvania, 97.6% in Florida, 99.1% in Maryland, and 97.8% in Illinois. Massachusetts, New Jersey, Pennsylvania, Florida, and Maryland counted both staff and residents who contracted COVID-19 at their facilities; the other states included resident cases only.

or fewer relative to low-performing facilities (1- to 3-star facilities), adjusting for the number of certified beds and including county fixed effects. The study was conducted using SAS version 9.4 (SAS Institute Inc). Two-sided P values were considered significant at the $P < .05$ level. The Harvard T. H. Chan School of Public Health Institutional Review Board waived the need for informed consent.

Results | Of the 4254 NHs across the 8 states, 4254 (100%) had star ratings for health inspection; 4241 (99.7%), quality measures; and 4225 (99.3%), nurse staffing domains. Within each domain, 1451 (34.1%) were considered high performing for health inspection; 2974 (70.1%) for quality measures; and 1517 (35.9%) for nurse staffing (Table 1). High-performing NHs were less likely to have had more than 30 COVID-19 cases than were low-performing facilities across each domain (health inspections, 348 [24.0%] vs 948 [33.8%]; quality measures, 897 [30.2%] vs 397 [31.3%]; nurse staffing, 382 [25.2%] vs 907

[33.5%]). High-performing NHs had a lower median number of certified beds. After adjustment, NHs with high ratings on nurse staffing were less likely to have more than 30 COVID-19 cases vs facilities with 11 to 30 and vs facilities with 10 or fewer cases than were low-performing NHs (OR, 0.82; 95% CI, 0.70-0.95; $P = .01$) (Table 2). There was no significant association between high- vs low-performing NHs in the health inspections or quality measures domains with COVID-19 cases.

Discussion | Across 8 states, high-performing NHs for nurse staffing had fewer COVID-19 cases than low-performing NHs. In contrast, there was no significant difference in the burden of COVID-19 cases between high- vs low-performing NHs for health inspection or quality measure ratings. These findings suggest that poorly resourced NHs with nurse staffing shortages may be more susceptible to the spread of COVID-19.[3,4] Although guidance on best practices on infection control are important, which has been the primary strategy used by CMS to

Table 2. Association Between Nursing Home Ratings on Health Inspections, Quality Measures, and Nurse Staffing Domains With COVID-19 Cases

High-performing vs low-performing nursing homes across CMS domains	Ordinal odds ratio of a nursing home having >30 cases vs 11 to 30 cases vs ≤10 cases[a]	P value
Health inspection	0.91 (0.78-1.07)	.25
Quality measures	1.05 (0.90-1.23)	.52
Nurse staffing	0.82 (0.70-0.95)	.01

Abbreviations: CMS, Centers for Medicare & Medicaid Services; COVID-19, coronavirus disease 2019.

[a] Separate ordinal logistic regression models across each rating category were used to calculate the likelihood of high-performing nursing homes (those rated 4 or 5 stars) vs low-performing nursing homes (those rated 1 to 3 stars) having more than 30 COVID-19 cases vs 11 to 30 cases vs no more than 10 cases. All models were adjusted for certified beds of each nursing home and included county fixed effects.

date, policies that provide immediate staffing support may be more effective at mitigating the spread of COVID-19.[5,6]

This study has limitations. It included data from only 8 states; however, these states rank among those with the highest COVID-19 burden. The state-reported data used are also more reliable than the national COVID-19 data set recently released by CMS, which reports suggest is incomplete and inaccurate. In addition, high-performing NHs may have greater capacity to test and diagnose cases, which may lead to an underestimate of the association between low performance on the staffing domain and higher COVID-19 cases.

Jose F. Figueroa, MD, MPH
Rishi K. Wadhera, MD, MPP
Irene Papanicolas, PhD
Kristen Riley, BA
Jie Zheng, PhD
E. John Orav, PhD
Ashish K. Jha, MD, MPH

Author Affiliations: Department of Health Policy and Management, Harvard T. H. Chan School of Public Health, Boston, Massachusetts (Figueroa, Riley, Zheng, Orav, Jha); Richard A. and Susan F. Smith Center for Outcomes Research, Beth Israel Deaconess Medical Center, Boston, Massachusetts (Wadhera); Department of Social and Health Policy, London School of Economics, London, United Kingdom (Papanicolas).

Corresponding Author: Jose F. Figueroa, MD, MPH, Department of Health Policy and Management, Harvard T. H. Chan School of Public Health, 677 Huntington Ave, Kresge Room 413, Boston, MA 02115 (jfigueroa@hsph.harvard.edu).

Accepted for Publication: July 22, 2020.

Published Online: August 10, 2020. doi:10.1001/jama.2020.14709

Author Contributions: Drs Figueroa and Zheng had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Concept and design: Figueroa, Wadhera, Papanicolas, Jha.
Acquisition, analysis, or interpretation of data: Figueroa, Wadhera, Riley, Zheng, Orav.
Drafting of the manuscript: Figueroa, Riley.
Critical revision of the manuscript for important intellectual content: Figueroa, Wadhera, Papanicolas, Zheng, Orav, Jha.
Statistical analysis: Papanicolas, Zheng, Orav.
Obtained funding: Figueroa.
Administrative, technical, or material support: Figueroa, Riley, Jha.
Supervision: Figueroa, Jha.

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Policies Among US Pediatricians for Dismissing Patients for Delaying or Refusing Vaccination

In January 2019, the World Health Organization declared vaccine hesitancy one of the top 10 threats to global health.[1] Some US pediatricians dismiss children from their practice whose parents refuse vaccination.[2] However, little is known about the current prevalence of this practice.

Methods | We conducted a survey from April to July 2019 among US pediatricians using a physician survey network. Physicians were recruited to fill sampling quotas representative of American Academy of Pediatrics membership with respect to region, practice location, and practice setting and asked to complete 2 to 4 surveys each year.[3]

The survey assessed pediatricians' current practices, experiences, and office policies regarding dismissal of families who refuse or ask to "spread out" either vaccines in the primary series or any vaccines using a series of 4-point Likert scales (never, rarely, sometimes, often/always) and yes-or-no questions. The survey was pilot tested in national samples of pediatricians. The survey was administered via mail or internet (Vovici) using Dillman's tailored approach.

We compared respondents with nonrespondents using t test and χ^2 analyses. We conducted a multivariable analysis with the dependent variable of having an office policy to dismiss families for vaccine refusal of 1 or more vaccines in the primary vaccine series. Independent variables included practice characteristics, presence of a state philosophical exemption, and state's degree of difficulty in obtaining an exemption (easy vs medium/difficult).[4] We used log-binomial regression to obtain risk ratios and 95% CIs. P values were 2-sided and $P < .05$ was considered significant. Analyses were performed using SAS software, version 9.4 (SAS Institute Inc).