

By Fangli Geng, David G. Stevenson, and David C. Grabowski

## DATAWATCH

# Daily Nursing Home Staffing Levels Highly Variable, Often Below CMS Expectations

*Staffing is an important quality measure that is included on the federal Nursing Home Compare website. New payroll-based data reveal large daily staffing fluctuations, low weekend staffing, and daily staffing levels often below the expectations of the Centers for Medicare and Medicaid Services (CMS). These data provide a more accurate and complete staffing picture for CMS and consumers.*

**S**taffing is an important quality measure used to profile nursing homes on the federal Nursing Home Compare website. Since staffing data were first reported on the website in 1998, Nursing Home Compare has relied on facility-reported data that describe staffing during the two weeks before each nursing home's

annual recertification survey.<sup>1</sup> Researchers have questioned the completeness and accuracy of these rarely audited facility-reported staffing data.<sup>1-4</sup> In 2016 the Centers for Medicare and Medicaid Services (CMS) introduced the Long-term Care Facility Staffing Payroll-Based Journal (PBJ) system, to which nursing homes are required by Section 6106 of the Affordable Care

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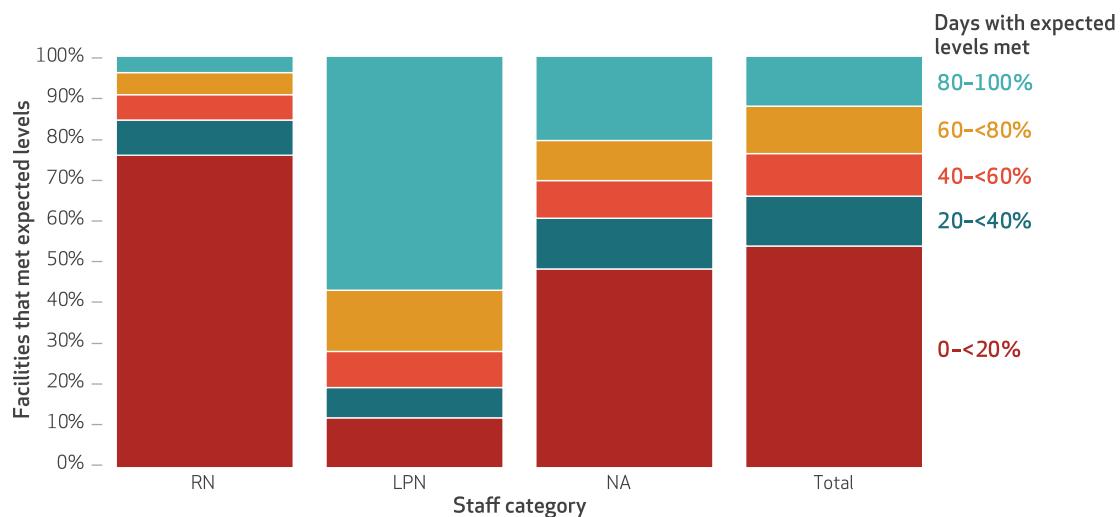
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## EXHIBIT 1

**Percent of nursing homes that met the staffing levels expected by the Centers for Medicare and Medicaid Services (CMS) for all staff categories and total staffing time, by percent of days when expected levels were met, April 2017–March 2018**



**SOURCE** Authors' analysis of data from the Long-term Care Facility Staffing Payroll-Based Journal (PBJ) and Nursing Home Compare. **NOTES** N = 15,331. From Nursing Home Compare, we obtained expected staffing levels for each nursing home, which are calculated by CMS after adjusting for the acuity of residents in each facility, based on the Staff Time and Resource Intensity Verification Project Study (see note 7 in text). "RN" includes the categories of registered nurse, RN director of nursing, and RN with administrative duties. "LPN" includes the categories of licensed practical nurse and LPN with administrative duties. "NA" includes the categories of certified nurse aide (CNA), nurse aide in training, and medication aide or technician. For each facility, we used the monthly expected staffing level as a threshold for the entire month. We then compared the reported staffing level on each day to the threshold for that month and calculated what proportion of the time during a year facilities met or exceeded the expected level of staffing.

Act to submit auditable payroll-based staffing and resident census data quarterly.<sup>5</sup> With their detailed daily snapshots, PBJ data permit deeper insights into staffing patterns than was previously possible. Importantly, the data suggest that a large proportion of nursing homes often have daily staffing below CMS's case-mix-adjusted expected staffing levels (exhibit 1).

Reflecting the potential value of the PBJ data, CMS began using them as the source for staffing information in Nursing Home Compare and the Five-Star Quality Rating System in April 2018. In this article we showcase the more granular PBJ staffing data as a new and valuable resource to expand the evidence base on nursing home staffing by analyzing PBJ and facility-reported staffing levels, staffing at the time of the annual inspection relative to the rest of the year, staffing across different days of the week, facility factors associated with low weekend staffing, observed versus expected staffing based on resident acuity, and compliance with federal nurse staffing standards.

## Study Data And Methods

We obtained facility-level data from the Long-term Care Facility Staffing Payroll-Based Journal for the one-year period of April 2017–March 2018. We used data on daily resident census and payroll-based measures of nurse staffing to calculate hours per resident day by staff category. For comparison, we obtained facility-reported staffing and resident census data and annual inspection survey dates from the Certification and Survey Provider Enhanced Reports (CASPER) for calendar years 2017 and 2018. For PBJ and CASPER data, we applied inclusion and exclusion criteria consistent with those used in the CMS Five-Star Quality Rating System.<sup>6</sup>

From Nursing Home Compare, we collected additional facility information, including ownership type, size, overall five-star rating, and expected staffing levels. CMS calculates expected staffing levels for each facility, adjusting for the acuity of residents in the facility and based on the Staff Time and Resource Intensity Verification Study.<sup>7</sup> This information is updated monthly, and we used the information available as of March 2018 to categorize facilities based on their organizational characteristics.

For each analysis, we excluded facilities with missing information and reported the resulting sample size. For additional details on our data and methods, see the online appendix.<sup>8</sup>

Our study was limited in several ways. First, PBJ and CASPER staffing data are measured with potential error. Because CASPER data are facility-reported over a two-week look-back period, they are susceptible to upcoding by facilities and have not been subject to audit. Also, staffing around the time of the annual survey could exceed typical staffing levels if facilities increase staffing during their anticipated survey window.

Second, PBJ collects data only on paid hours. Therefore, it might not accurately reflect salaried staff hours (for example, if salaried staff work more or less than forty hours per week) or distinguish between hours worked and hours paid but not worked (such as sick leave and vacation).<sup>1</sup> Data from the Current Population Survey suggest that people in higher-paid staffing categories in nursing homes are more likely to be salaried; nonetheless, four out of five nursing staff (registered nurses [RNs] and licensed practical nurses [LPNs]) in nursing homes are paid hourly (Kezia Scales and Stephen Campbell, PHI, personal communication based on their unpublished analyses of data from the Current Population Survey, March 13, 2019).

## EXHIBIT 2

**Hours per resident day of direct care staffing across nursing homes, by ownership type, staff category, and data source, April 2017–March 2018**

Ownership type (number of facilities) and data source	Mean hours per resident day			
	RN	LPN	NA	Total direct care staff
For profit (8,882)				
	CASPER	0.420	0.871	2.315
	PBJ	0.359	0.811	2.161
Government (856)				
	CASPER	0.492	0.844	2.638
	PBJ	0.431	0.789	2.452
Nonprofit (2,904)				
	CASPER	0.557	0.834	2.658
	PBJ	0.502	0.785	2.545
All (12,642)				
	CASPER	0.455	0.861	2.411
	PBJ	0.394	0.804	2.264

**SOURCE** Authors' analysis of data from the Long-term Care Facility Staffing Payroll-Based Journal (PBJ), the Certification and Survey Provider Enhanced Reports (CASPER), and Nursing Home Compare. **NOTES** We included the same staffing categories for the PBJ and CASPER data to facilitate direct comparison across the measures. Using payroll data for each facility, we calculated total direct care staffing levels by summing the staffing hours of the categories registered nurse (RN), licensed practical nurse (LPN), and nurse aide (NA). "NA" includes the categories of certified nurse aide (CNA), nurse aide in training, and medication aide or technician. Payroll-reported mean hours per resident day (HPRD) for each facility were calculated by dividing the aggregate reported hours by the aggregate resident census for the study period. Using CASPER data, we calculated total direct care staffing levels by summing contract, part-time, and full-time hours for each staff category. We included facilities whose CASPER survey dates were in the period April 14, 2017–April 1, 2018. The CASPER-reported mean HPRD for each facility was calculated by converting the full-time-equivalent information in CASPER using the following formula: (total direct care staffing level times 70) divided by (number of residents times 14). For a facility that had more than two surveys within the period, the CASPER-reported mean hours per resident day was calculated by this formula: (70 times the aggregate reported hours) divided by (14 times the aggregate number of residents). We included only facilities that had reported hours for the selected period in payroll data and CASPER. The means and standard deviations (reported in appendix exhibit B; see note 8 in text) were weighted by the numbers of residents in facilities. All differences between PBJ data and CASPER or facility-reported data were significant ( $p < 0.001$ ) according to paired two-sample t-tests of 95% confidence intervals.

Finally, although we converted the payroll-based and facility-reported staffing measures to comparable units (hours per resident day), each measure collects staffing hours and resident census information through different processes.

## Study Results

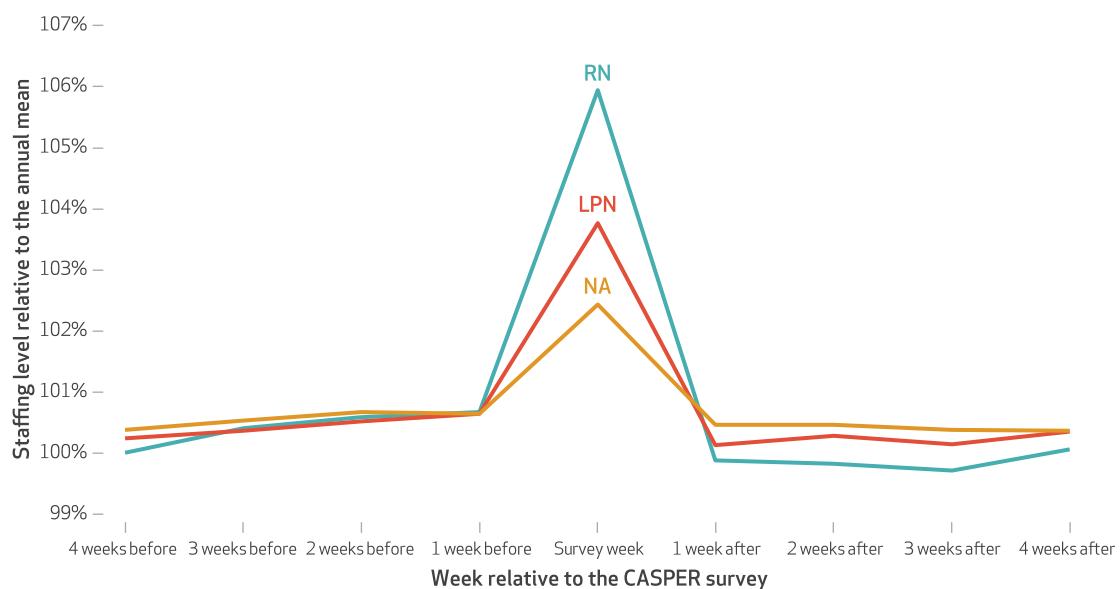
**PAYROLL-BASED JOURNAL—REPORTED AND FACILITY-REPORTED STAFFING** We compared staffing in the PBJ data with facility-reported staffing (in CASPER) over the same two-week period. On average, the discrepancy between PBJ and CASPER staffing hours per patient day was greatest in for-profit facilities, followed by nonprofit and then government facilities. For each staffing type and across all ownership categories, the mean PBJ-reported hours per resident day were lower than reported in CASPER (exhibit 2). Overall, 70 percent of facilities reported higher total direct staffing time per resident in CASPER than in PBJ data—specifically, 71 percent of for-profit, 69 percent of government-owned, and 66 percent of nonprofit facilities (appendix exhibit A).<sup>8</sup>

**STAFFING AROUND THE TIME OF THE INSPECTION SURVEY** Using PBJ data, we examined staffing fluctuation around the time of facilities' annual inspection surveys relative to their annual staffing average (exhibit 3). In the weeks before and after the survey week, mean staffing levels were higher than annual staffing levels. Staffing levels increased before the survey week, reached a peak during the survey week, and then dropped following the survey. Trends were consistent across staffing categories (RN, LPN, and nurse aide), but RN staffing had the largest increase around the time of the survey.

**STAFFING DIFFERENCES ACROSS DAYS OF THE WEEK** Using payroll staffing information, we examined nurse staffing differences across the days of the week. Across staffing categories (RN, LPN, and nurse aide), staffing levels were stable during the weekdays but dropped on Saturdays and Sundays, especially in the case of RN staffing (exhibit 4). On average, RN, LPN, and nurse aide weekend staffing time per resident day was 17 minutes (42 percent), 9 minutes (17 percent), and 12 minutes (9 percent), respectively, less than weekday staffing time (data not shown).

### EXHIBIT 3

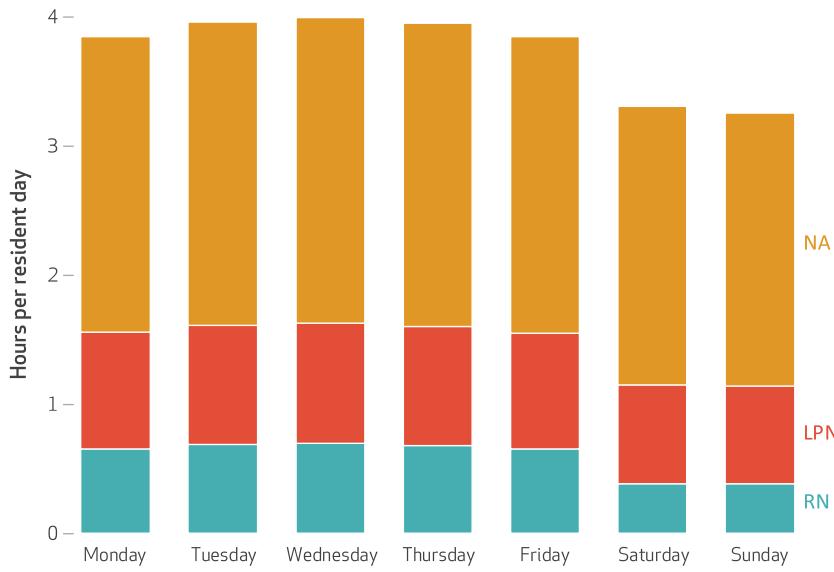
Staffing levels of nursing homes as percent of the annual mean level around the time of the inspection survey, by time and staff category, April 2017–March 2018



**SOURCE** Authors' analysis of data from the Long-term Care Facility Staffing Payroll-Based Journal (PBJ) and the Certification and Survey Provider Enhanced Reports (CASPER). **NOTES** N = 9,419. For each facility, we identified the days within the period starting four weeks before the CASPER survey week and ending four weeks after the survey week. Based on the PBJ, we calculated the mean registered nurse (RN), licensed practical nurse (LPN), and nurse aide (NA) (categories explained in the notes to exhibit 1) staffing hours per resident day of all facilities for each week during the nine-week period. The mean staffing hours per resident day were calculated by dividing the aggregate reported hours of all facilities of all days in a given week by the aggregate resident census of all facilities in all days in that week. Facilities with any missing entry for any day in the nine-week period were excluded from this analysis. We then calculated the relative length of staffing time for each week, compared to the mean staffing time that corresponded to the whole study period.

## EXHIBIT 4

Staffing hours per resident day at nursing homes across days of the week, by staff category, April 2017–March 2018



**SOURCE** Authors' analysis of data from Long-term Care Facility Staffing Payroll-Based Journal (PBJ).

**NOTES** N = 15,399. We calculated the mean hours per resident day of all facilities for each day of the week by dividing the aggregate reported hours for a certain day of the week by the aggregate resident census for that day of the week. "Registered nurse (RN)," "licensed practical nurse (LPN)," and "nurse aide (NA)" are explained in the notes to exhibit 1. We calculated the resident-to-staff ratio for a certain day of the week by dividing 24 hours by the mean hours per resident day for that day of the week.

**WEEKEND STAFFING BY FACILITIES WITH DIFFERENT ORGANIZATIONAL CHARACTERISTICS** To understand which facilities decreased staffing on weekends, we classified facilities by size, overall five-star rating, ownership type, and proportion of residents on Medicaid, and we compared the weekend and weekday mean staffing levels (exhibit 5). For LPN and nurse aide staffing, the decrease in weekend staffing was similar across the different facility categories of interest. However, the percentage decrease in RN staffing during weekends varied across facilities of different sizes, star ratings, and shares of residents on Medicaid. Larger facilities, on average, had a bigger decrease in staffing time during weekends. Facilities with higher five-star overall ratings had smaller RN decreases during the weekends. And facilities with lower shares of Medicaid residents had smaller decreases, compared to facilities with higher Medicaid shares.

**ACTUAL VERSUS EXPECTED STAFFING** We compared daily PBJ staffing levels to CMS-calculated expected staffing levels for each month (exhibit 1). During the study year, for total staffing, 54 percent of facilities met the expected level less than 20 percent of the time. For RN staffing, 91 percent of facilities met the expected level less than 60 percent of the time: 28 percent of facilities for LPN staffing and 70 percent of facil-

ties for nurse aide staffing.

#### FACILITY COMPLIANCE WITH NURSE STAFFING STANDARDS

**STANDARDS** Given the low proportion of facilities that met the expected staffing threshold for RNs, we used the PBJ data to investigate whether facilities had at least one RN on site for at least eight hours a day—a federal requirement that applies to almost all nursing homes nationwide. For RN staffing, 96.05 percent of facilities met the requirement for at least 80 percent of the days during the study year (exhibit 6).

#### Discussion

Staffing data from the Long-term Care Facility Staffing Payroll-Based Journal offer researchers, policy makers, and advocates an improved tool to use in monitoring nursing home staffing and assessing its potential importance to resident outcomes. For decades, publicly reported nursing home staffing measures have relied on facility-reported information during the narrow window of time around each facility's annual inspection survey. Not only were these older data subject to reporting bias, but they also were rarely audited to ensure accuracy. Although not without limitations (described above), PBJ data offer a much fuller picture of nursing home staffing throughout the year, including on weekends and at times when state surveyors are not on site. Because PBJ data are a newly available resource, their validity is relatively understudied. Nonetheless, our confidence in the data is bolstered by the fact that they are easily auditible and reflect the hours paid (as opposed to reported) by the nursing home. Comparing nursing home staffing levels with PBJ and older CASPER data, we found that the older facility-reported staffing levels were higher than those in the PBJ data, especially among for-profit nursing homes.

In previous studies of nursing home staffing, researchers and policy makers typically focused on average staffing levels, which potentially mask large fluctuations in daily staffing. We found nursing home staffing to be much lower on weekends—particularly RN staffing in facilities that cared for a higher share of Medicaid residents. Adverse events such as falls and medication errors might be more likely to occur during those understaffed days, regardless of whether the facility has high levels of staffing at other times. For this reason, CMS should leverage the daily payroll data to incorporate staffing variation over time, in addition to average staffing levels, in its calculation of star ratings.

Consistent with anecdotal accounts,<sup>9</sup> we found that nursing homes "staff up" in advance of—and during—surveyor visits. CMS could encourage greater randomness in the timing of inspections

**EXHIBIT 5**
**Mean weekend staffing in nursing homes, by staff category and selected organizational characteristics,  
April 2017–March 2018**

Organizational characteristic	No. of facilities	RN		LPN		NA	
		Mean HPRD	Percent of weekday average	Mean HPRD	Percent of weekday average	Mean HPRD	Percent of weekday average
<b>SIZE (MEAN NUMBER OF BEDS)</b>							
Small (52)	5,039	0.504	61	0.711	83	2.255	92
Medium (102)	5,840	0.358	57	0.771	83	2.125	92
Large (174)	4,438	0.360	57	0.771	84	2.086	91
<b>OVERALL RATING (STARS)</b>							
1	1,831	0.258	52	0.776	82	1.907	90
2	2,842	0.328	55	0.78	83	2.043	91
3	2,448	0.348	56	0.768	83	2.065	91
4	3,347	0.403	57	0.761	84	2.184	92
5	4,347	0.496	59	0.734	85	2.295	92
<b>OWNERSHIP TYPE</b>							
For profit	10,732	0.349	56	0.765	83	2.030	91
Government	1,028	0.420	57	0.745	83	2.295	90
Nonprofit	3,557	0.485	58	0.755	86	2.393	92
<b>MEDICAID PERCENTAGE (MEAN)</b>							
Low (30%)	4,411	0.492	58	0.789	84	2.278	92
Middle (64%)	4,530	0.356	55	0.754	83	2.116	92
High (82%)	4,435	0.319	57	0.755	83	2.006	91
Overall	15,399	0.384	57	0.763	83	2.130	91

**SOURCE** Authors' analysis of data from the Long-term Care Facility Staffing Payroll-Based Journal (PBJ), the Certification and Survey Provider Enhanced Reports (CASPER), and Nursing Home Compare. **NOTES** "Registered nurse (RN)," "licensed practical nurse (LPN)," and "nurse aide (NA)" are explained in the notes to exhibit 1. Staffing is presented in hours per resident day (HPRD). For each staff category, mean weekend staffing was calculated by dividing the aggregate reported weekend hours by the aggregate weekend resident census for that category for the study period. For each category, weekday mean staffing was calculated in the same way. Weekend staffing as a percentage of weekday average is the mean weekend mean staffing divided by the mean weekday staffing. Medicaid percentage is the percentage of residents who were enrolled in Medicaid, based on the CASPER data.

by surveyors to prevent this type of gaming on the part of facilities. CMS could also use PBJ data to monitor whether the staffing in place around the time of the survey is typical for the facility.

One troubling aspect of our findings is that 75 percent of nursing homes were almost never in compliance with what CMS expected their RN staffing level to be, based on residents' acuity. Still, almost all nursing homes met the federal eight-hour RN staffing requirement for the majority of days. These conflicting results suggest that the eight-hour requirement does little to ensure adequate RN staffing levels needed to care for people who live in nursing homes.

Policy makers are already beginning to use PBJ data in their oversight and monitoring of facilities. CMS used PBJ data to lower the quality star ratings at one out of eleven facilities on Nursing Home Compare, because of both low RN staffing and failure to submit data.<sup>10</sup> In November 2018 CMS announced actions that will help state surveyors identify facilities with especially low weekend staffing or no on-site RN during several days in a quarter. States are also now required to

conduct at least half of the required off-hour surveys on weekends at these facilities.<sup>11</sup> In the wake of a *New York Times* story that documented discrepancies between payroll and administrative data,<sup>12</sup> Sen. Ron Wyden (D-OR) issued a letter demanding that CMS fully implement the transition to using PBJ data and pursue in-

**EXHIBIT 6**
**Percent of days that registered nurse (RN) staffing in nursing homes met the minimum federal standard in April 2017–March 2018**

Percent of days facilities met the standard	Facilities meeting the standards	
	Number	Percent
0-<20%	20	0.13
20-<40%	52	0.34
40-<60%	83	0.54
60-<80%	454	2.95
80-100%	14,790	96.05

**SOURCE** Authors' analysis of data from the Long-term Care Facility Staffing Payroll-Based Journal (PBJ) and Nursing Home Compare. **NOTES** N = 15,399. "RN" includes the categories of RN, RN director of nursing, and RN with administrative duties. The minimum standard is eight RN hours per day.

creased protections for nursing home residents.<sup>13</sup> Similarly, the Office of Inspector General of the Department of Health and Human Services has announced that it will monitor CMS's collection of the payroll data and enforcement of related staffing standards.<sup>14</sup>

## Conclusion

Payroll-Based Journal staffing data have the potential to revolutionize efforts to monitor and

study the key role of nursing home staffing. By offering a more objective and detailed characterization of nursing home staffing, PBJ data have several important strengths relative to facility-reported administrative data. These features will benefit public reporting, monitoring, and value-based purchasing efforts and, more generally, help advance understanding of how staffing potentially contributes to improved resident outcomes and quality of care. ■

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represent the views of the Department of Veterans Affairs or the US government. David Grabowski serves as a paid consultant to Precision Health

Economics, Vivacitas, and CareLinx. He also serves on the Scientific Advisory Committee of NaviHealth.

## NOTES

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## Original Study

## Shortages of Staff in Nursing Homes During the COVID-19 Pandemic: What are the Driving Factors?



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## ABSTRACT

**Keywords:**  
 Staff shortages  
 personal protection equipment  
 COVID-19  
 nursing homes

**Objectives:** During the Coronavirus Disease 2019 (COVID-19) pandemic, US nursing homes (NHs) have been under pressure to maintain staff levels with limited access to personal protection equipment (PPE). This study examines the prevalence and factors associated with shortages of NH staff during the COVID-19 pandemic.

**Design:** We obtained self-reported information on staff shortages, resident and staff exposure to COVID-19, and PPE availability from a survey conducted by the Centers for Medicare and Medicaid Services in May 2020. Multivariate logistic regressions of staff shortages with state fixed-effects were conducted to examine the effect of COVID-19 factors in NHs.

**Setting and Participants:** 11,920 free-standing NHs.

**Measures:** The dependent variables were self-reported shortages of licensed nurse staff, nurse aides, clinical staff, and other ancillary staff. We controlled for NH characteristics from the most recent Nursing Home Compare and Certification and Survey Provider Enhanced Reporting, market characteristics from Area Health Resources File, and state Medicaid reimbursement calculated from Truven data.

**Results:** Of the 11,920 NHs, 15.9%, 18.4%, 2.5%, and 9.8% reported shortages of licensed nurse staff, nurse aides, clinical staff, and other staff, respectively. Georgia and Minnesota reported the highest rates of shortages in licensed nurses and nurse aides (both >25%). Multivariate regressions suggest that shortages in licensed nurses and nurse aides were more likely in NHs having any resident with COVID-19 (adjusted odds ratio [AOR] = 1.44, 1.60, respectively) and any staff with COVID-19 (AOR = 1.37, 1.34, respectively). Having 1-week supply of PPE was associated with lower probability of staff shortages. NHs with a higher proportion of Medicare residents were less likely to experience shortages.

**Conclusions/Implications:** Abundant staff shortages were reported by NHs and were mainly driven by COVID-19 factors. In the absence of appropriate staff, NHs may be unable to fulfill the requirement of infection control even under the risk of increased monetary penalties.

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The epicenter of the Coronavirus Disease 2019 (COVID-19) pandemic in the United States has been in long-term care facilities, particular nursing homes (NHs).<sup>1</sup> The first COVID-19 case in an NH was confirmed in a Kirkland, Washington, facility on February 28, 2020.<sup>2</sup> Since then, the Centers for Medicare and Medicaid Services (CMS)

reported 107,389 confirmed cases and 71,278 suspected cases of COVID-19 among residents based on self-reported data by NHs released in June 20, 2020.<sup>3</sup> NH residents are extremely vulnerable to COVID-19 because they are older, functionally impaired, and have multiple comorbidities.<sup>1,4</sup> This frail population thus bore more than

John Bowblis owns Bowblis Economic Consulting, which provides consulting services to long-term care providers. None of the material discussed in this paper is directly related to these services.

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27.5% of all confirmed cases resulting in death.<sup>3</sup> In fact, a *New York Times* analysis claims that NH residents and workers accounted for one-third of COVID-19 death in the United States.<sup>5</sup>

A critical aspect of NH care is staff.<sup>6–10</sup> Before the pandemic, NH staff was the single largest cost to operating an NH.<sup>11</sup> NHs must staff positions to provide direct care to residents but also ancillary services, such as housekeeping and food service. Examples of staffing categories include licensed nurses (ie, registered nurses [RNs] and licensed practical nurses [LPNs]), nurse aides that assist licensed nurses and provide direct care to residents (certified nurse aides [CNAs]), clinical staff (ie, physicians and other advanced practice providers), and other ancillary staff (eg, recreation and food services).<sup>12</sup> Research suggests that NHs with higher staffing levels tend to provide better quality of care,<sup>4,6–10,12–16</sup> but low wages, and less-desirable work environments compared with alternatives have made it difficult for NHs to hire and retain staff.<sup>10,17–19</sup> Reliance on government payment models, such as Medicaid, which reimburses at or below actual costs,<sup>20</sup> further limits NHs' ability to increase wages or offer other benefits to hire and retain staff.

These structural challenges have only become worse for NHs during the coronavirus pandemic.<sup>21,22</sup> NH workforce does not have the luxury of being able to social distance, as their job requires close contact with the residents. At the early stage of the pandemic, NHs lacked the life-saving personal protection equipment (PPE) to prevent the transmission within the facility.<sup>23–25</sup> The shortage put staff at increased risk of contracting the virus, with staff suspected of having contracted COVID-19 required to quarantine for at least 14 days. The net result was existing NH staff were often sidelined. Yet, other factors also created pressure. NHs needed to implement infection control protocols, including isolating residents who were suspected of having the virus.<sup>26</sup> The ban on visitors to NHs also reduced the availability of some informal care provided to residents by visiting relatives. This created a situation in which time and effort needed from NHs staff increased, yet structural factors made it more difficult to address,<sup>8,22,25,27</sup> creating the potential for a staff shortage.<sup>22</sup> CMS acknowledged this shortage by temporarily suspending the competency requirement for providing direct care to residents,<sup>28</sup> but the additional \$600 per week federal unemployment benefit hurt the ability of NHs to recruit needed staff.<sup>22</sup>

The coronavirus pandemic has led to an urgent shortage of staff faced by NHs,<sup>22,25</sup> yet which facilities and what factors drove these shortages are not well understood. To mitigate this knowledge gap, we analyzed the first-ever national COVID-19 NH staff data from CMS to examine the staffing shortages in NHs. Understanding the potential predictors of staffing shortages can help policy makers and NH administrators implement effective interventions to combat staff shortages.

## Methods

### Data Sources

We consolidated several publicly available datasets to create our analytic file. We download the Nursing Home COVID-19 Public File (COVID-19 File) from the Nursing Home Compare (NHCompare) website for COVID-19-related information, including detailed self-reported data on the number of resident and staff COVID-19 cases, supply of PPE, and shortages of staff. As of June 15, 2020, CMS published data of the weeks ending on May 24 and 31, 2020 for each certified NH and conducted the quality check of the data.<sup>3</sup> Of the 15,451 NHs with data on May 31, 2020, 80.1% (12,375) passed the quality check. NHs that did not pass the quality check tended to be smaller, for-profit, and with lower five-star ratings.

The COVID-19 file was merged with other data to obtain NH characteristics, particularly the April 2020 monthly NHCompare archive database and the Certification And Survey Provider Enhanced Reporting (CASPER). The NHCompare archive contains summary information about each NH, including select measures of facility structure, nursing staff levels, and star ratings. This information is updated regularly by CMS and contains the most recent publicly available information regarding facilities. CASPER captures a snapshot of each facility's payer-mix and resident case-mix before the pandemic. CASPER includes data collected as part of initial and annual recertification inspections of all Medicare and Medicaid-certified NHs, with these inspections occurring every 9 to 15 months. Because CASPER is available with a lag, we used the most recent inspection for each facility that occurred from August 2018 through October 2019 (with a median date of March 28, 2019). The 2010 Rural-Urban Commuting Areas Codes (RUCAs) that incorporate information on both population size and commuting time were downloaded to define the rurality of NHs.<sup>29</sup> County market factors were obtained from the 2018–2019 Area Health Resources File.<sup>30</sup> Truven Health Analytics' 2016 report on Medicaid expenditures for NHs was used to estimate state Medicaid reimbursement rates.<sup>15,31</sup>

### Study Cohort

The primary analysis included all free-standing NHs with COVID-19 information in the week of May 31, 2020, that could be merged with NHCompare and CASPER data, resulting in 11,920 unique NHs.

### Dependent Variables

The dependent variables included whether the NH self-reported a shortage in staff (yes/no) for the following type of staff: licensed nurse staff, nurse aides, clinical staff, and other staff. Licensed nurse staff included RNs and LPNs. Nurse aides included the CNAs, nurse aides, and medication aides/technicians. Clinical staff referred to physician, physician assistant, advanced practice nurse. Finally, other staff included all staff not mentioned in the preceding categories (eg, ancillary services such as housekeeping).

### Covariates

Covariates associated with potential shortages included COVID-19 factors, NH and market characteristics, and state policy relating to NHs.<sup>4,9,15,32,33</sup> COVID-19 factors included the cumulative number of residents and staff diagnosed with COVID-19 per 100 beds. We scaled the number of cases to 100 beds to account for differences in facility size. PPE has been shown to be very critical in preventing the transmission of COVID-19. We included 3 binary variables indicating whether a NH had a 1-week supply of N95 masks, eye protection, and gowns.

We used CASPER data to extract NH characteristics that might be associated with staffing shortages: staffing levels (RNs, LPNs, and CNAs measured in hours per resident day [HPRD]), NH structure (ownership, chain status, total beds, occupancy rate, and dementia special care unit), resident case-mix and payer-mix (case-mix acuity index, % Medicaid residents, and % Medicare residents), rurality, and NHCompare Overall Five-star Rating.<sup>4,15,32,34–36</sup> Rurality of NHs was determined from zip codes merged with 2010 RUCAs.<sup>37</sup> NHs were grouped into urban, large rural city/town (micropolitan), and small rural town/ isolated small rural town (rural).<sup>38</sup>

We included the following factors that described the NH market identified as the county in which the NH was located<sup>4</sup>: primary care

physician per 1000 population, concentration of total NH beds measured by the Herfindahl-Hirschman Index (HHI),<sup>39</sup> Medicare Advantage penetration rate (% Medicare Advantage of all Medicare beneficiaries in the county), median household income (\$), and % older population ( $\geq 65$ ).<sup>4,15,32–34</sup> Medicaid reimbursements were approximated by the ratio of a state's total Medicaid expenditure on NHs derived from Truven reports<sup>31</sup> divided by the total number of Medicaid bed days estimated from the number of NH residents with Medicaid payer reported in CASPER data.<sup>15</sup> Finally, we included state effects to control for unobserved fixed differences across states.

### Statistical Analysis

Descriptive analyses were conducted to show staff shortages, COVID-19 factors, NH characteristics, market factors, and state policy. We also compared these factors by whether the NHs had

any staff with COVID-19 and tested the statistical significance of differences between NHs with and without any staff with COVID-19 using *t*-tests for continuous variables and  $\chi^2$  tests for binary variables. We then conducted 4 separate multivariate logistic regressions to examine factors associated with shortages of staff with standard errors clustered at county level, as many COVID-19 policies including reporting are county-based. We dichotomized the residents and staff with COVID-19 at 1 to indicate whether the facility had any confirmed COVID-19 for easy interpretation and to avoid potential bias in reported cases. Overall 5-star rating was categorized as 4 or 5 stars versus 1 to 3 stars as an indicator of high rating. Continuous variables (except staffing and Medicaid rates) were standardized at overall means and SDs to reduce variance and simplify the comparison of parameter estimates.<sup>33</sup> The data of COVID-19 File in the week of May 24, 2020, were analyzed as sensitivity analysis and showed similar results (not reported).

**Table 1**  
Nursing Home Characteristics, Market Factors, and State Policy

Variables	All NHs (N = 11,920)	Staff with COVID-19 (n = 4466)	Staff without COVID-19 (n = 7454)	<i>P</i> value*
	Mean (SD) or N (%)	Mean (SD) or N (%)	Mean (SD) or N (%)	
<b>Outcome measures</b>				
Shortage of licensed nurse staff (RN+LPN)	1897 (15.9)	877 (19.6)	1020 (13.7)	<.01
Shortage of nurse aides <sup>†</sup>	2189 (18.4)	996 (22.3)	1193 (16.0)	<.01
Shortage of clinical staff (MD+NP+PA)	301 (2.5)	161 (3.6)	140 (1.9)	<.01
Shortage of other staff	1170 (9.8)	567 (12.7)	603 (8.1)	<.01
<b>COVID-19 factors</b>				
Total residents with COVID-19 per 100 beds	5.68 (30.24)	13.86 (35.58)	0.79 (25.31)	<.01
Total staff with COVID-19 per 100 beds	3.79 (18.86)	10.13 (29.77)	0.00 (0.00)	<.01
Has 1-week supply of N95 masks	9796 (82.2)	3727 (83.5)	6069 (81.4)	<.01
Has 1-week supply of eye protection	10,705 (89.8)	4088 (91.5)	6617 (88.8)	<.01
Has 1-week supply of gowns	9486 (79.6)	3559 (79.7)	5927 (79.5)	.82
<b>NH characteristics</b>				
<b>Staffing</b>				
RN staffing level (HPRD)	0.66 (0.42)	0.68 (0.42)	0.65 (0.42)	<.01
LPN staffing level (HPRD)	0.86 (0.33)	0.88 (0.32)	0.85 (0.34)	<.01
CNA staffing level (HPRD)	2.29 (0.53)	2.28 (0.54)	2.29 (0.52)	.33
<b>Structure</b>				
<b>Ownership</b>				
For-profit	8561 (71.8)	3190 (71.4)	5371 (72.1)	<.01
Government	647 (5.4)	192 (4.3)	455 (6.1)	
Not-for-profit	2712 (22.8)	1084 (24.3)	1628 (21.8)	
<b>Chain-affiliated</b>				
Number of beds	7205 (60.6)	2541 (57.0)	4664 (62.7)	<.01
Occupancy rate (0–100)	108.47 (58.65)	129.75 (72.16)	95.73 (44.12)	<.01
Dementia special care unit	78.91 (16.55)	81.61 (15.00)	77.30 (17.22)	<.01
<b>Resident and payer mix</b>				
Case-mix acuity index	10.42 (1.35)	10.56 (1.32)	10.34 (1.36)	<.01
% Medicaid paid (0–100)	59.44 (23.45)	58.75 (24.49)	59.84 (22.80)	.01
% Medicare paid (0–100)	13.11 (12.88)	13.85 (12.99)	12.66 (12.79)	<.01
<b>Rurality</b>				
Urban	7871 (66.3)	3698 (83.1)	4173 (56.2)	<.01
Micropolitan	1703 (14.3)	384 (8.6)	1319 (17.8)	
Rural	2300 (19.4)	368 (8.3)	1932 (26.0)	
Overall 5-star Rating $\geq 4$	5519 (46.3)	2105 (47.1)	3414 (45.8)	.16
<b>Market factors at county level</b>				
Primary care physician per 1000 population	0.60 (1.21)	0.93 (1.49)	0.40 (0.96)	<.01
Competitive market (HHI < 0.15)	8872 (74.4)	3803 (85.2)	5069 (68.0)	<.01
% Medicare Advantage penetration (0–100)	31.63 (13.75)	32.67 (13.13)	31.00 (14.08)	<.01
Median household income (\$)	58,206.04 (15,797.69)	63,264.92 (17,467.63)	55,139.06 (13,820.35)	<.01
% Older population ( $\geq 65$ ) (0–100)	16.90 (4.02)	15.95 (3.43)	17.47 (4.24)	<.01
<b>State policy</b>				
Medicaid reimbursement rates	179.74 (52.43)	185.89 (57.38)	176.06 (48.87)	<.01

HHI, Herfindahl-Hirschman Index; MD, physician; NP, Nurse Practitioner; PA, Physician Assistant.

Micropolitan, large rural city/town; Rural, small rural town/ isolated small rural town.

Data sources included the COVID-19 Nursing Home Dataset for COVID-19-related information, Nursing Home Compare Data (April 2020) for nursing home characteristics, CASPER (2018–2019) for nursing home characteristics, and Area Health Resources File (2018–2019) for market factors.

\**P* values measure whether nursing homes of staff with versus without COVID-19 had the same characteristics using *t*-tests for continuous variables, and  $\chi^2$  tests for binary variables.

<sup>†</sup>Nurse aides included the certified nursing assistant, nurse aide, medication aide, and medication technician.

All statistical analyses were performed in SAS 9.4 (SAS Institute Inc., Cary, NC) and Stata 16.0 (StataCorp LLC, College Station, TX).

## Results

Descriptive results by whether NHs had any staff with COVID-19 are presented in Table 1. Of the 11,920 NH sample, 15.9%, 18.4%, 2.5%, and 9.8% reported shortages of licensed nursing staff, nurse aides, clinical staff, and other staff, respectively. On average, 5.7 (SD 30.2) residents and 3.8 (SD 18.9) staff per 100 beds were confirmed with COVID-19; 82.2%, 89.8%, and 79.6% NHs had a 1-week supply of N95 masks, eye protection, and gowns, respectively. Most NHs were for-profit (71.8%), chain-affiliated (60.6%), with most residents paid by Medicaid (59.4%), and located in urban areas (66.3%). Approximately one-half (46.3%) of NHs had overall 5-star rating  $\geq 4$ . The average % Medicare Advantage penetration was 31.6% and state on average reimbursed NHs \$179.7 per resident day. Table 1 also suggests that almost all predictors were significantly different in NHs having any staff with versus without COVID-19, except for 1-week supply of gowns, CNA staffing level, and overall 5-star rating (all  $P \leq .01$ ). NHs having any staff with COVID-19 were more likely to experience shortages of licensed nurse, nurse aides, clinical staff, and other staff.

Figure 1 presents the geographic variation of staff shortages in licensed nurse and nurse aides. NHs in east and midwest states had a greater percentage of reported shortages, with the following states reporting the highest rate of shortages in licensed nurse and nurse aides (both  $>25\%$ ): District of Columbia, Georgia, Minnesota, and Rhode Island. Figure 2 suggests that number of residents and staff with COVID-19 were highly correlated and also varied by states. Connecticut, District of Columbia, Massachusetts, and New Jersey reported more than 20 residents and 10 staff per 100 NH beds. Together, Figure 1 and 2 imply that states with higher number of residents and staff with COVID-19 were more likely to report shortages in licensed nurse and nurse aides.

Multivariate logistic regression results are shown in Table 2. NHs having any resident with COVID-19 were more likely to experience shortages of nursing staff, nursing aides, clinical staff, and other staff (adjusted odds ratio [AOR] = 1.60, 1.44, 2.10, and 1.71, respectively; all  $P < .01$ ). Similarly, NHs with any staff with COVID-19 were more likely to report all shortages of all types of staff (AOR ranges 1.34–1.43; all  $P < .01$ ). Having a 1-week supply of eye protection and gowns was associated with lower probability of staffing shortages.

Previous staffing levels were not associated with staffing shortages during the pandemic (at the 5% level), except that NHs with higher RN

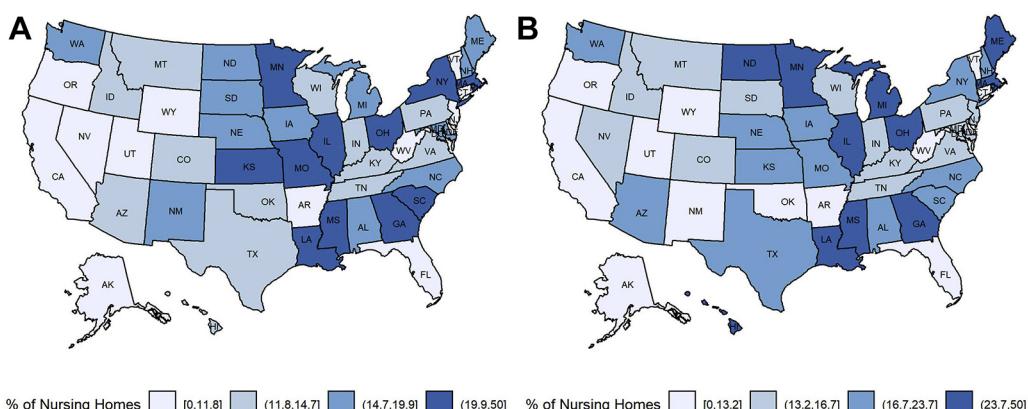
staffing level were less likely to report shortages in licensed nurse staff. Most NH structure factors were not significantly associated with staff shortages, except for occupancy rates. NHs with higher occupancy rates were less likely to have shortage in licensed nurse staff, nurse aides, and other staff. NHs with more Medicare residents were less likely to have shortages in licensed nurse staff, nurse aides, and other staff. No differences in staff shortages were found among NHs located in urban, micropolitan, or rural areas. NHs with  $\geq 4$  overall ratings were less likely to report shortages in licensed nurse staff, nurse aides, and other staff (AOR = 0.79, 0.83, 0.85, respectively; all  $P < .01$ ). Most market factors in the model were not associated with staffing shortages, except market competition for shortage in other staff and % Medicare Advantage penetration for shortage in licensed nurse staff. Finally, Medicaid reimbursement rates were not associated with any shortage in staff.

## Discussion

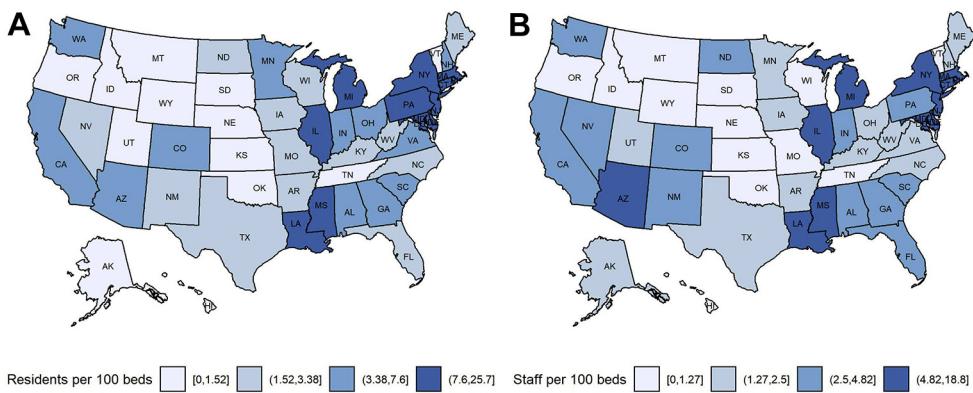
Using publicly available staff data, we found that 16% to 18% of NHs reported shortages in licensed nurse staff and nurse aides during the coronavirus pandemic. These reported shortages were not evenly distributed across states, with 1 of 4 facilities in states like Georgia and Minnesota reporting shortages in licensed nurses or aides. Those numbers are concerning, as licensed nurse and nurse aides are the essential workers who provide most of the direct care to residents. Adequate staffing levels are required to provide high-quality care to residents.<sup>7,12</sup> A recent article reported that higher RN staffing levels before the pandemic was associated with fewer COVID-19 cases in a sample of Connecticut NHs.<sup>35</sup>

A major finding of our study is that staff shortages were associated with COVID-19-related factors. NHs having any resident or staff with COVID-19 were significantly more likely to experience shortages of all types of staff, with resident cases of the virus having a stronger effect on licensed nurse staff and clinical staff than nurse aides. This might be because COVID-19 residents require clinical care usually at the level of RNs or physician. Even in May 2020, 20% of NHs did not have a 1-week supply of gowns, calling for help from federal and state governments.<sup>24,25</sup> NHs with a 1-week supply of eye protection and gowns were less likely to report staff shortages, reinforcing the importance of PPE on staff security. Importantly, available supply of N95 masks, which are required only for closer procedure care, were not related to shortages.

Findings support the expectation that NHs with higher staffing levels before the pandemic might be less susceptible to shortages



**Fig. 1.** Percentage of nursing homes reporting staff shortages by state. (A) Reported shortage of licensed nurse staff (including the RN, LPN, and vocational nurse as reported by the provider). (B) Reported shortage of nurse aides (including the CNA, nurse aide, medication aide, and medication technician as reported by the provider).



**Fig. 2.** Prevalence of nursing home residents and staff with COVID-19. (A) Total number of residents with COVID-19 per 100 beds. (B) Total number of staff with COVID-19 per 100 beds. Number of cases were scaled to account for differences in nursing home size.

during the pandemic: better RN staffing was related to fewer shortages in licensed nurses and nurse aides (marginally), but not to clinical staff or other staff.<sup>35</sup> More CNAs before the pandemic was marginally related only to fewer shortages in nurse aides. Unexpectedly, more CNAs was related to higher clinical staff shortages, possibly indicating that those NHs were more likely to rely on post-acute care. Shortage of

clinical staff is different from shortage of front-line staff. Clinical staff are often only present some days of the week and many respond through phone or video calls.

NHs that took care of more post-acute, Medicare-paid residents were less likely to have shortages in clinical staff, as did nonprofit NHs. A reason for this may be states putting temporary bans on elective

**Table 2**

Multivariate Logistic Regression Models Examining Factors Associated With Reported Shortages of Licensed Nurse, Nurse Aide, Clinical and Other Staff in NHs on May 31, 2020

Variables	Licensed Nurse Staff	Nurse Aides	Clinical Staff	Other Staff
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
<b>COVID-19 factors</b>				
Any resident with COVID-19	1.60*** (1.38–1.85)	1.44*** (1.25–1.67)	2.10*** (1.54–2.87)	1.71*** (1.43–2.05)
Any staff with COVID-19	1.37*** (1.19–1.58)	1.34*** (1.17–1.53)	1.43** (1.05–1.94)	1.38*** (1.17–1.64)
Has 1-week supply of N95 masks	1.14 (0.90–1.43)	1.02 (0.84–1.25)	1.25 (0.87–1.79)	0.98 (0.78–1.24)
Has 1-week supply of eye protection	0.70*** (0.55–0.89)	0.64*** (0.52–0.79)	0.46*** (0.31–0.69)	0.78* (0.61–1.01)
Has 1-week supply of gowns	0.53*** (0.44–0.64)	0.55*** (0.47–0.65)	0.77 (0.54–1.10)	0.57*** (0.47–0.70)
<b>NH staffing</b>				
RN staffing level (HPRD)	0.66*** (0.49–0.89)	0.80* (0.62–1.04)	1.18 (0.70–1.99)	0.81 (0.58–1.13)
LPN staffing level (HPRD)	0.91 (0.72–1.15)	0.97 (0.78–1.22)	0.97 (0.61–1.55)	0.94 (0.69–1.28)
CNA staffing level (HPRD)	1.00 (0.87–1.14)	0.88* (0.77–1.00)	1.34* (0.98–1.84)	1.00 (0.85–1.19)
<b>NH structure</b>				
Ownership (Ref: for-profit)				
Government	1.31* (0.99–1.72)	1.20 (0.92–1.55)	1.07 (0.58–1.97)	1.35* (0.99–1.85)
Not-for-profit	1.00 (0.86–1.18)	1.08 (0.93–1.26)	0.67** (0.45–0.99)	0.99 (0.82–1.19)
Chain-affiliated	0.96 (0.85–1.08)	0.90* (0.80–1.00)	1.25 (0.96–1.62)	0.91 (0.78–1.06)
Number of beds <sup>†</sup>	0.98 (0.91–1.05)	1.01 (0.94–1.08)	0.92 (0.78–1.08)	0.91** (0.83–1.00)
Occupancy rate <sup>†</sup>	0.86*** (0.80–0.92)	0.91*** (0.85–0.98)	0.98 (0.82–1.17)	0.90** (0.82–0.99)
Dementia special care unit	1.08 (0.92–1.25)	1.07 (0.92–1.24)	1.29 (0.91–1.85)	1.22* (1.00–1.49)
<b>NH resident and payer mix</b>				
% Medicaid paid <sup>†</sup>	1.00 (0.92–1.10)	1.06 (0.98–1.15)	0.97 (0.81–1.16)	1.09* (0.98–1.21)
% Medicare paid <sup>†</sup>	0.79*** (0.70–0.90)	0.82*** (0.74–0.91)	0.81* (0.65–1.01)	0.80*** (0.70–0.92)
Case-mix acuity index <sup>†</sup>	1.01 (0.93–1.10)	0.99 (0.92–1.07)	1.02 (0.87–1.19)	1.02 (0.94–1.12)
<b>Rurality (ref: urban)</b>				
Micropolitan	0.96 (0.79–1.16)	0.83* (0.70–1.00)	0.95 (0.62–1.48)	0.90 (0.71–1.15)
Rural	1.11 (0.90–1.37)	0.96 (0.78–1.17)	0.98 (0.60–1.58)	0.97 (0.75–1.26)
Overall 5-star rating ≥4	0.79*** (0.70–0.89)	0.83*** (0.74–0.93)	0.89 (0.68–1.16)	0.85** (0.73–0.98)
<b>Market factors</b>				
Primary care physician <sup>†</sup>	0.92* (0.85–1.01)	0.98 (0.90–1.06)	1.04 (0.91–1.19)	1.01 (0.90–1.14)
Competitive market (HHI < 0.15)	1.01 (0.85–1.19)	0.93 (0.79–1.09)	0.86 (0.58–1.29)	0.75*** (0.62–0.92)
% Medicare Advantage penetration <sup>†</sup>	1.11** (1.00–1.22)	1.07 (0.97–1.17)	1.02 (0.84–1.24)	1.02 (0.90–1.17)
Median household income (\$) <sup>†</sup>	0.96 (0.88–1.03)	0.94 (0.87–1.02)	0.99 (0.84–1.15)	1.05 (0.95–1.15)
% Older population (≥65) <sup>†</sup>	1.04 (0.96–1.13)	1.04 (0.97–1.12)	1.07 (0.93–1.24)	1.08 (0.98–1.18)
Medicaid reimbursement Rates	0.97 (0.90–1.03)	0.97 (0.91–1.04)	1.04 (0.86–1.27)	1.00 (0.92–1.09)
Observations	10,870	10,928	10,666	10,859

CI, confidence interval; OR, odds ratio.

Micropolitan = Large Rural City/Town; Rural = Small Rural Town/ Isolated Small Rural Town.

Standard errors were clustered at county level; State fixed-effects were not presented.

\*\*\*P < .01, \*\*P < .05, \*P < .1.

<sup>†</sup>Continuous variables were standardized with a mean of 0 and an SD of 1.

surgeries, which led to reduced Medicare post-acute care stays. Although previous work suggests that COVID-19 cases were higher in urban areas,<sup>7</sup> we found no difference in reported staff shortages in rural versus urban NHs. The lack of available workforce in the rural market before the pandemic makes rural NHs more vulnerable to COVID-19, even if they were less likely to have staff with COVID-19 compared with urban NHs (21.8% vs 5.5%).<sup>40</sup> NHs with overall star rating  $\geq 4$  were less likely to report staff shortages, suggesting they might be more resilient to the pandemic.<sup>35</sup>

Our results suggest that self-reported shortages in NH staffing are primarily associated with COVID-19-related factors. However, NHs are still faced with multiple other challenges. Media attention has put pressure on regulators to punish NHs given the large number of deaths seen nationally. However, the structure of NH care, the fact that NH residents are frail and more susceptible to the virus, and early miss-steps such as not providing NHs PPE when supplies were scarce and sending patients with coronavirus to NHs may have led to this situation. CMS has recently increased the civil monetary penalties up to \$20,000 per instance for noncompliance with infection control.<sup>41</sup> This places great financial challenges on NHs, especially considering that most NH care is reimbursed by Medicaid at lower than operating cost. Even before the pandemic, NHs were reliant on higher margin Medicare residents to provide financial cushion to invest in staff and quality.<sup>42</sup> Indeed, NHs with higher Medicare prevalence were less likely to suffer staff shortages. Securing the financial health of NHs that allows them to address these staff shortages needs to be a priority that might help NHs ensure that fewer residents are exposed to COVID-19.

Although our study highlights staffing shortages in the NHs, we acknowledge several limitations. Our findings may not be generalizable to all NHs, as 20% of NHs did not pass the data quality check of CMS. Information regarding the COVID-19 factors and whether the NH had a staff shortage are self-reported and may be inaccurate. Finally, the most up-to-date information regarding facility characteristics is unavailable, requiring us to rely on resident and payer-mix characteristics from 2018–2019, and Medicaid reimbursement rates from 2016.

## Conclusions and Implications

Approximately 1 of 6 NHs self-reported having a shortage in licensed nurse and nurse aide staffing during the COVID-19 pandemic. These shortages are not evenly distributed across states. Staff shortages are mainly driven by COVID-19 factors, such as resident and staff with COVID-19, as well as PPE supply. Policymakers should further support NHs to prevent the transmission of COVID-19 among their vulnerable residents and valuable workforce, and help them acquire sufficient PPE. Current policy efforts that focus on preventing the spread of the infection within and across NHs include (dis)incentives such as large fines, which might be counter-productive. Monetary penalties might motivate NHs to avoid violation of infection control, but without funds to hire and retain staff, NHs lack the capacity to fulfill the requirement. The availability of high-quality direct care workers becomes even more critical as many states are reopening the economy and lifting bans on visitors to NHs.

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# Effect of a Guideline-Based Multicomponent Intervention on Use of Physical Restraints in Nursing Homes

## A Randomized Controlled Trial

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**P**HYSICAL RESTRAINTS, SUCH AS BI-lateral bed rails, belts, and fixed tables in a chair, are regularly applied in German nursing homes even though German legislation clearly requires that residents have free body movement<sup>1</sup> and despite evidence for their lack of effectiveness and safety.<sup>2,3</sup> Thus, legal regulations do not appear to adequately protect nursing home residents. For US nursing homes, a recent survey reported physical restraint rates of more than 20%.<sup>4</sup>

Nursing home care does not necessitate the administration of physical restraints, as demonstrated by our own epidemiological research. We found pronounced center variation, with best-practice centers applying very few physical restraints.<sup>1</sup> Reasons for differences between centers are unclear, but the “culture of care,” as reflected in the attitudes and beliefs of nursing staff, may determine observed variation.<sup>1,5</sup> Accordingly, a “culture change” has been demanded for nursing homes because avoidance of physical restraints is mandatory from a professional point of view.<sup>6,7</sup>

**Context** Despite unambiguous legal regulation and evidence for lack of effectiveness and safety, physical restraints are still frequently administered in nursing homes.

**Objective** To reduce physical restraint prevalence in nursing homes using a guideline- and theory-based multicomponent intervention.

**Design, Setting, and Participants** Cluster randomized controlled trial of 6 months’ duration conducted in 2 German cities between February 2009 and April 2010. Nursing homes were eligible if they had 20% or more residents with physical restraints. Using external concealed randomization, 18 nursing home clusters were included in the intervention group (2283 residents) and 18 in the control group (2166 residents).

**Intervention** The intervention was based on a specifically developed evidence-based guideline and applied the theory of planned behavior. Components were group sessions for all nursing staff; additional training for nominated key nurses; and supportive material for nurses, residents, relatives, and legal guardians. Control group clusters received standard information.

**Main Outcomes Measures** Primary outcome was percentage of residents with physical restraints (bilateral bed rails, belts, fixed tables, and other measures limiting free body movement) at 6 months, assessed through direct unannounced observation by blinded investigators on 3 occasions during 1 day. Secondary outcomes included restraint use at 3 months, falls, fall-related fractures, and psychotropic medication prescriptions.

**Results** All nursing homes completed the study and all residents were included in the analysis. At baseline, 30.6% of control group residents had physical restraints vs 31.5% of intervention group residents. At 6 months, rates were 29.1% vs 22.6%, respectively, a difference of 6.5% (95% CI, 0.6% to 12.4%; cluster-adjusted odds ratio, 0.71; 95% CI, 0.52 to 0.97;  $P=.03$ ). All physical restraint measures were used less frequently in the intervention group. Rates were stable from 3 to 6 months. There were no statistically significant differences in falls, fall-related fractures, and psychotropic medication prescriptions.

**Conclusion** A guideline- and theory-based multicomponent intervention compared with standard information reduced physical restraint use in nursing homes.

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Intervention programs developed in Europe and the United States all comprise educational approaches targeting nursing staff.<sup>8,9</sup> Our recent Cochrane review<sup>8</sup> did not reveal convincing evidence for the efficacy of educational approaches. However, most included studies had a high risk of bias. We developed an evidence-based practice guideline and subsequently derived a guideline-based multicomponent intervention aiming to reduce prevalence of physical restraint use. We used a cluster randomized controlled

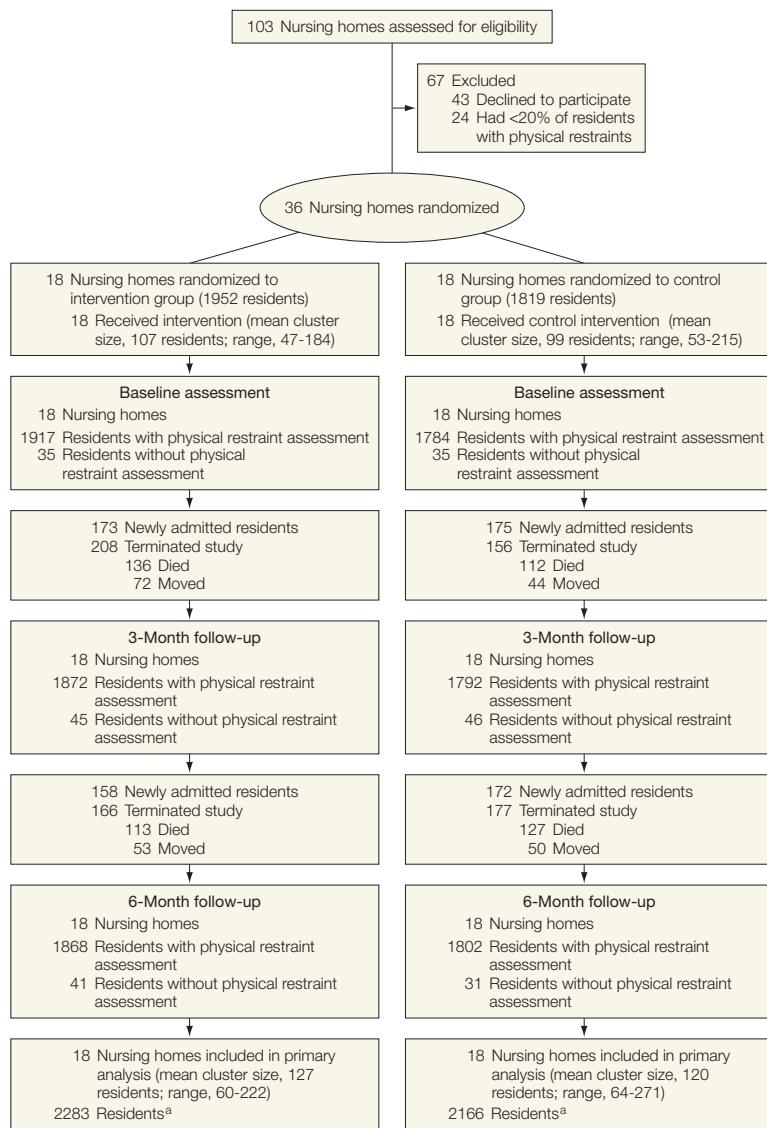
trial to test the effectiveness of the complex intervention in German nursing homes.

## METHODS

Potential participating nursing homes were identified in the city of Hamburg in northern Germany and the city and region of Witten in western Germany through publicly available registers containing approximately 150 nursing homes in Hamburg and 90 in Witten and vicinity. Nursing homes were eligible if they had a self-reported rate of

at least 20% of residents with physical restraints, assessed by a short questionnaire completed by the head nurses. In Hamburg, all 19 nursing homes from an earlier epidemiological study<sup>1</sup> with at least 20% of residents with physical restraints were contacted first. Subsequently, 74 randomly selected nursing homes were contacted. In Witten, 10 nursing homes involved in previous research activities<sup>10</sup> were contacted (FIGURE). Recruitment was terminated when the required sample size of 36 clusters was reached. A cluster was defined as a nursing home or an independently working unit within a large nursing home.

**Figure.** Flow of Clusters and Participants Through Trial



## Guideline Development

The study started with the development of an evidence-based guideline. We used internationally recommended methodological procedures, published in advance.<sup>11</sup> First, representatives of 8 relevant organizations were contacted to assess possible guideline topics. Surveys were also conducted during this phase to determine the attitudes of nurses, residents, and family members.<sup>10,12,13</sup>

In a next step, a multidisciplinary guideline development group of nationwide experts from all relevant fields, including a residents' representative, was convened. Group members received a 1-day introduction to evidence-based medicine and guideline development.<sup>14,15</sup> The guideline development group met 5 times between October 2007 and May 2008. Based on systematic literature reviews following the GRADE framework,<sup>15</sup> recommendations were made for 24 interventions to avoid use of physical restraints. The guideline includes only 1 strong recommendation for "educational programs for nursing staff." There are 7 weak recommendations in favor of and 2 against interventions and 14 interventions without recommendation (eTable 1, available at <http://www.jama.com>). Apart from the recommendations and comprehensive description of their evidence base, the 290-page guideline contains background informa-

tion, such as definitions of physical restraints, falls, and fall-related injuries and descriptions of legal issues. Concise versions were developed for nurses, legal guardians, relatives, and residents.

### **Intervention**

A multicomponent intervention was developed based on the guideline, an exploration of best practices, and current research findings (eTable 2). To analyze best-practice strategies, we interviewed head nurses of nursing homes that had few physical restraints in our previous study.<sup>1</sup> The underlying theory of the intervention was the theory of planned behavior,<sup>16</sup> which has been proven useful to explain health professionals' intentions and behavior.<sup>17</sup> Based on earlier work on guideline implementation,<sup>18</sup> the intervention aimed to address the 3 main components of the model: attitudes, subjective norms, and perceived behavioral control. In addition to full and concise versions of the guideline, the intervention provided information programs for all nursing staff, explicit endorsement of nursing home leaders, education and structured support of key nurses in each cluster, and support material (eTable 2).

All intervention components were pretested for feasibility and acceptability. In 3 focus group interviews, relatives of nursing home residents ( $n=9$ ) and nursing home nurses ( $n=14$ ) discussed the support material for the intervention (eTable 2). Participants viewed the guideline and support material as helpful and practical. A number of editorial changes were made following participants' suggestions. In 4 nursing homes not involved in the main study, the final 90-minute information program was presented to 41 nurses. Results led to minor modifications. All study procedures and instruments were pretested in 4 additional nursing homes randomly assigned to the control group ( $n=3$ ) or the intervention group ( $n=1$ ). Because the procedures proved feasible and no changes were made, the nursing homes were included in the main study.

In the control group, head nurses received written information about the use of physical restraints and methods to avoid physical restraints, using three 12- to 24-page brochures previously developed by a Hamburg-based multidisciplinary group. Also, the topic of physical restraints was discussed during a short presentation by one of the researchers. Apart from the experimental intervention, control group and intervention group clusters were treated equally. In Germany, nursing homes are legally required that at least 50% of nursing staff be fully trained, ie, registered, (geriatric) nurses with 3 years of vocational training. Other nursing staff have completed 1 year of training or on-the-job training.

### **Study Design**

A detailed study protocol has been published.<sup>19</sup> The study was a parallel-group cluster randomized controlled trial with 1:1 randomization and 6 months of follow-up. Because the intervention targeted institutions rather than individuals, randomization was carried out on a cluster level.

Computer-generated randomization lists were used for allocation of clusters in blocks of 4, 6, and 8 nursing homes. Randomization was stratified by region, ie, Hamburg and Witten. Allocation of clusters was performed by an external person not involved in the study, who informed cluster representatives about group assignment. The study ran from February 2009 to April 2010. Baseline data were assessed before randomization for all residents living in the cluster. Data on physical restraints were assessed for residents present on the day of data collection. All residents newly admitted to clusters during follow-up and present on the day of follow-up data collection were included in the study with a reduced set of baseline data. Therefore, study group sizes differ slightly between time points of physical restraint assessment (Figure). Residents were excluded if they had been admitted to nursing homes during the study but were not present on the day of physical restraint assessment.

Data on characteristics of nursing homes and residents were collected before randomization using instruments proven valid and feasible in earlier studies<sup>1,20</sup> with minor adaptations. Characteristics of nursing homes were collected from head nurses. Characteristics were assessed for each resident living in the nursing home at the day of data collection. Residents received code numbers for deidentification, and nursing staff collected baseline data supported by the investigators. A validated proxy-rating tool<sup>21</sup> was used to assess resident cognitive status. The scale has a maximum score of 16 (highest impairment) with a cutoff of 4 for cognitive impairment. Residents' behavioral and psychological symptoms related to dementia were determined using a modified Cohen-Mansfield Agitation Inventory,<sup>22</sup> as used in previous studies.<sup>1,20</sup> The inventory consists of 5 symptom complexes (restlessness, verbal agitation, handling things inappropriately, negative attitude, aggression), each rated on a 4-point Likert scale (never, once or twice, repeatedly, permanently), assessing symptoms within the preceding 4 weeks. All other data, including medication prescriptions, were extracted from residents' records with functional status assessed using degrees of disability of the German statutory health insurance system.<sup>23</sup> For feasibility reasons, a reduced set of characteristics was assessed for residents admitted during follow-up.

Data on the prevalence of physical restraint use at baseline were obtained by trained external investigators before randomization through direct observation at 3 time points during 1 day (morning, noon, evening). All residents with a physical restraint at 1 or more of the 3 time points were counted as having a restraint. For organizational reasons, assessment of baseline physical restraints took place 1 to 2 days after collection of demographic data, resulting in slightly different group sizes (Figure). To ensure resident privacy and to guarantee anonymity, the external investigators were accompanied by a

**Table 1.** Characteristics of Nursing Home Residents<sup>a</sup>

	Baseline Sample		Total Sample	
	Intervention Group (n = 1917)	Control Group (n = 1784)	Intervention Group (n = 2283)	Control Group (n = 2166)
Age, mean (SD) [range], y	83 (10) [37-107]	85 (9) [38-107]	83 (10) [34-107]	85 (9) [38-107]
Women	1429 (75)	1420 (80)	1676 (73)	1677 (77)
Length of residence, median (range), mo	26 (10-57)	28 (10-56)	20 (4-50)	19 (3-49)
Degree of disability				
None	153 (8)	99 (6)	196 (9)	147 (7)
Considerable	642 (34)	642 (36)	812 (36)	833 (38)
Severe	756 (39)	721 (40)	874 (38)	835 (39)
Most severe	366 (19)	322 (18)	401 (18)	351 (16)
Residence at special dementia care unit	209/1907 (11)	213/1772 (12)	NA	NA
Legal guardian designated	885/1907 (46)	771/1772 (44)	NA	NA
≥1 Fall in preceding 12 mo	677/1835 (37)	649/1684 (39)	NA	NA
≥1 Fall-related fracture in preceding 12 mo	69/1834 (4)	84/1675 (5)	NA	NA
Cognitive impairment	1212/1905 (64)	1109/1761 (63)	NA	NA
Agitated behavior in preceding 4 wk				
Restlessness	761/1902 (40)	563/1770 (32)	NA	NA
Verbal agitation	528/1903 (28)	392/1769 (22)	NA	NA
Handling things inappropriately	529/1903 (28)	387/1769 (22)	NA	NA
Negative attitude	669/1892 (35)	464/1738 (27)	NA	NA
Aggression	432/1904 (23)	332/1769 (19)	NA	NA

Abbreviation: NA, not applicable.

<sup>a</sup>Values are No. (percentage) or mean (SD) [range] if not indicated otherwise. In case of missing data, values are No./Total No. (percentage).

nurse who kept the code list and who also asked residents' permission for the investigator to enter their rooms. The date of data collection was only known to clusters' head nurses, who were instructed not to inform staff on the wards in order to ensure objective data assessment.

Data on prevalence of physical restraint use at the 3- and 6-month follow-ups were assessed similarly to baseline by external investigators blinded to cluster group allocation. To check for effective blinding, during the second measurement point at 3 months, external researchers were asked about their perception of the visited cluster's group allocation using a short questionnaire. If raters visited the cluster at 2 or all 3 time points, the questionnaire was completed at the last visit. After 6 months, data on medication prescriptions were again collected from residents' records. For practical rea-

sons, these were only assessed for residents present at the start of the study and still living in the nursing home at the end of follow-up. Falls and fall-related injuries were documented prospectively by nursing homes using their routine data collection systems as legally required.

## Outcomes

The primary outcome was the percentage of residents with at least 1 physical restraint at the 6-month follow-up, with physical restraints defined as "any device, material, or equipment attached to or near the resident's body, which cannot be controlled easily or removed by the person and which deliberately prevents or is deliberately intended to prevent free body movement to a position of choice."<sup>24</sup> Secondary outcomes were the number of falls and fall-related fractures. Psychotropic medication data were extracted from

prescribed medications using the simple classification of the Anatomical Therapeutic Chemical Classification system,<sup>25</sup> as used in previous studies.<sup>26</sup>

Different preplanned steps of process evaluation were performed to comprehensively analyze the underlying processes as well as barriers and facilitators of the multicomponent intervention (eTable 3).<sup>27-29</sup>

Cost parameters on the expenses for the implementation of the intervention were collected during and after the trial using a structured protocol. Institutional costs of the intervention's delivery were calculated based on documented real costs for materials and staff time spent.

## Sample Size Calculation

Based on previous study data, we expected the control group to be mostly stable throughout the intervention with an assumed prevalence of physical restraint use of 33%.<sup>1</sup> The study design was planned to detect a reduction of physical restraint use in the intervention group to a rate of 21% at 6 months with a power of 90% and a significance level of 5% using a 2-sided cluster-adjusted  $\chi^2$  test.<sup>30</sup> The anticipated effect was assumed to exceed previously reported results of interventions aiming to reduce physical restraints.<sup>9,31,32</sup> An intraclass correlation coefficient (ICCC) of 0.034 and a design factor of 5.0 were assumed based on published estimations under comparable circumstances.<sup>1</sup> Therefore, a sample of 2824 residents in 34 nursing homes with a mean cluster size of 83 residents was planned. Presuming a drop-out rate of 5% of nursing homes and 2% of residents (excluding residents with early study termination through death or moving), 36 nursing homes with a mean cluster size of 85 residents were needed.<sup>30</sup>

## Statistical Analyses

Statistical analyses were conducted after the end of follow-up by the statistician (B.H.), who was unaware of group allocation of clusters. No interim analyses were performed. Analyses were by intention to treat; no participants or clusters changed groups and

no cluster dropped out during follow-up. There were no missing data for the primary outcome after 3 and 6 months. Frequencies of missing data for baseline characteristics are presented in TABLE 1.

Baseline data for the 3 measuring points were analyzed descriptively for control group and intervention group without statistical testing or cluster adjustment except physical restraints and psychotropic medication prescriptions, which were adjusted for cluster.

The population analyzed for the primary end point consisted of participants seen at least once during physical restraint assessment after 6 months. The main outcome, ie, prevalence of residents with at least 1 physical restraint, was analyzed using a 2-sided cluster-adjusted  $\chi^2$  test at a level of significance of  $\alpha = .05$ .<sup>30</sup> Additionally, corresponding cluster-adjusted 95% confidence intervals of prevalence and nonadjusted odds ratio (OR) differences were calculated<sup>30</sup> and estimations of pooled ICCC reported. Cluster-adjusted 95% confidence intervals of prevalence data were estimated corresponding to the cluster size weighted prevalence estimation from cluster means taking into account variance of cluster means.<sup>30,33</sup> Cluster size weight

refers to the proportion of the cluster to the specific analysis population, and only confidence intervals had to be adjusted for cluster correlation.

Further outcome measures, ie, prevalence of different physical restraints at different measurement points, falls, fall-related fractures, and psychotropic medication prescriptions, were analyzed using the same methods.<sup>30</sup> Statistical tests and confidence intervals were calculated for separate populations at baseline, after 3 months, and after 6 months. In a post hoc analysis, we completed a repeated-measures analysis as well (eAppendix). Statistical analyses were performed using SAS version 9.3 TS1M0 (on Windows 7, 64 bit; SAS Institute).

### Ethical Considerations

The protocol was approved by the ethics committees of the School of Nursing Science at Witten/Herdecke University (April 24, 2009) and the Hamburg Chamber of Physicians (April 8, 2009; reference No. PV3165) as well as the Hamburg data protection office. Head nurses or managers of participating nursing homes gave written informed consent. As successfully applied in an earlier study,<sup>1</sup> a waiver of consent from participating residents

was obtained from the data protection officer and the ethics committees. To protect resident privacy, investigators had no direct access to resident data, and all resident-related data were de-identified. Investigators were unaware of residents' data, including their names.

## RESULTS

Thirty-six nursing homes were included with 3771 residents at baseline: 18 nursing homes with 1952 residents in the intervention group and 18 nursing homes with 1819 residents in the control group. Three clusters (all in Hamburg and all in the control group) were independently working units within a large nursing home; 33 were entire nursing homes. Clusters were of variable size (eTable 4). Thirty nursing homes were located in Hamburg and 6 in the city or the area of Witten. The number of residents differed between measurement points: 3701 at baseline assessment, 3664 after 3 months, and 3670 after 6 months, resulting in 4449 residents assessed at least once during the study (Figure). Six hundred seventy-eight residents were included after initial baseline assessment in their nursing home. Overall, 707 residents terminated the study early

**Table 2.** Prevalence of Physical Restraint Use

	Baseline		3-Month Follow-up		6-Month Follow-up	
	Intervention Group (n = 1917)	Control Group (n = 1784)	Intervention Group (n = 1872)	Control Group (n = 1792)	Intervention Group (n = 1868)	Control Group (n = 1802)
Any physical restraint, No.	604	545	447	546	423 <sup>a</sup>	525 <sup>a</sup>
% (95% CI) <sup>b</sup>	31.5 (26.1-37)	30.6 (25.6-35.5)	23.9 (19.3-28.5)	30.5 (26.6-34.4)	22.6 (18.5-26.8)	29.1 (25.0-33.3)
Restrictive bed rails, No.	559	505	406	490	379	472
% (95% CI) <sup>b</sup>	29.2 (22.7-35.6)	28.3 (23.1-33.5)	21.7 (16.9-26.5)	27.3 (22.7-32)	20.3 (16-24.6)	26.2 (21.7-30.7)
Any waist belt, No.	53	51	42	56	31	54
% (95% CI) <sup>b</sup>	2.8 (1-4.5)	2.9 (1.2-4.5)	2.2 (0.6-3.9)	3.1 (1.7-4.5)	1.7 (0.7-2.6)	3.0 (1.9-4.1)
Waist belt in bed, No.	12	17	13	16	17	19
% (95% CI) <sup>b</sup>	0.6 (0.2-1.1)	0.9 (0.06-1.9)	0.7 (0.3-1.1)	0.9 (0.2-1.6)	0.9 (0.4-1.4)	1.1 (0.07-2)
Waist belt in chair, No.	47	40	35	42	20	41
% (95% CI) <sup>b</sup>	2.5 (0.8-4.1)	2.2 (0.9-3.6)	1.9 (0.4-3.3)	2.3 (1.2-3.5)	1.1 (0.2-1.9)	2.3 (1.3-3.2)
Fixed table, No.	40	29	31	33	8	30
% (95% CI) <sup>b</sup>	2.1 (0.7-3.5)	1.6 (0.6-2.6)	1.7 (0.7-2.6)	1.8 (0.9-2.8)	0.4 (0.1-0.7)	1.7 (0.6-2.8)
Other physical restraint, No.	71	70	49	82	67	78
% (95% CI) <sup>b</sup>	3.7 (1.9-5.5)	3.9 (1.7-6.2)	2.6 (1.5-3.8)	4.6 (2.1-7.1)	3.6 (1.5-5.7)	4.3 (1.6-7.1)

<sup>a</sup>Primary end point.

<sup>b</sup>All percentages and CIs are adjusted for cluster.

due to death ( $n=488$ ) or moving ( $n=219$ ). No nursing home dropped out of the study.

Baseline characteristics of clusters and participants, including physical restraints, were generally comparable between study groups (eTable 4, Table 1, and TABLE 2). Five nursing homes had lower than the self-reported prevalence of 20% of residents with physical restraints (eFigure), most likely a result of usual fluctuations.

Results for the primary outcome, ie, prevalence of physical restraint use at 6 months, are displayed in Table 2 and the eFigure. At baseline, prevalence of physical restraint use was comparable between groups: 31.5% in the intervention group vs 30.6% in the control group. After 6 months, physical restraint prevalence was significantly lower in the intervention group, 22.6%, vs 29.1% in the control group (difference, 6.5%; 95% CI, 0.6% to 12.4%; cluster-adjusted OR, 0.71; 95%

CI, 0.52 to 0.97;  $P=.03$ ; ICCC, 0.029). The eFigure provides a graphical illustration of the results. All physical restraints were used less frequently in the intervention group compared with the control group. Results at 3 months showed similar results: intervention group: 23.9%, vs 30.5% in the control group, a difference of 6.6% (95% CI, 0.6% to 12.6%; OR, 0.72; 95% CI, 0.53 to 0.97;  $P=.03$ ; ICCC, 0.029) (Table 2).

Results for falls, fall-related fractures, and prescriptions of psychotropic medication showed no statistically significant differences between groups (TABLE 3 and TABLE 4).

Results of the process evaluation (eTable 2) will be published in detail elsewhere and are therefore only presented in brief. Overall, 50 information programs were administered to the 18 intervention group clusters with 569 nurses participating. Directly after the course, the majority (74.5%) under-

stood at least 4 of the 6 questions concerning the program's main messages. A short survey at the end of the study with 1 randomly chosen staff nurse in each nursing home revealed that nurses found the intervention to have changed "institutional cultures" and nurse attitudes toward physical restraints. The qualitative analysis of 40 in-depth interviews with nominated key nurses and head nurses identified important facilitators of and barriers to reducing prevalence of physical restraint use. Potential facilitators were supportive attitudes among head nurses; in-house quality circles with case discussion; counseling and education of relatives; and explicit and qualified information for judges, legal guardians, and physicians. Important barriers were negative experiences of nurses, concerns and uncertainties of relatives and legal guardians, and organizational problems (eg, staff fluctuation).

Resource use due to the implementation of the multicomponent intervention yielded total costs of \$36 838 (€27 288) in the intervention group (eTable 5).

The survey of external researchers' perception of visited clusters' group allocation indicated successful blinding. During 69 visits at the 3-month follow-up, 37 ratings (53.6%; 95% CI, 41.2%-65.7%) were correct in identifying clusters as an intervention group or control group cluster.

**Table 3.** Falls and Fall-Related Fractures During the Study Period

	Intervention Group (n = 2283)	Control Group (n = 2166)	Difference, % (95% CI)	OR (95% CI)
Residents with ≥1 fall, No.	528	565		
% (95% CI) <sup>a</sup>	23.1 (19.1 to 27.2)	26.1 (21.1 to 31.1)	3.0 (-3.5 to 9.4)	0.85 (0.60 to 1.21)

Residents with ≥1 fall-related fracture, No.	32	40		
% (95% CI) <sup>a</sup>	1.4 (0.8 to 2.0)	1.9 (1.1 to 2.6)	0.5 (-0.5 to 1.4)	0.76 (0.42 to 1.38)

Abbreviation: OR, odds ratio.

<sup>a</sup>Percentages and CIs are adjusted for cluster.

**Table 4.** Psychotropic Medication Prescriptions

	Baseline			6-Month Follow-up		
	Intervention Group (n = 1917)	Control Group (n = 1784)	Difference, % (95% CI)	Intervention Group (n = 1562) <sup>a</sup>	Control Group (n = 1485) <sup>a</sup>	Difference, % (95% CI)
Any psychotropic drug, No.	1052	966		854	802	
% (95% CI) <sup>b</sup>	54.9 (51.6 to 58.2)	54.1 (49.8 to 58.5)	-0.7 (-6.2 to 4.7)	54.7 (51.1 to 58.3)	54.0 (50.1 to 57.9)	-0.7 (-6.0 to 4.6)
Antipsychotics, No.	593	505		478	419	
% (95% CI) <sup>b</sup>	30.9 (27.5 to 34.4)	28.3 (24.0 to 32.6)	-2.6 (-8.1 to 2.9)	30.6 (26.4 to 34.8)	28.2 (23.3 to 33.1)	-2.4 (-8.8 to 4.0)
Anxiolytics, No.	224	206		186	162	
% (95% CI) <sup>b</sup>	11.7 (9.3 to 14.0)	11.5 (8.6 to 14.5)	-0.1 (-3.9 to 3.6)	11.9 (9.2 to 14.6)	10.9 (8.0 to 13.8)	-1.0 (-5.0 to 3.0)
Hypnotics, No.	165	161		133	130	
% (95% CI) <sup>b</sup>	8.6 (6.5 to 10.7)	9.0 (7.0 to 11.1)	0.4 (-2.5 to 3.3)	8.5 (6.2 to 10.9)	8.8 (7.3 to 10.2)	0.2 (-2.5 to 3.0)
Antidepressants, No.	464	476		402	410	
% (95% CI) <sup>b</sup>	24.2 (20.3 to 28.1)	26.7 (22.9 to 30.4)	2.5 (-2.9 to 7.9)	25.7 (21.7 to 29.8)	27.6 (23.6 to 31.6)	1.9 (-3.8 to 7.6)

<sup>a</sup>Residents assessed at both baseline and 6 months.

<sup>b</sup>Percentages and CIs are adjusted for cluster.

**COMMENT**

Our cluster randomized controlled trial demonstrated that a guideline-based multicomponent intervention significantly reduced prevalence of physical restraint use. The basis for the intervention was a carefully developed evidence-based guideline on the avoidance of physical restraints that followed recent methodological standards of guideline development. However, the guideline in our study was merely the basis for the intervention, not its central component. As opposed to other guideline-based interventions, the central recommendation is not to perform a certain action, ie, not to apply physical restraints. Therefore, the main message of the guideline and the related intervention is that it is possible to refrain from using restraints. It is also made clear that implementing a certain set of "alternatives" is not an adequate strategy, as there is no strong evidence that these help avoid use of restraints.

Our study results extend the small body of evidence on interventions aiming to reduce prevalence of physical restraint use. Earlier controlled trials reported complex interventions with inconsistent results. However, their methodological quality was limited and process evaluation explaining barriers and facilitators had not been reported.<sup>8,34,35</sup>

In our recent Cochrane review,<sup>8</sup> we summarized 5 randomized controlled trials aiming to reduce prevalence of physical restraint use. In contrast to these previous studies, the present intervention was rigorously based on relevant theory and extensive preparatory work. The intervention also comprises different components targeting all relevant persons, aiming to implement a "practice culture" without physical restraints. It therefore goes beyond other approaches that were restricted to nurse education and counseling.<sup>31,32,36,37</sup>

We developed our intervention according to the UK Medical Research Council's methodological guidance for the development and evaluation of

complex interventions.<sup>28</sup> Our process evaluation, for example, shows the important role of head nurses in nursing homes with marked reduction in the prevalence of physical restraint use. However, because of the exploratory nature of the process evaluation, findings should not be overinterpreted. In particular, associations between single process measures and outcomes might not be causally related.

Our study has important strengths. All study procedures were transparently reported in advance.<sup>11,19</sup> Study procedures ensured a low risk of bias. We used direct observation to assess prevalence of physical restraint use. The study also has potential limitations. Head nurses of control and intervention clusters had to be informed about the dates for assessing prevalence of physical restraint use. Although they had agreed not to communicate the dates to their staff, information leakage cannot be ruled out. However, we had investigated this methodological problem in a preparatory study and found comparable results for scheduled and unannounced visits.<sup>1</sup> The analysis of psychotropic medication use was limited to residents present both at baseline and at 6 months. Furthermore, concerning physical restraint use, 6 months may appear to be a short time period in which to judge the sustainability of a fundamental change in practice. Nevertheless, considering the consistent effects after 3 and 6 months, we are confident that a "culture change" has been achieved, resulting in a continuing avoidance of physical restraints. As it seems infeasible to further optimize the intervention with justifiable effort, more pronounced reduction or even complete prevention of physical restraint use may require more stringent implementation of legal regulations with clear penalties. The results of this study are likely generalizable to countries with comparable legal and professional conditions.

**Author Contributions:** Drs Köpke and Meyer 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.

**Study concept and design:** Köpke, Mühlhauser, Haastert, Meyer.

**Acquisition of data:** Köpke, Gerlach, Haut, Möhler, Meyer.

**Analysis and interpretation of data:** Köpke, Mühlhauser, Haastert, Meyer.

**Drafting of the manuscript:** Köpke, Mühlhauser, Meyer.

**Critical revision of the manuscript for important intellectual content:** Gerlach, Haut, Haastert, Möhler.

**Statistical analysis:** Haastert.

**Obtained funding:** Köpke, Mühlhauser, Meyer.

**Administrative, technical, or material support:** Gerlach, Haut, Möhler.

**Study supervision:** Köpke, Mühlhauser, Meyer.

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**Online-Only Material:** eTables 1 through 5, the eFigure, and the eAppendix are available at <http://www.jama.com>.

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## Original Study

## Front-line Nursing Home Staff Experiences During the COVID-19 Pandemic



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## ABSTRACT

**Keywords:**  
Nursing home  
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qualitative

**Objective:** The Coronavirus disease 2019 (COVID-19) pandemic is an unprecedented challenge for nursing homes, where staff have faced rapidly evolving circumstances to care for a vulnerable resident population. Our objective was to document the experiences of these front-line health care professionals during the pandemic.

**Design:** Electronic survey of long-term care staff. This report summarizes qualitative data from open-ended questions for the subset of respondents working in nursing homes.

**Setting and Participants:** A total of 152 nursing home staff from 32 states, including direct-care staff and administrators.

**Methods:** From May 11 through June 4, 2020, we used social media and professional networks to disseminate an electronic survey with closed- and open-ended questions to a convenience sample of long-term care staff. Four investigators identified themes from qualitative responses for staff working in nursing homes.

**Results:** Respondents described ongoing constraints on testing and continued reliance on crisis standards for extended use and reuse of personal protective equipment. Administrators discussed the burden of tracking and implementing sometimes confusing or contradictory guidance from numerous agencies. Direct-care staff expressed fears of infecting themselves and their families, and expressed sincere empathy and concern for their residents. They described experiencing burnout due to increased workloads, staffing shortages, and the emotional burden of caring for residents facing significant isolation, illness, and death. Respondents cited the presence or lack of organizational communication and teamwork as important factors influencing their ability to work under challenging circumstances. They also described the demoralizing impact of negative media coverage of nursing homes, contrasting this with the heroic public recognition given to hospital staff.

**Conclusions and Implications:** Nursing home staff described working under complex and stressful circumstances during the COVID-19 pandemic. These challenges have added significant burden to an already strained and vulnerable workforce and are likely to contribute to increased burnout, turnover, and staff shortages in the long term.

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The Coronavirus disease 2019 (COVID-19) pandemic has had devastating effects on nursing homes and other long-term care settings. Long-term care residents are bearing a disproportionate share of morbidity and mortality from the virus, representing roughly 6% of cases but 40% of deaths.<sup>1</sup> As of mid December 2020, almost 729,000 residents had been infected and over 100,000 had died.<sup>1</sup>

Although there has been considerable public scrutiny of the impact of COVID-19 on residents, much less attention has focused on how the pandemic has disrupted the lives of long-term care professionals and

their roles caring for this vulnerable population. The only systematic data collection of staff infections and deaths is by the Centers for Disease Control and Prevention; these data are limited to nursing homes and are incomplete before May 2020. Still, these estimates show that as of late November 2020, at least 322,000 nursing home staff had been infected and more than 1100 had died.<sup>2</sup>

The pandemic has added significant strain to an already vulnerable nursing home workforce, which has historically experienced high levels of turnover, chronic staffing shortages, and high burnout.<sup>3–6</sup> To protect this workforce against the long-term impact of the pandemic, we must first understand how COVID-19 has affected the day-to-day work of staff. We conducted an online survey to document the experiences of front-line staff working in nursing homes and other long-term care settings during the pandemic to reveal key challenges and areas for intervention. In this report, we present qualitative findings from the survey's open-ended questions for the subset of respondents working in nursing homes.

## Methods

From May 11 through June 4, 2020, we used social media (Facebook and Twitter) and professional networks to disseminate an electronic survey to a convenience sample of health care professionals working in nursing homes and other long-term care settings. The survey included both closed- and open-ended questions. Because nursing homes and other long-term care facilities face unique and distinct challenges with regard to their COVID-19 responses, we limited our analysis for the current report to qualitative data provided by respondents who identified their employer as a nursing home. Quantitative findings have been previously reported.<sup>7,8</sup>

The survey ended with 4 open-ended questions: (1) What are your biggest challenges or concerns affecting your ability to do your job during the COVID-19 pandemic? (2) Thinking about your facility's experience during the COVID-19 pandemic, what is going well so far? (3) Thinking about your facility's experience during the COVID-19 pandemic, what could be going better? and (4) Is there anything else that hasn't been asked that you would like to share? The 4 investigators independently reviewed the transcripts of responses to these 4 questions. Using thematic analysis and an inductive coding approach, we each independently coded the data and generated initial themes. We then met to review and reach consensus on themes, as well as illustrative quotes for each theme.

Because staff participated in the interviews in a professional capacity and did not provide any personal information, this analysis was not considered human subjects research or subject to Institutional Review Board approval.

## Results

We received 251 responses to the survey. Thirteen were excluded because of missing data on all questions. Of the remaining 238 respondents, 152 (63.9%) reported working in nursing homes and were included for analysis. A total of 132 (86.8%) reported providing direct patient care and 60 (39.5%) had supervisory or management responsibilities. The sample included 76 (50.0%) certified nursing assistants, certified medical assistants, or certified medical technicians; 19 (12.5%) physicians; 15 (9.9%) advanced practice clinicians; 14 (9.2%) registered nurses; 10 (6.6%) administrators; and 9 (5.9%) licensed practical nurses. Other disciplines represented less than 5% of the sample. Three-quarters of respondents ( $n = 113$ , 74.3%) worked in nursing homes that had at least 1 resident or staff COVID-19 case at the time of the survey, and 72 (47.4%) reported providing direct care to 1 or more residents with COVID-19 in the prior month.

We identified 7 themes from respondents' written responses to the open-ended questions.

### *Theme 1: Constraints on Personal Protective Equipment (PPE) and Testing*

Earlier in the pandemic, access to adequate PPE was a serious concern. However, on the whole, respondents described PPE availability as comparatively better when completing the survey in May or June 2020.

"When everything first hit, nothing was in place. There was no COVID unit, there [were] no COVID swabs available, there was no staff. After the crisis was in full tilt, then we started getting things we needed." (*Advanced Practice Clinician*)

"We now have enough of everything... Stress occurred when staff had to use garbage bags etc. to protect themselves... using N95s that you knew were not acceptable." (*Advanced Practice Clinician*)

At the same time, respondents in management roles reported going to great lengths to procure PPE, including spending a great deal of time, money, and effort to obtain sufficient quantities.

*What are your biggest challenges?* "Obtaining needed supplies from unconventional suppliers. Actually leaving the building to go pick up supplies [from places] such as distilleries and plastics manufacturers." (*Administrator*)

"Not nearly enough financial assistance for actual workers or the facilities that had to buy massive supplies...." (*Administrator*)

*What could be going better?* "Availability of PPE and always trying to locate some takes a lot of time." (*Registered Nurse*)

They also described continued reliance on crisis standards for extended reuse of gowns and masks.

"[We are] reusing...gowns and going in and out of rooms with the same gown. The face masks [are] being reused for a week." (*Certified Nursing Assistant*)

"[We need] access to PPE. Enough so we could use it properly, as we were trained, and not the crisis level of acceptable use..." (*Administrator*)

"Having to reuse PPE is not ideal, but it is the best we can do right now." (*Administrator*)

*What could be going better?* "Having the supplies you NEED to do your job without having to reuse what we have which is a huge concern as far as infection control goes!" (*Certified Nursing Assistant*)

Testing was cited as an ongoing challenge, particularly by physicians and advanced practice clinicians, with many respondents commenting on the need for "more tests" or "more testing." Others detailed improved access compared with the beginning of the pandemic, but highlighted the competing priorities to identify and quarantine staff and resident cases.

"We now have enough tests, but cannot test all staff because we would go from critical staff shortage to [an] untenable staff shortage... We cannot sweep test all residents, as our 46-bed isolation unit is full and [we have] no place to isolate the asymptomatic positives." (*Physician*)

*What are your biggest challenges?* "Lack of assistance from [the Department of Health and Human Services] and local government sectors. It took a great length of time to allocate testing and a lab to deal with the size of our building." (*Registered Nurse*)

"During the height of the outbreak, outside services- lab, x-ray, and IV services were... strained and response times were inconsistent and often slow." (*Advanced Practice Clinician*)

#### *Theme 2: Burdensome Regulations and Guidance*

Administrators and other respondents working in management roles discussed the challenges of navigating frequent changes in regulations and guidance. They commented that direction from multiple local, state, and federal agencies was at times not only confusing but also contradictory. They also cited the time and attention required to monitor numerous communications and continually update internal policies, procedures, and operations to remain in compliance.

"Keeping up with all the changing regulations is challenging... that is, federal, state and local health departments. And many times the guidance conflicts." (*Administrator*)

*What are your biggest challenges?* "Constant changing regulations. Spending too much time reading, researching, typing, and re-typing policies and procedures to be current and educating staff and residents... Constant reporting at the county, state and federal levels and trying to learn how and where to report (their systems)." (*Administrator*)

"Guidance has been spotty and unrealistic." (*Physician*)

#### *Theme 3: Concern for Self and Family*

Many respondents, particularly certified nursing assistants, commented on the fear and stress associated with possibly being infected and infecting family members. Several remarked that they or their family members were in high-risk groups due to age or chronic illness.

"I am one of the vulnerable population, as I am 64, I have asthma, and I am morbidly obese." (*Certified Nursing Assistant*)

*What are your the biggest challenges?* "That I don't get it. My age and I'm a smoker play a big part." (*Certified Nursing Assistant*)

"I am also a caregiver to my immunocompromised mother so there is a HUGE fear of contracting the virus and being unaware, possibly infecting my mom." (*Certified Nursing Assistant*)

#### *Theme 4: Concern for Residents*

Respondents cited the ongoing challenges of trying to protect the residents under their care, while worrying about the impact of social distancing and isolation on residents, particularly those with dementia and those used to seeing their families regularly.

"We have had increased numbers of deaths in otherwise stable residents, typically showing signs of failure to thrive... These changes seemed to have started 4–6 weeks after... visitation/activity restrictions and all had families that regularly visited prior to the pandemic." (*Advanced Practice Clinician*)

"Our [Memory Care] residents are not able to follow instructions easily and have poor safety awareness, limited potential to retain new education, [and are] unable to social distance due to advanced dementia. The wander, touch each other, touch each other's things, etc." (*Licensed Practical Nurse*)

"At times I feel like we are killing the residents with the cure [the isolation]." (*Certified Nursing Assistant*)

*What could be going better?* "Emotional support and activities for residents. They are bored and depressed and don't always

understand why we have so many restrictions." (*Advanced Practice Clinician*)

#### *Theme 5: Burnout*

Respondents remarked on the mental and physical exhaustion of working during the pandemic due to staffing shortages, increased workloads, and new responsibilities. The emotional burden of caring for residents experiencing distress, illness, and death was also cited as significant.

"I have to work 16 hours on the weekends and I wear a mask all the time... and I have a headache most of my shift! ... I feel so drain[ed] when I get off work." (*Certified Nursing Assistant*)

"Too many [patients] with COVID, not enough time to call families and discuss goals of care... Also, burnout. I have been taking care of only COVID patients for 8 weeks... losing this many residents and keeping going is tough." (*Physician*)

"We are short of help, which means I must care for 20 residents alone." (*Certified Nursing Assistant*)

*What are your biggest challenges?* "Having a burnout of aides due to ... working 12 hours for as many as 10 days in a row, unable to leave." (*Certified Nursing Assistant*)

#### *Theme 6: Teamwork, Communication, and Flexibility*

Many respondents, particularly those in leadership roles, commented with pride on how staff were working together and fulfilling multiple roles to care for residents.

"We work as much as possible as a TEAM to provide the best quality of care than we can for the residents!" (*Certified Nursing Assistant*)

*What is going well?* "Teamwork. Sharing common goals of caring for these patients." (*Advanced Practice Clinician*)

"The cooperation of the staff, residents, and families has been absolutely wonderful and has made these difficult circumstances tolerable." (*Administrator*)

"Our staff are filling multiple roles while we fight this virus: they are caregivers, entertainers, spiritual companions, family members... They really have been heroes." (*Administrator*)

Communication from management was also cited by multiple respondents as an important factor influencing their ability to perform their jobs, although some noted that communication had been effective, whereas others commented that it had been lacking.

*What are your biggest challenges?* "Breakdown of communication and lack of PPE ... changing things daily and not keeping us informed." (*Certified Nursing Assistant*)

"We have an extremely strong management team that has supported the floor staff through the whole process. [Our] managers have worked in every department to provide assistance [and] reassurance. We began planning early." (*Licensed Practical Nurse*)

#### *Theme 7: Public Blame and Lack of Recognition*

Poignantly, respondents contrasted the level of public support for hospitals and hospital workers, who are often referred to as heroic,

with a lack of recognition and even vilification of nursing homes and their staff.

"We would all love it if the general public, media, and government showed the same respect for nursing homes as they do for hospitals." (*Social Worker*)

"It is very frustrating that hospitals receive praise for what they are doing. [Nursing homes] and their leaders are an amazing group of providers and we get no credit, we are left as the scapegoats, the government adds tons of requirements, additional punitive surveys, and unrealistic guidelines." (*Administrator*)

*Is there anything you would like to share?* "The standard we are held to compared to any other health care providers. The vilifying of people risking their lives while trying to save others. The mere fact that we have been turned into criminals for not being able to keep up with an event that the entire world could not manage, but somehow nursing facilities should have done better than world leaders." (*Administrator*)

Many respondents described the burden of public scrutiny and blame on the industry.

"[Nursing home] staff are treated as if they are the cause of the deaths, not the unseen virus... No one tells all the positive things [staff] have done to protect the residents they love. That is very sad to me." (*Registered Nurse*)

"The other thing that has taken an emotional toll is the amount of negative media...[Our] profession has done an unbelievable job in preparing for and fighting this invisible enemy. You can do everything right and still be negatively impacted.... then there is fault [implied]." (*Administrator*)

"My patients' deaths are being politicized." (*Physician*)

## Discussion

In May and June 2020, front-line nursing home staff described working under complex, challenging, and evolving conditions during the COVID-19 pandemic. Data collection for the survey took place more than 3 months after a nursing home in Washington became the initial US epicenter of COVID-19<sup>9</sup> and at a time when there were already more than 50,000 cases and 10,000 deaths among nursing home residents.<sup>10</sup> Yet, respondents reported that needed resources, including testing and PPE, were still lacking, and that many facilities were still relying on extended use and reuse procedures for PPE. More recent evidence has shown that many nursing homes are still experiencing PPE shortages,<sup>11</sup> a concerning finding given the more than 322,000 nursing home staff infections and 1100 staff deaths as of late October.<sup>2</sup>

Administrators described going to great lengths to source PPE and other supplies from at times unconventional suppliers, and to coordinate testing for their facilities, particularly in the earlier months of the pandemic. This administrative burden has continued to grow in recent months. Staff working in leadership roles have had to navigate frequently changing and at times contradictory guidance from multiple local, state, and federal agencies; build data systems to meet weekly and lengthy federal reporting requirements; manage staffing shortages; build systems for point-of-care testing and reporting; coordinate complex cohorting protocols for admissions and new cases; maintain communication with residents' families and implement new visitation procedures; navigate state and federal survey processes; and manage significant additional operating expenses.

A number of the themes elicited raise significant concerns for the long-term effects of the pandemic on the nursing home workforce. Respondents reported experiencing burnout, and described the physical, mental, and emotional burden of taking on heavier caseloads and learning new roles and processes. In addition, they expressed sincere concern and empathy for their residents experiencing isolation, illness, and death. The nursing home environment is unique in that staff often work with their residents for months or years at a time, getting to know them and their families well. This added familiarity can make the emotional toll of caring for residents in these circumstances all the more challenging.

Direct-care staff, nursing assistants in particular, cited fears of becoming infected and of possibly infecting their families. These fears are not unfounded; a recent report found that roughly 43% of health care workers hospitalized with COVID-19 were nurses or nursing assistants.<sup>12</sup> Nursing assistants in nursing homes are particularly vulnerable because of the high level of personal care required in this setting, putting them in regular prolonged close proximity with residents. Their vulnerability is only amplified if they do not have comprehensive health insurance or paid sick leave to protect themselves in the event of illness.<sup>13,14</sup>

Poignantly, despite there being no specific question on the topic in the survey, a number of respondents commented on the demoralizing impact of negative media coverage and public scrutiny of nursing homes, contrasting the praise and resources given to hospital workers with a lack of recognition and even blame directed at nursing home staff. The federal government has been criticized as taking an overly punitive approach to nursing homes during the pandemic,<sup>15</sup> despite significant evidence that both high- and low-quality facilities are vulnerable when there is high community virus prevalence.<sup>16–19</sup> This has been coupled with extensive national and local news coverage of hard hit nursing homes that has often portrayed them negatively<sup>20–22</sup>; for example, referring to nursing homes as "death pits" in one high-profile article.<sup>22</sup>

Combined, these factors bode poorly for long-term staff retention in an already vulnerable and strained workforce. Burnout is an important contributor to staff turnover,<sup>23</sup> a chronic problem in nursing homes,<sup>3,24</sup> and is likely only to worsen as a result of the pandemic. Past evidence has shown consistent relationships of high turnover and staff burnout to poor resident outcomes and missed care.<sup>5,25–28</sup> Strong organizational leadership is critical in crisis situations, and nursing home owners and administrators must maintain regular lines of communication with staff to keep them informed of policy changes, local conditions, safety protocols, and available resources. Short-term interventions, such as hazard pay and paid sick leave, have been highly variable across states and facilities. However, such measures are particularly important for nursing assistants and other low-wage staff, many of whom experience significant financial vulnerability.<sup>13,14</sup> With nursing homes facing considerable added costs and operating losses due to the pandemic,<sup>29</sup> state and federal investment in such initiatives, in addition to PPE supply chains and testing capacity, will be critical in the coming months and years to support and sustain this workforce.

We note a number of limitations. First, this was a convenience sample of nursing home staff recruited via social media and professional networks who may not be representative of a broader population of nursing home employees, and could be subject to response bias. Understanding these limitations, we chose this approach so that we could quickly disseminate the survey and document the experiences of long-term care staff in as close to real-time as possible, given the rapidly evolving nature of the pandemic. Second, we were unable to validate respondent employment or position because we did not collect licensure or certification details, or the names or addresses of employers. We instead relied on respondents to self-report their professional discipline and employer type. Finally, because we relied

on open-ended survey questions, we were unable to ask clarifying questions or follow-up to validate our interpretation with respondents. We did, however, have 4 investigators review the raw transcripts independently before meeting to compare interpretations, validate findings, and reach consensus on themes.

## Conclusions and Implications

Nursing home staff described working under complex, evolving, and stressful circumstances during the COVID-19 pandemic. These challenges have added significant burden to an already strained and vulnerable workforce and are likely to contribute to increased burnout, turnover, and staff shortages in the long term.

## Acknowledgments

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# Regulating U.S. Nursing Homes: Are We Learning From Experience?

Nursing home regulation does not work very well, but we need to understand the reasons for its failings in order to improve it.

by Kieran Walshe

**ABSTRACT:** The quality of care in U.S. nursing homes has been a recurrent matter of public concern and policy attention for more than thirty years. A complex regulatory system of state licensure and federal certification is in place, but problems of poor quality and neglect and abuse of patients still appear to be endemic. This paper describes how the current system of regulation developed, examines its impact, and draws on the wider literature on regulation to outline some characteristics that may have detracted from its effectiveness and contributed to its disappointing results. Future regulatory reform should pay more attention to the lessons of regulation in other settings and make more use of research and formative evaluation.

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FOR MORE THAN THIRTY YEARS the quality of care in nursing homes has been a recurring matter of public concern and debate in the United States. In the 1970s and 1980s researchers presented compelling evidence that the frail and vulnerable recipients of nursing home care were too often neglected, mistreated, or abused and that the system of nursing home regulation and licensure was largely ineffectual, failing to protect residents and to prevent quality problems.<sup>1</sup> In 1986 the Institute of Medicine (IOM) published an influential report that set out detailed recommendations for reforming the regulation of nursing homes, intended to bring about a major improvement in quality of care.<sup>2</sup> Those recommendations were largely accepted by Congress, enacted through the Nursing Home Reform Act as part of the Omnibus Budget Reconciliation Act (OBRA) of 1987, and have since been gradually implemented by the Centers for Medicare and Medicaid Services (CMS, formerly HCFA).<sup>3</sup>

It seems that the same quality problems that spurred calls for greater regulation in the 1970s and 1980s are still endemic in many

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nursing homes today.<sup>4</sup> Nursing home regulation remains the constant subject of policy attention, most recently via the Senate Special Committee on Aging, the Clinton administration's nursing home initiative, and the U.S. General Accounting Office (GAO), which has issued a stream of reports.<sup>5</sup> The IOM has just revisited nursing home regulation as part of a wider review of long-term care and has concluded that while regulation has brought some limited improvements in nursing home care, further reform is still needed.<sup>6</sup>

This paper briefly describes how nursing home regulation has developed in the United States from 1986 to the present and summarizes what is known about the impact of regulation on nursing home care. It then draws on the wider literature on regulation and its impact to outline some characteristics of nursing home regulation that may have detracted from its effectiveness and contributed to its rather disappointing results. The paper concludes that fundamental regulatory reform is needed but that greater attention should be paid to the lessons of regulation in other settings, and more use should be made of research and formative evaluation to improve the effectiveness of nursing home regulation.

## The Development Of Nursing Home Regulation

More than 1.6 million Americans live in nursing homes, most of them elderly, frail, and vulnerable persons who are likely to live out the remainder of their lives there. Because of their physical or mental infirmity and their dependence on their caregivers, they are often not able to act as assertive, well-informed consumers. In 1999 the United States spent about \$90 billion on nursing home care (about \$55,900 per resident), and 60 percent of the cost was borne by states and the federal government through the Medicaid and Medicare programs.<sup>7</sup> The great majority of nursing homes (93 percent) are operated in the private sector, 67 percent of them by for-profit organizations, including a growing number of large corporations whose facilities house thousands of residents.<sup>8</sup>

Concern about quality of care in nursing homes can be traced back at least to the 1950s. Before the establishment of Medicare and Medicaid in 1965, there were essentially no federal standards regulating nursing homes, regulation was left up to the states, and standards varied widely. Although federal regulations were enacted once Medicare and Medicaid began to pay for nursing home care, they were inadequate in design, poorly implemented, and often unenforced by the federal and state agencies that shared regulatory responsibility. A succession of studies in the 1970s and early 1980s highlighted continuing serious problems with nursing homes' quality of care and were one reason that Congress asked the IOM in 1984

to investigate and recommend reforms.<sup>9</sup>

The IOM's 1986 report outlined proposals for a comprehensive and radical reform of regulatory arrangements.<sup>10</sup> The standards for nursing homes were to be revised to make them more focused on quality of care, more detailed and comprehensive in their coverage, and more explicit about the rights of residents. The survey or inspection process used to check compliance with the standards also was to be reformed, to make it less oriented toward paper records and structures and more focused on direct observation of care and communication with residents. A much broader range of enforcement mechanisms was to be introduced, including financial penalties, blocks on payment for new admissions or all residents, provisions to take over the management of failing homes, and ultimately termination of participation in Medicare/Medicaid. These reforms passed Congress with broad bipartisan support and were enacted as the Nursing Home Reform Act, part of OBRA 1987.

It took the CMS (then HCFA) three years to put into operation the regulations to implement OBRA 1987 and seven years to implement the regulations needed to put its regulatory enforcement mechanisms in place. Over that time political support for the OBRA 1987 reforms slackened, and although a number of proposals were brought forward in Congress in the mid-1990s aimed at repealing or weakening nursing home regulation, none were successful.<sup>11</sup> Even once the reforms were in place, a succession of GAO reports highlighted continuing quality-of-care problems in nursing homes and major flaws in OBRA's implementation and the management of nursing home regulation by the CMS. In response, the Clinton administration launched a nursing home initiative in 1998 aimed at improving the effectiveness of regulation.

The current regulatory arrangements are administratively complex but conceptually straightforward. The CMS is responsible for producing and maintaining federal regulations with which all homes that wish to participate in Medicare and Medicaid must conform. The state survey, licensing, and certification agencies are responsible for surveying or inspecting nursing homes to check their compliance with the regulations, investigating complaints, and reporting the results to the CMS. When deficiencies are identified, state agencies and the CMS regional offices share responsibility for taking enforcement action to make sure that nursing homes deal with the problems and come back into compliance. The CMS funds most of the costs of Medicare/Medicaid certification and oversees the performance of state survey agencies to make sure that the federal regulations are implemented appropriately. States also have their own licensing requirements, with which all homes (not just

those participating in Medicare and Medicaid) must conform. State regulations may parallel or exceed federal requirements and generally have separate provisions for licensing nursing homes, undertaking surveys or inspections, investigating complaints, identifying deficiencies, and taking enforcement action.

## Impact Of Regulation On Performance

Although numerous studies have examined the implementation of nursing home regulation and the management of regulatory arrangements, these reports are of limited help in determining what impact regulation has had on nursing home performance and the quality of nursing home care.<sup>12</sup> The impact of regulation has not been much researched, in part perhaps because it presents several methodological challenges. First, the absence of any control or comparison group (since virtually all nursing homes are regulated) means that one can really only study changes in quality over time and attempt to determine whether those changes can be attributed to regulatory interventions.

Second, much of the data available on the quality of care in nursing homes are the product of the regulatory process itself, which means that changes in the process affect the data and are difficult to distinguish from underlying changes in quality. For example, changes in the deficiency rates found in nursing home surveys over time or variations in these rates across states may result from differences in the stringency, scope, or implementation of the survey process or from real differences in quality of care, and it is not possible to disentangle the two.<sup>13</sup> Third, the reliability, validity, completeness, and timeliness of much of the routinely available data (such as the Minimum Data Set data collected on every nursing home resident and the Online Survey Certification and Reporting, or OSCAR, database of survey findings) have been questioned, and some caution is needed in using such data.<sup>14</sup>

■ **Residents' physical condition.** Nevertheless, there is some evidence that the quality of care in nursing homes has improved greatly in many areas over the past ten to fifteen years and that at least some of that improvement has been brought about by the OBRA 1987 regulatory reforms.<sup>15</sup> For example, the inappropriate use of physical and chemical restraints has declined, as have rates of urinary incontinence and catheterization. Hospitalization rates also have fallen (which may be a good proxy for quality of care if poor care increases the risk of hospitalization). On the other hand, pressure sore rates have not changed; malnutrition, dehydration, and other feeding problems remain relatively common; and rates of bowel incontinence have risen slightly.

*"The increasing dominance of the industry by major corporations may have been accelerated by nursing home regulation."*

■ **Industry changes.** Nursing home regulation also may have had effects on the nursing home industry. For example, in other settings it has been found that regulation favors larger, multisite corporations over smaller, single-site, owner-operated businesses, because larger organizations can spread the fixed costs of regulation across a greater business volume and are more able to develop in-house skills in regulatory compliance.<sup>16</sup> Over the past decade the nursing home industry has become increasingly dominated by major corporations, the largest of which control hundreds of nursing homes and many thousands of beds. This trend may reflect the economics of nursing home provision but also may have been accelerated by nursing home regulation.

■ **Costs of regulation.** The costs of nursing home regulation are difficult to quantify. The CMS and the states spent \$382.2 million in 2000 on running the state licensing and certification agencies that implement both federal and state nursing home regulations. This is only 0.4 percent of all spending on nursing home care and equates to about \$22,000 per nursing home or \$208 per nursing home bed.<sup>17</sup> However, these costs are probably only a small part of the overall costs of regulation, most of which fall on nursing homes themselves. First, nursing homes incur costs in dealing with the regulatory agencies, preparing for and hosting survey visits, gathering and providing data, responding to complaint investigations, and so on. Second, nursing homes incur costs when they are required to make changes to comply with the regulations. The experience of other sectors suggests that these interaction and compliance costs are probably greater than the regulatory agency costs outlined above, but there are no data available to allow these costs to be quantified.<sup>18</sup>

■ **Stakeholders' debate.** Most stakeholders in nursing home regulation—such as the CMS and state survey agencies, nursing home providers, consumer groups, researchers, and independent governmental evaluators—would concur that the OBRA 1987 reforms have brought some improvements in the quality of nursing home care, but beyond that, opinions fall broadly into two camps.<sup>19</sup> Some think that because many quality problems still exist, regulation should be tightened with tougher standards and more aggressive enforcement, and they argue for more frequent inspections, more use of sanctions and penalties, and more uniform and rigorous application of existing regulations. Others believe that the current

regulatory burden is already too great and that regulation has created a punitive, adversarial climate that is hostile toward quality improvement. They argue that regulation should be simplified and reduced, focused mainly on a smaller number of “problem” nursing homes, and reoriented toward a model based on cooperation and partnership between regulators and regulated organizations. There is little consensus among stakeholders about whether the benefits of nursing home regulation over the past decade outweigh its considerable costs. The debate has become polarized and politicized and, in the absence of robust empirical evidence on the effectiveness of regulation, is likely to remain so.

## Learning From Regulation In Other Settings

A substantial literature exists on the use of regulation in a wide range of settings outside health care, including manufacturing industries, financial services, public utilities, and government agencies.<sup>20</sup> Although much research on regulation has been specific to particular countries, industries, or settings, a generic understanding of regulatory issues has begun to develop that offers many transferable concepts, models, and ideas.<sup>21</sup> However, it has been noted that most regulation tends to develop in isolation from similar regulatory initiatives or approaches in other settings, with little sense of a regulatory community able to share findings across sectors.

Over recent years a fast-growing literature has developed on regulation in health care, including the regulation of hospitals, managed care organizations, and the health care professions.<sup>22</sup> It appears that there is scope to make more use of this wider literature on regulation in health care and in other settings, both to review the progress of nursing home regulation to date and to influence its future development. To that end, I draw on this literature to outline six major problems in nursing home regulation and to explore how regulatory reform could improve the effectiveness of regulation in assuring and improving quality.

## Problems Of Nursing Home Regulation

**Deterrence, compliance, and responsive regulation.** Regulatory theorists often use two terms—*deterrence* and *compliance*—to describe the paradigms within which regulators work.<sup>23</sup> In brief, deterrence regulators see the organizations they regulate as “amoral calculators,” out to get what they can and willing to break the rules if they need to and can get away with it. As a result, their approach to regulation is formal, legalistic, punitive, and sanction-oriented. In contrast, compliance regulators see organizations as fundamentally good, well-intentioned, and likely to comply with regulations if they

can. Their approach to regulation is generally more informal, supportive, and developmental, and they use sanctions only as a last resort. Each approach has different advantages and disadvantages.

For example, deterrence regulation is likely to achieve change more quickly and may be more suited to situations in which the regulator is dealing with large numbers of heterogeneous organizations. However, it is usually more costly and can provoke defensive behavior by regulated organizations, which subverts the objectives of regulation. On the other hand, compliance regulation is cheaper, may achieve more change in the longer term, and may work better when dealing with a smaller number of more homogeneous regulated organizations. However, it can be easily undermined or circumvented by regulated organizations if they are determined to do so.

In practice, regulators often make use of a mixture of deterrence and compliance approaches. Robert Kagan and Lee Axelrad argue that regulation is very much a product of the political, social, and economic environment and that approaches to regulation vary considerably among countries.<sup>24</sup> The United States is perhaps the foremost proponent of deterrence regulation and uses this approach in many fields in which other countries use compliance approaches successfully.<sup>25</sup> Kagan and Axelrad characterize the American tradition of deterrence regulation as “adversarial legalism” and assert that it has high costs, a divisive and corrosive effect on relationships between organizations, and few compensating benefits.

Before 1987, American nursing home regulators were much criticized for doing too little to deal with persistent poor performance and widespread, long-standing quality problems. While approaches varied from state to state, many used a compliance model in which education and persuasion were seen as the main tools for improvement.<sup>26</sup> As a result, it was argued, some nursing homes flouted the regulations with impunity, regulators did not have sufficient powers to deal with such offenders, and so the whole process of regulation was brought into disrepute. Since the implementation of the OBRA 1987 reforms, nursing home regulation has developed most of the features of deterrence regulation, with great stress placed on developing and applying formal, written regulations; undertaking inspections or surveys; recording deficiencies and issuing citations; and enforcing regulation through the use of sanctions such as civil money penalties, denials of payment, or decertification. It is therefore not surprising that it suffers the problems of deterrence regulation, such as strained relationships between the various players in regulation, a defensive and uncooperative response to regulation from nursing home providers, and high regulatory costs. Despite its overt deterrence orientation, U.S. nursing home regulation still seems

*“Responsive regulation might not reduce regulatory costs overall, but it would be a much better use of resources.”*

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to be ineffective at dealing with many problems of persistent poor performance. It is interesting to note that nursing home regulation in other countries is generally less deterrence oriented, as is the regulation of other types of health care organizations in the United States.<sup>27</sup>

A number of regulatory theorists have argued in recent years for a more contingent or adaptive approach to regulation, and their ideas may have some relevance to the regulation of nursing homes. Called “responsive” or “smart” regulation, this approach seeks to find a more effective regulatory paradigm that combines some of the benefits of both deterrence and compliance regulation.<sup>28</sup> The main principle of responsive regulation is that regulatory methods and approaches should be adapted in response to the behavior of individual regulated organizations. A broad, graduated hierarchy of regulatory interventions and enforcement actions is used, and while most regulation takes place at lower levels, the regulator has the capacity and the will to use higher-level interventions and actions if need be. In this way, most of the benefits of compliance regulation—such as cooperation, information sharing, negotiated agreement, and low regulatory costs—are retained, but the powerful incentives and sanctions of deterrence regulation are still available.

At present, nursing home regulation exhibits few, if any, of the features of responsive regulation. Nursing homes are surveyed annually and treated similarly, regardless of whether they are good or poor performers—a “cookie-cutter” approach that neither adequately rewards good-quality care nor deals forcefully enough with poor-quality care. Nursing home regulators have little scope to use their discretion and professional judgment in applying the highly prescriptive regulations and are actually prevented by the regulations from giving nursing homes advice or assistance. It seems that there is considerable scope to make use of the ideas of responsive regulation to create regulatory arrangements for nursing homes that would be less focused on deterrence, more capable of monitoring and discriminating between nursing homes on the basis of their performance, and more able to tailor regulatory interventions to the performance needs of individual nursing homes. This might not reduce regulatory costs overall, and would mean investing more in regulating poor-quality nursing homes, but it would be a much better use of regulatory resources.

■ **Regulatory fragmentation.** Regulation is sometimes fragmented, with different agencies responsible for different functions or performance areas and even some direct overlap of oversight. Regulatory fragmentation may result in duplication, an increased regulatory burden and higher regulatory costs, and some conflict or confusion between the requirements of different regulators. It also may weaken regulatory oversight, because no one agency has either all of the information needed to assess performance or complete responsibility for dealing with performance problems.<sup>29</sup>

The regulation of nursing homes is fragmented in three ways. First, although federal responsibility rests with the CMS, it is split between the central agency and its regional offices, which deal separately with developing and promulgating regulations and setting guidance for state survey agencies, on the one hand, and with financing, contracting with and overseeing state survey agencies, and enforcing regulations, on the other. These responsibilities are only brought together at the level of the CMS administrator, and there is good evidence that this fragmentation causes communication problems and reduces the effectiveness of regulation.

Second, regulatory responsibility is split between the CMS and the state survey agencies, and the relationship does not appear to be an easy one, marked more by bureaucratic direction and dissonance than by real interagency dialogue or collaboration. The CMS sets out in excruciating detail in its *State Operations Manual* what it expects state agencies to do, but those agencies struggle to fulfill their mandate in the real world within the resources that the CMS allocates to them.<sup>30</sup> State survey agencies have a dual accountability—to the CMS and to their state government—so conflicts can and do arise. The CMS is meant to oversee the performance of state agencies but has done little to monitor them and in any case has limited powers to do anything about performance problems.

Third, there is really not one system of regulation, but two—federal certification and state licensure—running side by side. This results in some duplication, occasional conflicts, and considerable confusion. For example, when state survey agencies find a deficiency at a nursing home, they may choose to pursue it through state or federal enforcement mechanisms, or both.

The current level of fragmentation creates unnecessary complexity for regulators and for nursing homes, probably reduces the effectiveness of regulation, and certainly increases its costs. These regulatory structures are an accident of history; they reflect the gradual and piecemeal development of state and federal regulatory arrangements since 1965. A simpler regulatory structure with one regulator would probably be much more efficient and effective. However, im-

provements could be made to the current system of regulation by simplifying and bringing together responsibility within the CMS and taking steps to develop a more proactive and productive relationship between the CMS and the state survey agencies.

**■ Clarity and priority of the regulatory mission.** While some regulators are agencies established for the purposes of regulation, others undertake regulation as one of a number of related activities. There can be some benefits to integrating the regulatory function with other responsibilities, but the main disadvantage is that the clarity and priority of the regulatory mission may be compromised when the agency trades off regulatory objectives against other objectives. Regulatory organizations for which the regulatory mission is not clouded by a host of other competing nonregulatory objectives (such as the Food and Drug Administration or the Occupational Safety and Health Administration) may be more likely to be effective regulators because they can focus on a clear regulatory mission.

Nursing home regulation is only one responsibility among many for the CMS and for the state government departments in which the state survey agencies are located. It competes for attention with a multitude of other policy priorities, and it tends to be seen as a rather unexciting, unglamorous, and low-profile function. In these circumstances, it is likely that nursing home regulation will always struggle to secure resources and gain sustained policy attention unless it is forced up the policy agenda by external influences such as pressure from consumer groups or independent evaluators.<sup>31</sup> This problem of prioritization may be one of the reasons why the implementation of the OBRA 1987 reforms proceeded so slowly (with the CMS taking seven years to introduce some regulations). Reorganizing responsibility for nursing home regulation within the CMS could help to provide greater clarity of mission, but putting nursing home or long-term care regulation in the hands of a separate agency would probably be the most effective way to ensure that the issue gets the attention it deserves. The same problems may exist at the state level, especially when nursing home regulation is one relatively small function of a much larger entity. It might not be feasible to have a separate state agency for nursing home regulation except in the largest states, but it would be possible to reorganize responsibility for nursing home regulation to give it greater visibility and policy attention.

**■ Balancing independence and accountability.** Regulators have to be held accountable for what they do, and public regulatory agencies are generally made accountable by reporting, directly or indirectly, to an elected legislative body. However, regulators sometimes need to take actions that may be politically unpopular or that may arouse the opposition of important stakeholder groups, and in

these instances they need some degree of freedom to act without interference. In any case, a regulator's credibility with stakeholders may depend upon its perceived independence from sectional interests and its ability to act as a nonpartisan "honest broker." Regulatory governance arrangements therefore need to provide a balance of accountability and independence.

Nursing home regulation has become highly politicized, and various stakeholders attempt to influence the regulators and to shape the legislative framework for regulation. For example, nursing home providers have made large political contributions; in some states nursing home providers are prominent in the local political party hierarchies; and some state and federal legislators have substantial financial interests in nursing home care. On the other hand, there are powerful, well-organized national and state consumer and citizen groups that often run influential campaigns. Legislators at both the state and federal levels have taken a close interest in the work of nursing home regulators, held hearings and commissioned reports from evaluators, and sought to influence both, either directly through new legislation or indirectly by controlling the resources made available to run the regulatory agencies. While this kind of attention may be an inevitable result of the political process, it does not necessarily make for effective regulation. Regulators working in the glare of political and public attention tend to be highly cautious, risk-averse, and overinfluenced by the likely political and public response to their actions. Although it is perfectly legitimate and desirable that providers, consumers, legislators, and other stakeholders should be involved in shaping the regulatory process, nursing home regulators need to be freed up to do their jobs without undue interference.

Regulatory accountability is also an important guard against having the regulatory process be "captured" by any one sectional group or interest, most commonly the organizations that are being regulated. However, it can be argued that nursing home regulation has been captured, not by the providers but by the payers for nursing home care. The CMS and state governments act both as regulators of nursing homes and as funders (through Medicare and Medicaid) of 60 percent of the costs of nursing home care. If the CMS, as regulator, makes changes in the regulations that will cost money to implement, then the CMS, as funder, comes under pressure to increase reimbursements. The current debate about whether federal regulations should be amended to set minimum staffing ratios for nursing homes is an illustration of this problem. Some estimates suggest that federal minimum staffing ratios could increase the costs of nursing home care by \$3–\$15 billion a year, depending on where the mini-

*“Regulatory alignment might be improved if measures were taken to increase competition on quality grounds.”*

mum staffing level is set, and the nursing home industry has been quick to assert that Medicare and Medicaid should be ready to increase reimbursement levels accordingly.<sup>32</sup> While affordability is an important issue, and the costs and benefits of any regulatory changes should be carefully analyzed, it is probably unhealthy for the regulatory process to be so completely in the hands of a single interest group. A more balanced model of regulatory accountability might involve the separation of regulatory and funding responsibilities in state and federal government agencies and the provision of a formal role for a wider range of stakeholders such as consumer groups, provider associations, educators, and researchers in holding nursing home regulators accountable for their performance.

■ **Regulatory alignment.** Regulation is most effective when the requirements or objectives of regulatory agencies are aligned with other influences on the behavior of regulated organizations. For example, regulatory compliance with environmental health standards among food producers is generally good, because the producers recognize that any major food-related disease outbreak can result in great harm to their commercial interests, such as loss of market share and damage to their public image and reputation. Alain Enthoven argues for a “procompetitive” approach to health care regulation in market situations, in which, as far as possible, the regulatory regime is designed to reinforce or complement existing market incentive structures or influences on regulated organizations.<sup>33</sup>

However, for nursing homes, the pressures of the marketplace are not well aligned with the objectives of regulation.<sup>34</sup> While nursing home regulation attempts to promote high quality of care, the market does not seem to reward nursing homes that provide such care. First, restrictions on nursing home developments have weakened competition by constraining supply in many areas, even though occupancy statistics now suggest that there is some excess capacity overall.<sup>35</sup> Second, nursing home consumers (potential residents, their families, and caregivers) are poorly equipped with information to compare quality among nursing homes. Thus, their choices are often driven mainly by the proximity of the home to family members. Once they are residents of a home, their dependence on it makes it difficult to speak out about quality problems, and it is difficult for them to move if the quality of care does not meet their expectations. Third, the financial pressures on nursing homes from

low rates of Medicaid reimbursement have driven many to reduce their spending to sustain their profits.

When regulatory objectives and market pressures collide, as they do for nursing homes, organizations will often attempt to reconcile the conflicting pressures, but ultimately the stronger market pressures are likely to prevail. For nursing homes, regulatory alignment might be improved if measures were taken to increase competition on quality grounds and to provide greater financial incentives to provide good-quality care. Regarding competition, initiatives that offer nursing home consumers much more information about the facilities when they are making their initial choice would be helpful, and some examples already exist. It also would be useful to make it easier for residents to change nursing homes. Regarding incentives, some measures of quality need to be incorporated into the complex prospective payment system for Medicare and Medicaid so that a proportion of reimbursement is dependent on the quality of care. This is not an easy task, but it is disappointing that past experiments with quality-based reimbursement have never been implemented widely, despite their promising results.<sup>36</sup>

■ **Regulatory tripartism.** The relationship between a regulator and a regulated organization is not simply bilateral. Many other stakeholders have an interest or involvement in the organization's performance, and it has been argued that regulatory arrangements should be designed to make use of or co-opt these other groups for the purposes of regulation—an approach that is called *tripartism*. For example, workers in a manufacturing firm have a strong self-interest in good workplace safety arrangements, and so occupational safety and health regulations often require manufacturers to have some kind of formal employee involvement and representation in workplace safety structures and processes. In this way, workers and their representatives are brought into the regulatory process, where they can be an important source of information to the regulator and can help to promote regulatory compliance. Regulatory agencies have very limited resources in comparison with the organizations they regulate, and even the most intensive approaches to regulatory oversight are unlikely to involve regulators in inspecting more than a small proportion of the activities they oversee. Tripartism provides a mechanism by which regulators can extend their oversight by using other stakeholders as informants and can secure greater regulatory compliance by using those stakeholders to pressure regulated organizations to change.

Many formal and informal nursing home stakeholders have an interest in the regulatory process. Residents and their families hold perhaps the greatest stake in assuring good quality of care, but

consumer and citizen groups, staff unions and associations, provider groups (including nursing home associations and corporate owners of chains or networks of nursing homes), and other health care organizations and professions (such as hospitals, social workers, and physicians) also interact with nursing homes, and a federally funded network of long-term care ombudsmen oversees nursing home care.<sup>37</sup>

Current nursing home regulatory arrangements are mainly structured bilaterally, around the relationship between the regulator and the nursing home, and they make relatively little use of these other interest groups. While nursing home regulators do interview residents and staff as part of their regular surveys and will respond to and investigate complaints from any source, there is no formal regulatory requirement for any other stakeholder involvement. Regulators could make more use of tripartism by requiring nursing homes to have strong resident and family councils and providing more support for them; by providing more resources for the admirable but chronically underfunded long-term care ombudsman program and doing more to link it up with resident and family groups in nursing homes; by requiring nursing homes to have forums in which workers can raise quality problems and by safeguarding “whistleblower” employees who express legitimate concerns about quality; and by incorporating more extensive consultation with stakeholders into the nursing home survey process.

**N**URSING HOME REGULATION IS CLEARLY NECESSARY, but not all regulation is good and effective. It seems that although the OBRA 1987 nursing home reforms have achieved some important quality improvements, there is too little evidence to be able to determine whether the benefits justify the costs. The current regulatory arrangements could be improved, and regulatory experience in other settings may offer some valuable insights. Even so, there is clearly a need for more research aimed at developing a better understanding of the costs and effects of different regulatory methods and so informing regulatory policy.

For the future, further regulatory reform for nursing homes is probably inevitable. The IOM has recently recommended a number of changes, including a greater focus on providers that are chronically poor performers (by using more frequent surveys and increasing penalties); more CMS monitoring of the regulatory process to ensure that regulations are applied consistently; and more research into whether regulation has sufficient resources.

However, it can be argued that more fundamental reforms to the current regulatory arrangements are needed that are less focused on

changing the regulations and more concerned with reforming the regulators themselves and changing the culture of the regulatory process. For example, future reforms could include a shift toward a more responsive approach to regulation; changes to the structure of the CMS and the state survey agencies to reduce fragmentation, focus their regulatory mission, and improve regulatory governance; the alignment of regulatory and other incentives for nursing home providers; and the incorporation of a wider range of stakeholders into the regulatory process. Whatever changes are made, it is important that they be properly evaluated.

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# Two Decades of Nursing Home Compare: What Have We Learned?

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## Abstract

Approximately two decades ago, federally mandated public reporting began for U.S. nursing homes through a system now known as Nursing Home Compare. The goals were to provide information to enable consumers to choose higher quality nursing homes and to incent providers to improve the quality of care delivered. We conduct a systematic review of the literature on responses to Nursing Home Compare and its effectiveness in meeting these goals. We find evidence of modest but meaningful response by both consumers and providers. However, we also find evidence that some improvement in scores does not reflect true quality improvement, that disparities by race and income have increased, that risk-adjustment of the measures is likely inadequate, and that several key domains of quality are not represented. Our results support moderate success of Nursing Home Compare in achieving intended goals but also reveal the need for continued refinement.

## Keywords

Nursing Home Compare, public reporting, nursing home, quality, information

Quality of care in nursing homes has long presented a policy challenge (Institute of Medicine, 1986). Publicly reporting information about nursing home quality is one of the most prominent policy efforts aimed at improving nursing home quality in the past two decades. The Centers for Medicare and Medicaid Services (CMS) has implemented public reporting through Nursing Home Compare (NHC), a web-based report card on all Medicare- and/or Medicaid-certified nursing homes in the United States. As in the case of other health care report cards, the goal is to provide consumers with information about quality that will inform their choice of nursing homes and increase the probability of going to a high-quality provider. In turn, providers are hypothesized to use the quality information for benchmarking and to face an incentive to score well on the report cards, lest they lose market share. Numerous studies have examined these assertions and the potential for unintended consequences, while media reports have at times cast skepticism on the report card's validity (Thomas, 2014). In this article, we systematically review the empirical evidence on the effectiveness of NHC that has emerged in the two decades since the system was initiated.

## History of NHC

In 1998, the first version of the NHC website was launched with information limited to nursing home regulatory deficiencies. In 2000, the available information was expanded to include nurse staffing data. While these quality measures were publicly available, they were not widely disseminated or publicized. Then, in 2002, through the Nursing Home Quality Initiative, CMS released what became widely known as NHC, a web-based guide detailing quality of care at over 17,000 Medicare- or Medicaid-certified nursing homes (CMS, 2002). It included 10 clinical quality measures, six of which measure quality for long-stay residents with chronic care needs and four of which measure quality for patients in postacute care with skilled needs. It also

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included information on staffing and rates of regulatory deficiencies. Prior to the 2002 launch, a 7-month pilot was conducted in six states (Colorado, Florida, Maryland, Ohio, Rhode Island, and Washington). The expanded version of NHC was launched nationally in November 2002, allowing consumers to compare quality measures across nursing homes nationwide (CMS, 2002; Harris & Clauser, 2002). The release of this web-based information about nursing home quality was actively promoted to consumers in 2002, with the hope that consumers would use this information to help choose a nursing home.

In June 2008, CMS announced it would make significant changes to the NHC rating system by introducing five-star summary ratings. Starting on December 18, 2008, CMS began publicly rating each nursing home with a star rating ranging from one to five stars, which is still used today. The star ratings give consumers a simplified, composite look at nursing home quality. Nursing home star ratings are based on quality in three domains: health inspections (based on scope and severity of health deficiencies found during the two most recent state inspections and number of repeat visits needed to confirm the correction of deficiencies), staffing (based on case-mix adjusted measures of total nursing hours per resident day and registered nurse hours per resident day), and quality measures (averaged over 4 quarters and originally based on 10 clinical quality outcomes measures). At its implementation, the five-star rating system was one of the largest experiments using a summary rating in a public health care report card. CMS continues to invest resources into this public reporting effort, updating the reported scores on a quarterly basis, amending the list of included measures, improving the interface, and raising awareness among consumers and other stakeholders.

### New Contributions

NHC constitutes a major policy initiative designed to improve consumer choice and quality of care for a particularly vulnerable population—individuals who need nursing home care. Findings from evaluations of public reporting in other health care sectors, while related, may not apply to the nursing home sector because of several unique characteristics: a population with high rates of cognitive impairment and other comorbidities; a sector with a long history of quality problems; the long-term nature of the care, which raises the importance of location and proximity to family members; and, for some, the planned nature of nursing home entry allows the time needed to gather information about nursing homes before making a choice. Thus, distributing information about quality may be simultaneously more important and more challenging than in

other sectors. Although numerous studies have evaluated the effectiveness of NHC at various points of time and from various perspectives, the evidence about its impact to date has not been systematically reviewed and summarized. Several prior reviews of public reporting included studies of Nursing Home Compare among studies in other health care sectors, but these reviews are generally dated, preceding the five-star system, and many used restrictive inclusion criteria such that few nursing home studies were included (Berger et al., 2013; Mukamel et al., 2014; Totten et al., 2012; Vukovic et al., 2017). This article fills a key gap, providing a comprehensive overview of empirical evidence on the effects of NHC including effects of the five-star system. In addition to providing insights about consumer and provider behavior in response to public reporting of quality, the goal of our review is to inform the evolution and refinement of the NHC system.

### Conceptual Framework

We conceptualize the effects of public reporting using tools from the economics of information (Arrow, 1963). Public reporting is intended to work through two main mechanisms: consumer response and provider response. For consumers—whom we define broadly to include prospective nursing home residents, their families, or other individuals involved in the decision to be admitted to a particular nursing home, such as discharge planners and referring providers—demand for nursing home care depends primarily on health status, out-of-pocket price, availability of potential alternatives such as informal caregivers, and perceptions about the quality of care they will receive. However, health care markets are subject to imperfect and asymmetric information, whereby consumers are unable to assess the level of clinical quality of their potential nursing home choices with certainty. Finding valid information may entail high search costs. They may therefore use noisy but lower cost signals for quality such as nonprofit status or “hotel” amenities. Public reporting of health care quality is intended to solve, at least in part, the problem of asymmetric information by making information about quality more readily available to consumers and lowering search costs. Thus, all else equal, consumers should be more likely to choose high-quality providers and less likely to choose low-quality providers under public reporting.

The degree of consumer response to public reporting may differ by the type of nursing home care needed. People searching for short-term, postacute care for rehabilitation after an acute hospitalization may be better able to respond than those searching for long-term, chronic care for functional and/or cognitive impairment. Postacute stays are generally covered by Medicare,

making out-of-pocket price less of an issue, and postacute patients tend to be younger and less cognitively impaired, making the use of quality information more feasible (Werner et al., 2012). On the other hand, decisions about postacute care at the end of an acute hospitalization may be more rushed and subject to bed availability.

This demand response by consumers is expected to prompt a provider response. In the absence of public reporting, imperfect and asymmetric information may lead providers to choose a level of quality where the marginal cost of providing quality is less than the social optimum that would be achieved under perfect information. In other words, providers react to consumers' inability to judge quality by underproviding quality. In the presence of public reporting, which partially solves the information issue, providers face a demand curve that is more responsive to the level of quality. Thus, providers are expected to increase the level of quality in order to maintain or increase market share. Even in the absence of competition and concerns about market share, report cards may provide information to providers against which they can benchmark their quality improvement efforts; nonprofit nursing homes, for example, may include the provision of high-quality care in their objective functions directly.

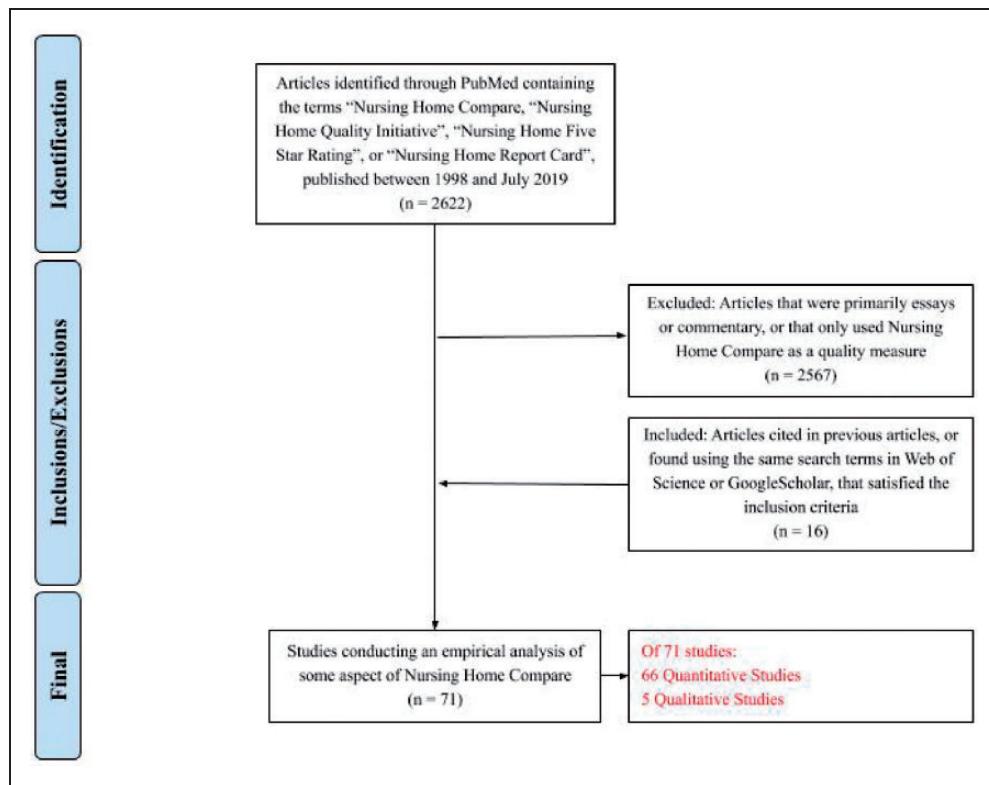
Whether the hypothesized effects of public reporting are realized depends on a number of assumptions about consumers and providers (Casalino et al., 2007; Mukamel, Weimer, et al., 2007; Werner & Asch, 2005): that consumers know about and can access and understand the reported information; that consumers have a choice of providers willing and able to accommodate them nearby such that they can act on the information; that providers know how to improve quality; and that providers engage in good-faith efforts to broadly improve quality and not just improve scores. The hypothesized effects of public reporting also depend on assumptions about the measures themselves: that they are useful, valid, and reliable representations of quality and cover domains that are salient to consumers. Violations of these assumptions could lead to a dampening of the effects or to unintended consequences, namely: (a) heterogeneity and potential disparities in benefits; (b) selection of healthier residents that could lead to access problems for less healthy residents; (c) targeted improvement that results in no improvement or worsening quality in nontargeted areas, also known as "teaching to the test"; and (d) possible gaming of the system and changes in documentation such that scores improve without true improvements in quality. We review the evidence on each of these unintended consequences as well as direct evidence of consumer and provider response to NHC.

## Method

We conducted a systematic review of the literature published between 1998 (when the first version of NHC appeared) and July 2019 to find peer-reviewed empirical articles assessing NHC. A search on PubMed using the search terms "Nursing Home Compare," "Nursing Home Quality Initiative," "Nursing Home Five Star Rating," and "Nursing Home Report Card" resulted in 2622 potential articles. We then conducted a title and abstract review to narrow the pool to articles that included an empirical (quantitative or qualitative) analysis of some aspect of NHC, retaining 55 of the 2,622 articles. We excluded articles that were primarily essays or commentary. We also excluded articles that simply used the NHC measures as outcomes in an analysis but whose intent was not to evaluate or inform NHC. These decisions were independently conducted by two of the authors and any discrepancies were resolved through discussion among all three authors. Finally, we conducted searches using the same search terms in Web of Science and Google Scholar to identify articles not indexed in PubMed, and we checked reference sections of all the articles already identified for citations to articles we might have missed. These efforts resulted in an additional 16 articles that met our inclusion criteria, bringing the total number of articles to 71. Our search strategy is displayed in Figure 1.

We read the 71 included articles to assess methodology and findings. Study designs were evaluated for rigor and the extent to which they enabled causal inference. We did not exclude studies based on weak study designs, as even simple descriptive studies of trends can be informative; however, we placed more weight on studies with more rigorous designs (those using randomized or quasi-experimental designs such as longitudinal panel designs, regression discontinuity, difference-in-differences, or instrumental variables) when drawing conclusions across studies. We classified articles according to whether they mainly assessed consumer response, provider response, or issues related to the presentation and validity of the reported measures. A complete list of included studies, with review categories and study designs, can be found in Appendix Table 1 in the Supplemental Material, available online.

We structure the results of our review according to the broad categories in our conceptual model. First, we review the evidence on consumer response to NHC, followed by provider response to NHC. Next, we review the indirect effects or unintended consequences of NHC, including disparities, selection, teaching to the test, and potential gaming of the data. Finally, we review the evidence on the presentation, validity, and content of the measures themselves.



**Figure 1.** Search strategy for review of nursing home compare.

## Results

### Consumer Response to NHC

As consumer use of health care report cards is central to their intended purpose, a first-order question is whether consumers use them and respond to their publication. Early evaluations of NHC used surveys and descriptive pre-post trend analysis to assess whether consumers appeared to be shifting toward higher quality nursing homes after NHC was launched. Stevenson (2006) found that occupancy rates of highly rated nursing homes increased slightly after the limited 1998 launch, suggesting a positive but quite small response. Castle (Castle, 2009a, 2009b) conducted a mail survey of family members of newly admitted nursing home residents to probe their use of the 2002 version of NHC, finding that 12% of respondents reported using it.

Three studies employed more rigorous designs to assess whether market share shifted as a result of NHC prior to the five-star system. These studies examined the effects of NHC on market share, defined as the percentage of residents market-wide who go to each nursing home, a common way to measure consumer response. Grabowski and Town (2011) employed a difference-in-differences model based on comparing pilot states, which implemented the 2002 changes 7 months earlier, to nonpilot states, and vice versa when the remaining

states implemented. Focusing on long-stay, chronic care residents, they found no significant effect of NHC on market share for four of the five quality measures they studied. In contrast, Feng Lu (2012) used a similar design but found significant effects on market share for most of the five quality measures studied. These two analyses focused on different quality measures, which may explain their divergent results, but in both cases the significant effects were small. Werner et al. (2012) used a discrete choice estimation with an instrumental variable to examine choice of nursing homes for postacute care and found significant market share changes in response to higher scores on some (but not all) postacute quality measures on NHC. Because most postacute care patients are covered by Medicare and therefore can consider quality without considering price, it is plausible that postacute care residents respond more to NHC than the long-stay, chronic care residents. Still the effects for postacute care residents were also small. Overall, quantitative evidence on consumer use of NHC prior to the five-star system is consistent with modest use of the system, with small changes in market share potentially concentrated among postacute care patients.

The evidence on consumer response to NHC after the 2008 launch of the five-star summary score is sparse but more consistent. An analysis of descriptive trends among long-stay residents showed a significant decline in the

number being served in one-star nursing homes and a significant increase in the number being served in five-star nursing homes during the first 2 years of the new system (Konetzka, Grabowski, et al., 2015). A more rigorous analysis of these shifts during the same time period, analyzed using a discrete choice model and controlling for other nursing home characteristics, found that one-star facilities typically lost 8% of their market share and five-star facilities gained 6% of their market share (Werner et al., 2016). Finally, Perraillon et al. (2019) used a regression discontinuity design to assess the causal effect of the switch to star ratings in the first 6 months after they were released, estimating an effect at each star level relative to the star level below. They found that nursing homes with five, four, and three stars received 2% to 5% more admissions than similar nursing homes with one fewer star, but that there was little effect among lower quality nursing homes (two vs. one star). Of note, all three of these studies found practically meaningful effect sizes that were larger than the somewhat inconsistent effects found prior to the five-star system. In terms of encouraging the use of NHC by consumers, the five-star summary ratings appear to be effective.

Some of the same studies that examined consumer response on average also examined heterogeneity of response. One might assume that public reporting would be more effective in moving market share in more competitive markets, that is, when consumers have more choice. Similarly, nursing homes with high occupancy may not be able to increase market share due to capacity constraints, even if very highly rated. Prior to the five-star ratings, the evidence on these factors was mixed. Grabowski and Town (2011), who did not find overall effects on market share among long-stay residents, also did not find that market competition influenced changes in market share after the 2002 launch. In contrast, Werner et al. (2012), who found an overall market share response among postacute patients, found that the effect was driven by nursing homes that were not already at high occupancy. After the five-star ratings were implemented, several studies demonstrated the expected effects: Gains in admissions or market share for highly rated facilities were more pronounced in more competitive markets and among lower occupancy facilities (Perraillon et al., 2019; Werner et al., 2016).

**Insights Into Consumer Response.** Beyond studies examining whether and to what extent consumers have responded to NHC, research has begun to unpack the mechanisms behind these findings, drawing from both quantitative and qualitative studies. An early national survey showed that use of the Internet was common in searching for information about nursing homes, but that only

12% of respondents could remember using NHC specifically (Castle, 2009a, 2009b). Furthermore, only about a third of those used NHC for quality information, whereas others were looking just for names and addresses of nearby facilities. Awareness of NHC could be enhanced through state health care websites, almost all of which now include links to NHC, but the links are sometimes difficult to find, offer little explanation, and use inconsistent terminology (Liu & Lu, 2015).

Qualitative, interview-based studies conducted in limited geographical areas after the launch of the five-star system produced similar findings to those in the survey, revealing substantial use of the Internet but low awareness and use of NHC itself (Konetzka & Perraillon, 2016; Schapira et al., 2016). Konetzka and Perraillon (2016) found that many consumers, when shown the NHC website, were suspicious of the source of the data and wondered if the nursing homes themselves influenced or created the site, that is, it was not immediately apparent to them that the site was produced by the government. Schapira et al. (2016) also found that consumers wanted more information on the source of the data. Quality was found to be only one factor among many considered by consumers, with recommendations from doctors, the availability of specialized services, distance to family and friends, and the availability of a bed (especially for those on Medicaid) often dominating quality as a constraint or driver of choice (Konetzka & Perraillon, 2016). Limited supply of high-quality nursing homes in low-income neighborhoods remains a difficult challenge (Konetzka, Grabowski, et al., 2015). Overall, these studies provide some explanations for a modest consumer response to NHC—low awareness, mistrust of the data, competing considerations, and constrained choice sets.

### **Provider Response to NHC**

Complementary to the issue of consumer response is the question of whether providers respond to public reporting by improving the quality of care delivered, as this is also a fundamental goal of public reporting policies. Similar to consumer response, the evidence on provider response prior to the five-star system was mixed. Early descriptive studies found small improvements in some of the long-stay quality measures but not in others, with more consistent improvement in the short-stay quality measures (Castle et al., 2007; Castle et al., 2008; Zinn et al., 2005).

Several more rigorous studies used different forms of quasi-experimental design to identify plausibly causal improvement in the clinical quality measures. One study used a survey of nursing home administrators to assess whether and how they were responding to their scores and then interacted an indicator for these

responses with changes over time in five selected quality measures; that study found significant improvements linked to nursing home actions in three of the five measures (Mukamel, Weimer, et al., 2008). Two studies that used the difference in timing of implementation between pilot and nonpilot states to identify effects of NHC found conflicting evidence on whether nursing homes had improved their scores due to NHC (Feng Lu, 2016; Grabowski & Town, 2011). A study that examined changes in vaccination rates after measures of vaccination rates were added to NHC used rates among community-dwelling elderly people as a comparison, and found no effect attributable to NHC (Cai & Temkin-Greener, 2011). Finally, one study that focused on the postacute care measures constructed a comparison group using small facilities, which were exempt from publishing measures on NHC. The study found that nursing homes improved on all three postacute care measures in an absolute sense, and on two of the three relative to small facilities (Werner, Konetzka, Stuart, et al., 2009). A follow-up study examined the extent to which improvements in the average level of postacute care quality were due to within-facility improvement over time versus shifts in market share toward higher quality nursing homes, concluding that both were contributing (Werner et al., 2010). Overall, the evidence points to providers increasing quality in response to the pre-five-star version of NHC, but with the most consistent improvements concentrated among postacute quality measures.

Evidence on quality improvement due to NHC under the five-star system is relatively sparse. Several studies documented substantial upward trends in within-facility reported quality over time (Han et al., 2017; Konetzka, Grabowski, et al., 2015; Werner et al., 2016), consistent with government-sponsored reports showing dramatic improvement in scores (Abt Associates, 2014). In a study of antipsychotic medication use, which was added to NHC and to the five-star calculation in 2013, Bowblis et al. (2015) found large and significant improvements relative to facilities not subject to reporting of the measure. Although the absolute trends in improved scores under the five-star system are substantial, with the exception of the latter study on antipsychotic use, these trends have not been rigorously studied as a causal effect of NHC.

Provider response to NHC may include nonquality responses, such as changes in the price charged to private-pay residents or changes in payer mix and profits. If a nursing home scores well on NHC, the incentive to improve further may be blunted, but the high score is a form of advertising that may simultaneously increase demand and the price that a nursing home is able to charge to private-pay residents. A few studies examined price responses. Clement et al. (2012) examined the

immediate aftermath of the 2002 launch of NHC using a pre-post design in one state and found some increases in price, but these were among low-scoring facilities, making it difficult to attribute the response to NHC. Using a more rigorous design, Feng Lu (2012) found no evidence of price changes in response to NHC. However, after the five-star system was implemented, Huang and Hirth (2016) used a difference-in-differences model to reveal increases in private-pay price for highly rated nursing homes relative to low-rated homes, especially in more competitive markets. Finally, two studies examined the relationship between NHC quality scores and profits using difference-in-differences and instrumental variables models. Nursing homes that scored well or improved substantially on NHC were found to have higher subsequent profit margins, largely as a result of increasing occupancy and the share of Medicare days (Park et al., 2011). However, the increases in profit margins were not necessarily large enough to result in further quality improvement (Park & Werner, 2011).

Just as in the consumer studies, some of the studies that examined provider response on average also examined heterogeneity of response. If public reporting is more effective in moving market share in more competitive markets, then providers in more competitive markets should also have greater incentive to improve. Similarly, nursing homes that are already at high occupancy should have less incentive to improve. Empirical evidence on provider response generally supports these hypotheses. Several studies found that the likelihood of a nursing home improving in at least some quality scores and taking actions toward quality improvement was higher in more competitive areas (Castle et al., 2007; Castle et al., 2008; Grabowski & Town, 2011; A. S. Kim, 2016a; Zinn et al., 2008; Zinn et al., 2010) and in areas with low occupancy (Castle et al., 2007; Castle et al., 2008; A. S. Kim, 2016a). In addition, one early survey-based study of the 2002 version of NHC found that administrators of nursing homes in the bottom 20% of scores reported being more likely to take immediate action to improve scores than administrators of homes that scored better (Zinn et al., 2008). Somewhat surprisingly, no difference was found by ownership of nursing homes (for-profit vs. not-for-profit; chain vs. independent) in terms of the quality response to NHC (Feng Lu, 2016; Zinn et al., 2005; Zinn et al., 2010).

**Insights Into Provider Response.** Beyond studies examining whether and to what extent providers have responded to NHC, several surveys and qualitative studies lend insights into why, how, and when providers respond. In the early years after the 2002 launch, few nursing home administrators believed that NHC played an important role in consumers' decisions, based on lack

of inquiries from consumers about the scores (Mukamel, Spector, et al., 2007; Zinn et al., 2008). Accordingly, although most providers reported checking their scores, only a third said they would use the scores for quality improvement (Castle, 2005).

This began to change quickly over time, with providers increasingly reporting that they not only checked their scores but investigated the cause of low scores (Mukamel, Spector, et al., 2007). After the five-star system was launched, administrators began to closely monitor their scores, use high scores for advertising, and develop strategies to improve scores. Nursing home chains often employed management-level staff to monitor scores and address problems across member facilities (Perraillon et al., 2017). The level of effort and resources devoted to monitoring and improving scores is proportional to the extent to which key constituencies seem to care about the scores (Perraillon et al., 2017; Zinn et al., 2010)—where key constituencies include not only consumers, but increasingly, accountable care organizations, managed care companies, and hospitals looking for postacute partners. Nursing homes with high occupancy rates report that they are less concerned about their scores (Perraillon et al., 2017).

Even if report cards provide incentives to try to improve scores, it is not always clear how to improve quality in each area. Evaluation of a pilot project using the clinical quality measures suggested that improvement on most of the measures involves changing processes of care, but that nursing homes may need technical assistance in order to know how to improve (Kissam et al., 2003). Little research to date has been conducted on which specific quality improvement strategies are effective to improve on the NHC measures.

### *Unintended Consequences: Disparities*

A common concern with public reporting is that the information will disproportionately benefit those who are already advantaged (consumers with higher education, higher income, and/or who do not identify as a racial or ethnic minority), potentially increasing disparities in access to high-quality care. An alternative hypothesis is that public reporting acts as an equalizer, providing information to less advantaged consumers that would otherwise be difficult to find. Studies to date provide some evidence to support the first hypothesis. Werner et al. (2012) found that postacute patients with a higher level of education were more likely than those with lower education to respond to the 2002 launch of NHC. Konetzka, Brauner, et al. (2015) found that, although there was an overall shift toward five-star facilities and away from one-star facilities among long-stay residents after the five-star system was implemented, this shift was substantially smaller

for individuals dually enrolled in Medicaid and Medicare (relative to those enrolled in Medicare only). One study used Oaxaca decomposition methods to find that education, health needs, and distance to high-quality nursing homes explained significant portions of the difference in the star rating of nursing home that Medicaid and non-Medicaid residents were admitted to (Sharma et al., 2019).

Surveys and qualitative studies found complementary evidence on heterogeneity of use by income and race. An early survey found that comprehension of the quality information among respondents was high on average but was lower for individuals with lower incomes or whose family member resided in a high-Medicaid facility (Castle, 2009a, 2009b), whereas one of the later qualitative studies found that respondents with lower income or Black race expressed less desire to use NHC when told about it (Schapira et al., 2016). Overall, these studies are consistent in suggesting that NHC may be widening disparities even as consumers shift to higher quality facilities on average.

Mirroring results on the consumer side indicating that consumers with lower income, on Medicaid status, and of minority race and ethnicity are less likely to respond to NHC, examination of provider performance under NHC suggests strong differences in performance by provider characteristics. A common concern is that providers who serve low-income consumers will lack the resources needed for quality improvement and, subsequently, will not reap the financial benefits of scoring well, fueling a cycle of increased disparities. Unroe et al. (2012) found that one-star nursing homes had older patients who were more likely to be Black, have Medicaid, and have more comorbidities relative to five-star nursing homes. Konetzka and Gray (2017) found a clear and monotonic gradient between star rating, percentage of Medicaid, and the income level of the neighborhood in which a nursing home is located, with low income and high Medicaid associated with lower star ratings. Although it is difficult to disentangle true differences in quality from inadequate risk-adjustment, controlling for these factors would not change the star ratings of most facilities (Konetzka & Gray, 2017). One study revealed an effect of NHC on disparities in access as well: After the 2002 launch of NHC, high-scoring nursing homes that were capacity-constrained had significant increases in private-pay admission and decreases in Medicaid-admission compared to low-scoring homes. Thus, even as Medicaid recipients potentially use NHC to choose higher quality nursing homes, those same nursing homes are using their increased market demand to exclude Medicaid recipients and improve their payer mix (He & Konetzka, 2015). Overall, the evidence on provider-level disparities under NHC points to the policy reinforcing resource

differentials and having adverse effects, but the causal relationships have not been fully established.

### ***Unintended Consequences: Selection***

A second common concern with public reporting policies is that imperfect risk-adjustment will incentivize providers to engage in selection of patients that will make their scores look better, sometimes referred to as “cherry-picking” or “cream-skimming.” This type of selection is difficult to identify in quantitative data, as it is difficult to separate changes in case-mix that are due to provider selection versus consumer-driven changes in nursing home choice, or “sorting.” Sicker consumers, for example, may disproportionately avoid low-scoring providers because they have more at stake than healthier consumers.

Using a nursing home fixed effects model, an initial look at the selection issue after the 2002 launch of NHC revealed a significant but small decline in the percentage of patients entering nursing homes with pain or memory limitations that was concentrated in low-scoring nursing homes, but no overall compelling evidence of selection (Mukamel et al., 2009). Werner et al. (2011) examined the same issue using a difference-in-differences model based on differences in timing of implementation for pilot states versus other states, finding that patient sorting was likely to be occurring: High-scoring nursing homes were increasingly admitting higher risk patients while low-scoring nursing homes were increasingly admitting lower risk patients, at least with respect to pain; there was also some evidence that pain was being downcoded on average but little evidence of selection was found. The lack of evidence for substantial selection at admission under NHC is perhaps not surprising, given that both Medicaid and Medicare reimburse on a per diem basis and the payment can be earned long before a resident becomes eligible to be counted in NHC scores. Konetzka et al. (2013) used multiple quasi-experimental designs to find that some selection was occurring on discharge instead, that is, postacute residents were more likely to be hospitalized just before being counted in NHC scores if they were at risk of scoring poorly. In more recent years, this incentive may have been tempered by an increased policy focus on reducing hospital readmissions.

Overall, although there is some evidence of nursing homes selecting healthier patients, the effects are small. This may be due to competing priorities, as found in interviews with nursing home administrators and staff: Nursing homes want to maximize revenues, which requires filling beds, and performing well on NHC is a secondary consideration. In addition, when selection occurs, it is often to avoid litigation, and litigious residents are not necessarily those who would make the nursing home score poorly on NHC (Perraillon et al., 2017).

### ***Unintended Consequences: Teaching to the Test***

A third common concern with public reporting is that targeted areas of quality will improve at the expense of areas that are important but not rewarded. This concept of “teaching to the test” is also related to Holmstrom and Milgrom’s theory of multitasking in the context of optimal contracts for employee performance when an employee engages in multiple tasks (Holmstrom & Milgrom, 1991). In the context of public reporting and other types of quality improvement incentives, the theory implies that measuring and rewarding quality in some areas can either have positive spillovers to other areas (if there are complementarities in production) or may harm quality in other areas (if resources are shifted to targeted areas). NHC targets clinical quality measures that are arguably specific and may engender specific quality improvement strategies that could “crowd out” quality improvement along other dimensions.

Research on NHC to date lends considerable support to the idea that nursing homes teach to the test. Surveys of administrators after the 2002 launch found that, rather than investing in new quality improvement programs, nursing homes were more likely to refocus existing programs and rearrange priorities to try to improve NHC scores (Mukamel, Spector, et al., 2007; Zinn et al., 2008). Several national studies using quasi-experimental designs followed, showing that untargeted areas of quality stagnated or declined as targeted areas improved (Feng Lu, 2012; Werner, Konetzka, & Kruse, 2009; Werner, Konetzka, Stuart, et al., 2009). One study focused in on the substantial decline in physical restraint use after restraints was included in the 2002 launch of NHC, finding a concurrent increase in antipsychotic medication use (a possible chemical restraint) prior to antipsychotic use being added to NHC (Konetzka et al., 2014). Mukamel et al. (2010) followed a different strategy to capture the idea broadly, examining changes in the ratio of clinical to “hotel” expenditures after NHC. They found that once clinical measures were reported, resources were shifted to clinical expenditures, especially among nursing homes that were lower quality, for-profit, members of a chain, had lower occupancy, or were in more competitive areas. Overall, these studies provide substantial evidence that providers respond to the incentives under NHC by focusing on targeted measures, potentially ignoring other important areas of quality.

### ***Unintended Consequences: Gaming of the Data***

Although provider performance on measured outcomes in NHC appears to have improved, policy makers, the media, and the public are increasingly skeptical about whether the improved performance is real, that is, truly

reflects improvements in residents' outcomes. Several media articles drew national attention to the skepticism about the measures, highlighting cases where consumers felt misled by high ratings, choosing nursing homes that fell far short of expectations and where family members experienced adverse events (Thomas, 2014, 2015). The concern stems in part from the fact that two of the three main quality domains under the five-star system, the clinical quality measures and staffing ratings, are based on self-reported data from nursing homes, raising the possibility of improving scores through changes in documentation used for the quality measure without accompanying changes in the underlying construct being measured. Documentation changes could be legitimate increases in attention and accuracy, or could constitute "gaming"—outright falsification of data, or employing questionable strategies to improve scores. In contrast, inspections, the third main quality domain used in the five-star rating, is not based on self-reported data and is therefore given the most weight in the five-star formula (Abt Associates, 2014).

Empirical efforts to identify the degree of gaming in NHC have used a common, if indirect, strategy, implemented in multiple ways. The strategy is based on the assumption that "real" improvement should be at least somewhat correlated either with the mechanisms to improve quality or with related (untargeted) measures of quality where spillovers from true quality improvement would be expected. In terms of mechanisms, one study found that the correlation between outcomes included in the NHC quality measures and associated measures of process decreased after public reporting began, such that very little of the postpublication change in outcomes could be explained by changes in process (Werner et al., 2013). Similarly, very little of the reported improvement in staffing ratios under the five-star system could be corroborated by changes in staffing costs, indicating that either staffing levels were being inflated or jobs were being reclassified as providing direct care (Sharma et al., 2017); this is consistent with earlier survey evidence that poor-scoring facilities were more likely to revise job descriptions (Zinn et al., 2008). In terms of correlation with other measures of quality, one study found that differences in ratings for inspections were correlated with differences in complaints (an untargeted area of quality), but differences in the self-reported domains were not correlated with complaints, suggesting ratings inflation in the self-reported domains (Han et al., 2016); this inflation was also correlated with a financial incentive to score well (Han et al., 2017). Similarly, the correlation between star ratings and potentially preventable rehospitalization rates for postacute patients became weaker after the five-star ratings were published, indicating potential inflation in the five-star ratings (Ryskina et al., 2018).

Several studies that examined narrower, more direct documentation issues also found evidence of a NHC effect. Werner et al. (2011) found a decrease in average documented pain levels for postacute patients on admission to nursing homes after pain was included as a quality measure in 2002; because other, correlated characteristics of admitted patients were not changing, the decrease was likely due to a coding change. Konetzka, Brauner, et al. (2015) found that nursing home residents with dementia were more likely to be coded as having end-stage disease after NHC was launched, given that many of the quality measures exclude residents with end-stage disease from the denominator.

Finally, qualitative evidence drawn from interviews with nursing home administrators and nursing staff underscores and is consistent with the quantitative evidence that gaming is occurring (Perraillon et al., 2017). Nursing home representatives reported substantial coding-related efforts to improve scores on the clinical quality measures, often led by a centralized director of clinical operations in the case of chain facilities. Strategies included asking residents about pain only after pain medications were given; timing assessments such that adverse events would not be counted in the look-back period for some measures; and counting nondirect-care staff in nursing hours. All of these strategies would potentially improve scores without changing care.

### **Presentation, Measurement, and Content of NHC**

Conceptually, consumer and provider responses to NHC are inherently tied to the presentation of the quality information, the validity of the measures, and whether important areas of quality are excluded. A fairly robust body of evidence exists on each of these topics.

**Presentation.** Prior to the five-star system, although consumers generally understood the information contained in each quality measure included in NHC (Castle, 2009b), parts of the way NHC presented information were confusing. In particular, several studies found that consumers had a difficult time reconciling that most of the clinical quality measures are adverse events and, thus, lower scores represent higher quality (Gerteis et al., 2007; Schapira et al., 2016). In addition, consumers often had trouble with graphical representations of the data as opposed to text labels such as "high quality" or "low quality" (Castle, 2009b; Gerteis et al., 2007). The addition of the five-star summary rating was more intuitive and familiar, despite difficulty understanding how the rating was calculated (Schapira et al., 2016). The fact that consumer response increased substantially after the five-star system was implemented supports the idea that

a simplified and familiar composite measure constitutes a more effective presentation than the prior system (Perraillon et al., 2019; Werner et al., 2016).

The five-star summary rating was, in part, a solution to presenting numerous individual measures with no systematic way for consumers to aggregate across measures and rank choices. In calculating a summary measure, however, it was necessary for CMS to decide which measures to include and how much weight to give each measure. The complex formula for the star ratings reflects these decisions, informed with the help of a technical expert panel to triangulate which measures were both important and reliably measured. An alternative view is that consumers themselves should decide on these weights. Mukamel et al. developed a tool for hospital patients in need of a nursing home placement to create their own ranking of local choices by choosing those measures that they valued most. A randomized trial of the tool showed that, relative to using the standard NHC, consumers using the tool prioritized measures differently than the standard NHC, had higher satisfaction with the process, left the hospital slightly sooner, and were more likely to choose a higher quality facility even in terms of the NHC rating (Mukamel, Amin, Weimer, Ladd, et al., 2016; Mukamel, Amin, Weimer, Sharit, et al., 2016; Weimer et al., 2019). In related work, the same team showed that a contingent valuation approach, asking consumers hypothetically to trade off travel time for nursing home quality, is a valid approach to constructing NHC weights from the consumer perspective (Weimer et al., 2019).

**Validity of the Measures.** A perhaps inevitable area of concern with the NHC measures is inadequate risk-adjustment. Most providers feel that risk-adjustment could be improved and that lack of adequate risk-adjustment means that their nursing home is not accurately represented on NHC (A. S. Kim, 2016b; Perraillon et al., 2017). The staffing measures and many of the clinical quality measures incorporate some risk-adjustment, while the inspections rating is not risk-adjusted. Research to date on NHC risk-adjustment focuses exclusively on the clinical quality measures. Despite extensive testing of the clinical quality measures in the 1980s and 1990s (Zimmerman et al., 1995), before NHC was launched, vulnerabilities remain in part due to inherent tradeoffs between the desire for validity and the desire to avoid complexity. Studies have examined the effects of including additional factors in risk-adjustment, finding that resident case-mix can explain 50% of the variation in the quality measures that are not risk-adjusted and that unadjusted measures have high false negative rates (Li et al., 2009; Li et al., 2010); that nursing home rankings would change significantly if some risk factors were added using appropriate statistical

modeling (Arling et al., 2007; Mukamel, Glance, et al., 2008); and that the inappropriate antipsychotic medication measure in NHC may substantially overstate rates due to inadequate risk-adjustment (Lucas et al., 2014). Overall, although an inherent tradeoff exists between better risk-adjustment and complexity, these studies demonstrate that fairly simple additions to variables used to risk-adjust the clinical quality measures could significantly improve the validity of nursing home rankings in this domain.

Beyond risk-adjustment, several studies criticized the validity of the staffing measures. Some of the criticism focused on the data source used, until recently, to calculate the staffing measures, which drew from approximately annual, point-in-time estimates of staffing levels collected during inspections; those data could be subject to inflation if nursing homes increased their staffing at the time of anticipated inspections and potentially did not reflect long-term performance (Sharma et al., 2017). This problem has been alleviated with the use of ongoing payroll-based staffing data in NHC (Geng et al., 2019). Nonetheless, there are remaining concerns that average staffing ratios are just one perspective on the adequacy of staffing; the reported staffing ratios may not reflect fluctuations in staffing, the experience and skill of staff within each job title, or turnover (Snyder et al., 2019).

A common way to assess the validity of reported quality measures is to examine either the correlation among reported measures or the correlation with broad but unreported measures of quality. Conceptually, one would not expect perfect correlation among reported measures when measures represent different domains of quality, as a provider could legitimately be good in some domains and not in others. At the same time, very low correlations across measures or with broad measures of quality may be interpreted as potential validity problems with the measures themselves, due to the expectation of at least some joint production across domains of quality (e.g., good management should lead to higher quality across domains). Several studies found low correlations among reported measures (Brauner et al., 2018; Saliba et al., 2018). Studies found little correlation between reported measures and quality of life (S. J. Kim et al., 2014) and resident or family satisfaction (Calikoglu et al., 2012; Williams et al., 2016), but it is not apparent that reported measures should be correlated with resident or family satisfaction if measures are valid, given that they are distinct domains of quality.

In terms of broad measures of quality that arguably should be correlated with NHC measures, two measures often studied were the rate of admissions or readmissions to the hospital, measures that were added to NHC in the past several years, and mortality. The evidence connecting NHC to these broader measures is

mixed. Studies examining individual quality measures (not the composite star ratings) generally found weak or no correlations between the quality measures and hospitalization/mortality (Fuller et al., 2019; Neuman et al., 2014; Saliba et al., 2018; Snyder et al., 2019; Unroe et al., 2012; Xu et al., 2019).

Although there is limited direct evidence on the validity of the five-star composite rating, several pieces of evidence support that the star ratings capture meaningful information about nursing home quality, at least at the extremes. First, studies have found the overall star rating to satisfy face validity in terms of nursing home characteristics typically associated with higher or lower quality: five-star nursing homes are more likely to be nonprofit, independent, have more Medicare and private-pay residents, have more educated residents, and a lower percentage of non-White compared with one-star homes, which are more likely to be for-profit, to be part of a chain, have a high Medicaid census, and to serve a less educated, less affluent, and higher percentage of minority population (Konetzka & Gray, 2017; Perrailon et al., 2019; Unroe et al., 2012). Second, several studies that examined the relationship between the overall star rating and hospital admissions/readmissions and mortality found a meaningful relationship whereby nursing homes with higher star ratings had lower rates of these adverse outcomes (Cornell et al., 2019; Unroe et al., 2012). In the most rigorous of these studies, Cornell et al. used variation in postacute patient distances to nursing homes of different star ratings within ZIP codes over time as an instrument to identify effects that account for patient selection into nursing homes of different quality levels; they found sizable effects whereby being admitted to nursing homes of higher star ratings for postacute care led to lower mortality and lower risk of long-term nursing home admission, with somewhat mixed results on hospital admission (Cornell et al., 2019).

A final important issue with respect to validity of the included measures is whether they validly differentiate between levels of quality. Several studies found that only ratings at the extremes (five stars vs. one star) were predictive of rehospitalization for heart failure (Unroe et al., 2012), of resident and family satisfaction (Williams et al., 2016), and patient safety outcomes (Brauner et al., 2018) with no meaningful difference among nursing homes rated two, three, or four stars. However, these studies were descriptive and reflected only associations. The more rigorous study by Cornell et al. found more monotonic relationships between star rating and several adverse outcomes—mortality and long-term nursing home admission—although not for hospital readmissions. Thus, although the five-star composite measure seems to have face validity and predictive validity at the extremes, the evidence is mixed as to

whether the star ratings are helpful to consumers choosing among nursing homes that are closer to average.

In summary, after two decades of use and refinement, the validity of NHC and its measures seems to have improved with the addition of the five-star composite measure, claims-based quality measures, and payroll-based staffing data. However, as the studies in this section show, the measures are still in need of refinement in terms of risk-adjustment, lack of correlation among measures that should be correlated, and a composite measure that can better distinguish modest increments in quality.

**Content: What Is Missing?** Even if all included measures are valid, response to any public reporting system may be limited if important domains of quality are missing, domains that may be strong drivers of decisions. Two key domains have surfaced in this regard: resident and family satisfaction and end-of-life care, neither of which is directly measured in NHC. Lack of a satisfaction domain is due to the fact that the administrative data sets underlying the NHC measures do not contain information on satisfaction, making additional data collection required if satisfaction were to be reported. One study calling for the addition of a satisfaction domain found that resident and family satisfaction were only weakly correlated with each other, such that one could not substitute for the other (Williams et al., 2016). Several qualitative studies of consumers found that resident and family satisfaction were key items that consumers would like to see added to NHC (Konetzka & Perrailon, 2016; Schapira et al., 2016), consistent with the fact that recommendations from family and friends still weighs heavily in consumer decisions about where to seek nursing home care. Although our review did not find parallel evidence that consumers were looking for information on end-of-life care, nursing homes often serve as the final home for many residents prior to death. Accordingly, researchers have noted the complete lack of measures in this area and have proposed several measures using existing administrative data that could fill this gap (Mukamel et al., 2012; Mukamel, Ladd, et al., 2016). The proposed measures pertain to place of death and use of hospice.

Several other studies pointed to additional measures or areas that could be better represented on NHC. One study proposed a measure of urinary incontinence that could serve as an additional clinical outcome measure (Mukamel et al., 2003). Konetzka and Perrailon (2016) found that consumers would also be interested in information about costs and specialized services offered being posted on NHC, as these were often key drivers of choice that currently need to be ascertained directly from individual nursing homes. Finally, one study found that the NHC measures did not reflect

nursing home performance on patient safety very well, with some key outcomes such as medication errors being buried within the inspections domain (Brauner et al., 2018).

## Discussion

We conducted a systematic review of the evidence on the use and effectiveness of NHC that has emerged since NHC's genesis more than two decades ago. Our search revealed a rich body of quantitative and qualitative research that speaks to how consumers have responded, how providers have responded, the unintended consequences, and issues related to the validity and comprehensiveness of the NHC measures. Overall, we found evidence that NHC has been moderately successful in meeting intended goals: NHC affects consumer choices to a modest but meaningful degree, especially under the five-star rating system, and providers pay attention to the system and try to improve their scores. Both effects appear to be stronger for postacute care than for chronic care. Because consumer use of NHC is modest due at least in part to lack of awareness, ongoing campaigns to make more consumers aware of NHC could increase use.

Our review revealed two key unintended consequences of NHC that are of particular concern. First, there are ways for providers to game the system, and evidence that they do, especially with respect to the measures based on self-reported data. Identifying gaming and trying to prevent it is difficult without substantial audits and monitoring. CMS has instead moved toward improving the sources and quality of the data. For example, staffing measures are now based on a payroll-based data collection system; while still self-reported, the required detail and potential for audits is likely to limit the potential for gaming. CMS has also added several claims-based measures to the quality domain to eliminate reliance only on Minimum Data Set data. A related issue to gaming is that providers implement narrow efforts to improve performance on included metrics, that is, they "teach to the test," while not investing broadly in quality. While technically allowed, this does little to achieve the goal of overall nursing home quality improvement. In addition to lessening reliance on self-reported data, future refinements of NHC should consider ways to incent broad-based quality improvement.

The second key unintended consequence of NHC is the exacerbation of disparities by race, ethnicity, and Medicaid enrollment status. Our review supports that traditionally underserved individuals and communities are less likely to use NHC and less likely to end up in higher quality nursing homes as a result of NHC. This is due to both consumer-driven factors (e.g., being less

likely to be aware of or to use NHC) and provider-driven factors (e.g., providers in low-income areas being less likely to score well). In part, this is due to entrenched geographic disparities in supply of high-quality nursing homes, as few people want to move far from home for nursing home care, even if higher quality. Countering the exacerbation of disparities under NHC is therefore a difficult challenge, likely requiring substantial additional incentives and resources to motivate quality improvement in nursing homes in low-income neighborhoods.

Our review revealed several important domains of quality that are currently missing from NHC, detracting from the ideal of a more comprehensive picture of quality. These domains are end-of-life care and resident and family satisfaction. In addition, the salient domain of patient safety, while not entirely missing, is not well represented in the current version of NHC. Like other changes to NHC, while the addition of these areas may make NHC more complete, they may also increase complexity and further limit consumer use. The trade-offs between the desire to minimize complexity and the desire to maximize comprehensiveness should be considered carefully for any potential addition to NHC.

Our review has several limitations. First, the designs of included studies varied widely. Although we were unable to discuss the strengths and weaknesses of each study due to the volume of studies, we noted in the text which results were based on stronger quasi-experimental designs. Second, we searched for articles published by July 2019, but NHC remains a popular target of research and relevant studies continue to emerge.

Despite the large body of evidence to date on NHC, several areas are ripe for additional research to inform policy. First, little research has examined the consequences of the fairly recent changes to NHC, the addition of payroll-based staffing data and claims-based quality measures. Second, our review revealed general validity of the five-star composite rating system at the extremes, but unclear ability to make meaningful distinctions among nursing homes between those extremes. Additional research would be helpful to investigate this issue and to assess the need for refinement or development of an alternative rating system to ameliorate this problem. One alternative would be to collapse several categories of the star rating if they do not reflect meaningful differences. Third, newly available data on private-pay prices in nursing homes could lead to additional explorations of the relationship between performance on NHC and prices (Loomer et al., 2019). Finally, a new rule from CMS requires hospital discharge planners to provide patients with information about their potential choices for postacute care, including information about quality and resource use (CMS, 2019). Research will be needed to determine the role of

NHC in meeting these new requirements, and whether awareness and use of NHC increase as a result.

We conclude from our review that overall, NHC is useful and, to a moderate extent, is working as intended, but with some unintended consequences that need to be addressed. Like any public policy tool, the need for ongoing refinement should be expected. Quality measurement and reporting is inherently messy and imperfect, but moving toward the goal of empowering consumers with information about quality seems worth the challenge. Even with ongoing refinement, however, public reporting will never be a panacea. It is just one tool among many and will not erase the need for appropriate payment incentives, regulation, and technical assistance.

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## Association Between CMS Quality Ratings and COVID-19 Outbreaks in Nursing Homes — West Virginia, March 17–June 11, 2020

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Nursing homes are high-risk settings for outbreaks of SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19) (1,2). During the COVID-19 pandemic, U.S. health departments worked to improve infection prevention and control (IPC) practices in nursing homes to prevent outbreaks and limit the spread of COVID-19 in affected facilities; however, limited resources have hampered health departments' ability to rapidly provide IPC support to all nursing homes within their jurisdictions. Since 2008, the Centers for Medicare & Medicaid Services (CMS) has published health inspection results and quality ratings based on their Five-Star Quality Rating System for all CMS-certified nursing homes (3); these ratings might be associated with facility-level risk factors for COVID-19 outbreaks. On April 17, 2020, West Virginia became the first state to mandate and conduct COVID-19 testing for all nursing home residents and staff members to identify and reduce transmission of SARS-CoV-2 in these settings (4). West Virginia's census of nursing home outbreaks was used to examine associations between CMS star ratings and COVID-19 outbreaks. Outbreaks, defined as two or more cases within 14 days (with at least one resident case), were identified in 14 (11%) of 123 nursing homes. Compared with 1-star-rated (lowest rated) nursing homes, the odds of a COVID-19 outbreak were 87% lower among 2- to 3-star-rated facilities (adjusted odds ratio [aOR] = 0.13, 95% confidence interval [CI] = 0.03–0.54) and 94% lower among 4- to 5-star-rated facilities (aOR = 0.06, 95% CI = 0.006–0.39). Health departments could use star ratings to help identify priority nursing homes in their jurisdictions to inform the allocation of IPC resources. Efforts to mitigate outbreaks in high-risk nursing homes are necessary to reduce overall COVID-19 mortality and associated disparities. Moreover, such efforts should incorporate activities to improve the overall quality of life and care of nursing home residents and staff members and address the social and health inequities that have been recognized as a prominent feature of the COVID-19 pandemic in the United States (5).

COVID-19 surveillance data from the West Virginia Department of Health and Human Resources were used to identify all nursing home outbreaks during March 14–June 11, 2020. These outbreaks were identified through routine COVID-19 surveillance and by universal nursing home testing, which was conducted per the governor's executive

order\* during April 21–May 8, 2020 (4). For this report, an outbreak was defined as two or more laboratory-confirmed SARS-CoV-2 cases occurring within 14 days in a nursing home, with at least one of those cases in a resident.

Nursing home data were downloaded from the CMS Nursing Home Compare website† on June 11, 2020, and included data on all CMS-certified nursing homes (3). CMS-trained inspectors conduct annual unannounced health inspections of all nursing homes; inspection deficiencies are recorded, scored, and summarized into an overall five-star rating (1 star = lowest quality, 5 star = highest quality) that is adjusted based on nursing home staffing levels (e.g., nursing hours per resident) and quality of care measures (e.g., hospital readmissions). This analysis is based on star ratings from the most recent nursing home inspections in West Virginia, conducted during December 13, 2018–February 26, 2020, approximately 2 weeks before the first reported COVID-19 case in the state. Most inspections were conducted in 2019 (101 of 123; 82%) and 2020 (21; 17%); one inspection was conducted in 2018.

Wilcoxon rank-sum tests were used to evaluate continuous variables and Fisher's exact tests for categorical variables, to compare facilities with and without COVID-19 outbreaks (outbreak- and nonoutbreak facilities) on several CMS survey measures, including ownership type, average daily number of residents, average daily staffing hours per resident, cumulative county-level COVID-19 incidence, and number of CMS inspection deficiencies, fines, and penalties. P-values <0.05 were considered statistically significant. Logistic regression models were used to assess the association between overall star ratings and COVID-19 outbreaks, adjusting for county-level COVID-19 incidence (analyzed as continuous cases per 100,000 population) and average daily number of facility residents (analyzed as continuous number of facility residents per day). To facilitate interpretation of the OR for county-level incidence and average daily number of facility residents, the variables were rescaled by a factor of 10 (i.e., divided by 10). The overall star rating was analyzed as a three-level variable (1-star, 2–3-star, and 4–5-star). The outcome of interest was experiencing a COVID-19 outbreak, and the reference group was

\* <https://governor.wv.gov/Documents/2020%20Executive%20Orders/Executive-Order-April-17-2020-Nursing-Home-Testing.pdf>.

† <https://data.cms.gov/data/nursing-home-compare>.

1-star-rated nursing homes. ORs and 95% CIs were estimated with R statistical software (version 3.6.1; The R Foundation). This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.<sup>§</sup>

As of June 11, 2020, there were 123 CMS-certified nursing homes in West Virginia, including 18 (15%) rated as 5-star, 22 (18%) as 4-star, 28 (23%) as 3-star, 34 (28%) as 2-star, and 20 (16%) as 1-star; one (1%) nursing home was unrated (Table 1). Most (19 of 20, 95%) 1-star-rated nursing homes were for-profit operations and tended to have more residents than did higher rated nursing homes. Nurse staffing levels were generally lower in 1-star-rated facilities, compared with those in higher rated facilities (Table 1).

As of June 11, the West Virginia Department of Health and Human Resources reported COVID-19 outbreaks in 14 (11%) nursing homes, with 226 cases among residents (median = 2.5 per nursing home, range = 1–71) and 140 cases among staff members (median = 4, range = 0–39). Average daily resident census in outbreak facilities (92) was higher than that in nonoutbreak facilities (76) ( $p = 0.03$ ) (Table 2). Total nurse staffing hours per resident per day were similar in outbreak and nonoutbreak facilities, but mean number of nurse aide hours per resident per day in outbreak facilities (1.9) was lower than was that in nonoutbreak facilities (2.2) ( $p = 0.02$ ). COVID-19 incidence was higher in counties where outbreak facilities were located (mean = 178 per 100,000) compared with that in counties where nonoutbreak facilities were located (105 per 100,000) ( $p = 0.001$ ). The mean number of health deficiencies was higher in outbreak facilities (mean = 15) than in nonoutbreak facilities (mean = 11) ( $p = 0.03$ ) (Table 3).

Seven (50%) of 14 outbreak facilities had 1-star ratings compared with 13 (12%) of 109 nonoutbreak facilities (Table 3). One outbreak facility was a CMS-designated Special Focus Facility and did not receive a star rating and was not included in regression analysis. Special Focus Facility designation is reserved for the lowest rated facilities in the state with a history of serious inspection deficiencies (i.e., potential to harm residents). In unadjusted analyses, the odds of a COVID-19 outbreak in a nursing home increased by 5% for each additional 10 incident cases per 100,000 in the county ( $OR = 1.05$ , 95% CI = 1.00–1.09) and by 14% for each additional 10 facility residents ( $OR = 1.14$ ; 95% CI = 0.98–1.33). Compared with 1-star-rated nursing homes, the unadjusted odds of a COVID-19 outbreak were significantly lower among 2- to 3-star-rated nursing homes ( $OR = 0.16$ ; 95% CI = 0.04–0.59) and 4- to 5-star-rated nursing homes ( $OR = 0.05$ , 95% CI = 0.003). After adjusting for county-level

## Summary

### What is already known about this topic?

Nursing homes are high-risk settings for COVID-19 outbreaks. The Centers for Medicare & Medicaid Services (CMS) publishes star quality ratings of all CMS-certified nursing homes.

### What is added by this report?

During March–June 2020, 14 (11%) of 123 West Virginia nursing homes experienced COVID-19 outbreaks. Compared with 1-star-rated (lowest rating) nursing homes, the odds of a COVID-19 outbreak were 87% lower among 2- to 3-star-rated facilities and 94% lower among 4- to 5-star-rated facilities.

### What are the implications for public health practice?

CMS star ratings can serve as proxy indicators for COVID-19 outbreak risk; health departments could use them to identify priority nursing homes and inform the allocation of infection prevention and control resources.

COVID-19 incidence and the number of facility residents, odds of a COVID-19 outbreak were significantly lower in higher quality nursing homes, based on star rating. Compared with 1-star-rated nursing homes, the odds of a COVID-19 outbreak were 87% lower among 2- to 3-star-rated nursing homes ( $aOR = 0.13$ ; 95% CI = 0.03–0.54) and 94% lower among 4- to 5-star-rated nursing homes ( $aOR = 0.06$ ; 95% CI = 0.003–0.39); specifically, the odds of a COVID-19 outbreak among 1-star-rated nursing homes were approximately seven times higher than among 2- to 3-star-rated facilities and approximately 17 times higher than among 4- to 5-star-rated facilities after controlling for number of residents and county-level incidence.

## Discussion

West Virginia nursing homes located in counties with high incidences of COVID-19 and those with 1-star ratings have a higher risk of experiencing COVID-19 outbreaks. The odds of a COVID-19 outbreak in 1-star-rated nursing homes were approximately seven times higher than were those in 2- to 3-star-rated facilities and approximately 17 times higher than in 4- to 5-star-rated nursing homes. Early reports have shown that controlling SARS-CoV-2 transmission in nursing homes is challenging (1,2); however, rapid and early deployment of IPC strategies,<sup>¶</sup> such as visitor restrictions, use of face masks, staff member education, symptom screening, preparing and implementing outbreak plans, and facility-wide serial testing might successfully prevent or contain outbreaks (6). Lower rated nursing homes might struggle to implement effective IPC measures for COVID-19 and might require assistance. Health departments could evaluate the use of CMS star ratings for their

<sup>§</sup>45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

<sup>¶</sup><https://www.cdc.gov/coronavirus/2019-ncov/hcp/long-term-care.html>.

**TABLE 1. Nursing home characteristics, staffing levels, and county characteristics of all Centers for Medicare & Medicaid Services-certified nursing homes, by overall star rating — West Virginia, 2020**

Characteristic	Overall star rating, mean (95% CI)					
	1-star n = 20	2-star n = 34	3-star n = 28	4-star n = 22	5-star n = 18	All* n = 123
For-profit nursing home, no. (%)	19 (95.0)	27 (79.4)	21 (75.0)	17 (77.3)	10 (55.6)	95 (77.2)
No. of certified beds	107 (88–126)	94 (80–107)	82 (71–93)	83 (65–101)	61 (40–81)	87 (80–93)
No. of facility residents per day	95 (78–111)	85 (73–97)†	75 (64–85)	70 (57–82)	56 (36–76)	77 (71–84)
<b>Nurse staffing level</b>						
Nurse aide hours per resident per day	2.0 (1.8–2.2)†	2.2 (2.1–2.4)†	2.1 (2.0–2.3)	2.2 (2.0–2.4)	2.4 (2.2–2.6)	2.2 (2.1–2.3)
Registered nurse hours per resident per day	0.5 (0.4–0.6)†	0.6 (0.5–0.7)†	0.6 (0.5–0.7)	0.6 (0.5–0.7)	1.2 (0.7–1.7)	0.7 (0.6–0.8)
Total nurse hours per resident per day	3.4 (3.2–3.6)†	3.7 (3.5–3.9)†	3.7 (3.4–3.9)	3.7 (3.5–4)	4.7 (3.9–5.5)	3.8 (3.6–4)
<b>Facility county characteristic</b>						
County population (x10,000)	9.6 (6.5–12.7)	5.5 (4.0–7.1)	4.1 (2.7–5.5)	4.4 (3.2–5.7)	5.0 (2.2–7.9)	5.6 (4.7–6.5)
County-level COVID-19 incidence§	113 (68–159)	109 (74–144)	143 (84–203)	101 (65–138)	92 (60–124)	113 (94–132)

Abbreviations: CI = confidence interval; COVID-19 = coronavirus disease 2019.

\* One nursing home did not receive a star rating.

† One nursing home not reporting.

§ County level COVID-19 cases per 100,000 population; calculated based on cumulative county case counts as of June 11, 2020.

**TABLE 2. Nursing home characteristics, staffing levels, and county characteristics, by COVID-19 outbreak status — West Virginia, March 17–June 11, 2020**

Characteristic	Nursing home outbreak* status, mean (95% CI)				P-value†
	Nonoutbreak n = 109	Outbreak n = 14	All n = 123		
For-profit nursing home, no. (%)	82 (75.2)	13 (92.9)	95 (77.2)	0.19	
No. of certified beds	84.6 (77.0–92.1)	104.1 (86.0–122.2)	86.8 (79.8–93.8)	0.05	
No. of facility residents per day	75.6 (68.9–82.4)§	92.2 (79.6–104.8)	77.5 (71.3–83.7)	0.03	
<b>Nurse staffing level</b>					
Nurse aide hours per resident per day	2.2 (2.1–2.3)¶	1.9 (1.7–2.1)	2.2 (2.1–2.3)	0.02	
Registered nurse hours per resident per day	0.7 (0.6–0.8)¶	0.6 (0.5–0.7)	0.7 (0.6–0.8)	0.90	
Total nurse staffing hours per resident per day	3.8 (3.7–4.0)¶	3.5 (3.2–3.8)	3.8 (3.6–4.0)	0.22	
<b>Facility county characteristic</b>					
County population (x10,000)	5.1 (4.3–5.9)	9.3 (5.0–13.7)	5.6 (4.7–6.5)	0.08	
County-level incidence**	105.1 (85.6–124.6)	177.8 (108.4–247.2)	113.4 (94.3–132.5)	0.001	

Abbreviations: CI = confidence interval; COVID-19 = coronavirus disease 2019.

\* An outbreak was defined as two or more confirmed cases detected in a nursing home within 14 days, with at least one case in a resident.

† P-values based on Wilcoxon rank-sum test (for continuous variables) and Fisher's exact test (for categorical variables).

§ One nursing home not reporting.

¶ Two nursing homes not reporting.

\*\* County level COVID-19 cases per 100,000 population; calculated based on cumulative county case counts as of June 11, 2020.

facilities to identify priority nursing homes for IPC support and resource allocations to help prevent outbreaks or slow the spread of SARS-CoV-2. Health departments can use resources like the CDC's COVID-19 Infection Control Assessment and Response\*\* tool to help nursing homes assess outbreak preparedness and implement recommended IPC measures.

Studies have found that nursing homes with low star ratings are associated with a higher risk of health care-associated infections (7), worse post-surgery outcomes (8), and higher readmission rates following hospitalization (8,9) compared with those with higher ratings. At least two studies have hypothesized that lower nursing staff levels might underlie the association between low star ratings and resident health outcomes (8,9).

In this report, outbreak facilities had significantly lower nurse aide staffing levels, suggesting that staffing might also be an important factor in outbreak prevention. Low nurse staffing levels might contribute to lower quality of care and could pose challenges to implementing effective IPC strategies including symptom monitoring and rapid detection of COVID-19 in residents. Low nurse staffing levels also might be indicative of under-resourced nursing homes without financial resources to hire sufficient staff or purchase supplies needed for effective IPC, even with health department support.

The findings in this report are subject to at least four limitations. First, CMS star ratings are composite measures of inspection factors, and this study does not identify specific factors driving the association between star rating and outbreak risk; thus, recommendations cannot be made regarding which quality metrics to improve to prevent outbreaks. Therefore,

\*\* <https://www.cdc.gov/coronavirus/2019-ncov/hcp/assessment-tool-for-nursing-homes.html>.

**TABLE 3. Summary of overall star rating\* and health inspection deficiencies† of nursing homes — West Virginia, 2020**

Characteristic	Outbreak status			P-value§
	Nonoutbreak n = 109	Outbreak n = 14*	All n = 123	
<b>Overall star rating, no. (%)</b>				
1 Star	13 (12)	7 (50)	20 (16)	<0.001
2 Star	34 (31)	0 (0)	34 (28)	
3 Star	23 (21)	5 (36)	28 (23)	
4 Star	21 (19)	1 (7)	22 (18)	
5 Star	18 (17)	0 (0)	18 (14)	
<b>Deficient infection prevention control program, no. (%)†,¶</b>				
Within last year	69 (63)	12 (86)	81 (66)	0.14
Within last 2 years	90 (83)	14 (100)	104 (85)	0.12
<b>Summary of complaints, fines, and deficiencies, mean (95% CI)†</b>				
No. of substantiated complaints**	1.3 (0.8–1.8)	4.8 (1.6–8.0)	1.7 (1.1–2.3)	<0.001
No. of health inspection deficiencies	10.5 (9.2–11.9)	14.9 (10.5–19.2)	11.0 (9.7–12.3)	0.03
No. of penalties	0.2 (0.1–0.4)	0.5 (0.1–0.9)	0.3 (0.2–0.4)	0.06
No. of fines	0.2 (0.1–0.3)	0.4 (0.1–0.8)	0.2 (0.2–0.3)	0.17
<b>Counts of health inspection deficiencies by category, mean (95% CI)†</b>				
Quality of life and care	2.4 (2.0–2.8)	3.8 (2.6–5.0)	2.6 (2.2–2.9)	0.01
Resident assessment and care planning	2.2 (1.9–2.5)	3.5 (2.9–4.1)	2.3 (2.1–2.6)	<0.001
Nursing and physician services	0.4 (0.3–0.5)	0.6 (0.2–0.9)	0.4 (0.3–0.5)	0.15
Resident rights	1.9 (1.6–2.3)	1.8 (0.9–2.7)	1.9 (1.6–2.2)	0.89
Nutrition and dietary	0.8 (0.6–1.0)	1.4 (0.4–2.3)	0.9 (0.7–1.1)	0.24
Pharmacy service	1.0 (0.8–1.2)	1.2 (0.8–1.7)	1.0 (0.8–1.2)	0.21
Environmental	1.0 (0.8–1.1)	1.2 (0.8–1.7)	1.0 (0.9–1.1)	0.35
Administration	0.4 (0.2–0.5)	0.8 (0–1.6)	0.4 (0.3–0.6)	0.26

**Abbreviation:** CI = confidence interval.

\* Only 13 outbreak facilities received a star rating; one outbreak nursing home was designated a Special Focus Facility and not rated because of a history of serious quality issues.

† These health inspection deficiencies were recorded during unannounced inspections conducted during December 13, 2018–February 26, 2020.

§ P-values based on Wilcoxon rank-sum test (for continuous variables) and Fisher's exact test (for categorical variables).

¶ This CMS inspection finding based on the requirement that "the facility must establish and maintain an infection prevention and control program designed to provide a safe, sanitary, and comfortable environment and to help prevent the development and transmission of communicable diseases and infections." Refer to 42 C.F.R. Sect. 483.80 for full requirements.

\*\* Number of concerns or complaints (related to abuse, neglect, poor care, insufficient staffing, unsafe or unsanitary conditions, dietary problems, or mistreatment) reported to CMS that were investigated and substantiated; inspectors responsible for annual health inspections are federally required to investigate all complaints

although improving resident care is important, general quality improvement programs without a focus on metrics that strengthen IPC might not lead to reductions in outbreak risk. CMS has responded to the COVID-19 pandemic by guiding the Quality Innovation Network—Quality Improvement Organizations (part of a federal program charged with improving health care quality for Medicare beneficiaries) to low-rated nursing homes, which have a history of IPC challenges and rising incidence and prevalence rates, to address quality issues as well as to provide COVID-19-specific IPC support.†† Second, although the models used in these analyses are adjusted for county-level COVID-19 incidence and number of facility residents, there might be additional unaccounted-for confounding factors. For example, data about COVID-19 IPC measures and interventions in place in nursing homes and data on resident demographics were not available yet might be important confounding factors in the apparent association between nursing home quality and outbreak risk. However, confounding might not be a relevant issue if star ratings are used only for risk

stratification. Third, the association between star rating and nursing home outbreaks is based on West Virginia's experience and might not be generalizable to other states or jurisdictions. Finally, staffing and resident estimates provided by CMS were based on annual daily averages and might not reflect actual staffing levels during the analytic period.

Low-rated nursing homes are more likely than are higher rated nursing homes to serve patients experiencing social and economic disadvantage, including dual Medicare-Medicaid enrollees, racial and ethnic minority populations, and persons with low income (10) who might already be at higher risk for severe COVID-19 illness and death, thus compounding the risk. The COVID-19 pandemic has highlighted the long-standing inequitable distribution of poor health among many U.S. communities, including among nursing home residents and staff members who shoulder a disproportionate burden of COVID-19 morbidity and mortality (5). Efforts to mitigate the risk for outbreaks in high-risk nursing homes are necessary to reduce overall COVID-19 mortality and associated disparities. Moreover, such efforts should incorporate activities

†† <https://www.cms.gov/files/document/qso-20-31-all.pdf>.

to improve the overall quality of life and care of nursing home residents and staff members and address the social and health inequities that have been recognized as a prominent feature of the COVID-19 pandemic in the United States (5).

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RESEARCH ARTICLE

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# Social media ratings of nursing homes associated with experience of care and “Nursing Home Compare” quality measures

Yue Li<sup>1\*</sup> , Xueya Cai<sup>2</sup> and Matthew Wang<sup>3</sup>

## Abstract

**Background:** Social media platforms offer unique opportunities for patients and families to provide real-time feedback on their healthcare experiences. Consumer-generated social media ratings of hospitals tend to reflect the more subjective aspects of inpatient care experiences; however, evidence on nursing home care is extremely limited.

**Methods:** We collected consumer-reported 5-star ratings of Maryland nursing homes posted from July 2015 to July 2017 on 4 popular social media or online review sites (Facebook, Yelp, Google Consumer Reviews, and Caring.com). We determined if the average score of social media ratings was associated with experience-of-care ratings derived from survey of family members or other responsible parties of nursing home residents, and with “Nursing Home Compare” (NHC) 5-star ratings and individual quality measures.

**Results:** One hundred ninety-six out of 206 nursing homes in Maryland were reviewed on at least one site and thus had one or more star ratings posted. The overall ratings were 3.11 on average on these sites and 3.03 on the NHC website, with a Pearson correlation of 0.41 ( $p < 0.001$ ) between the 2 sets of ratings. The correlations between the social media rating and survey-based experience-of-care ratings ranged from 0.40 to 0.60, and the correlations between the social media rating and individual NHC quality measures of citations, nurse staffing, and complaints were about 0.35 (in absolute values). The social media rating also predicted well NHC and experience-of-care measures after adjusting for nursing home covariates and market competition.

**Conclusions:** The 5-star ratings collected from 4 social networking sites was correlated with and predictive of the NHC and survey-based experience-of-care measures for Maryland nursing homes.

**Keywords:** Nursing home, 5-star rating, Social media, Experience of care

## Background

Nearly 70% of individuals currently 65 years old will require long-term care during the remainder of their lives [1]. Each year, the nation’s 15,000 nursing homes provide residential post-acute and long-term care to over 3 million older and disabled Americans who are too frail to be supported in community-based settings [2]. Concerns exist that the quality of care in many nursing homes is less than adequate [3–5], and that patient outcomes and experience of care vary substantially over facilities [6–8]. Federal and state programs have been

developed in the past several decades to address these quality deficits through stronger state regulations [9–11], as well as the national “Nursing Home Compare” report cards that publish key quality measures, such as nurse staffing and deficiency citations, to foster market competition and consumer choices of local facilities [12–14]. More recently, several states started to publicly report experience-of-care ratings of nursing homes which are derived from rigorously designed surveys of nursing home patients or their family members [8, 15–17]. Publications of these experience-of-care measures are intended to promote person-centered care in nursing homes that emphasizes collaborative care decision making, patient autonomy, and engagement of patients and family members [18].

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In addition to these government published experience-of-care and quality measures, social media platforms, such as Facebook, Yelp, Google Reviews, and Twitter, offer unique opportunities for patients and families to provide real-time feedback on their experiences with individual healthcare providers [19]. Social media use has increased dramatically in the past decade with, for example, over 200 million unique Facebook users in the United States as of January 2018 [20], 170 million monthly visitors to Yelp in 2017 [21], and 245.5 million monthly visitors to Google in the U.S. in December 2017 [22]. Moreover, the use of social networking sites among adults 50 to 64 years increased from 33 to 51%, and usage among adults 65 and older tripled from 11 to 35%, during the period of 2010–2015 [23].

Emerging evidence suggests that consumer-generated social media ratings of hospitals tend to reflect the more subjective aspects of inpatient care experiences and may also be correlated with clinically-oriented quality measures [24–26]. Nevertheless, little is known if this is the case for nursing home care [27], and two recent studies analyzing on-line ratings of nursing homes available on Yelp [28] or Facebook [16] found no or minimal correlation with the 5-star ratings that the Centers for Medicare and Medicaid Services (CMS) developed based on deficiency of care, nurse staffing, and outcome measures.

This study collected on-line consumer ratings of Maryland nursing homes in the most recent two years (2015–17) from 4 popular social media or online review sites (Facebook, Yelp, Google Review, and Caring.com). We then determined if aggregated ratings from these crowdsourcing sites were associated with family-reported care experience scores, and with CMS' "Nursing Home Compare" 5-star ratings and other quality measures.

## Methods

### Data sources

This study relied on data from 3 major sources: the archived Nursing Home Compare (NHC) data of 2017; the 2016 Maryland nursing home experience-of-care survey conducted by the Maryland Health Care Commission (MHCC); and on-line consumer ratings we collected from 4 popular social networking sites.

The NHC data are maintained and updated by the CMS and contain key nursing home characteristics such as facility name and address, nurse staffing, deficiency citations, consumer complaints filed against the facility, and 5-star ratings. The 5-star quality ratings were designed to simplify information for consumers by aggregating quality measures into a rating system of one to five stars, with more stars indicating better quality. The ratings are derived from 3 domains of quality: nurse staffing to resident ratios (for registered nurses [RNs] and all nursing staff including RNs, licensed practical

nurses, and certified nursing assistants), deficiency citations (assigned during annual and complaint inspections), and clinical outcomes of residents based on Minimum Data Set assessments; an overall rating further aggregate the three domains [14].

The MHCC publishes on-line the nursing home experience-of-care rating scores annually based on mailed surveys of designated responsible parties (i.e. family members or legal guardians/representatives) of all long-term residents in Maryland [29]. This study followed the methodologies (survey design, samples, and survey methods) described in previous reports [15, 17, 29]. Briefly, the 2016 survey was conducted between March and June of 2016, and responses reflected family member evaluations of care provided from late 2015 to early 2016. All Maryland nursing homes serving long-term residents ( $n = 222$  facilities) participated in this year's survey and surveys were mailed to all responsible parties ( $n = 16,631$ ) of their residents. Follow-up mails and phone calls were made to non-respondents. A total of 8356 completed surveys were received finally, resulting in an overall response rate of 53%. The survey asked 17 questions to assess 5 domains of resident care including (1) staff and administration, (2) care provided to residents, (3) food and meals, (4) autonomy and resident rights, and (5) physical aspects of the facility. The rating of each domain is the average of scores of all questions within the domain, and has a range between 1 (worst experience with care) and 4 (best experience with care). The survey also asked two additional questions about (1) overall experience with care in the nursing home on a rating from 1 (worst possible care) to 10 (best possible care) and (2) whether the respondent would recommend the nursing home to those who need nursing home care (yes/no).

Using the list of Maryland nursing homes published by the MHCC, we first conducted Google Maps search to obtain each nursing home's Google Customer Reviews 5-star rating scores from past or existing patients/families, and to identify the web page of each facility as well. We then searched within each facility's page for a link to the Facebook page and to the Yelp page of the nursing home. For nursing home websites that did not include a link to their Facebook or Yelp page, we searched Facebook and Yelp respectively for the facility's official page, and confirmed this information using facility name and address. Finally, we identified all Maryland nursing homes from caring.com, an online reviews website specifically designed for customer search for and rating on professional senior care providers such as assisted living facilities, nursing homes, and hospices.

All the 4 crowdsourcing sites (Facebook, Yelp, Google Customer Reviews, and caring.com) allow customers to rate their experiences with healthcare providers using 1 (worst experience) to 5 (best experience) stars and post

optional review texts [16, 25, 26, 28]. We collected all star-ratings posted on the 4 sites during the period of July 2015 to July 2017; no potentially identifiable information (e.g. reviewer ID or user name) was collected from these sites. We chose this period because it matches roughly the periods of data collection in the Maryland nursing home care experience survey (2016) and in the 2017 NHC quality measures (e.g. 5-star ratings largely derived from 2015 to 17 data).

### Analysis

We analyzed facility-level average score of 5-star ratings from the 4 social media or consumer review websites (hereafter referred to as social media ratings), experience-of-care ratings, NHC 5-star overall ratings, and individual NHC quality measures including annual number of deficiency citations, case mix adjusted hours per resident day for RNs and for all nurses, and number of complaints filed by consumers or caregivers against the facility during 2015–17 that resulted in a deficiency citation. The goal of these analyses was to determine how well the average score of social media ratings is correlated with or predictive of the NHC measures and the survey-based care experience ratings for Maryland nursing homes. We performed descriptive analyses and ran Pearson correlation analyses on all measures and scores from alternative sources.

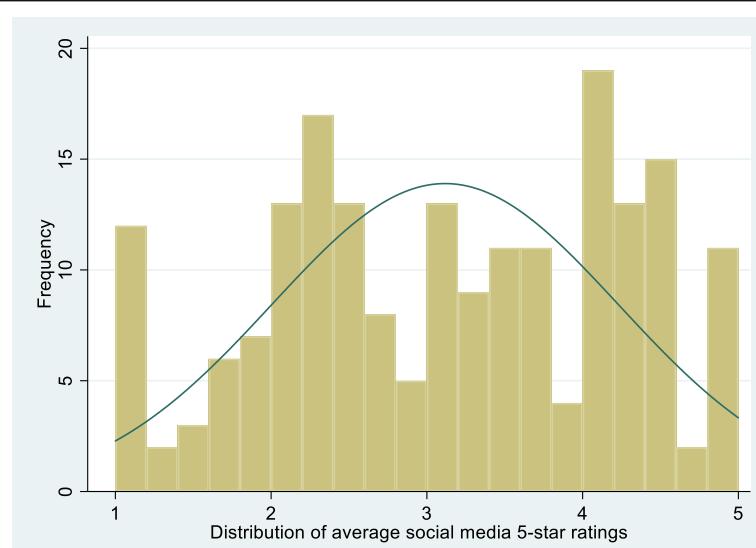
We further fit separate multivariable linear regression models to test the association of the average social media rating score (independent variable) with each NHC measure or the overall or domain-specific experience-of-care rating (dependent variable). All regression models controlled for nursing home and county covariates including number of certified beds, total number of residents, profit status (for-profit or not), chain affiliation (yes/no), a case mix index calculated based on the Resource Utilization Groups classification system, percentages of Medicare residents in the nursing home, percentage of Medicaid residents, percentage of white residents, and a measure of market competition for nursing home care calculated from the county-level Herfindahl–Hirschmann index. In each model, the average social media rating, which ranged from 1 to 5 continuously, was categorized as < 2 stars, from 2 (inclusive) to 4 stars, and ≥ 4 stars, with the first group serving as the comparison group. We present adjusted NHC measures or experience-of-care ratings by social media rating group based on model predictions.

### Results

From the Maryland Health Care Commission 2016 report, we identified between 196 and 206 nursing homes that had scores for overall or domain-specific experience-of-care ratings (the scores for about 16–26 nursing homes were not published in the report due to low response rates). Of the maximum of 206 nursing homes, 196 were reviewed from July 2015 to July 2017 on at least one of the 4 social networking sites and thus had at least one star rating posted; specifically, 47 nursing homes (24%) had at least one star rating available on 1 social networking site only, 75 nursing homes (38%) on 2 sites only, 58 nursing homes (30%) on 3 sites only, and 16 nursing homes (8%) on all 4 sites searched. The numbers of nursing homes with at least one star rating posted on individual websites were 119 on Facebook, 51 on Yelp, 170 on Google Consumer Reviews, and 100 on caring.com, during the 2-year period.

Figure 1 shows the distribution of the average rating scores for Maryland nursing homes reported on the 4 social media sites. Among the 196 nursing homes, the overall 5-star rating score was 3.11 on average (standard deviation [SD] = 1.11) on the 4 social networking sites and was 3.03 (SD = 1.37) on the “Nursing Home Compare” website (Table 1). According to the MHCC survey, the overall experience-of-care score was 8.21 on average (SD = 0.80) out of a range from 1 to 10, and 87% of surveyed family members or other responsible parties (SD = 12.1) would recommend the nursing home to others; the average scores for individual survey domains were around 3.5 (possible range 1–4) and varied over nursing homes. Other measures based on citations, nurse staffing, and complaints also varied over nursing homes in Maryland, as did other key facility characteristics such as size, resident census, and ownership types (Table 1).

Table 2 shows that the correlation coefficient between the social media 5-star rating and that of the NHC was 0.41 ( $p < 0.001$ ), indicating moderate correlation [30]. The correlations between the social media rating and MHCC’s experience-of-care ratings ranged from 0.40 to 0.60, which were slightly higher than the correlations between the NHC 5-star rating and MHCC’s experience-of-care ratings. The correlations between the social media rating and individual NHC quality measures of citations, staffing, and complaints were about 0.35 (in absolute values), which were somewhat lower than the correlations between the NHC 5-star rating and individual quality measures ( $p < 0.001$  in all cases). In sensitivity analyses we limited the correlation analyses to nursing homes with at least 5 social media ratings posted (Appendix: Table 4;  $n = 130$  nursing homes) or with at least 10 social media ratings posted (Appendix: Table 5;



**Fig. 1** Average 5-star rating scores for Maryland nursing homes reported on 4 social media or online review sites (Facebook, Yelp, Google Consumer Reviews, and Caring.com) from July 2015 to July 2017

$n = 72$  nursing homes); the results were similar although the correlations between the social media rating and other ratings and quality measures were somewhat higher.

Results of multivariable regressions (Table 3) suggested that the social media rating predicted well other ratings and quality measures after adjusting for nursing home covariates and market competition. For example, compared to nursing homes with social media rating < 2 stars (average adjusted NHC 5-star rating 2.07), nursing homes with average social media rating of 2–4 stars had adjusted NHC 5-star rating of 2.80 ( $p < 0.05$  for difference), and nursing homes with average social media rating  $\geq 4$  stars had adjusted NHC 5-star rating of 3.89 ( $p < 0.01$ ). Similarly, compared to nursing homes with social media rating < 2 stars (adjusted number of complaints 13.38), nursing homes with average social media rating of 2–4 stars had adjusted number of complaints of 9.21 ( $p < 0.05$ ), and nursing homes with average social media rating  $\geq 4$  stars had adjusted number of complaints of 2.67 ( $p < 0.01$ ).

## Discussion

This study found that the average score of 5-star ratings posted by consumers on 4 social media and consumer review websites (Facebook, Yelp, Google Consumer Reviews, and caring.com) was correlated moderately with the “Nursing Home Compare” 5-star rating and quality measures (Pearson correlations 0.30–0.40), and was correlated moderately to strongly [30] with the experience-of-care ratings derived from survey of family members (or other responsible parties) of Maryland nursing home residents (Pearson correlations 0.40–0.6). The social media rating

score also predicted independently the “Nursing Home Compare” and experience-of-care scores after adjustment for common nursing home characteristics and market competition for nursing home care.

These findings are consistent with those of studies on the associations between social media ratings of hospital care and traditional hospital performance measures [24–26]. For example, Ranard and colleagues [25] reported that the average Yelp rating of hospitals had a Pearson correlation of 0.50 with an HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) overall experience-of-care score. Campbell and Li [26] focused on hospitals in New York State and found similar correlations of average Facebook consumer ratings with the overall HCAHPS score (Pearson correlation 0.54), as well as with HCAHPS scores for individual domains of care.

Two recent studies on nursing homes, however, reported that consumer ratings on Facebook [16] or Yelp [28] showed no or minimal correlations with the “Nursing Home Compare” and experience-of-care performance scores. The two studies searched and obtained consumer rating scores from each site (Facebook or Yelp), and their correlation analyses were limited to a small percentage (15–35%) of studied nursing homes that were reviewed on each site. Thus, the limited samples in these studies may bias their results. As one of the studies [28] and a commentary written by Dr. Bardach [27] pointed out, and as demonstrated in another recent study on English hospitals [31], aggregating data from alternative crowdsourcing sites might help improve the effort of identifying high-performing versus low-performing nursing homes.

**Table 1** Descriptive statistics of Maryland nursing homes in 2016 ( $n = 196$ )<sup>\*</sup>

	Mean $\pm$ SD or Prevalence (n)
Social media 5-star rating (1–5)	3.11 $\pm$ 1.11
Nursing Home Compare overall 5-star rating (1–5)	3.03 $\pm$ 1.37
Experience-of-care survey rating	
Overall rating (1–10)	8.21 $\pm$ 0.80
Percentage of recommendation (0–100)	86.6 $\pm$ 12.1
Staff & administration (1–4)	3.64 $\pm$ 0.18
Care provided to residents (1–4)	3.47 $\pm$ 0.21
Food & meals (1–4)	3.47 $\pm$ 0.23
Autonomy (1–4)	3.51 $\pm$ 0.27
Physical environment (1–4)	3.39 $\pm$ 0.25
Quality measure	
Total number of deficiency citations	12.38 $\pm$ 7.70
Adjusted registered nurse staffing (hours per resident day)	0.59 $\pm$ 0.25
Adjusted total nurse staffing (hours per resident day)	3.89 $\pm$ 0.79
Number of complaints	7.68 $\pm$ 8.92
Certified number of beds	127.5 $\pm$ 62.2
Total number of residents	112.4 $\pm$ 56.7
Occupancy rate	0.87 $\pm$ 0.10
For profit ownership	77.6% (152)
Chain affiliation	60.3% (118)
Case mix index	1.33 $\pm$ 0.14
Percentage of Medicare residents	21.20 $\pm$ 15.79
Percentage of Medicaid residents	56.98 $\pm$ 24.68
Percentage of white residents	66.10 $\pm$ 28.76
Competition for nursing home care	0.88 $\pm$ 0.15

\*Our sample include 196 Maryland nursing homes with at least one social media rating, with Nursing Home Compare overall rating and quality measures, and with experience-of-care survey ratings

This study improved on the data collection methods of previous studies by assembling rating scores from 4 popular social media or consumer review websites. The benefits of our improved data collection are that (1) it substantially reduced sample selection because the majority of nursing homes (i.e. 95% in this study) were identified as being reviewed on at least one site; and (2) it allowed us to select only consumer ratings posted in recent 2 years (2015–17) for analyses on these identified nursing homes, which presumably improved the accuracy of the estimated correlations and predictive abilities of social media ratings in regard to NHC and experience-of-care performance measures published around the same period of time. Of note, most social media or consumer review sites started their consumer rating system at least 5 to 10 years ago (e.g. 2013 on Facebook, and 2009 on caring.com) and the inclusion of posted ratings from all years would be another source of bias for estimated correlations.

**Table 2** Pearson correlation coefficients between social media 5-star rating, Nursing Home Compare (NHC) 5-star rating, experience-of-care survey ratings, and common quality measures for Maryland nursing homes

	Social media 5-star rating	NHC 5-star rating
Social media 5-star rating	–	0.41***
NHC 5-star rating	0.41***	–
Experience-of-care survey rating		
Overall rating	0.57***	0.53***
Percentage of recommendation	0.56***	0.46***
Staff & administration	0.46***	0.40***
Care provided to residents	0.49***	0.44***
Food & meals	0.40***	0.30***
Autonomy	0.47***	0.46***
Physical environment	0.53***	0.52***
Quality measures		
Number of deficiency citations	–0.33***	–0.49***
Adjusted registered nurse staffing	0.34***	0.39***
Adjusted total nurse staffing	0.36***	0.48***
Number of complaints	–0.35***	–0.48***

\*\*\* $p < 0.001$  in all cases

Our study also showed that compared to NHC 5-star ratings, the aggregated social media ratings were slightly better correlated with MHCC's experience-of-care ratings, but were somewhat less correlated with individual NHC quality measures (e.g. deficiency citations). This pattern may reflect the different aspects of nursing home care that individual measures tend to emphasize. Ratings on social media sites and in the MHCC survey may both largely reflect the perspectives of family members of residents and their experience with caregivers in the facility, and thus are expected to be well correlated. In contrast, the NHC 5-star ratings reflect an amalgamation of deficiency citations (state official evaluations of care problems during on-site inspections), nurse staffing patterns (self-reported by nursing homes), and clinical outcomes of residents (e.g. pressure ulcer rate), which were expected to be less well correlated with family reported ratings.

Social media ratings of nursing homes and other health-care providers are real time, non-technical, and increasingly accepted by consumers and policy makers as a useful source of consumer feedback and voices [27]. Thus, they offer a new opportunity for informed consumer choice of high-quality nursing homes, market-driven quality improvement (e.g. through quality report cards), and person-centered care. These online consumer ratings are available for almost all nursing homes in the nation and tend to reflect family members' and residents' care experiences, which are not captured in the current "Nursing Home Compare" report cards but could be incorporated

**Table 3** Adjusted Nursing Home Compare 5-star rating, experience-of-care survey ratings, and quality measures for Maryland nursing homes, according to social media 5-star ratings

	Social media 5-star rating		
	< 2 stars (n = 32 nursing homes)	2–4 stars (n = 104 nursing homes)	≥4 stars (n = 60 nursing homes)
Adjusted NHC 5-star rating	2.07	2.80**	3.89***
Adjusted experience-of-care rating			
Overall rating (1–10)	7.64	8.05*	8.82***
Recommendation rate, %	77.6	85.2**	95.0***
Staff & administration (1–4)	3.55	3.61	3.76*
Care provided to residents (1–4)	3.34	3.43	3.61**
Food & meals (1–4)	3.36	3.42	3.61**
Autonomy (1–4)	3.40	3.45	3.69
Physical environment (1–4)	3.26	3.34	3.58**
Adjusted quality measures			
Number of deficiency citations	17.00	13.16	8.87**
Adjusted registered nurse staffing	0.49	0.57	0.73*
Adjusted total nurse staffing	3.56	3.79	4.31
Number of complaints	13.38	9.21**	2.67***

Note: prediction of each adjusted rating or quality measure was based on a linear regression model that had social media 5-star rating as the independent variable and adjusted for nursing home bed size, total number of residents, profit status, chain affiliation, case mix, percentages of Medicare and Medicaid residents, percentage of white residents, and market competition for nursing home care

\* $p < 0.10$ ; \*\* $p < 0.05$ ; and \*\*\* $p < 0.01$  when compared to the adjusted rating or quality measure in the reference group (social media rating < 2 stars)

in these report cards in the future. Future research is also necessary to analyze the narrative reviews accompanying the posted ratings in order to identify specific topics of care experiences that underlie the ratings and to better inform future efforts of incorporating consumer perspectives into quality report cards.

We acknowledge potential limitations of this study. First, our analyses were limited to nursing homes in Maryland. Thus, results of this study should be generalized to nursing homes in other states with some caution. Second, our analyses were cross-sectional and therefore the estimated predictive abilities of social media ratings in multivariable analyses may be confounded by unmeasured nursing home and market characteristics. Future studies could collect the social media data over a longer period of time and determine longitudinally the associations and predictive abilities of social media ratings with respect to other traditional nursing home quality measures. In addition, although this study collected ratings posted on 4 alternative, popular social media or consumer rating sites, it is possible that a consumer gives the same rating score for a nursing home on alternative crowdsourcing sites which leads to an issue of multiple counting in calculating an average score. Although Facebook

requires a log-in before reviews can be posted, other sites do not have this requirement and do allow for anonymity of reviewers. Thus, we had no way to identify multiple postings or possible manipulations of on-line reviews (although all sites, especially Yelp and caring.com implement their own filtering algorithm). Finally, due to the extended stay of many nursing home patients in a facility, their family members may be reluctant to give very negative reviews or very low on-line ratings for the facility. Thus, the overall social media ratings may somewhat over-estimate the actual care experiences of patients although this does not necessarily mask the comparative differences in rating scores across facilities, or reduce the correlations between social media ratings and other measures.

## Conclusion

In conclusion, the aggregate score of 5-star ratings collected from 4 social networking sites (Facebook, Yelp, Google Consumer Reviews, and caring.com) was correlated with and predictive of the “Nursing Home Compare” ratings and quality measures, and survey-based experience-of-care ratings published for Maryland nursing homes. Social media ratings of nursing homes may offer a new opportunity to incorporate consumer perspectives into existing quality report cards.

## Appendix

**Table 4** Pearson correlation coefficients between social media 5-star rating, Nursing Home Compare (NHC) 5-star rating, experience-of-care survey ratings, and common quality measures for Maryland nursing homes with 5 or more social media 5-star ratings (n = 130 nursing homes)

	Social media 5-star rating	
Social media 5-star rating	–	0.46***
NHC 5-star rating	0.46***	–
Experience-of-care survey rating		
Overall rating	0.65***	0.50***
Percentage of recommendation	0.63***	0.43***
Staff & administration	0.58***	0.38***
Care provided to residents	0.60***	0.39***
Food & meals	0.45***	0.27***
Autonomy	0.53***	0.43***
Physical environment	0.66***	0.47***
Quality measures		
Number of deficiency citations	-0.33***	-0.55***
Adjusted registered nurse staffing	0.38***	0.42***
Adjusted total nurse staffing	0.49***	0.47***
Number of complaints	-0.43***	-0.53***

\*\*\* $p < 0.001$  in all cases

**Table 5** Pearson correlation coefficients between social media 5-star rating, Nursing Home Compare (NHC) 5-star rating, experience-of-care survey ratings, and common quality measures for Maryland nursing homes with 10 or more social media 5-star ratings (n = 72 nursing homes)

	Social media 5-star rating	NHC 5-star rating
Social media 5-star rating	–	0.40***
NHC 5-star rating	0.40***	–
Experience-of-care survey rating		
Overall rating	0.72***	0.51***
Percentage of recommendation	0.65***	0.42***
Staff & administration	0.66***	0.39***
Care provided to residents	0.65***	0.39***
Food & meals	0.57***	0.26**
Autonomy	0.61***	0.43***
Physical environment	0.67***	0.47***
Quality measures		
Number of deficiency citations	-0.35**	-0.61***
Adjusted registered nurse staffing	0.30*	0.32**
Adjusted total nurse staffing	0.48***	0.39***
Number of complaints	-0.50***	-0.61***

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

## Abbreviations

CMS: Centers for Medicare and Medicaid Services; MHCC: Maryland Health Care Commission; NHC: Nursing Home Compare; RNs: registered nurses

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## Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available because of confidential performance information for individual nursing homes, but are available from the corresponding author on reasonable request.

## Authors' contributions

YL conceptualized and designed the study, obtained the data, and drafted and revised the article. XC participated in the design of the study, performed statistical analyses and revised the article. MW obtained the data, assisted with data analyses, and contributed to the writing of part of the article. All authors have read and approved the manuscript.

## Ethics approval and consent to participate

This study was approved by the Research Subjects Review Board (RSRB) of the University of Rochester Medical Center (RSRB00063252). Consent to participate was waived by the RSRB because this study does not require individual participation. No administrative permissions were required to access the raw data.

## Consent for publication

Not applicable.

## Competing interests

The authors declare that they have no competing interests.

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## Original Study

## Is There a Link between Nursing Home Reported Quality and COVID-19 Cases? Evidence from California Skilled Nursing Facilities

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## ABSTRACT

**Keywords:**  
COVID-19  
nursing home  
quality ratings

**Objectives:** During the Coronavirus disease 2019 (COVID-19) outbreak in the United States, nursing homes became the hotbed for the spread of COVID-19. States developed different policies to mitigate the COVID-19 risks at nursing homes, including limiting nursing home visitation and mandating staff screening. The purpose of this study is to examine whether COVID-19 cases and deaths are related to the nursing home reported quality.

**Design:** We combined the COVID-19 data reported by the California Department of Public Health, quality ratings provided by Nursing Home Compare, and patient racial information from Long-Term Care Focus to examine the association between nursing home reported quality and COVID-19 cases and deaths.

**Settings and Participants:** Cross-sectional data from 1223 California skilled nursing facilities with reported quality and longitudinal data of COVID-19 cases were used.

**Methods:** The dependent variable is COVID-19 residents' cases and deaths. The main independent variable is nursing home reported quality. Nursing home ownership, size, years of operation, and patient race composition are also included.

**Results:** Nursing home star ratings and greater percentage of residents from different racial and ethnicity groups were significantly ( $P < .01$ ) related to increased probability of having a COVID-19 residents' case or death.

**Conclusions and Implications:** Nursing homes with 5-star ratings were less likely to have COVID-19 cases and deaths after adjusting for nursing home size and patient race proportion.

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As the first outbreak of Coronavirus disease 2019 (COVID-19) appeared at LifeCare Center of Kirkland, nursing homes became the hotbed for COVID-19.<sup>1</sup> As of April 23, 2020, there have been over 50,000 COVID-19 cases and 10,000 reported deaths at nursing homes, representing 11% of all COVID-19 cases and 27% of the total number of deaths in the United States, respectively.<sup>2</sup> In some states, more than one-half of COVID-19 deaths happened at nursing homes.<sup>3</sup> The aging population is the most vulnerable group under the COVID-19 pandemic,<sup>4</sup> and nursing homes are the major resident place for older adults in the United States. To mitigate the risk at nursing homes, the Centers for Medicare and Medicaid Services

(CMS) published a comprehensive guide on infection control procedures, personal protection equipment, symptom screening, and facility staffing.<sup>5</sup> States also come up with their own policies in terms of nursing home visitation, staff screening, and personal protection equipment use.<sup>6</sup>

Quality is an essential issue in nursing homes. In 2008, CMS adopted a 5-star quality rating system to measure the nursing home quality of care, and the quality information was publicly available on the Nursing Home Compare (NHC) website.<sup>7,8</sup> The website reported the overall star ratings of nursing homes together with specific ratings on health inspection, staffing, and quality measures. The study has testified the reliability of the star quality ratings by examining the association between nursing home published quality information and outcome for heart failure patients.<sup>9</sup> Based on structured interviews from nursing home residents and caregivers, the study also confirmed the value of star ratings in helping residents in making choices about nursing homes.<sup>10</sup>

The authors declare no conflicts of interest.

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As the number of COVID-19 cases continues to increase in the United States, we were curious about the relationship between nursing home reported quality and COVID-19 cases and deaths. The purpose of this study is to explore the impact of the nursing home reported quality on COVID-19 cases and deaths, and to track the COVID-19 cases development rates at California skilled nursing facilities (SNFs) based on their quality ratings.

## Methods

We merged California SNFs COVID-19 data (June 2, 2020) together with 2019 NHC data and 2017 nursing home data from Long-Term Care Focus. NHC data provided us with the overall and domain-specific quality ratings on each nursing home along with information about nursing home ownership, bed occupancy, and facility operation date.<sup>8</sup> We also retrieved data from California SNFs COVID-19 cases and deaths, which was collected and reported by the California Department of Public Health. This data described how SNFs in California were impacted by COVID-19 based on the confirmed COVID-19 cases from residents and the cumulative number of COVID-19 related deaths.<sup>11</sup> Patient racial and ethnicity information came from nursing home Long-Term Care Focus data.<sup>12</sup>

Our dependent variables were 2 critical factors of COVID-19: resident confirmed cases and deaths. We used the nursing homes' star ratings from NHC as our primary independent variable. There are 5 levels with 1 to 5 stars in increasing order of quality. Univariate analyses of the independent variables (analysis of variance for the continuous variables and  $\chi^2$  test for the categorical variables) were conducted to calculate the number of nursing homes and the average number in each category: no COVID-19 cases, less than 11 COVID-19 cases, and more than 11 cases (including 11). Except for the primary independent variable of quality ratings, the independent variables also include ownership type [for profit (FP), not-for-profit (NFP), and government], bed occupancy, percentage of white residents, and facility age. Based on the California state average of white population (59.5%), we categorized the white resident percentage into 2 groups: above state average and below state average. Next, we fit a multivariate logistic regression model with whether or not there are any confirmed cases by June 2, 2020, as the binary dependent variable. Our key independent variable is nursing home quality ratings. Three-star nursing homes were used as the reference group to compare with other groups. We combined NFP and government-owned nursing homes as the reference group and compared them with FP nursing homes. We also included bed occupancy and facility history as

measured by years of operation and the proportion of white residents in each nursing home. To see the development rates of COVID-19 cases from April 23 to June 2, 2020, we did a trend analysis to see how the rate of confirmed cases adjusted by facility size changed over time. Analyses were performed using R v 3.6.2.

## Results

We analyzed data on 1223 California nursing homes, which included both skilled nursing facilities and nursing homes that reported COVID-19 cases and deaths in California. The descriptive analyses showed that nursing homes with higher star ratings generally had a lower number of confirmed COVID-19 cases and deaths (Table 1). Nursing homes with lower white residents' percentage had higher COVID-19 cases and deaths. Compared with NFP and government-owned SNFs, FP nursing homes had more COVID-19 cases. Nursing home bed occupancy was positively associated with COVID-19 cases and deaths.

Further, we checked the relationship between COVID-19 confirmed cases and deaths with quality ratings and other factors. To examine the effect of these factors, we used a multivariate logistic regression model and summarized the results in Table 2. Our model showed that overall quality rating, white resident percentage, ownership, and bed occupancy had a significant impact on COVID-19 cases and deaths. Specifically, the odds ratio (OR) of COVID-19 cases between the 5-star group and the 3-star group was 0.41, with 95% confidence interval (CI) ranging from 0.27 to 0.62. For residents' deaths, the OR was 0.3 and 95% CI is between 0.18 and 0.48. A similar pattern was observed for the 4-star ratings group (Cases: OR 0.66, 95% CI 0.44–0.98; Deaths: OR 0.65, 95% CI 0.42–1.01). Compared with nursing homes with higher percentage of white residents, nursing homes with below state average white residents had a higher odds in having COVID-19 cases (OR 1.95, 95% CI 1.49–2.55) and deaths (OR 1.64, 95% CI 1.21–2.23). Compared with NP and government-owned nursing homes, FP nursing homes were more likely to have COVID-19 infection (OR 1.49, 95% CI 0.97–2.34) and COVID-19 related deaths (OR 1.69, 95% CI 1.01–3.00). In addition, we found a positive relationship between nursing home size (measured by bed occupancy) and COVID-19 cases (OR 1.009, 95% CI 1.006–1.012) and deaths (OR 1.006, 95% CI 1.003–1.009).

We conducted a trend analysis of confirmed COVID-19 cases adjusted by bed occupancy at each nursing facility among different quality ratings (Figure 1). First, we observed that 5-star quality nursing homes had the lowest increasing rate of COVID-19 cases, followed by nursing homes with 4-star quality ratings. Moreover, we checked the

**Table 1**  
Descriptive Analyses of Nursing Home COVID-19 Cases and Deaths

	COVID-19 Cases				COVID-19 Deaths				P Value
	0	<11	≥11	P Value	0	<11	≥11	P Value	
As reported by June 2, 2020	795	205	223	<.0001	944	217	62		.0001
Overall ratings									
1	70 (9.6%)	24 (12.4%)	34 (16.4%)		85 (9.7%)	36 (17.6%)	7 (12.3%)		
2	112 (15.3%)	40 (20.6%)	59 (28.5%)		137 (15.7%)	54 (26.5%)	20 (35.1%)		
3	111 (15.2%)	40 (20.6%)	54 (26.1%)		142 (16.3%)	45 (22.1%)	18 (31.6%)		
4	159 (21.7%)	41 (21.1%)	38 (18.4%)		188 (21.6%)	40 (19.6%)	10 (17.5%)		
5	280 (38.3%)	49 (25.3%)	22 (10.6%)		320 (36.7%)	29 (14.2%)	2 (3.5%)		
Ownership				<.0001					.0002
NFP	118 (16.0%)	27 (13.8%)	8 (3.8%)		133 (15.1%)	19 (9.2%)	1 (1.7%)		
FP	587 (79.6%)	167 (85.2%)	202 (95.7%)		712 (81%)	186 (90.3%)	58 (98.3%)		
Government	32 (4.3%)	2 (1.0%)	1 (0.5%)		34 (3.9%)	1 (0.5%)	0		
White resident percentage ( $\geq 59.5\%$ )	403 (56.2%)	79 (41.4%)	64 (31.2%)	<.0001	453 (53%)	75 (37.3%)	18 (31.0%)	<.0001	
Bed occupancy	77.54 (41.56)	93.68 (46.54)	113.18 (70.59)	<.0001	81.34 (50.08)	100.60 (46.24)	121.40 (56.30)	<.0001	
Facility age	37.79 (13.58)	37.85 (13.61)	41.39 (11.43)	.0019	38.00 (13.52)	39.73 (12.56)	40.96 (11.51)	.0812	

Count (percentage) and P value from  $\chi^2$  test are presented for overall rating, facility ownership, and white resident percentage.

Mean (standard deviation) and P value from analysis of variance are presented for continuous variables.

**Table 2**  
Multivariate Logistic Regression Results

Covariates	COVID-19 Cases		COVID-19 Deaths	
	OR	95% CI of OR	OR	95% CI of OR
Ownership				
NFP	Reference			
FP	1.49*	0.97, 2.34	1.69*	1.01, 3.00
Quality ratings				
3	Reference			
1	0.83	0.52, 1.33	1.04	0.64, 1.69
2	1.02	0.68, 1.53	1.23	0.80, 1.87
4	0.66**	0.44, 0.98	0.65*	0.42, 1.01
5	0.41***	0.27, 0.62	0.30***	0.18, 0.48
Bed occupancy	1.009***	1.006, 1.012	1.006***	1.003, 1.009
White resident percentage				
≥59.5%	reference			
<59.5%	1.95***	1.49, 2.55	1.64***	1.21, 2.23
Facility age (y)	1.006	0.995, 1.017	1.006	0.993, 1.019

\*\*\*P < .01; \*\*P < .05; \*P < .10

1107 complete cases contribute this logistic model.

development of COVID-19 cases between FP and NFP nursing homes (Figure 2). Compared with NFP nursing homes, the development rate of COVID-19 cases is higher in FP nursing homes.

## Discussion

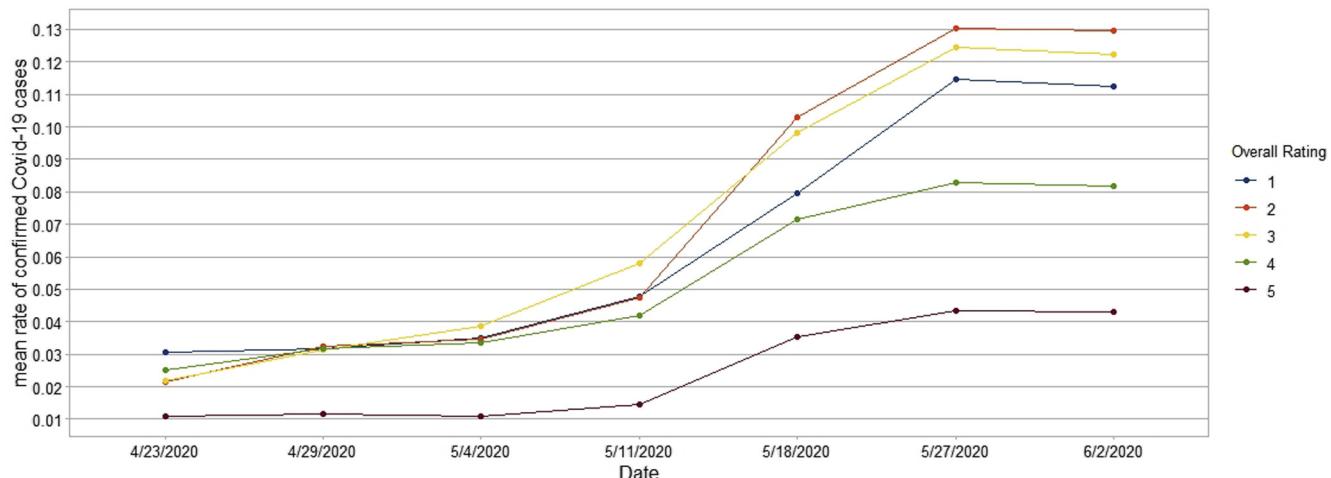
Nursing homes with 5-star quality ratings showed significantly less COVID-19 cases compared with nursing homes with 1 to 4 star ratings. Larger nursing homes with higher bed occupancy rates were positively associated with COVID-19 cases and deaths. After controlling for the bed occupancy rate at each nursing home, the trend analysis from April 23 to June 2 showed that the increasing rate of COVID-19 related cases was much lower in 5-star nursing homes compared with other nursing homes. Previous studies also confirmed the association between nursing home quality ratings and performance as measured by the improved patient outcome<sup>9</sup> and reduced nursing home costs.<sup>13</sup> However, the quality information provided by NHC was not widely adopted by hospitals as part of the discharge plan and used by patients and caregivers in choosing facilities.<sup>10,14</sup> The NHC website provides salient quality-related information about nursing homes in the United States; public awareness, including healthcare organizations and consumers about the NHC quality together with the COVID-19 information, should be increased.

We also found that nursing homes with a lower proportion of white residents were more likely to have COVID-19 cases. This finding was consistent with a recent study and report that examined the characteristics of US nursing homes with COVID-19 cases.<sup>15,16</sup> This study found that nursing homes with a higher proportion of black patients were more likely to be influenced by COVID-19, which is similar to the trend observed in general that black communities were the hardest hit by COVID-19.<sup>17</sup> Our study confirmed the findings published by New York Times that claimed nursing homes with more black and Latino residents were twice as likely to be hit by the coronavirus.<sup>18</sup>

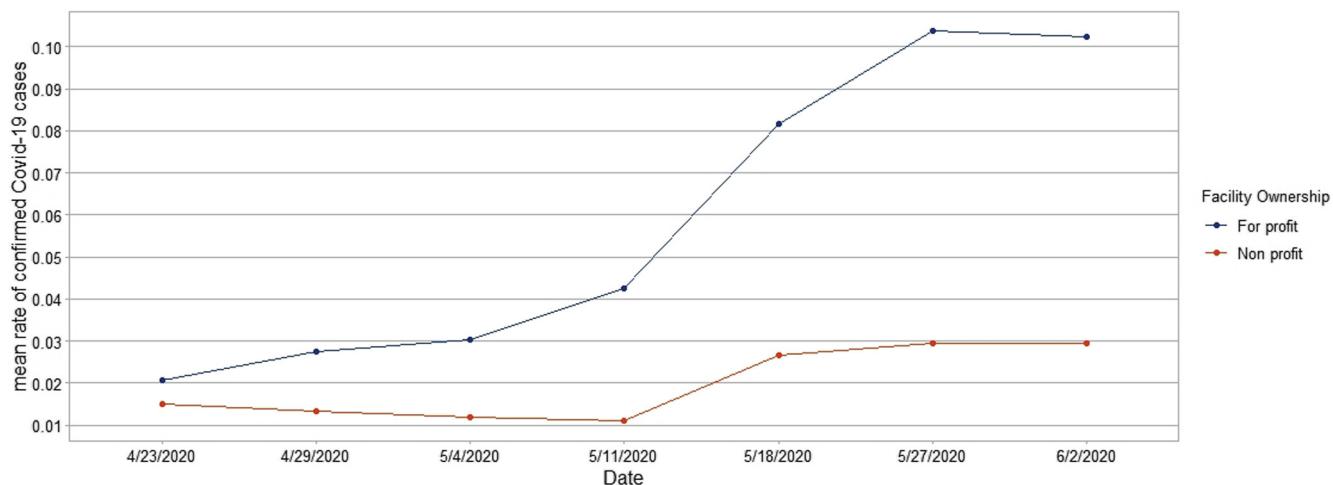
Compared with NFP and government-owned nursing homes, FP nursing homes have relatively more COVID-19 cases and related deaths. Our study is consistent with previous findings that FP nursing homes provided worse care to patients and offered less nursing care compared with NFP and public nursing homes.<sup>19</sup> A more recent study also found that nursing homes associated with large- and medium-for-profit chains had lower family ratings in terms of care experience and satisfaction.<sup>20</sup> When facing the COVID-19 pandemic, the development rate of COVID-19 cases was faster in FP nursing homes compared with NFP and government-owned nursing homes.

For nursing homes that did not report quality to CMS, we observed considerable variability in COVID-19 cases and deaths among these 8 nursing homes. Some of these nursing facilities fell into the category of "too new to rate," and some of them had a special quality cautious mark being applied to indicate significant quality problems.<sup>8</sup> Particular attention should be paid to the nursing facilities with quality problems, including the COVID-19 cases and deaths. Future studies can be done to examine the quality difference between nursing homes COVID-19 reporters and nonreporters.

There were several limitations of this study. First, we only used California SNFs COVID-19 data because of the data availability and standardization issue. We will further examine the relationship between nursing home quality and COVID-19 cases when the national level COVID-19 data required by CMS come out. Second, SNFs with less than 11 COVID-19 cases were marked as "<11" for the de-identification purpose. Therefore, we did not have the actual number of cases and deaths for SNFs with less than 11 cases. Last but not the least, nursing home COVID-19 cases were strongly correlated with testing capability, but without the testing data, we were unable to link the testing capacity to COVID-19 cases at each nursing facility. We also did not include nursing home staffing



**Fig. 1.** Change of COVID-19 confirmed cases adjusted by bed occupancy with time by overall quality ratings.



**Fig. 2.** Change of COVID-19 confirmed cases adjusted by bed occupancy with time by ownership.

patterns, location, and patient comorbidities, which could potentially contribute to the relationship between nursing home quality and COVID-19 cases.

## Conclusions and Implications

Nursing homes with 5-star ratings and higher percentage of white residents were less likely to have COVID-19 cases and deaths after adjusting for nursing home size, ownership, and years of operation. Updated information about COVID-19 related cases and quality information at the national level would be valuable to consumers.

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# Association Between 5-Star Nursing Home Report Card Ratings and Potentially Preventable Hospitalizations

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## Abstract

Nursing homes' publicly reported star ratings increased substantially since Centers for Medicare & Medicaid Services's Nursing Home Compare adopted a 5-star rating system. Our objective was to test whether the improvements in nursing home 5-star ratings were correlated with reductions in rates of hospitalization. We hypothesized that increased attention to 5-star star ratings motivated nursing homes to make changes that improved their star ratings but did not affect their hospitalization rate, resulting in a weakened association between ratings and hospitalizations. We used 2007–2010 Medicare hospital claims and nursing home clinical assessment data to compare the correlation between nursing home 5-star ratings and hospitalization rates before versus after 5-star ratings were publicly released. The correlation between the rate of hospitalization and a nursing home's 5-star rating weakened slightly after the ratings became publicly available. This decrease in correlation was concentrated among patients receiving post-acute care, who experienced relatively more hospitalizations from best-rated nursing homes. The improvements in nursing home star ratings after the release of Medicare's 5-star rating system were not accompanied by improvements in a broader measure of outcomes for post-acute care patients. Although this dissociation may be due to better matching of sicker patients to higher-quality nursing homes or superficial improvements by nursing homes to increase their ratings without substantial investments in quality improvement, the 5-star ratings nonetheless became less meaningful as an indicator of nursing home quality for post-acute care patients.

## Keywords

nursing homes, care quality, public reporting, hospitalization rates, subacute care, hospitals, patient readmission, regression analysis

### What do we already know about this topic?

Nursing homes' publicly reported star ratings increased substantially since Centers for Medicare & Medicaid Services's Nursing Home Compare adopted a 5-star rating system; however, whether these changes represent true improvements in nursing home quality is unknown.

### How does your research contribute to the field?

The improvements in nursing home star ratings after the release of Medicare's 5-star rating system were not accompanied by improvements in potentially preventable hospitalizations—a broader measure of outcomes for post-acute care patients.

### What are your research's implications toward theory, practice, or policy?

Our findings present empiric evidence in support of including broad-based measures of quality such as hospitalization measures in public reporting in an attempt to measure and report on multiple dimensions of health care quality to the public.

## Introduction

Public reporting of health care provider quality is often promoted as an effective means to improve patient outcomes and has thus been broadly embraced by private and public payers. By measuring and then making provider quality information publicly available to patients and referring providers, public reporting aims to improve health care quality

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through competition. That is, the average quality of care patients receive should increase as high-quality providers gain more market share and low-quality providers work to improve their performance to avoid losing market share. Empirical evidence, however, is mixed. Although some early studies found evidence that public reporting was associated with quality gains by hospitals,<sup>1</sup> nursing homes,<sup>2-4</sup> and individual providers,<sup>5</sup> these findings were not consistent across settings.

Nursing homes represent an important group of health care providers that are subject to public reporting. Most nursing homes in the United States provide 2 distinct types of services: (1) post-acute care to patients who require short-term rehabilitation or skilled nursing care after discharge from the hospital and (2) long-term care to patients with significant functional impairments who are no longer able to manage independently in the community. Nursing home care accounts for significant Medicare and Medicaid spending. In 2015, Medicare fee-for-service spending for post-acute care stays accounted for \$29.8 billion,<sup>6</sup> and state Medicaid programs spent \$54.8 billion on long-term care in nursing homes.<sup>7</sup> Despite a long history of stringent regulatory and reporting requirements, numerous studies document persistent deficits in nursing home quality. For example, the rates of avoidable hospitalizations from the worst-performing nursing homes in 2013 were almost double those from the nursing homes with the lowest rates.<sup>6</sup>

Nursing homes have been subject to public reporting since 2002, when the Centers for Medicare & Medicaid Services (CMS) launched the Nursing Home Compare website for Medicare- and Medicaid-certified nursing homes. The website included information on regulatory compliance, staffing measures, and 10 clinical quality measures.<sup>8</sup> While evaluations found that Nursing Home Compare improved nursing home performance on some of the quality measures,<sup>3,9</sup> the effects were small and did not extend to performance on broader, untargeted measures of quality such as rehospitalization rates.<sup>9</sup>

In an effort to increase consumer use of the report cards, Nursing Home Compare adopted a 5-star rating system in December 2008. Individual measure scores were combined into 3 subscores (staffing, deficiencies, and clinical quality measures) that were in turn combined into a global rating. All 4 ratings (the global rating and the 3 sub-scores) were displayed as stars, ranging between 1 and 5 stars. By adopting a familiar and simple rating system, the 5-star Nursing Home Compare became easier for consumers to use and understand.<sup>10</sup> In fact, consumer awareness and use of Nursing Home Compare appear to have increased since the implementation of the 5-star Report Card, with more consumers choosing 5-star facilities after the ratings became available.<sup>11</sup>

There is also some evidence that nursing home awareness of their quality ratings increased under the star system. Since the 5-star rating system was implemented, nursing homes' reported star ratings increased rapidly and substantially.<sup>12</sup>

The proportion of nursing homes with 4- or 5-star ratings increased from 37% in 2009 to 54% in 2014.<sup>13-15</sup> However, there has been some skepticism about whether these changes represent true improvements in nursing home quality.

### **Conceptual Framework**

Public reporting of health care quality aims to improve outcomes through 2 mechanisms—by giving consumers information that help them identify and choose high-quality providers and by incentivizing low-quality providers to improve. However, fundamentally improving quality of care requires significant financial resources by providers. When faced with pressure to improve quality of care, it is possible that some providers will “teach to the test”—that is make superficial changes in their care delivery that will improve their measured performance without investing in true quality improvement in a broader sense. Prior literature has found evidence of nursing homes shifting expenditures toward measured quality<sup>16</sup> and that when nursing homes have improved their publicly reported performance, other quality measures that are not targeted by public reporting have not improved.<sup>6</sup>

In the worst case, teaching to the test may result in crowding out of unmeasured performance—improvements in measured performance while untargeted (and unmeasured) performance worsens. Holmstrom and Milgrom<sup>17</sup> developed a theory of multitasking, which predicts that measuring and rewarding quality in some areas may harm quality in other areas. This is specifically the case when quality is multidimensional and when quality improvement efforts target only some dimensions of quality, which is typical in health care where it is difficult (or impossible) to measure all aspects of quality. Because quality is multidimensional, multitasking theory predicts that providers will divert resources away from unrewarded and unmeasured aspects of quality toward those that are measured and rewarded. There is some evidence of multitasking in nursing homes under public reporting, where quality of care outside the scope targeted by public reporting worsened in some cases.<sup>18,19</sup> Evidence also suggests that inadvertent negative consequences of public reporting on unreported quality due to multitasking occurs whether or not the unreported quality measure is a substitute for the publicly reported quality measure (eg, antipsychotic and other medication use,<sup>20</sup> physical and chemical restraint use<sup>21</sup>).

Potentially avoidable hospitalizations are important clinical setbacks for patients in nursing homes and have thus become a target for improvement by hospitals, nursing homes, and policymakers. Hospitalization rates capture information about many aspects of nursing home quality, as achieving low hospitalization rates often requires broad-based nursing home resources and staffing to prevent, diagnose, and treat adverse clinical developments without hospital transfer. However, until recently (2016), hospitalization rates from nursing homes were not direct targets of Nursing Home Compare.<sup>22</sup> Thus, it is possible that in

response to the 5-star rating system, nursing homes made changes that resulted in improvements in their star ratings, but that these changes were too narrow to affect a broader measure of quality such as preventable hospitalizations.

Our study was designed to measure the correlation between changes in a nursing home's 5-star rating and changes in the broad but (until recently) unreported measure of potentially preventable hospitalization rates, focusing on this change before versus after the release of, and attention to, the 5-star rating. We hypothesized that increased attention to 5-star star ratings motivated nursing homes to make changes that weakened the association between ratings and hospitalizations, making the ratings less meaningful as a broad-based indicator of nursing home quality. No prior work has examined this question using the 5-star nursing home report card. Furthermore, because the 5-star rating is heavily weighted toward measures focused on long-stay residents, with fewer measures capturing quality of care for post-acute care patients, these effects might be larger in the post-acute care population. As nursing homes focus on long-stay quality measures (which are more numerous), post-acute care quality might be crowded out. Last, we hypothesized that, compared with nonprofit nursing homes, for-profit nursing homes would be more likely to teach to the test. To attract larger market share, for-profit nursing homes would be more susceptible to the pressures of public reporting and, to contain costs, for-profit nursing homes would be more likely to make superficial changes that narrowly improve star ratings but do not affect the underlying quality of care (eg, manipulating staffing data to improve ratings or shifting medication use from antipsychotics targeted by quality metrics to other sedating medications that have similar adverse effect profiles but were not targeted by the measures<sup>23</sup>).

## Methods

### Overview of Study Design

Using 2007-2010 data from Medicare claims and nursing home clinical assessments, we measured the change in the association between a nursing home's 5-star rating and the number of potentially preventable hospitalizations per 30 days before vs after the implementation of 5-star Nursing Home Compare report card in December 2008, controlling for nursing home and patient characteristics.

### Data Sources

Patient-level data from the 100% Medicare Provider Analysis and Review (MedPAR) file, Medicare Beneficiary Summary file, and the nursing home Minimum Data Set (MDS) were used to create a longitudinal monthly record of each patient's hospital and nursing home stays from January 2007 through September 2010. The MedPAR file includes hospital claims and was used to determine hospital admissions and discharge

dates, as well as the Charlson comorbidity index.<sup>24</sup> The MDS includes detailed patient-level clinical assessment data collected at least quarterly for long-term care patients and more frequently for post-acute care patients. The MDS was used to supplement patient diagnosis information derived from hospital claims as well as to track patient admission and discharge from the nursing home. We merged these data with the publicly available Nursing Home Compare data which included the 5-star rating for each nursing home as well as the 5-star rating for each of the 3 subscores. The 5-star ratings were calculated retrospectively for the time period prior to December 2008 and updated quarterly since December 2008. We used the Online Survey Certification and Reporting (OSCAR) dataset to obtain nursing home characteristics reported annually as part of federal and state certification requirements.

### Study Sample

We included all Medicare fee-for-service beneficiaries with a nursing home stay of any length from January 2007 to June 2010, excluding patients covered under Medicare Advantage during the calendar year as they have incomplete data in Medicare claims. We analyzed all nursing home stays as well as post-acute and long-term care stays separately. Post-acute care stays were distinguished from long-stay stays by the presence of a 5-day Medicare assessment in the MDS, which is used as the admission assessment for post-acute care patients in MDS and is required for Medicare billing. We assumed that post-acute care patients transitioned to long-stay if they also had at least one quarterly assessment as the Medicare benefit for post-acute care lasts only 100 days. Our final sample included 5 208 015 unique patients admitted to one of 16 046 nursing homes during the study period, representing 43 734 881 thirty-day nursing home episodes of which 7 659 917 were post-acute and 36 074 964 were long-term care.

### Outcome Variable: Hospitalizations

Our primary outcome variable was nursing home hospitalization rates. For both long- and short-stay nursing home residents, low-hospitalization rates are considered a marker of nursing home quality.<sup>25-33</sup> To measure this, we calculated the number of potentially preventable hospitalizations per 30 nursing home days, weighted to account for the number of days the patient spent in the nursing home. One challenge in evaluating the effect of nursing home quality on hospitalizations is that the estimated effect of nursing home care on hospitalizations may be biased by the amount of time patients are exposed to that nursing home's care.<sup>34</sup> To account for the differences in patient exposure to nursing home care, we divided each patient's record into 30-day episodes of nursing home care from the initial admission to a nursing home through the last discharge during the study period. If a patient

was hospitalized during a 30-day episode but returned to the same nursing home within 3 days of hospital discharge, then the days in the nursing home following discharge counted toward the same 30-day episode. If a patient was discharged to a new nursing home, then the day following discharge started a new 30-day episode. If a nursing home episode was less than 30 days, the number of hospitalizations per 30 days was then weighted by the length of the associated episode using the reciprocal of the fraction of 30 days the patient spent in the nursing home. Thus, 30-day nursing home exposure period was the unit of analysis. Defining the episodes as 90 days of nursing home care rather than 30 days resulted in consistent findings.

Potentially preventable hospitalizations, which represent a subset of all hospitalizations, were prespecified from claims data through a review of literature<sup>35-38</sup> and include the following diagnoses: angina, asthma, chronic obstructive pulmonary disease (COPD), cellulitis, congestive heart failure (CHF), dehydration, diabetes, gastroenteritis, seizure disorder, hypertension, hypoglycemia, urinary tract infection (UTI), pneumonia, and severe ear, nose, or throat infection. We used the number of total all-cause hospitalizations per 30 days as a secondary outcome, also weighted by nursing home exposure.

### Independent Variables

One of our key independent variables was nursing homes' 5-star ratings from Nursing Home Compare. Because publicly available 5-star ratings of nursing homes are only available from 2008 on, we recalculated the ratings across our entire study period (2007-2010) by applying a previously described and tested methodology.<sup>11,39</sup>

Our other key independent variable is an indicator for whether the 30-day episode occurred before or after publication of the 5-star Nursing Home Compare report card (ie, zero before December 2008 and one after December 2008). This variable was interacted with the 5-star ratings. We created a narrow washout period around December 2008, excluding any 30-day intervals of nursing home care that included December 2008, as the effect of the 5-star report card during this transition period depends on the precise timing of the episode. We also conducted analyses widening the washout period to 90 days and 365 days, which did not affect our findings.

We controlled for patient characteristics including age, gender, race, Charlson comorbidity index,<sup>24</sup> additional patient-level clinical information from MDS assessments, including the Barthel functional index,<sup>40</sup> and comorbidities of pneumonia, UTI, septicemia, antibiotic resistant infection, and the presence of a pressure ulcer, oral feeding tubes, parenteral nutrition, or indwelling urinary catheter. We also controlled for Do-Not-Resuscitate and Do-Not-Hospitalize status reported in the MDS. We also controlled for time-varying nursing home characteristics including size, nursing staffing levels, occupancy, payer case mix, and chain and hospital

ownership indicators from OSCAR. A 1-year look-back period was used to calculate all risk-adjustment variables.

### Statistical Analysis

To test for changes in the relationship between a nursing home's 5-star rating and its hospitalization rate after the 5-star ratings became publicly available, we estimated the following using linear regression:

$$Y_{i,n,t} = \beta_1 Rating_{n,t} + \beta_2 Post_t + \beta_3 Rating_{n,t} \\ \times Post_t + \beta X_{i,t} + \beta NH_{n,t} + \varphi_n + \varepsilon_{i,n,t}, \quad (1)$$

where  $i$  indicates patients,  $n$  indicates the nursing home, and  $t$  indicates the time period of the 30-day episode (before or after December 2008).  $Y$  measures our patient-level outcomes over each 30-day nursing home exposure period (the number of potentially preventable hospitalizations or total hospitalizations per 30 days in the nursing home). These outcomes are estimated as a function of 4 dummy variables indicating the 5-star rating of the nursing home where the episode occurred, omitting a dummy for 1-star ( $Rating_{n,t}$ ), whether the episode occurred before or after the release of the 5-star report card ( $Post_t$ ), and the interaction between the two. We also include a vector of patient controls ( $X_{i,t}$ ), a vector of time-varying nursing home characteristics ( $NH_{n,t}$ ), and nursing home fixed effects ( $\varphi$ ). The Huber White sandwich estimator was used in all regressions to account for clustering of observations within nursing homes.

Because more stars represent better quality in the 5-star quality ratings, we expect a negative coefficient for the main effect of the overall 5-star rating on the number of hospitalizations. A negative coefficient would indicate that higher-quality nursing homes have lower hospitalization rates, consistent with the view that hospitalization rates reflect broad-based quality. If our hypothesis is correct, this inverse association between 5-star ratings and hospitalizations would weaken after the implementation of 5-star Nursing Home Compare report card, and we would expect a positive coefficient on the interaction. The sum of the coefficients on the interaction and the main  $Post$  effect represents the difference in the number of potentially preventable hospitalizations per 30 days after the implementation of 5-star report card, accounting for patient and nursing home factors. We report the linear combination of  $\beta_2 + \beta_3$ , which represents the total change in the number of hospitalizations at each star level in the post period, and test whether the linear combination of these 2 coefficients was statistically different from zero.

We repeated the analyses after stratifying by type of stay (post-acute vs long-term care) and profit status.

Statistical analyses were performed using STATA, version 14.0. The study was approved by the University of Pennsylvania Institutional Review Board and the Centers for Medicare and Medicaid Services privacy board.

**Table 1.** Characteristics of 30-Day Nursing Home Episodes.

	Overall sample	PAC	LTC
n	43 734 881	7 659 917	36 074 964
Female, %	68.6	63.9	69.6
Race, %			
White	84.2	87.3	83.6
Black	11.7	9.3	12.2
Other	4.1	3.4	4.2
Age, mean (SD)	80.2 (11.6)	80.0 (10.7)	80.2 (11.8)
Barthel index, mean (SD)	33.9 (25.3)	36.4 (19.8)	33.4 (26.4)
Charlson comorbidity index, mean (SD)	2.7 (2.1)	3.0 (2.5)	2.6 (2.0)

Note. The combined dataset of Nursing Home Compare, the Minimum Data Set, Medicare Provider Analysis and Review, and Medicare Beneficiary Summary Files for 5 208 015 beneficiaries admitted to one of 16 046 US nursing homes between January 2007 and June 2010. The sample includes 3 549 449 PAC and 2 749 397 LTC unique patients. PAC = post-acute care; LTC = long-term care.

## Results

Table 1 describes characteristics of the 30-day nursing home episodes. Patients receiving care in nursing homes were elderly (mean age 80.2 years) and had high levels of comorbidity (mean Charlson comorbidity index 2.7) and functional disability (mean Barthel index 33.9). Patients in post-acute care were more likely to be male and white and had higher levels of comorbidity, whereas patients in long-term care had higher levels of functional disability (see also Appendix Table A1).

Table 2 shows the unadjusted number of potentially preventable hospitalizations, displayed as the number of hospitalizations per 100 patients per 30 days before and after the release of 5-star ratings. Before the release of the 5-star system, there is a consistent and monotonic relationship between the overall 5-star rating and hospitalization rates, with higher-quality nursing homes exhibiting lower hospitalization rates. This aligns with expectations that hospitalization rates are a marker of quality. After the release of the 5-star system, the gradient is reduced, with a smaller span in hospitalization rates between 1-star and 5-star nursing homes. This aligns with expectations that the ratings are becoming less meaningful over time as a broad indicator of quality. In fact, for post-acute care stays, the unadjusted rates of potentially preventable hospitalizations from 2- to 5-star rated facilities were higher after 5-star release compared with before. For the long-term care stays, there was also a monotonic relationship between nursing homes' overall star ratings and hospitalization rates, though the gradient in hospitalization rates between 1-star and 5-star facilities was smaller than it was for the post-acute population. However, this gradient did not change substantially after the 5-star rating system was released. This suggests that star ratings retained their association with hospitalization rates over time in the case of the long-stay population.

These observations are upheld in multivariate regression, where we found that the release of the 5-star ratings was associated with a weakening of the association between star ratings and the number of potentially preventable hospitalizations

(Figure 1). For all nursing home stays, the number of potentially preventable hospitalizations was highest among 1-star nursing homes and lowest among 5-star nursing homes both before and after the 5-star release. However, the difference in potentially preventable hospitalization rates between 1- and 5-star nursing homes decreased substantially after the release of the 5-star rating system, and the change pre- to post-5-star was statistically significant for 1, 2, and 3-star facilities (where potentially preventable hospitalization rates declined by 0.27, 0.10, and 0.12 per 100 patients per 30 days, respectively). After stratifying by type of stay, we find that the results are similar in the post-acute care population, where rates of potentially preventable hospitalizations declined among 1-star facilities (by 0.52 per 100 patients per 30 days) and increased among 4- and 5-star nursing homes (by 0.28 and 0.57 per 100 patients per 30 days, respectively). These changes are consistent with the hypothesis that there was teaching to the test after the release of the star ratings, as the star ratings became less associated with hospitalization rates. In contrast, among long-term care residents the 5-star rating system remained predictive of potentially preventable hospitalization rates after the 5-star rating system was released.

Figure 2 depicts the changes in the relationship between star rating and number of potentially preventable hospitalizations, stratified by profit status. Overall, we observe the anticipated larger dissociation between star ratings and the number of potentially preventable hospitalizations among for-profit nursing homes compared with nonprofit nursing homes for all stays and for post-acute care stays, though most of the changes in hospitalization rates among post-acute care stays within star ratings are not statistically significant. Stratified analyses for the long-term care episodes did not reveal consistent trends (see also Appendix Table A2).

We repeated all analyses using total hospitalizations as the outcome of interest. The findings were generally consistent with the potentially preventable hospitalizations results (Appendix Table A3). Appendix Table A4 reports the net difference in potentially preventable hospitalizations after vs before 5-star between 1-star and higher-star nursing homes. The findings were generally consistent when we excluded

**Table 2.** Unadjusted Number of Potentially Preventable Hospitalizations per 100 Patients per 30 Days, by Star Rating.

Overall 5-star rating	All stays		PAC		LTC	
	Before 5-star release	After 5-star release	Before 5-star release	After 5-star release	Before 5-star release	After 5-star release
1-star (lowest)	5.2	4.7	12.5	12.3	3.7	3.4
2-star	4.8	4.6	11.9	12.0	3.3	3.2
3-star	4.7	4.5	11.4	11.5	3.2	3.0
4-star	4.4	4.2	10.5	10.9	3.0	2.7
5-star (highest)	4.1	4.0	9.9	10.6	2.7	2.5

Note. Sample means of the unadjusted number of hospitalizations per 100 patients per 30 days by nursing home subgroup, weighted to nursing home exposure (using the reciprocal of the fraction of 30 days the patient spent in the nursing home). PAC = post-acute care; LTC = long-term care.

patients <65 years of age or extended the washout period to 365 days (Appendix Table A5). After stratifying our sample into stays in nursing homes that increased their 5-star rating vs those that decreased their rating over the study period, we found that the findings were concentrated among facilities that increased their star ratings (Appendix Table A6).

## Discussion

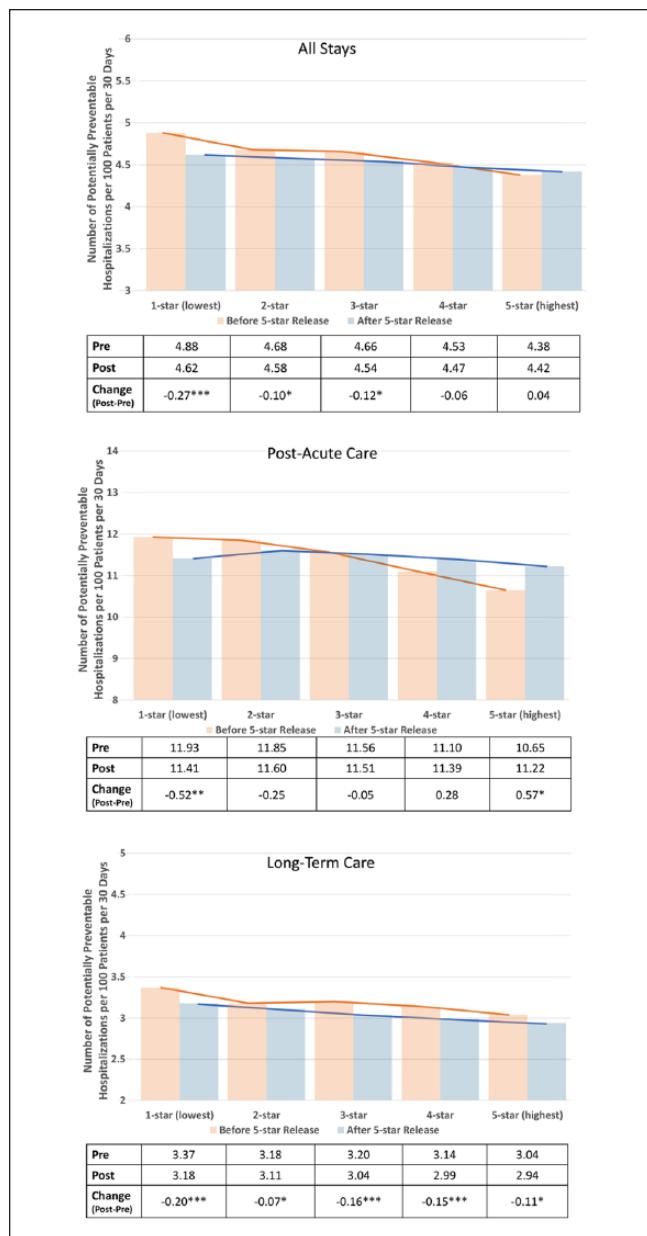
We observed a dissociation between the 5-star nursing home ratings and rates of patient hospitalizations from post-acute care nursing home stays after CMS began publishing the 5-star ratings, suggesting that improvements in 5-star ratings were not consistently accompanied by improvements in this broader-based but unmeasured indicator of care quality. While hospitalization rates were generally lower overall after the implementation of 5-star report card, the inverse relationship between the number of hospitalizations and a nursing home's 5-star ratings weakened for post-acute care patients. In some cases (among patients receiving post-acute care in 4- and 5-star nursing homes), potentially preventable hospitalization rates actually went up after the 5-star Nursing Home Compare report card was implemented. While there has been a consistent downward trend in rates of hospitalizations from nursing homes,<sup>41</sup> our estimates accounted for these baseline trends. We also found that the dissociation was concentrated among for-profit nursing homes.

There are several possible explanations of these findings. One is that nursing homes are “teaching to the test.” We not only find some evidence of a decreased correlation between star rating and hospitalization rates after the release of the 5-star ratings, we also find some evidence suggestive of crowd-out. As 5-star ratings include more measures aimed at long-term care patients than post-acute care patients, nursing homes may focus more on long-stay quality at the expense of post-acute care quality. Indeed, hospitalization rates actually went up for post-acute care patients in 4- and 5-star nursing homes after 5-star ratings’ release. Furthermore, for-profit nursing homes that we expected a priori to be most likely to “teach to the test” had the largest dissociations between star

ratings and hospitalization rates. Nursing homes’ increased attention to 5-star ratings since their release may have resulted in nursing homes making specific improvements that resulted in higher ratings rather than improving broad-based quality that was unmeasured by 5-star (such as potentially preventable hospitalizations).

It may be surprising that we did not observe an improvement in hospitalization rates among post-acute care patients over this time period, as it was a time when increasing attention was focused on high readmission rates and those rates began declining nationally.<sup>41</sup> However, we control for secular trends in readmission rates that would otherwise be observed in this groups and identify only differences within nursing homes that are related to changes in a nursing home’s star rating. While Nursing Home Compare incorporated rehospitalization measures as part of its clinical quality indicators in 2016, hospitalization rates do not capture other aspects of quality (such as patient satisfaction, for example). Our findings present empiric evidence in support of including broad-based measures of quality such as hospitalization measures in public reporting in an attempt to measure and report on multiple dimensions of health care quality to the public. Development and inclusion of more such quality measures could further improve nursing home care.

There are other possible explanations for our findings. One is patient selection. If more complex and sicker patients were better matched to higher-star nursing homes after 5-star release, while worse-rated nursing homes selected less risky patients, then we might expect to see similar results. Although we did not observe such differences in the distribution of patients across nursing homes before vs after the 5-star ratings were released (Appendix Table A1), there may have been unobserved trends in patient case mix. However, we observed similar trends in unadjusted models that do not control for patient characteristics, suggesting that changes in case mix are unlikely to explain the dissociation observed in our study. Nevertheless, it is possible that for-profit nursing homes with higher 5-star ratings were incentivized to select high-risk patients (by partnering with hospitals willing to share their readmission incentives, for example). Selection



**Figure 1.** Adjusted difference in the number of potentially preventable hospitalizations per 100 patients per 30 days post vs pre 5-star nursing home compare report card release.

Note: The bars represent risk-adjusted hospitalization rates before and after 5-star release for each nursing home star rating. The difference between the bars listed in the table below is the sum of the coefficients on the interaction *Rating* × *Post* and the main *Post* effect and represents the difference in hospitalization rates attributable to the implementation of 5-star reporting, after adjusting for time trends and differences in hospitalization rates. *P* values refer to statistical significance of the difference between pre-5-star and post-5-star hospitalizations rates compared with zero.

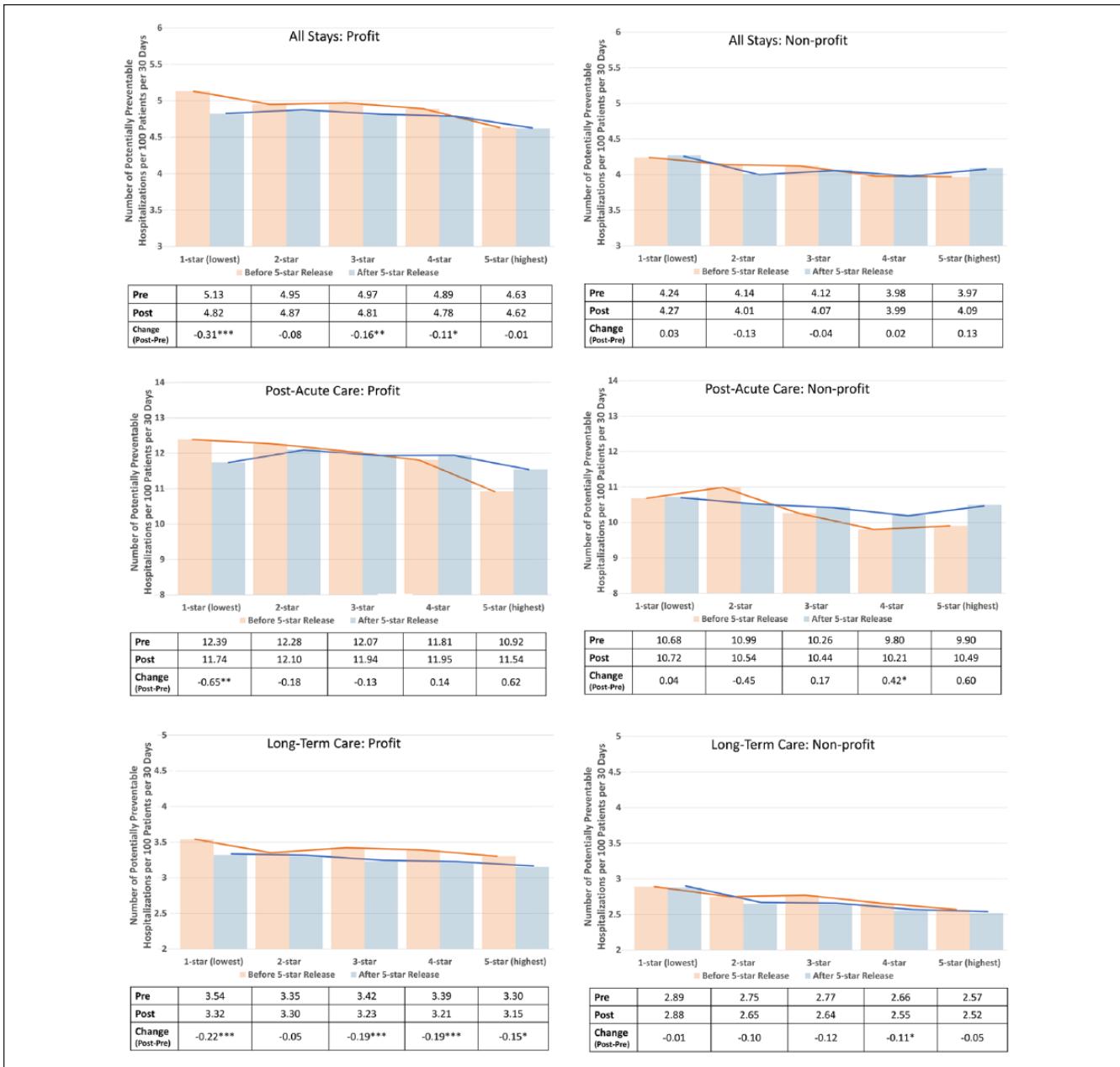
\**p* < 0.1. \*\**p* < .01. \*\*\**p* < .001.

of lower risk patients by poorly rated facilities would also explain the decrease in hospitalization rates among 1-star facilities after 5-star release.

We did not observe an analogous weakening of the correlation between the outcomes and 5-star ratings for long-term care stays. Given the differences in patient and payer characteristics between the two populations, it is possible that nursing home processes of care delivery are sufficiently different to explain this discrepancy. Within the clinical quality subcategory of ratings, quality measures used to calculate this rating differ between short-term stay and long-term care. It is possible long-term care quality measures are more relevant for broad outcomes such as hospitalizations, such that efforts to improve ratings spill over to quality more generally. Furthermore, there were more long-term care clinical quality measures than post-acute care measures in Nursing Home Compare. In 2008, for example, 7 of the 10 clinical quality measures included were long-term care measures, whereas 3 were post-acute care measures (delirium, pain, and pressure ulcers). Thus, nursing homes' efforts to improve quality may have been shifted toward long-term care because 5-star ratings were weighted toward long-term care measures. One possible solution may be creating 2 separate 5-star ratings: one for post-acute and one for long-term care in each nursing home.

This study has several limitations. First, the observational retrospective study does not test whether the 5-star reporting system caused changes in hospitalization rates. However, it examines the important question of whether these measures are correlated with one another, as one might expect them to be, and whether the correlation changes over time. Second, although we controlled for unobserved time-invariant nursing home characteristics using fixed effects, we were unable to adjust for unobserved time-varying market and nursing home characteristics that may influence the correlation between star ratings and hospitalizations. This limits our ability to identify the specific mechanisms behind the changes in correlation. Third, we selected an unreported measure of quality—potentially preventable hospitalizations—because it is generally considered to broadly capture quality of care and is thought to be amenable to improvement through better care delivery. However, some hospitalizations may be appropriate even if categorized as potentially preventable. Furthermore, hospitalizations may be a flawed indicator of quality for long-term patients since nursing homes have an incentive to send patients back to the hospital because their per diem reimbursement from Medicare for post-acute care is greater than private pay or Medicaid long-stay reimbursement rates. This measure may also not capture other aspects of quality that may have improved through nursing home efforts to increase their ratings (such as patient satisfaction, for example).

Our findings add to the body of evidence on unanticipated consequences of public reporting. They also highlight the challenges of creating a high-stakes public reporting system that is acceptable to the facilities being measured and also reports meaningful straightforward information to the consumer. Increased scrutiny and audit of self-reported



**Figure 2.** Difference in the number of potentially preventable hospitalizations per 100 patients per 30 days post vs pre 5-star, stratified by profit status.

Note. The bars represent risk-adjusted hospitalization rates before and after 5-star release for each nursing home star rating. The difference between the bars listed in the table below is the sum of the coefficients on the interaction Rating  $\times$  Post and the main Post effect and represents the difference in hospitalization rates attributable to the implementation of 5-star reporting, after adjusting for time trends and differences in hospitalization rates. P values refer to statistical significance of the difference between pre-5-star and post-5-star hospitalizations rates compared with zero.

\* $p < .1$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

performance data may address some of these concerns of “gaming” by the providers. For staffing data, for example, CMS is incorporating payroll-based reporting to improve its quality. In its current form, the overall 5-star Nursing Home Compare rating still appears to correlate with the broader measure of hospitalization, but the correlation has been decreasing, particularly for post-acute care patients. The

recent addition of a rehospitalization measure to Nursing Home Compare may alleviate this particular concern, but the challenge of incentivizing broad-based improvements will remain. Monitoring of “unreported” quality measures may be another way to address the “teaching to the test” phenomenon; however, such an approach is likely to face challenges from participating providers.

## Appendix

**Table A1.** 30-Day Episode Characteristics Over the Entire Study Period and Stratified by Whether the Episode Occurred Before or After 5-Star Nursing Home Report Card.

	Before			After		
	All	PAC	LTC	All	PAC	LTC
N	23 341 345	4 201 089	19 140 256	20 393 536	3 458 828	16 934 708
Female, %	68.7	64.3	69.6	68.5	63.6	69.5
Race, %						
White	84.5	87.5	83.7	84.0	87.1	83.4
Black	11.6	9.1	12.2	11.8	9.4	12.3
Other	3.9	3.4	4.1	4.2	3.5	4.3
Age, mean (SD)	80.5 (11.4)	80.0 (10.6)	80.6 (11.6)	79.8 (11.7)	79.9 (10.8)	79.8 (11.9)
Barthel index, mean (SD)	34.5 (25.5)	36.8 (20.0)	34.0 (26.5)	33.3 (25.2)	36.0 (19.5)	32.7 (26.1)
Charlson comorbidity index, mean (SD)	2.7 (2.1)	3.0 (2.5)	2.6 (2.0)	2.6 (2.1)	3.0 (2.5)	2.6 (2.0)
Pneumonia, %	4.0	9.7	2.8	3.7	9.7	2.5
UTI in last 30 days	11.3	19.2	9.5	10.6	18.8	8.9
Pressure ulcer in past 7 days	10.6	19.8	8.5	9.5	18.5	7.7
Feeding tube	5.6	4.1	5.9	5.3	4.0	5.5
Septicemia	0.7	1.9	0.5	0.7	1.9	0.4
Parenteral nutrition	3.2	9.9	1.8	2.6	7.7	1.6
Indwelling urinary catheter	9.2	19.8	6.9	8.1	17.4	6.2
Antibiotic resistant infection	1.9	3.5	1.6	1.9	3.5	1.6
Do not resuscitate	48.2	28.8	52.5	48.8	28.1	53.0
Do not hospitalize	2.5	1.1	2.8	2.7	1.0	3.1

Note. A total of 3 409 134 unique patients had 23 341 345 episodes pre-5-star and 3 021 604 patients had 20 393 536 episodes post-5-star. For PAC, 2 098 680 unique patients had 4 201 089 episodes pre-5-star and 1 728 294 patients had 3 458 828 episodes post-5-star. For LTC, 1 890 623 unique patients had 19 140 256 episodes pre-5-star and 1 722 773 patients had 16 934 708 episodes post-5-star. PAC = post-acute care; LTC = long-term care; UTI = urinary tract infection.

**Table A2.** Difference in the Number of Potentially Preventable Hospitalizations per 100 Patients per 30 Days Post vs Pre 5-Star Overall and Stratified by Profit Status.

	All stays		Post-acute care		Long-term care	
	Profit status		Profit status		Profit status	
	Overall	Nonprofit	Overall	Profit	Nonprofit	Overall
<i>Cumulative effect of Post and Rating × Post at each star level</i>						
One star	-0.266*** (6.21)	-0.314*** (6.55)	0.028 (0.25)	-0.524*** (2.90)	-0.647*** (3.28)	-0.044 (0.08)
Two star	-0.102* (2.53)	-0.079 (1.63)	-0.127 (1.52)	-0.253 (1.49)	-0.180 (0.92)	-0.447 (1.21)
Three star	-0.120** (2.98)	-0.161** (3.19)	-0.043 (0.57)	-0.045 (0.28)	-0.126 (0.64)	0.173 (0.58)
Four star	-0.056 (1.38)	-0.108* (1.86)	0.015 (0.24)	0.283* (1.79)	0.138 (0.65)	0.415* (1.67)
Five star	0.041 (0.59)	-0.009 (0.09)	0.128 (1.26)	0.570* (2.09)	0.623 (1.53)	0.598 (1.51)
Constant	0.468*** (1.83)	0.659* (1.97)	0.122 (0.26)	1.015 (0.96)	0.138 (0.11)	-2.342 (1.48)
Covariates	Yes	Yes	Yes	Yes	Yes	0.279 (1.31)
Nursing home FE	Yes	Yes	Yes	Yes	Yes	0.530* (1.89)
Patient-30-days, n	43 734 881	30 054 969	10 914 600	7 659 917	5 371 884	1 988 976
Nursing homes, n	16 046	11 331	4 672	15 259	10 966	4 398
						16 042
						11 328
						4671
						8 925 624

Note. The numbers in the table are the sum of the coefficients on the interaction Rating × Post and the main Post effect, which represent the difference in the number of potentially preventable hospitalizations per 30 days after the implementation of 5-star report card compared with before, accounting for patient and nursing home factors. FE = fixed effects.

\* $p < .1$ . \*\* $p < .01$ . \*\*\* $p < .001$ . T-statistic in parentheses.

Note. The numbers in the table are the sum of the coefficients on the interaction Rating × Post and the main Post effect, which represent the difference in the number of potentially preventable hospitalizations per 30 days after the implementation of 5-star report card compared with before, accounting for patient and nursing home factors. FE = fixed effects.

**Table A3.** Difference in the Number of Total Hospitalizations per 100 Patients per 30 Days Post vs Pre 5-Star Overall and Stratified by Profit Status.

	All stays			Post-acute care			Long-term care			
	Profit status		Overall	Profit status		Overall	Profit status		Profit	Nonprofit
	Profit	Nonprofit		Profit	Nonprofit		Profit	Nonprofit		
<b>Cumulative effect of Post and Rating <math>\times</math> Post at each star level</b>										
One star	-1.217*** (12.01)	-1.340*** (11.84)	-0.568* (2.24)	-2.475*** (5.79)	-2.871*** (6.14)	-0.226 (0.18)	-0.796*** (9.66)	-0.833*** (8.99)	-0.663*** (3.22)	
Two star	-0.967*** (10.54)	-0.961*** (8.71)	-0.933*** (4.74)	-2.451*** (6.36)	-2.385*** (5.39)	-2.120* (2.47)	-0.627*** (8.27)	-0.573*** (6.22)	-0.731*** (4.66)	
Three star	-0.706*** (7.60)	-0.829*** (7.07)	-0.517*** (3.00)	-1.456*** (3.88)	-1.768*** (3.83)	-0.594 (0.86)	-0.587*** (8.00)	-0.648*** (6.97)	-0.540*** (3.97)	
Four star	-0.516*** (5.63)	-0.648*** (5.02)	-0.373* (2.52)	-0.471 (1.32)	-0.994* (2.12)	0.172 (0.29)	-0.560*** (7.99)	-0.631*** (6.24)	-0.484*** (4.49)	
Five star	-0.533*** (3.24)	-0.737*** (3.01)	-0.498* (2.02)	-0.811 (1.18)	-0.783 (0.84)	-1.123 (1.01)	-0.556*** (4.44)	-0.775*** (3.95)	-0.451*** (2.72)	
Constant	15.777*** (26.20)	16.383*** (20.42)	15.008*** (13.70)	54.184*** (24.07)	56.838*** (18.56)	49.116*** (12.42)	7.403*** (15.66)	8.175*** (13.52)	-5.715*** (6.79)	
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Nursing home FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Patient-30-days, n	43 734 881	30 054 969	10 914 600	7 659 917	5 371 884	1 988 976	36 074 964	24 683 085	8 925 624	
Nursing homes, n	16 046	11 331	4672	15 259	10 966	4398	16 042	11 328	4671	

Note. The numbers in the table are the sum of the coefficients on the interaction Rating  $\times$  Post and the main Post effect, which represent the difference in the number of hospitalizations per 30 days after the implementation of 5-star report card compared with before, accounting for patient and nursing home factors. FE = fixed effects.

\*p < .1. \*\*p < .01. \*\*\*p < .001. T-statistic in parentheses.

**Table A4.** Difference in the Number of Potentially Preventable Hospitalizations per 100 Patients per 30 Days Post vs Pre 5-Star at Each Star Level Compared With 1-Star.

	All stays			Post-acute care			Long-term care		
	Profit status			Profit status			Profit status		
	Overall	Profit	Nonprofit	Overall	Profit	Nonprofit	Overall	Profit	Nonprofit
Relative effect of Post at each star level compared with 1-star									
One star	ref	ref	ref	ref	ref	ref	ref	ref	ref
Two star	0.164** (2.81)	0.235** (3.41)	-0.156 (1.13)	0.271 (1.12)	0.467* (1.70)	-0.491 (0.78)	0.121* (2.43)	0.176** (3.03)	-0.096 (0.85)
Three star	0.146* (2.47)	0.153* (2.17)	-0.072 (0.53)	0.479* (1.97)	0.522* (1.86)	0.129 (0.21)	0.037 (0.74)	0.035 (0.59)	-0.118 (1.00)
Four star	0.210*** (3.54)	0.206** (2.71)	-0.013 (0.10)	0.807** (3.35)	0.786** (2.69)	0.370 (0.62)	0.041 (0.83)	0.039 (0.61)	-0.107 (0.98)
Five star	0.307*** (3.75)	0.304** (2.61)	0.099 (0.65)	1.094** (3.33)	1.270** (2.80)	0.554 (0.82)	0.089 (1.35)	0.076 (0.79)	-0.046 (0.38)

\* $p < .1$ . \*\* $p < .01$ . \*\*\* $p < .001$ . T-statistic in parentheses.

**Table A5.** Sensitivity Analyses: Difference in the Number of Potentially Preventable Hospitalizations Post vs Pre 5-Star.

	All stays of patients >65 years of age			Washout period = 365 days		
	Stay type			Stay type		
	Overall	PAC	LTC	Overall	PAC	LTC
Cumulative effect of Post and Rating $\times$ Post at each star level						
One star	-0.220*** (4.80)	-0.426* (2.23)	-0.169*** (4.34)	0.025 (0.30)	-0.082 (0.24)	-0.036 (0.54)
Two star	-0.062 (1.45)	-0.234 (1.32)	-0.045 (1.27)	0.078 (1.06)	0.186 (0.62)	-0.020 (0.32)
Three star	-0.097* (2.28)	0.010 (0.06)	-0.154*** (4.43)	0.075 (1.01)	0.314 (1.10)	-0.094 (1.53)
Four star	-0.035 (0.82)	0.328* (2.01)	-0.147*** (4.32)	0.070 (0.96)	0.424 (1.55)	-0.144* (2.33)
Five star	0.078 (1.08)	0.667* (2.40)	-0.088 (1.55)	0.229* (1.89)	1.083* (2.31)	-0.076 (0.79)
Constant	-0.003 (0.01)	-3.870** (3.41)	-0.221 (0.93)	0.653 (1.47)	0.123 (0.08)	0.354 (0.96)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Nursing home FE	Yes	Yes	Yes	Yes	Yes	Yes
Patient-30-days, n	39 531 280	7 059 694	32 471 586	17 864 004	3 250 314	14 613 690
Nursing homes, n	16 022	15 239	16 018	16 020	15 177	16 012

Note. The numbers in the table are the sum of the coefficients on the interaction Rating  $\times$  Post and the main Post effect, which represent the difference in the number of hospitalizations per 30 days after the implementation of 5-star report card compared with before, accounting for patient and nursing home factors. PAC = post-acute care; LTC = long-term care; FE = fixed effects.

\* $p < .1$ . \*\* $p < .01$ . \*\*\* $p < .001$ . T-statistic in parentheses.

**Table A6.** Sensitivity Analyses: Difference in the Number of Potentially Preventable Hospitalizations Post vs Pre 5-Star for Nursing Homes With Decreasing or Increasing Stars Post vs Pre 5-Star.

	Decreased star level			Increased star level		
	Stay type			Stay type		
	Overall	PAC	LTC	Overall	PAC	LTC
Cumulative effect of Post and Rating $\times$ Post at each star level						
One star	-0.141* (1.93)	-0.731* (2.33)	0.016 (0.26)	—	—	—
Two star	0.158* (2.20)	0.110 (0.37)	0.156* (2.45)	0.065 (0.79)	-0.234 (0.67)	0.144* (2.14)
Three star	0.011 (0.13)	-0.293 (0.84)	0.026 (0.38)	-0.015 (0.87)	0.110 (0.40)	-0.075 (1.28)
Four star	-0.061 (0.51)	-0.192 (0.39)	0.045 (0.46)	0.059 (0.87)	0.371 (1.47)	-0.026 (0.45)
Five star	—	—	—	0.172* (1.78)	0.961** (2.61)	-0.025 (0.31)

(continued)

**Table A6. (continued)**

	Decreased star level			Increased star level		
	Overall	Stay type		Overall	Stay type	
		PAC	LTC		PAC	LTC
Constant	1.204* (2.30)	3.416* (1.65)	0.162 (0.37)	0.803 (1.28)	0.638 (0.26)	0.306 (0.61)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Nursing home FE	Yes	Yes	Yes	Yes	Yes	Yes
Patient-30-days, n	10 774 299	1 842 826	8 931 473	13 916 593	2 479 109	11 437 484
Nursing homes, n	8371	7874	8370	10 882	10 358	10 875

Note. The numbers in the table are the sum of the coefficients on the interaction *Rating × Post* and the main *Post* effect, which represent the difference in the number of hospitalizations per 30 days after the implementation of 5-star report card compared with before, accounting for patient and nursing home factors. PAC = post-acute care; LTC = long-term care; FE = fixed effects.

\* $p < .1$ . \*\* $p < .01$ . \*\*\* $p < .001$ . T-statistic in parentheses.

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**ABSTRACT** Market-based reforms in health care, such as public reporting of quality, may inadvertently exacerbate disparities. We examined how the Centers for Medicare and Medicare Services' five-star rating system for nursing homes has affected residents who are dually enrolled in Medicare and Medicaid ("dual eligibles"), a particularly vulnerable and disadvantaged population. Specifically, we assessed the extent to which dual eligibles and non-dual eligibles avoided the lowest-rated nursing homes and chose the highest-rated homes once the five-star rating system began, in late 2008. We found that both populations resided in better-quality homes over time but that by 2010 the increased likelihood of choosing the highest-rated homes was substantially smaller for dual eligibles than for non-dual eligibles. Thus, the gap in quality, as measured by a nursing home's star rating, grew over time. Furthermore, we found that the benefit of the five-star system to dual eligibles was largely due to providers' improving their ratings, not to consumers' choosing different providers. We present evidence suggesting that supply constraints play a role in limiting dual eligibles' responses to quality ratings, since high-quality providers tend to be located close to relatively affluent areas. Increases in Medicaid payment rates for nursing home services may be the only long-term solution.

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**I**t is well known that market failures in health care contribute to lower quality for consumers.<sup>1</sup> These failures are related to both demand- and supply-side factors. On the demand side, people often cannot make informed choices as a result of asymmetric information about product quality, which means in this case that patients have less information about quality than providers do. On the supply side, providers often do not compete on the basis of quality because of factors such as administratively set prices and regulations that impede competition.

These market failures are frequently amplified in long-term care, where demand is driven by people who are often among the most

vulnerable—the frail elderly with cognitive impairment—and who are potentially less able to search out and use information about quality. Many of these consumers lack family and financial resources to help them choose a care setting.

Supply-side competition in long-term care markets is blunted by a high degree of government involvement. In particular, Medicaid is the dominant payer of nursing home care, typically paying a rate far below the private-pay price. Moreover, long-term care markets are heavily regulated, which further impedes provider competition. For example, "certificate of need" laws in many states restrict the supply of nursing home beds so that it is difficult for new nursing homes to enter the market.

Government intervention in health care markets is often designed to make them more like well-functioning markets for other products. Such market-based approaches to improving health care quality are popular across the political spectrum, in part because they are intuitively appealing.

Perhaps the most prominent of market-based reforms in recent decades is the public reporting of health care quality. This is a direct attempt to solve the problem of asymmetric information by putting information about quality in the public domain. However, the evidence that consumers respond to such public reporting by choosing higher-quality providers is mixed.<sup>2,3</sup> Research on health plans,<sup>4-7</sup> hospitals,<sup>8,9</sup> and cardiac surgeons<sup>4</sup> has shown that providers that receive high rankings in publicly reported quality assessments do not consistently gain market share.

Two prior studies have examined the consumer response to public reporting in the nursing home sector. In research on long-stay nursing home residents, David Grabowski and Robert Town<sup>10</sup> found that the release of nursing home quality information in the form of residents' clinical outcome measures had no discernible effect on nursing homes' market share. In a study of nursing home residents who were receiving post-acute care, Rachel Werner and colleagues<sup>11</sup> found that quality ratings for pain control had a significant effect on nursing home choice, but the size of the effect was small.

We examined whether the most disadvantaged among nursing home residents—those dually enrolled in Medicare and Medicaid—benefit from the public reporting of quality, and we posit potential reasons why dual eligibles benefit less than non-dual eligibles do. Nursing home residents might experience improved care from public reporting in two ways. First, in choosing a nursing home, they might use publicly reported information to select a higher-ranked facility than they would have otherwise. Second, public reporting might motivate nursing homes to improve the quality of care they deliver. Residents already in nursing homes might benefit in this second way, if the nursing home they reside in improves its quality. These benefits might accrue unevenly across nursing home residents.

The intervention we studied was the five-star rating system introduced by the Centers for Medicare and Medicaid Services (CMS) in late 2008. There is little empirical evidence about the effectiveness of this system. Importantly, our goal was to examine responses to the intervention of the rating system, not to evaluate whether the rating system is an accurate reflection of nursing home quality.

## Dually Enrolled Beneficiaries

People who are enrolled in both Medicare and Medicaid (often called dual eligibles) have been the focus of increased policy attention in recent years as a result of their disproportionate use of health care services and share of costs. Dual eligibles account for only 15 percent of Medicaid enrollment and 21 percent of Medicare enrollment. However, they account for 39 percent of Medicaid expenditures and 36 percent of Medicare expenditures.<sup>12</sup>

Dual eligibles are a vulnerable population: They are much more likely than other Medicare beneficiaries to have incomes of less than \$10,000, be cognitively impaired, have less than a high school education, be in only fair or poor health, be disabled, be members of a racial or ethnic minority group, and reside in a nursing home.<sup>13</sup> Dual eligibles are also more likely than other nursing home residents to receive care in poor neighborhoods.<sup>14</sup> And they are subject to misaligned and conflicting policy incentives from Medicare and Medicaid.<sup>15</sup> Dual eligibles are thus more likely than other nursing home residents to receive low-quality health care.<sup>14</sup>

Nursing home residents who are dual eligibles are a heterogeneous group, and dual status does not necessarily imply previous poverty or a low level of education. Sometimes the high cost of nursing home care leads Medicare beneficiaries to spend down their private resources until reliance on Medicaid becomes necessary. An estimated 10 percent of nursing home residents transition to Medicaid during a nursing home stay—some of whom may have transferred assets in anticipation of needing nursing home care.<sup>16,17</sup> Nonetheless, the consequences of being dependent on Medicaid are likely to apply regardless of the pathway to Medicaid enrollment.

A substantial body of research has linked low-quality nursing home care to residents' source of payment. Nursing homes are funded largely by public payers, with approximately two-thirds of the residents in a typical facility on Medicaid (the majority of them are dual eligibles). Another 12 percent are funded by Medicare for postacute care, and most of the rest pay for their care privately.<sup>18</sup> Medicaid generally provides the lowest reimbursement rates of any payer, and, as a result, nursing homes generally prefer private-paying residents or those with Medicare.

Despite this payer-based disparity in reimbursement rates, researchers have not found that Medicaid residents receive lower-quality care than Medicare residents within a given facility.<sup>19,20</sup> Instead, there are differences in quality across nursing homes associated with the proportion of residents on Medicaid at each facility. A high proportion of Medicaid residents is

# Dual eligibles are more likely than others to reside in low-quality nursing homes and thus to receive low-quality care.

presumed to be responsible for a low level of resources.<sup>14</sup>

Therefore, dual eligibles are more likely than others to reside in low-quality nursing homes and thus to receive low-quality care. And because dual eligibles are generally sicker than other residents, the low quality of care they receive may affect them more.

## The Five-Star Rating System

In 2002 CMS publicly released a Web-based report card called Nursing Home Compare, which detailed the quality of care at all Medicare- or Medicaid-certified nursing homes. The rating system included numerous individual measures of staffing, regulatory compliance, and clinical outcomes. In December 2008 CMS launched a new rating system of nursing homes that aggregated the information into a rating system of one to five stars, with more stars indicating better quality.

In contrast to the 2002 system, the star rating system was intended to provide highly simplified information in a form that consumers would find familiar. The stars are based on three domains of quality: ratios of staff members to residents, residents' clinical outcomes, and the results of regulatory inspections. The overall rating combines the three domains. In this article we focus on the overall star ratings on the assumption that these garner the most attention from both providers and consumers.<sup>21</sup>

Public reporting systems such as the five-star rating system are designed to improve quality of care. However, it is unknown how public reporting affects vulnerable populations specifically.

On the one hand, public reporting might improve care for such populations. Because low-quality providers have the most to lose from the revealing of quality scores and have the greatest

potential for improvement under public reporting,<sup>22</sup> and because underserved patients are concentrated in low-quality providers,<sup>14,23,24</sup> disparities in quality could decrease through improvements in quality among such providers. In addition, well-educated consumers with more resources may be better positioned to judge the quality of facilities in the absence of public reporting, so the benefit of new and easier-to-access information may go disproportionately to less-well-educated consumers with fewer resources.<sup>25,26</sup>

On the other hand, vulnerable populations might not benefit from public reporting as much as other groups do. One study of Medicare-funded postacute care patients in nursing homes found that the response to the 2002 version of Nursing Home Compare was greater among highly educated consumers, compared to those with less education.<sup>11</sup>

Nursing homes that serve large populations of dual eligibles are less likely than other nursing homes to have the resources necessary to improve quality in response to public reporting. In addition, dual eligibles may be less able to benefit from quality information, either because they live in an area with few high-quality providers or few Medicaid beds at high-quality facilities, or because dual eligibles are less able to access and understand the information than non-dual eligibles are. Despite concern about the effects of public reporting on vulnerable populations, there is little empirical evidence about those effects.<sup>25,27-29</sup>

We hypothesized that dual eligibles benefited less than non-dual eligibles from the introduction of the five-star nursing home rating system. We tested this hypothesis by examining changes in the probability that members of the two groups would reside in a one-star or a five-star nursing home before and after the rating system was introduced. We also assessed the extent to which changes in the probability of residing in a one-star or five-star nursing home were due to providers' improving their ratings over time or to consumers' choosing different nursing homes.

## Study Data And Methods

In addition to basic descriptive analyses, we assessed these issues using difference-in-differences models, comparing residence in one-star and five-star nursing homes over time for dual eligibles and non-dual eligibles.

**DATA** Our analysis used data from 2008–10, a period that spanned the introduction of the five-star system in December 2008. We used three main data sets: Nursing Home Compare data;

the Nursing Home Minimum Data Set, version 2.0; and the Medicare Beneficiary Summary File.

The Nursing Home Compare data included star ratings for each nursing home for each month during the study period, including unpublished ratings for 2008. The Nursing Home Minimum Data Set contained clinical assessment data collected at regular intervals for every resident in a Medicare- or Medicaid-certified nursing home, regardless of payer source. We used this data set to obtain numbers and demographic and health characteristics of people in the sample. The Medicare Beneficiary Summary File was the source of our indicator for dual-eligible status.

Because our study focused on the long-stay population of nursing homes, we limited the sample to long-stay residents (those who spent at least ninety days in the nursing home). Each long-stay resident is assessed at least quarterly in the Nursing Home Minimum Data Set, including on admission, annually, quarterly, and at any significant change in status. We limited our sample to people who had at least one quarterly or annual assessment or an assessment because of a significant change in health status and who also had had one prior assessment of those types or an assessment on admission.

For people who had more than one assessment in a given quarter, we used only the last assessment. This avoided overweighting sicker residents who might have had more frequent assessments.

We excluded assessments for short-term stays for postacute care, but we included subsequent quarterly and annual assessments and those at any significant change for people who entered the nursing home through a postacute care stay and transitioned to long-term care. We merged these assessments with the facility star ratings for the middle month of each quarter.

Our goal in defining the sample was to generate a comprehensive view of the long-stay population during any given quarter in our study period. However, we allowed this population to change over time as a result of both admissions and discharges. Our sample included new admissions during the study period, even if residents entered the nursing home through a stay for postacute care—as long as they remained in the nursing home long enough to have a qualifying long-stay Nursing Home Minimum Data Set assessment.

Our sample consisted of 16,065,677 resident-quarter assessments from 5,591,356 residents of 15,894 nursing homes. On average, each resident in the sample was present for 3.3 quarters out of the 11 quarters in the study period. Thus, while providing a snapshot of the long-stay pop-

ulation each quarter, this definition of the sample gave us ample opportunity to detect both consumer-driven and provider-driven changes over time in the ratings of nursing homes.

There was very little facility entry (new homes beginning to operate) and exit (existing homes ceasing to operate) during the study period. Excluding those facilities that did not operate throughout the study period made no meaningful difference to the results.

Following standard practice, we defined *dual eligibles* as people who had full Medicaid coverage in addition to Medicare at any point during a quarter.<sup>30</sup> All others were considered non-dual eligibles. Most of the non-dual eligibles were Medicare beneficiaries. However, because Medicare does not cover chronic care stays in nursing homes, those residents had to pay for their long-term stay through private funds or other government sources—for example, Veterans Affairs or TRICARE funds.

**ANALYSIS** To assess the issue of differential effects between dual eligibles and non-dual eligibles, we began with a descriptive analysis of where each group received care over time, specifically in the two quarters in 2008 before the release of the star ratings and in the seven quarters in 2009–10 after the release.

For a more precise estimate of magnitudes and the ability to include control variables, we assessed the differential trends for dual eligibles and non-dual eligibles. We used difference-in-differences regression models, with resident-quarter observations as our unit of analysis. We modeled the probability of a resident's being in a one-star (or, separately, in a five-star) nursing home as a function of year dummies (with 2008 as the reference), dual-eligible status, and interactions between that status and each year dummy.

We ran these regressions with and without case-mix controls. For ease of interpretation, we present linear probability models. As a robustness check, we ran nonlinear models (including ordered probit regressions of the complete range of stars). They produced similar results, so we do not present the nonlinear models.

To examine whether dual eligibles' residence in better-rated nursing homes over time was due more to provider behavior or to differences in nursing home choice by consumers, we ran stratified regressions among dual eligibles and non-dual eligibles. We exploited the fact that inclusion of a nursing home fixed effect (essentially, a site dummy) gave within-facility estimates of changes in star ratings over time—that is, provider-driven changes in star ratings, holding consumer choice constant. Without the fixed ef-

fects, differences in star ratings for dual eligibles over time would reflect a combination of provider-driven changes and changes in the distribution of dual eligibles across different types of facilities.

Specifically, we modeled whether a person resided in a one-star or a five-star facility as a function of year dummy variables for 2009 and 2010 (using 2008 as a reference), with and without facility fixed effects. If dissimilar estimates resulted from these two regressions, consumer response was likely to be a significant factor in explaining changes in star ratings. Similar estimates would indicate that the changes were largely provider driven.

## Study Results

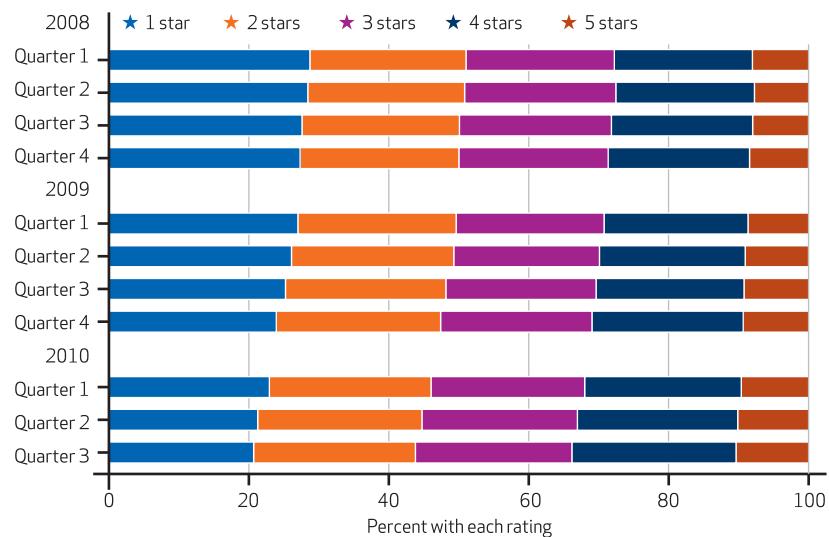
Characteristics of dual eligibles and non-dual eligibles in US nursing homes are displayed in online Appendix Exhibit A1.<sup>31</sup> Approximately 64 percent of long-stay nursing home residents were dual eligibles. Consistent with expectations, dual eligibles were more likely to be female and less likely to have a high school or college degree, compared to non-dual eligibles. Dual eligibles were disproportionately more likely than non-dual eligibles to be members of a minority group. However, more than three-quarters of dual eligibles were non-Hispanic whites. Dual eligibles also had higher rates of mental illness and dementia, compared to non-dual eligibles.

Exhibits 1 and 2 depict the distribution of dual eligible and non-dual eligible residents of nursing homes by the homes' star ratings. The leftward shift of the distributions over time indicates that both groups were less likely to reside in the lowest-rated homes over time and more likely to reside in the highest-rated homes. For example, at baseline (in the first quarter of 2008), more than a quarter of dual eligibles in nursing homes resided in one-star homes, a proportion that decreased to approximately a fifth by the third quarter of 2010. Although both groups appeared to reside in better-rated nursing homes over time, the distribution for non-dual eligibles was more favorable than that for dual eligibles in any given year.

Regression results captured the magnitude and significance of these shifts (Exhibit 3). At baseline (in 2008), dual eligibles were 4 percentage points more likely to be in a one-star home and 1.5 percentage points less likely to be in a five-star home, compared to non-dual eligibles. Non-dual eligibles' likelihood of being in a one-star home declined, and their likelihood of being in a five-star home increased. The same was true of dual eligibles, and the decline in likelihood of

## EXHIBIT 1

### Star Ratings Of Nursing Homes In Which Dual Eligibles Resided, 2008-10



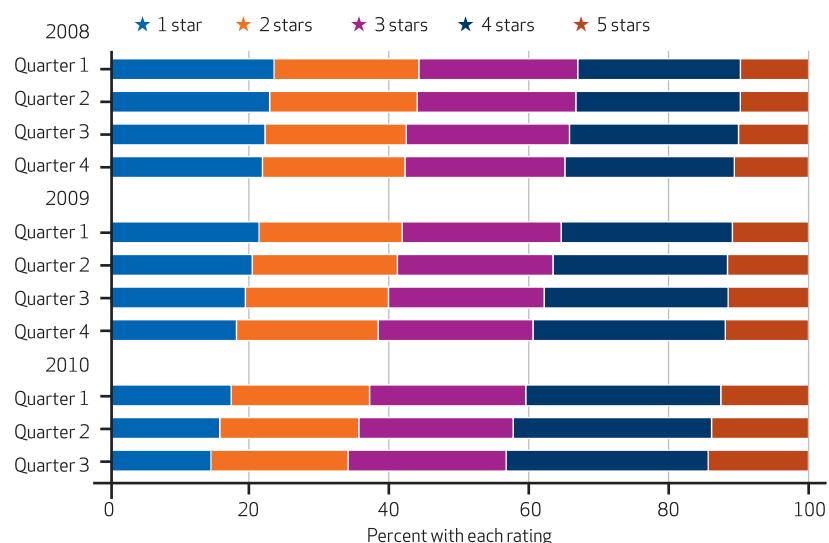
**SOURCE** Authors' analysis of data from the Centers for Medicare and Medicaid Services: Nursing Home Compare; the Nursing Home Minimum Data Set, version 2.0; and the Medicare Beneficiary Summary File.

residing in one-star facilities was not significantly different for the two groups.

However, by 2010 dual eligibles had experienced a smaller increase than non-dual eligibles in the shift toward five-star facilities. Whereas non-dual eligibles were 3.6 percentage points more likely to reside in a five-star nursing home

## EXHIBIT 2

### Star Ratings Of Nursing Homes In Which Non-Dual Eligibles Resided, 2008-10



**SOURCE** Authors' analysis of data from the Centers for Medicare and Medicaid Services: Nursing Home Compare; the Nursing Home Minimum Data Set, version 2.0; and the Medicare Beneficiary Summary File data.

## EXHIBIT 3

**Effects Of Dual Eligible Status On Residence In One-Star Or Five-Star Nursing Homes, 2008-10**

	Rating of nursing home	
	One star	Five stars
Dual eligibles, 2008 (relative to non-dual eligibles) <sup>a</sup>	0.040***	-0.015***
Dual-eligible status interacted with year <sup>b</sup>		
2009	0.003	-0.004
2010	0.002	-0.014***
Time trend for non-dual eligibles		
2009	-0.027***	0.015***
2010	-0.065***	0.036***
Constant	0.358***	0.053***

**SOURCE** Authors' analysis of data from the Centers for Medicare and Medicaid Services: Nursing Home Compare; the Nursing Home Minimum Data Set, version 2.0; and the Medicare Beneficiary Summary File. **NOTES** There were 16,065,677 resident-quarter assessments in both categories of nursing homes. Both regressions controlled for residents' demographic characteristics and health status. Full regression results are available in Appendix Exhibit A2 (see Note 31 in text). Estimation used linear probability regression models. <sup>a</sup>Baseline adjusted difference in the probability of being in a one-star or a five-star nursing home for dual eligibles, relative to non-dual eligibles.

<sup>b</sup>Extent to which time trends were different for dual eligibles and non-dual eligibles. \*\*\*p<0.01

in 2010 versus 2008 (Exhibit 3), the increase for dual eligibles was only 2.2 percentage points—that is, the 3.6-percentage-point-increase for non-dual eligibles minus the 1.4-percentage-point differential for dual eligibles (Exhibit 3).

Results of the stratified regressions comparing time trends with and without nursing home fixed effects are shown in Exhibit 4. For dual eligibles, the coefficients on the time trends produced extremely similar results whether or not we included those fixed effects in the model. Thus, the

demonstrated shifts among dual eligibles away from one-star facilities and toward five-star facilities cannot be attributed to dual eligibles' using the information on Nursing Home Compare to choose more highly rated nursing homes over time. Instead, dual eligibles have generally remained in (or have chosen) the same nursing homes that they were (or would have been) admitted to in 2008, but some of these nursing homes have achieved higher star ratings over time.

For non-dual eligibles, in contrast, the effects varied more, which indicates the presence of some consumer-driven response. For example, by 2010 non-dual eligibles were 6.6 percentage points less likely to be in a one-star nursing home, compared to 2008. Of that total, 1.2 percentage points were due to consumers' having gone to different nursing homes, while 5.4 percentage points could be attributed to provider-driven improvement in ratings. However, dual eligibles were 6.2 percentage points less likely to be in a one-star nursing home in 2010 than in 2008, with only 0.3 percentage point of the change being the result of consumers' going to different nursing homes.

As a robustness check, we estimated our main regressions with and without controlling for residents' characteristics. Education and race were significant in the expected direction: More highly educated people and non-Hispanic whites were more likely to receive care in highly rated nursing homes, compared to less educated people and nonwhites.

However, the improvements over time were very similar with and without the controls. This suggests that dual-eligible status itself (not simply as a proxy for race or ethnicity, health status, or education) likely plays an important role in the choice of nursing homes. That finding is consistent with the literature on Medicaid payment and quality of care.<sup>14,29</sup>

## EXHIBIT 4

**Time Trends In Residence Of Dual Eligibles And Non-Dual Eligibles In One-Star Or Five-Star Nursing Homes**

	Rating of nursing home			
	One star		Five stars	
	Total change	Provider-driven change	Total change	Provider-driven change
<b>DUAL ELIGIBLES ONLY</b>				
2009	-0.023	-0.022	0.010	0.010
2010	-0.062	-0.059	0.020	0.020
Constant	0.277	0.275	0.080	0.080
<b>NON-DUAL ELIGIBLES ONLY</b>				
2009	-0.027	-0.020	0.014	0.012
2010	-0.066	-0.054	0.035	0.032
Constant	0.222	0.216	0.099	0.101

**SOURCE** Authors' analysis of data from the Centers for Medicare and Medicaid Services: Nursing Home Compare; the Nursing Home Minimum Data Set, version 2.0; and the Medicare Beneficiary Summary File. **NOTES** "Total change" is without nursing home fixed effects. "Provider-driven change" is with nursing home fixed effects. Regression results, including t-statistics, are available in Appendix Exhibit A3 (see Note 31 in text). Estimates are based on linear probability regression models. All results are significant ( $p<0.01$ ).

**Discussion**

Our finding that dual eligibles tend to reside in lower-quality nursing homes was unsurprising and consistent with prior literature.<sup>14,29</sup> However, we provide new evidence of the following three points: Dual eligibles have increasingly been served by more highly rated nursing homes since the beginning of the five-star system; the shift toward higher-quality homes was smaller for dual eligibles than for non-dual eligibles; and the shift toward more highly rated homes among dual eligibles appears to be a result of providers' improving their ratings over time, not of dual eligibles' increasingly choosing different providers over time. Consumer response to the five-

# There are multiple ways for nursing homes to improve their scores beyond actually improving quality.

star rating system among non-dual eligibles has been somewhat larger than among dual eligibles.

**INFORMATION ON QUALITY** Why dual eligibles benefit less than non-dual eligibles from the public reporting of nursing home quality is less clear. However, investigating this question is crucial to the formulating of appropriate policy to address this disparity. Interest often centers on access to and usability of quality information. Researchers have found that consumers have difficulty processing a large number of quality metrics<sup>32,33</sup> and using quality metrics to judge a provider's overall quality.<sup>34,35</sup> Misunderstanding is more common among patients of lower socioeconomic status.<sup>36</sup>

In the case of nursing home residents, many of whom suffer from cognitive impairment, their placement in a particular home is likely to be heavily influenced by families and referring physicians. However, the extent to which these groups use quality reports is unknown and largely unstudied.

In contrast to prior evidence that education enhanced the response of Medicare-funded post-acute care patients to public reporting of nursing home quality,<sup>11</sup> our results indicate that education did not mediate the effect of dual-eligible status on benefit from public reporting. To the extent that education is a proxy for the ability to access and use Web-based quality information, this suggests that increasing access to the information may not be very effective in the presence of Medicaid payment.

**SUPPLY CONSTRAINTS** How supply constraints affect vulnerable populations under public reporting has received less attention. Supply constraints may take the form of living a long way from a highly rated nursing home or of the inability to access a Medicaid bed in a highly rated nursing home. Fewer nursing homes are located in neighborhoods whose residents are predominantly members of racial minority groups, and the nursing homes there tend to be of lower

quality than those in neighborhoods whose residents are predominantly white.<sup>14,37,38</sup> One study that examined nursing home placement by race found that the local supply of skilled nursing beds was a barrier to entering a nursing home for blacks, but not for whites.<sup>39</sup>

In addition, because Medicaid provides the lowest payment rates in the nursing home sector, a long history of access problems for Medicaid residents has been documented, especially when occupancy rates are high.<sup>40</sup> The access challenges associated with Medicaid payment may be the main drivers of the disparate effects we found between dual eligibles and non-dual eligibles.

Indeed, when we examined the geographic location of five-star nursing homes, we found evidence that suggested supply constraints for dual eligibles. Using the greater Chicago area as an example, online Appendix Exhibit A4<sup>31</sup> depicts the geographic distribution of nursing homes by star ratings and by median household income of each census tract. The distribution of green squares suggests that consumers throughout the greater Chicago area live within a relatively short distance of at least one low-quality (one-star) nursing home. The dark blue squares, however, demonstrate that five-star nursing homes have a very limited geographic distribution: Most of them are near the higher-income areas in the northern part of the city.

Thus, a consumer on the South Side of Chicago (in one of the poorer neighborhoods) would likely have to travel a great distance to reach a five-star nursing home. This suggests that supply constraints may help explain the lack of response to public reporting of quality among dual eligibles.

Solving the issue of supply constraints is an inherently difficult policy problem. The location decisions of nursing home providers are complex and likely involve proximity to referral sources as well as the socioeconomic status of the surrounding neighborhood. However, the reality is that few highly rated nursing homes exist in or near poorer neighborhoods.

The nursing home sector is largely for profit, and financial incentives may favor location in more affluent neighborhoods. Location in less affluent areas generally means operating on Medicaid reimbursement rates, as nursing home residents tend to be local. In turn, dependence on Medicaid reimbursement rates may limit a nursing home's ability to improve its quality over time.

A substantial increase in the Medicaid rate or a systematic replacement of Medicaid with a national insurance system for long-term care might be the only solutions that would lead to dramatic

change. However, both seem politically unlikely for the time being.

An alternative to changing the incentives for location would be to pursue policies that incentivize low-rated nursing homes to improve their quality, which is one of the goals of public reporting. Our results indicate that this provider-driven improvement was responsible for the bulk of the change in distribution of star ratings for dual eligibles between 2008 and 2010, consistent with evidence on provider-driven improvement overall during this period.<sup>41</sup>

## Conclusion

Our goal was to analyze changes in the ratings of nursing homes in which dual eligibles reside, since the ratings are a major policy intervention in which CMS continues to invest substantial resources. However, for these changes to indicate an increase in the well-being of dual eligibles, an improvement in the star ratings must reflect an actual improvement in quality. Recent press coverage casts doubt on this assumption.<sup>42</sup> There are multiple ways for nursing homes to improve their scores beyond actually improving quality, such as changing their coding practices and avoiding sicker residents.

The fact that dual eligibles as a group have found themselves to some extent in better-rated nursing homes over time may be taken as a good sign, with the caveat that the ratings might not indicate the homes' true quality. However, the gap between dual eligibles and non-dual eligibles still grew slightly over time. The latter group experienced a larger shift toward highly rated

nursing homes, in part driven by consumer response to the five-star rating system among non-dual eligibles.

Well-intentioned policies often have heterogeneous effects, and it remains open to debate whether average improvement is beneficial if disparities increase. Our analysis revealed a growing disparity within just a few years of the release of the five-star Nursing Home Compare rating system. As time goes on, public reporting could perpetuate and exacerbate this disparity. Any evaluation of the success of an intervention such as public reporting needs to consider the heterogeneity of effects as well as average effects.

In the case of nursing homes, a small overall effect that is subject to significant heterogeneity might not be surprising, and there may be additional heterogeneity within the broad categories of dual eligibles and non-dual eligibles. Decisions about nursing home choice depend upon many factors in addition to quality. In addition, consumers' responses to quality measures may depend in part on the extent to which they find the measures valid and useful.

The list of potential market failures (such as asymmetric information, constrained supply, and constrained price) in long-term care is long, and policies to mitigate any one of them in isolation are unlikely to lead to dramatic improvement. Even if the problem of asymmetric information is addressed through public reporting of health care quality, other market failures, such as constrained supply, may prove more intractable barriers to the existence of well-functioning markets. ■

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# **Professionals' Beliefs About Nursing Home Regulations in Missouri**

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*The process of nursing home regulation continues to need improvement to ensure the best possible quality of care. This study uses mixed methods to explore opinions of nursing home professionals and state nursing home regulation inspection team members about the regulation process and ideas for changing it in the State of Missouri. Data come from a survey of nursing home professionals (n = 334) and state regulation inspectors (n = 123) conducted in early 2004. Findings show disagreement about who is responsible for facilitating nursing home compliance; nursing home professionals desire state assistance in interpreting and applying regulations, whereas inspectors do not believe this will improve quality of care. Greater focus on resident needs may provide common ground for bridging this divide and developing interventions to ensure regulatory success.*

**Keywords:** *nursing home; regulation; inspection; quality of care*

With the passage of the Nursing Home Reform Act, contained within the Omnibus Budget Reconciliation Act (OBRA) of 1987, a new era of regulatory scrutiny began for nursing homes accepting Medicare and Medicaid financing. Over the past decade, analyses of regulatory deficiencies suggest that in some areas these regulatory reforms have helped to improve the quality of care adults receive in nursing homes. Specifically, researchers have documented improvements in quality of resident care related to an increase in staffing ratios

(Zhang & Grabowski, 2004) and a reduction of restraint usage (Castle, 2002). However, there are continuing calls for improvement in regulation enforcement and consistency of enforcement (Harrington, Mullan, & Carrillo, 2004), increased funding levels for state regulatory agencies, training for state regulation inspectors and oversight of state inspections by the Centers for Medicare and Medicaid Services (Harrington & Carrillo, 1999; U.S. General Accounting Office, 2003; Walshe & Harrington, 2002), and policy reform to address the subgroup of nursing homes that persistently receive low-quality performance ratings (Grabowski & Castle, 2003).

Critics suggest that the overall impact of the Nursing Home Reform Act should be evaluated, acknowledging that the punitive nature of regulation alone has not improved overall quality of care (Winzelberg, 2003) and has more often than not created adversarial relationships between state regulation inspectors and nursing homes (Wiener, 2003). Walshe (2001) recommends applying lessons learned in regulation from other industries to nursing home regulation, including employing responsive regulation instead of deterrence regulation, reducing regulatory fragmentation, and separating regulatory and funding responsibilities to create a more balanced model of regulatory accountability, including other stakeholder groups (e.g., families, ombudsman, staff) in the evaluation process. Noting that substantial work remains to be done to understand how the nursing home regulatory process can ensure that each resident receives high-quality care, scholars in the field are calling for a much wider range of research in long-term care (Feldman & Kane, 2003; Kemper, 2003) and increased professional activism in public policy (Kane, 2003) as a means to move knowledge forward.

## Missouri as a Case Study

Missouri, like other states, seeks to improve quality of care through the regulatory process. In 2004, the state partnered with the George Warren Brown School of Social Work at Washington University in St. Louis to explore policy and programmatic options to improve quality of care by soliciting opinions of the two stakeholder groups with the most direct experience

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in regulation application—state inspectors and nursing home professionals. Adversarial relations, commonly noted in nursing home industry publications (Burgess, 2003; Gold, 2000), make the outcomes of this study particularly important. If both groups agree an intervention is useful, that option may have a greater likelihood of successful implementation, thereby creating improvement in quality of care. If significant disagreement is present, an intervention may fail in meeting its goals.

The intent of this research is to provide state officials evidence for decision making about future nursing home regulatory policy and procedures. It may inform federal decision making as well; however, it is more likely that results will be important for administrators in other states who face similar challenges in applying both federal and state nursing home regulation policies to achieve quality-of-care outcomes. Specific research questions for this study are as follows: What is the general perception of the regulation system by nursing home professionals and state regulation inspectors? How helpful do they perceive specific changes to the regulation process, such as reforming regulations, implementing education and training programs, and providing regulatory consultation? Do nursing home professionals and state regulation inspectors vary in their perceptions of the regulation system and process by their professional background or training?

## Method

### *Data Source*

Survey data were gathered by mail from March through May 2004. The sample included all licensed nursing homes (NH) in Missouri ( $N = 498$ ) and all state nursing home regulation inspectors of Missouri's Division of Senior Services and Regulation (DSSR) ( $N = 220$ ). Three copies of the survey were sent to each nursing home, addressed to the chief administrator, director of nursing, and director of dietary services ( $N = 1,497$ ) and one to each DSSR inspector ( $N = 220$ ). The NH professional positions were selected for surveying because they usually have direct responsibility for an area of practice that is evaluated by state nursing home surveyors, and they are mandated positions within nursing homes by state regulations. Despite the important contributions social workers make to quality of life in some nursing homes, directors of social work were not targeted as part of the sample of NH professionals because social service is not an area of mandated evaluation by the state inspection team, nor are credentialed social workers required in all facilities. Although social workers and other nursing home staff were not sample subgroups, in some cases they did respond to the surveys.

In total, 1,717 identical surveys were mailed. Total response rate of both sample groups combined ( $N = 1,717$ ) was 27%. Surveys were returned from 222 different NHs, or 45% of the total NH sample. The overall response rate for NH professionals was 22% ( $n = 334$ ), because 71% of NHs returned only 1 survey, 22% returned 2 surveys, and 7% returned all 3 copies of the survey. Nearly 45% of respondents were chief administrators, 33% were directors of nursing, almost 19% were directors of dietary services, and fewer than 4% held other positions. Analysis of NH respondents and nonrespondents indicates that multiple responses were higher among rural nursing homes, but there were no differences in response rates based on federal deficiency violations over the preceding 4-year period (2001-2004) (State of Missouri, Division of Senior Services and Regulation, 2004). Thus, we concluded that the response bias based on outcomes of state regulatory inspections was minimal; however, response bias related to professional position may be present, as there is not equal representation across professional categories. Additionally, we acknowledge that other factors may also influence survey response, such as tenure in current position and in the field. Specifically, there may be a greater likelihood for professionals of higher ranking status, who have greater responsibility for nursing home compliance or who have greater employee loyalty to a specific nursing home, to return the mailed surveys. Professionals who are displeased with their current employment or who have very little experience with the survey process may be less likely to respond. Unfortunately, data were not available to analyze respondent bias in these areas.

The DSSR sample ( $n = 123$ ) had a 56% response rate. Nearly 17% of respondents were state administrators or managers of nursing home inspection regional sections, 19% were survey team supervisors, 50% were team members, and approximately 14% held other inspection positions. Responses are proportional to the professional roles within state inspection units. Although we recognize that the individual response rate for the NH sample is low, we feel the response rate for nursing home facilities is adequate for this exploratory case study.

### *Measures*

The survey consists of 32 closed-ended questions. Fourteen items positioned in 5-point Likert-type scales assess current regulatory policies and processes (*strongly agree* to *strongly disagree*) and ideas for changing the regulation process (*very helpful* to *not at all helpful*). These items were derived from previous documented interviews by DSSR with nursing home professionals and from relevant literature. Three open-ended questions

solicited additional recommendations for change. The remaining are categorical, addressing professional experience and demographics.

### *Analysis*

Analyses are descriptive, inferential, and thematic. Chi-square analyses test differences in assessments of the regulatory process between NH professionals and state regulators. Responses were unevenly distributed across five categories (See Table 1); therefore, we collapsed each 5-point scale item into two categories (i.e., *agree and disagree/helpful and unhelpful*). In each response set, the neutral category was combined with the negative response. Descriptive and bivariate analyses compare professional characteristics between NH professionals and state regulators. Multivariate logistic regressions examine associations between assessment of regulation and professional characteristics. Facility or office location (i.e., urban/suburban and rural areas) and business type of NH (i.e., nonprofit and for profit) were controlled for in relevant models. Open-ended questions were transcribed verbatim from surveys and thematically coded using Nud\*ist 6.0 software using the survey questions as code categories.

## **Results**

Table 1 shows the professional backgrounds of respondents, including current position. State regulation inspectors had more formal education than skilled nursing facility (SNF) professionals and have been in their current position for a longer period of time than SNF staff. There was no significant difference in the number of years worked in the long-term care field. Sixty-six percent of nursing home professionals had worked more than 11 years in the long-term care field (73% of owners or administrators, 63% of directors of nursing, and 59% of directors of dietary services or others had been in the field this long). Sixty-one percent of state inspectors had worked in the field for 11 years or more (64% of state administrators or inspection team managers, 84% of team supervisors, 52% of team members, and 50% of those in other inspection positions). Most respondents, then, had worked for more than a decade in the field.

Very few nursing home professionals had ever worked as part of a state inspection team (1%). More state inspectors had worked for nursing homes, including 18% as a director of nursing, 11% as a social worker, 7% as an administrator, 3% as a dietician, and 1% as a nursing home owner. Thus, in

**Table 1. Professional Backgrounds of Participants in the Sample**

<i>Characteristic</i>	<i>Total</i> (N = 457)	<i>NH</i> (n = 334)	<i>State</i> (n = 123)
Highest degree***			
High school/GED	19.5	22.9	1.08
Associate	34.9	40.3	20.8
Bachelor	33.1	25.7	52.5
Master/PhD	12.4	11.1	15.8
Years in current position***			
0-1	15.9	20.6	3.3
2-5	36.7	35.9	38.8
6-10	17.9	16.9	20.7
11-15	13.8	10.9	21.5
16+	15.7	15.6	15.7
Years in LTC field			
0-1	2.3	1.6	4.3
2-5	12.8	12.1	14.5
6-10	20.0	19.9	20.5
11-15	21.4	19.6	26.5
16+	43.5	46.9	34.2
Current profession			
NH administrator	NA	44.7	
NH dir. of nursing		33.0	
NH dietician		18.6	
Other NH position		3.6	
State administrator/manager			16.8
State inspection team supervisor			19.0
State inspection team member			50.5
Other state inspection position			13.7
Type of business	NA		NA
For profit		59.6	
Not for profit		38.5	
Public entity		1.9	
Locality of facility/office <sup>a</sup>	NA		
Urban		21.0	63.8
Suburban		20.0	6.7
Rural		59.0	29.4
No. inspections as NH staff***			
0-3	18.6	9.4	46.4
4-10	27.9	30.8	19.1
11+	53.5	59.8	34.6
No. inspections as state staff***			
0-10	66.1	91.2	10.2
11-20	3.4	4.2	1.7
21+	30.5	4.6	88.1

NOTE: NH = nursing home; LTC = long-term care; NA = not applicable. Row percentage in chi-square is reported.

a. NH-reported facility location and state-reported office location, respectively.

\*\*\**p* < .001.

terms of experience with regulation site inspection, most nursing home professionals had only participated in site inspection as a nursing home employee, whereas many state regulation inspectors had participated as both an inspector and a nursing home professional.

Table 2 presents agreement on survey items assessing the regulatory process and suggested innovations to it by total sample, and separately for the NH and DSSR groups.

Overall, nursing home professionals were less likely to hold positive opinions about the current regulation process than were state inspectors and more likely to agree that the proposed innovations would improve quality of care. Nursing home professionals agreed more often that improving relations with state inspectors was important for raising quality of care; the same pattern emerged regarding providing state assistance to assist with compliance. Both groups were in almost equal agreement that providing education and training for all levels of NH staff would help ensure regulatory compliance.

Qualitative findings help explain areas of disagreement. Several NH respondents indicated that the current process is unnecessarily punitive, suggesting that state inspectors often do not understand the reality of how a nursing home functions by perhaps taking a "godlike" stance during inspections. Building trust and mutual respect was noted as important by several NH respondents for improving relations. Some comments from state surveyors agreed with this idea, but many indicated that they saw few problems with current relations.

Other comments highlighted different philosophical stances toward the regulation process by nursing home professionals and state inspectors. For example, NH respondents often commented that new and changed regulations as well as employee turnover in state inspection teams meant that continual training was needed for nursing home staff and state inspectors. One NH professional stated, "Offer advice, ideas, etc. to promote better care. We now have an 'us against you' scenario. This could be much better if we worked together." A state inspector presented an opposing opinion, saying, "Facilities that want to do well already have this. It's called a paid consultant."

In another example, NH respondents noted that the current process of self-reporting was problematic in that it led to many small complaints being "hotlined," which resulted in an inspection visit. This was viewed as punishment for what should be a helpful process to improve quality of care. Conversely, a typical statement by a state respondent is reflected in the comment, "Self-reporting is already as easy as it can get."

The next set of analyses examined associations between assessment of the regulatory process and professional characteristics. Table 3 shows results of the multivariate logistic regressions for nursing home professionals. Table 4

**Table 2. Current Assessments of Regulation Process**

Survey item	Agreement (%)		
	Total (N = 457)	NH (n = 334)	State (n = 123)
"Please indicate how much you agree or disagree" with this statement			
The current skilled nursing facility regulatory process ensures quality of care of residents.	66.3	65.6	68.3
The current regulatory process uses a disciplinary approach to ensure quality of care.	76.1	78.1	70.7
A disciplinary approach to regulation improves the quality of care of skilled nursing facility residents.	53.5	48.2	68.0 ***
Relations between state inspection team members and professionals in skilled nursing facilities are usually positive.	61.3	58.7	68.3
Improving relations between the state and skilled nursing facilities will improve quality of care of residents.	82.3	88.6	65.0 ***
"Please indicate how helpful you think each idea is" for improving the regulation process			
Requiring continuing education credits for State Inspection Team members in skilled nursing facility regulations and procedures	86.4	88.3	81.3 *
Providing education and training for all levels of skilled nursing facility staff	96.5	96.1	97.6
Providing state assistance to help skilled nursing facilities correct violations after a facility has been inspected	74.8	83.8	50.4 ***
Revising the process for self-reporting abuse, neglect, and exploitation by skilled nursing facilities	64.3	70.7	47.2 ***
Providing a liaison to advise skilled nursing facilities about the regulation process and how to avoid receiving violations.	82.1	89.5	61.8 ***
Allowing a neutral party to sit in on the informal dispute resolution process	67.3	74.9	46.7 ***
Having one set of skilled nursing facility regulations instead of two (i.e., federal and state)	83.7	89.5	67.5 ***
Actively engaging residents' family members in monitoring the regulation process	46.1	46.5	45.1
Officially recognizing innovative programs that improve residents' quality of care	88.4	90.3	82.9 *

NOTE: NH = nursing home.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 3. Odds Ratios From Logistic Regressions for Nursing Home (NH) Professionals (*n* = 334)**

	OR (95% CI)						
	Ensure Quality of Care	Use Discipline	Discipline Improves	Positive Relations	Continuing Education	Correct Violation	Liaison
<b>Current profession</b>							
Director of nursing	1.49 (0.89-.2.64)	1.11 (0.57-.2.15)	1.81* (1.04-.3.15)	0.61 (0.35-.1.06)	1.23 (0.52-.2.91)	1.50 (0.73-.3.07)	4.76** (1.56-.14.50)
Dietician/social services	6.24*** (2.48-15.76)	2.03 (0.84-4.93)	3.62*** (1.79-.7.32)	1.68 (0.83-.3.41)	3.06 (0.91-10.23)	2.80* (1.03-.7.66)	1.92 (0.64-5.80)
<b>Education &amp; training</b>							
High school	1.43 (0.66-3.06)	0.64 (0.29-1.38)	1.17 (0.60-2.26)	0.93 (0.48-1.81)	0.53 (0.21-1.36)	0.72 (0.31-1.66)	1.18 (0.43-3.26)
<b>Employment Tenure</b>							
Years in job	0.74** (0.61-0.91)	0.91 (0.73-1.13)	0.88 (0.72-1.06)	0.81* (0.67-0.98)	0.89 (0.67-1.19)	0.93 (0.73-1.18)	1.04 (0.78-1.40)
<b>Facility location</b>							
Suburban	1.08 (0.47-.2.47)	2.10 (0.84-5.27)	1.11 (0.50-2.44)	0.63 (0.30-1.36)	0.19* (0.04-0.96)	0.80 (0.29-2.24)	2.21 (0.62-7.88)
Rural	1.38 (0.71-.2.69)	2.05* (1.02-4.10)	1.62 (0.86-3.06)	1.39 (0.75-2.59)	0.24 (0.05-1.05)	0.65 (0.37-1.96)	1.34 (0.55-3.29)
<b>Business type</b>							
Profit	1.92* (1.12-3.29)	1.11 (0.61-2.03)	1.34 (0.81-2.22)	0.96 (0.58-1.58)	0.50 (0.21-1.16)	0.83 (0.43-1.61)	0.94 (0.43-2.08)

NOTE: The reference groups are "administrator and owner" for current profession, "associate's degree and above" for highest educational degree, "urban" for facility location, and "nonprofit and public entity" for business type.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

Table 4. Odds Ratios From Logistic Regressions for State Regulation Inspector (DHSS) ( $n = 123$ )

	Ensure Quality of Care	Use Discipline	Discipline Improves Relations	Positive Relations	Improving Relations	Correct Violation	Violation	Self-Report	Liaison	IDR	Regulations	One Set of Family Monitor	Innovative Programs
Current profession													
Supervisor	0.85	0.42	0.79	1.07	0.24*	0.77	0.19	1.21	1.16	0.31	1.70	0.57	
Team member	1.08	0.85	0.72	1.82	0.88	1.18	2.01	1.18	1.77	0.52	1.00	1.63	
Other	1.04	0.51	0.37	0.85	0.65	0.81	3.31	1.23	3.09	0.30	2.69	— <sup>a</sup>	
Education & training													
Bachelor	1.47	0.44	0.54	2.05	0.58	0.55	0.81	0.58	0.82	0.78	1.91	0.78	
Graduate	5.34*	2.05	1.71	1.91	0.46	0.46	0.62	0.47	0.64	0.57	1.71	1.06	
Employment Tenure													
Years in job	0.78	0.91	1.23	0.71	1.19	0.91	0.99	0.97	0.83	1.17	0.80	0.99	
Office location													
Rural	1.11	1.44	0.82	0.14	2.32	0.82	0.91	1.13	0.91	1.23	1.35	0.44	

NOTE: The reference groups are "administrator and manager" for current profession, "high school and associate's degree" for highest educational degree, and "urban and suburban" for office location. IDR = informal dispute resolution.

a. The group "other" is combined with "members" because of little variation in responses.

\* $p < .05$ .

reports results for state regulation inspectors. Among NH respondents, nursing directors showed greater support for the current regulatory process than did administrators and were in more support of utilizing a state liaison to advise on compliance issues. Professionals working in their current position longer were less likely to agree that the current regulatory process ensures quality of care. (Years in the long-term care field is correlated with years in current position [.48] and thus is not included in the regressions; years in current position is selected for consistency in understanding variances by current professional position.) Analysis of the DHHS respondent group shows that compared with state administrators and managers, inspection team supervisors were 76% less likely to agree, in terms of odds, that improving relations between the state and NHs would improve quality of care.

Respondents provided qualitative comments on how the regulatory process in Missouri could be improved. General comments about the regulatory process from both NH and DSSR respondents indicated a desire for the state to assist with training nursing home staff in regulation compliance. Additional recommendations focused on state provision of better clarification of regulations and survey procedures, increased objectivity in the inspection process, and for improved communications between inspection teams and state inspectors. One quote from a nursing home professional exemplifies this frustration: "Each team focus is on different things; the survey process should be universal and equal." A substantial number of recommendations were made about holding nursing home owners more responsible for poor facilities. Both NH and state respondents noted staffing shortages and turnover on both sides as problematic for the regulatory process.

## **Discussion**

Findings from this study suggest that whereas nursing home professionals and state inspectors agree that skilled nursing facility regulations are disciplinary in nature, they disagree as to how well the regulations ensure quality of care. State inspectors have more faith in the regulatory system as it is; nursing home professionals seek changes that streamline regulations and help them interpret and apply the regulations. This may be one explanation as to why significantly more nursing home professionals than state inspectors believe that improving relations between the state and nursing homes will improve residents' quality of care. These differing stances perhaps highlight one of the factors contributing to adversarial relations between these groups—distinct perceptions about the role of the state in facilitating compliance. In sum, findings suggest that although nursing home professionals in general may not support the current regulatory process, they believe it can be improved with state

assistance in interpreting and applying regulations. This may or may not actually improve quality of care overall—which is perhaps reflected in the reduced optimism of tenured nursing home professionals about the ability of the regulatory system to produce high-quality care—but it does provide one area of stakeholder-identified intervention to explore.

Qualitative findings suggest that frustrations about a lack of focus on residents may be a potential area of common ground to underlie the development of such interventions. The almost unanimous agreement by nursing home professionals and state inspectors on the need for more training of nursing home staff on compliance issues may fit under this concern; there is equal agreement on the need for continual training of nursing home inspectors. Our survey results indicate that much of Missouri's nursing home professional staff has substantial professional experience but limited formal education. State regulation inspectors have both extensive field experience and college degrees including graduate training; however, recent state budget cutbacks have reduced funding for continuing education. Nationally, there is growing evidence of a lack of continuing training in regulation compliance for nursing home administrators and other staff (Griffith, Warden, Neighbors, & Shim, 2002; Ross, Carswell, Dalziel, & Aminzadeh, 2001; Singh, Shi, Samuels, & Amidon, 1997) and inspection team members (Harrington & Carrillo, 1999; Harrington et al., 2004). We did not ask about staff turnover rates, although they are nationally noted to be as high as 43% among administrators (Castle, 2002) and as high 53% among nurses (Harrington et al., 2004). Staff turnover may contribute to this need for ongoing education and training.

A potential bias among respondents is disagreement among types of professionals working in nursing homes that education and training are an important issue. Additionally, those who did not respond to this survey may hold different views about the regulation process that are not reflected in the results presented here. In terms of regional response variance, in Missouri, higher response rates in rural areas may result in positive response biases. In many small communities, nursing home residents, their families, and nursing home professionals have prior personal relationships that may influence quality of care provided in facilities. Additionally, affordability and accessibility of professional consultants to assist in interpreting regulations may make some nursing home professionals more amenable to relying on the state for compliance assistance.

### *Limitations*

Caution is advised in interpreting results from this survey. It is important to recognize that the survey method of data collection used in this study

limits its generalizability. The small response rate and unequal representation of nursing home professionals restrict interpretation of the findings outside of this specific respondent group. Had surveys been mailed to professionals by name or individual respondent incentives provided, response rates may have been higher. Due to resource constraints, this study was not able to address these limitations. Additionally, given the sensitive nature of the survey topic, there is potential for surveys to be completed by individuals falsely identifying themselves with a specific professional position to generate more positive or negative results. This cannot be detected in the returned survey. Finally, as these findings report on the particular nature of the relationship between nursing home professional and state inspector in Missouri, they may not reflect conditions in other states where relations are less adversarial or where issues such as continuing education are not noted to be problems. Findings should be evaluated in light of these factors. Although this study has many limitations, it does provide insight on the thoughts of nursing home professionals and state inspectors, which is new.

### **Next Steps for Missouri and Other States**

Findings from this study suggest that in some ways, nursing home professionals and state inspectors are at an impasse in terms of who is responsible for facilitating nursing home compliance to state and federal regulations. This is not surprising given that they are different stakeholders in this issue; it should be expected they have differing opinions on what steps are needed to reform the regulatory systems. States that decide to become more involved in promoting increased education and training on regulatory compliance for both nursing home staff and state inspectors may see better quality-of-care outcomes. Evaluation of specific intervention outcomes may prove financially challenging but ultimately worthwhile because education and training is one area that nursing home professionals and state regulation inspectors agree is important for improving quality of care.

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# A Panel Data Analysis of the Relationships of Nursing Home Staffing Levels and Standards to Regulatory Deficiencies

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**Objective.** To examine the relationships between nursing staffing levels and nursing home deficiencies.

**Methods.** This panel data analysis employed random-effect models that adjusted for unobserved, nursing home-specific heterogeneity over time. Data were obtained from California's long-term care annual cost report data and the Automated Certification and Licensing Administrative Information and Management Systems data from 1999 to 2003, linked with other secondary data sources.

**Results.** Both total nursing staffing and registered nurse (RN) staffing levels were negatively related to total deficiencies, quality of care deficiencies, and serious deficiencies that may cause harm or jeopardy to nursing home residents. Nursing homes that met the state staffing standard received fewer total deficiencies and quality of care deficiencies than nursing homes that failed to meet the standard. Meeting the state staffing standard was not related to receiving serious deficiencies.

**Conclusions.** Total nursing staffing and RN staffing levels were predictors of nursing home quality. Further research is needed on the effectiveness of state minimum staffing standards.

**Key Words:** Deficiencies—Nursing home quality—Nursing staffing—State staffing standard.

NURSING staffing levels are generally believed to be a key element in improving quality of care (QoC) in nursing homes. Yet, the data regarding the relationship of nursing staffing levels to nursing home quality as reported in the literature are inconclusive. Castle (2008) found that of 59 nursing home staffing studies since 1991 examining more than 300 quality indicators, only 40% of the indicators were positively associated with staffing levels. These inconsistent findings might be associated with the complexity of the phenomenon of interest, use of different samples or quality measures, or limitations in existing data sets and analytic methods (Kane, 2004; Mor, 2005); but, in any event, they limit the use of existing studies and justify further investigation of the relationship.

Nursing home deficiencies are the only available means of determining whether or not nursing homes meet regulatory standards. Because of their unique value, despite variability in the state nursing home survey process (Lee, Gajewski, & Thompson, 2006), numerous studies have explored the relationship between nursing staffing levels and nursing home deficiencies (Harrington, Zimmerman, Karon, Robinson, & Beutel, 2000; Johnson-Pawlson & Infeld, 1996; Konetzka, Yi, Norton, & Kilpatrick, 2004; O'Neill, Harrington, Kitchener, & Saliba, 2003). However, most studies are cross-sectional, using 1-year or multiyear

pooled data, and unobserved nursing home-specific traits cannot be adjusted for in such studies (Zhang & Grabowski, 2004). Ignoring unobserved heterogeneity may cause bias (Greene, 2003) in estimating the relationship between nursing staffing levels and deficiencies. Despite many states' recent implementation of or increase in nursing home staffing standards, few studies have examined whether the current state minimum nursing staffing standards may meaningfully decrease the probability of deficiencies that may cause serious harm or jeopardy to residents (Harrington, Swan, & Carrillo, 2007; Mueller et al., 2006).

To fill these gaps, we examined the extent to which nursing staffing levels and compliance with a state's minimum staffing standard are associated with total deficiencies, QoC deficiencies, and severe deficiencies. To strengthen existing evidence emerging for the most part from cross-sectional studies, the authors analyzed recent panel data (1999–2003) on nursing staffing from California nursing home cost reports. California has the largest number of nursing home beds and the most extensive historical data on nursing homes; in addition, in 1999, the state passed legislation that set the minimum nursing staffing standard for nursing homes at 3.2 total nursing hours per resident day (HPRD) (Harrington, O'Meara, & Kang, 2006).

## CONCEPTUAL FRAMEWORK AND HYPOTHESES

This study, like the study of Weech-Maldonado, Meret-Hanke, Neff, and Mor (2004), was guided by both Donabedian's (1988) structure-process-outcome (SPO) model of quality and the resource-based view (RBV) of the firm (Barney, 1991; Wernerfelt, 1984), an organization theory that explains performance differences among firms as being related to the variance in the firms' resources and capabilities. Donabedian's model posits that QoC structure is associated with QoC process and outcomes, which has been supported by many nursing home staffing and quality studies (Aaronson, Zinn, & Rosko, 1995; Anderson, Hsieh, & Su, 1998; Dellefield, 2006; Dyck, 2007). This study examined how nursing staffing level, an organizational structural characteristic, is associated with regulatory survey deficiencies, an organizational outcome.

We used the RBV of the firm to conceptualize nursing staffing levels as an indicator of a nursing home's commitment to nursing human resources (HRs). The RBV of the firm posits that an organization is a collection of productive resources that encompasses all tangible, intangible, and personnel-based resources owned and controlled by the organization to produce goods and services to satisfy human wants (Barney, 1991). Among these, HRs are vital in forming the basis of an organization's sustainable competitive advantage (Barney; Jackson, DeNisi, & Hitt, 2003). The selection and deployment of HRs, therefore, is a core strategic operation of an organization (Becker & Gerhart, 1996; Oliver, 1997).

HRs have been traditionally regarded as the single largest operational cost of nursing homes; a reduction in staff is frequently used to enhance organizational efficiency (Becker & Gerhart, 1996; Oliver, 1997). According to the RBV, however, improving organizational performance cannot be achieved solely by cost shifting or cost reduction; it also requires new value creation (Porter & Teisberg, 2004). Studies have reported positive associations between properly developed HR and/or HR systems and organizational performance (Aaronson et al., 1995; Lopez, 2003; Oliver, 1997). Thus, the RBV of the firm is consistent with Donabedian's SPO model of quality in its perspectives on the relationship between HRs and organizational outcomes (Weech-Maldonado et al., 2004).

We hypothesized that a nursing home's commitment to its nursing HRs would create and sustain the unique value of the organization. Commitment can be described and measured in various ways, such as staffing level, wage policies, educational support, and decision-making processes, all of which are aimed at achieving a high-performance work system (Becker & Gerhart, 1996; Oliver, 1997). Given that nursing workforce planning and deployment are major issues in the current nursing workforce shortage (Harrington, 2005a), we adopted nursing staffing as a context-sensitive indicator of organizational commitment to nursing HRs (Zinn, Aaronson, & Rosko, 1994) and examined its relationship to organizational performance as measured by deficiencies.

Total nursing staffing levels may reflect a nursing home's overall capacity to provide nursing care and may also affect the roles and performance of different types of nursing personnel in a nursing team. Nursing care requires collaborative teamwork; the quality and quantity of both licensed nurses and nonlicensed staff, the former leading the team and the latter delivering direct care, affect the QoC in a nursing home (Brannon, Barry, Kemper, Schreiner, & Vasey, 2007; Rantz & Connolly, 2004). Total nursing staffing level has been widely measured, and many studies have reported its positive relationship to process and outcome measures of quality (Bostick, Rantz, Flesner, & Riggs, 2006). The Institute of Medicine supported adoption of the standard of 4.1 total nursing HPRD, which was recommended by the Abt studies for the Centers for Medicare and Medicaid Services (CMS, 2000, 2001). Yet the total nursing staffing level of most nursing homes in the United States is much lower than recommended (Harrington, 2005b, 2005c). We hypothesized that a higher total nursing staffing level would be negatively related to the number of deficiencies that nursing homes received in state surveys (H1).

The role of registered nurses (RNs) in delivering quality nursing home care has been studied, but the findings are inconsistent. Most direct observation studies have reported that RN staffing is positively associated with QoC (Bates-Jensen, Schnelle, Alessi, Al-Samarrai, & Levy-Storms, 2004; Bostick, 2004; Schnelle, 2004; Schnelle et al., 2004; Simmons & Schnelle, 2004). Studies analyzing large secondary data sets, however, report more inconsistent findings (Castle, 2008). Based on our conceptual framework, we held that RNs have the leadership and assessment skills to provide resident-specific guided care, taking into consideration the unique context of each nursing home (Weech-Maldonado et al., 2004). As such, RN HRs may be critical to achieving high clinical performance and, ultimately, a nursing home's sustainable competitive advantage. We hypothesized that a higher RN staffing level would be negatively related to nursing home deficiencies (H2).

Approximately 40 states have established minimum nursing home staffing standards intended to improve staffing levels and QoC (Mueller et al., 2006). The required minimum nursing staffing levels, however, vary widely between states (Harrington, 2005b, 2005c). It has not been much examined whether state nursing home staffing standards require meaningful nursing staffing levels that can decrease deficiencies or improve resident outcomes. Mueller et al. (2006) reported no significant difference in the QoC between nursing homes in states where staffing standards were above 2.5 HPRD and nursing homes in states where staffing standards were below 2.5 total HPRD. California has a much higher nursing home staffing standard, 3.2 or more total nursing HPRD (Harrington & O'Meara, 2006), but whether this is a meaningful staffing level that can decrease harm to residents has not yet been evaluated. We hypothesized that meeting California's nursing

Table 1. Definition of Variables and Summary Statistics, 1999–2003 ( $n = 4,933$ )

Variable	Definition	$M (SD)$	Source
Deficiencies			
Total	Number of all federal and state deficiencies	15.56 (11.59)	ACLAIMS
QoC	Number of federal and state deficiencies in mistreatment, QoC, and resident assessment <sup>a</sup>	6.81 (5.52)	ACLAIMS
Serious deficiencies	Whether a nursing home received G or higher level of deficiencies (yes = 1)	0.19	ACLAIMS
Nurse staffing			
Total staffing hours	Sum of RN, LPN, and NA HPRD	3.23 (.66)	Cost report <sup>b</sup>
Meeting state staffing standard	Whether a nursing home provided 3.2 or more total nursing HPRD (yes = 1)	0.47	Cost report
RN hours	RN HPRD	0.35 (.26)	Cost report
LPN hours	LPN/licensed vocational nurse HPRD	0.61 (.27)	Cost report
NA hours	Nurse aide HPRD	2.27 (.41)	Cost report
Facility characteristics			
Small homes	Number of licensed beds < 60 (yes = 1)	0.24	Cost report
Medium homes	60 ≤ Number of licensed beds < 120 (yes = 1)	0.49	Cost report
Large homes	Number of licensed beds ≥ 120 (yes = 1)	0.27	Cost report
Profit status	Facility operated on a nonprofit basis (yes = 1)	0.12	Cost report
Medicare-paid days	% of resident days paid for mainly by Medicare	7.39 (6.77)	Cost report
Medi-Cal-paid days	% of resident days paid for mainly by Medicaid	64.41 (26.36)	Cost report
Self-pay days	% of resident days paid for mainly by self-pay	20.43 (21.65)	Cost report
Occupancy rate	(Total resident days/total number of licensed beds) × 100	87.62 (9.86)	Cost report
Chain affiliation	Two+ facilities with same owner (yes = 1)	0.63	OSCAR
Resident care needs	Facility's average case mix score <sup>c</sup>	1.07 (.31)	MDS
Market characteristics			
PCI (\$)	Per capita income in a county	31,987.9 (8446.1)	BEA
Population aged 85+	Number of people aged over 85 in a county	49,008.2 (47504.5)	BEA
Competition	Sum of squared market shares of the facilities in each county (Herfindahl index)	.05 (.11)	Cost report
Bay region	Bay area (yes = 1, no = 0)	0.21	Cost report
Los Angeles region	Los Angeles area (yes = 1, no = 0)	0.33	Cost report

Notes: ACLAIMS = Automated Certification and Licensing Administrative Information and Management System; OSCAR = Online Survey Certification And Reporting; MDS = Minimum Data Set; BEA = Bureau of Economic Analysis data; SD = standard deviation.

<sup>a</sup>Deficiency categories were created based on research by Mullan and Harrington (2001).

<sup>b</sup>Cost Report: the California Long-Term Care Annual Cost Report Data (COSHPP, 2004).

<sup>c</sup>The case mix score is an aggregate RUGs score calculated from the MDS data set (Fries et al., 1994).

home staffing standard would be negatively related to deficiencies (H3).

## METHODS

### Study Design and Sample

This study was a secondary panel data analysis, with the nursing home as the unit of analysis. All licensed, freestanding nursing homes in California that received state inspections between 1999 and 2003 were included in the study. Hospital-based nursing homes and uncertified nursing homes were excluded because their organizational characteristics, including staffing and resident care needs, are quite different from certified, freestanding homes (CMS, 2000, 2001). These selection criteria identified 1,165 nursing homes (with 5,328 total annual observations, 1999–2003) for inclusion, of which 66 (about 6%) were omitted from the final analytic data set. Twelve of these 66 nursing homes were excluded because their nursing staffing met one or more of the following conditions: total nursing HPRD was less than 0.5 or more than 12; the nursing home capacity was more than 60 beds and RN hours were zero; or the oc-

cupancy rate was more than 100%. These criteria are consistent with the criteria that CMS developed for its minimum nursing home staffing studies (CMS, 2000, 2001). The other 54 nursing homes were omitted because they did not have valid values for most variables, including the staffing, case mix, and chain-affiliation variables, in all five observed years. The final analytic sample consisted of a total of 4,933 yearly observations of 1,099 Medicare- and/or Medicaid-certified, freestanding, skilled nursing homes in California between 1999 and 2003.

### Data Sources

Data were obtained from five existing electronic databases (see Table 1). The annual cost report data that all licensed nursing homes submit to the California Office of Statewide Health Planning and Development (COSHDP, 2004) were used to derive measures of staffing, facility, and market characteristics. These data are more complete and reliable than staffing data from the federal Online Survey Certification And Reporting (OSCAR) system, which only contains staffing data for the two week period prior to the state survey (Kash, Hawes, & Phillips, 2007).

Nursing home deficiencies were obtained from the Automated Certification and Licensing Administrative Information and Management System (ACLAIMS) database, maintained by the California Department of Health Services (the California Department of Public Health Licensing and Certification Program, 2001). All state survey agencies are empowered to issue federal and state deficiencies: the former reflect minimum standards or requirements (i.e., the mini-code); the latter are additional requirements (i.e., the maxi-code). Although state and federal inspections (surveys) are conducted at the same time, state nursing home surveyors have the discretion to issue deficiencies under federal or state regulations (Tsoukalas et al., 2006). The same deficiency cannot be simultaneously cited under both federal and state regulations. If state deficiencies are not cited or reported, the deficiency count is underreported (Tsoukalas et al., 2006). Thus, to increase the reliability of the deficiency data, the ACLAIMS data set, which includes both state and federal deficiencies, was used rather than the OSCAR database, which includes only federal deficiencies. A separate model for state deficiencies was not developed because most homes during the study period received a relatively small number of state deficiencies. The findings of the federal deficiency only models were consistent with those of the total deficiency models that are reported here.

Chain affiliation was obtained from the OSCAR database. Because few variables in the OSCAR database are appropriate for risk adjustment (Castle, 2008), we used the facility-level case mix index (CMI) score calculated from the Minimum Data Set (MDS) (Fries et al., 1994) as a risk adjustor for this study. When we conducted the study, we were able to obtain only the CMI scores for the observed years, not the entire MDS, which includes detailed resident assessment data. Two county-level variables, per capita income and size of older adult population, were obtained from the U.S. Bureau of Economic Analysis (BEA, 2003).

#### *Variables and Measures*

**Dependent variables.**—The dependent variable of the study was nursing home deficiencies. Deficiencies are issued by California regional health department surveyors when a nursing home does not meet federal and/or state quality standards in the nursing home inspection process. Harrington and colleagues categorized all federal and state deficiencies into nine groups (Mullan, Joseph, & Harrington, 2001; O'Meara, Collier, & Harrington, 2005). We counted within the nine groups the number of total deficiencies, QoC deficiencies, and severe deficiencies that may cause harm or jeopardy. *Total deficiencies* is the sum of all federal and state deficiencies in the nine groups. *QoC deficiencies* is the sum of federal and state deficiencies in three of the nine groups: QoC, mistreatment, and resident assess-

ment. These groups are more closely related to nursing care than the other groups (i.e., administration, environment, life safety, nutrition, pharmacy, and resident rights). *Severe deficiencies* indicate whether a nursing home received one or more federal deficiencies indicating poor QoC that poses immediate harm or jeopardy (i.e., deficiencies classified by surveyors at a G or higher level) to patients (Harrington et al., 2000; O'Meara et al., 2005).

**Key explanatory variables.**—Three sets of nursing staffing levels were of primary interest: total nursing HPRD, meeting the state minimum nursing home staffing standard (hereafter *meeting state staffing standard*), and nursing HPRD by type of personnel: RNs, licensed practical nurses (LPN)/licensed vocational nurses, and nursing assistants (NAs). Total nursing HPRD, a continuous variable, was the sum of RN, LPN, and NA HPRD. The *meeting state staffing standard* variable was a dichotomous measure of whether or not a nursing home provided 3.2 or more total nursing HPRD (Harrington & O'Meara, 2006). The RN, LPN, and NA HPRD were calculated by dividing each category's hours by total resident days. If a nursing home had 59 or fewer licensed beds, the hours of the director of nursing were also included in RN hours, as in California's staffing standards (O'Meara et al., 2005). All nursing staffing data were obtained from the COSHPD (2004) data set, in which *nursing hours* included part-time and temporary hours, as well as full-time nursing employee hours, counting only productive hours and excluding time for vacation, sick time, disability, and other paid time off.

**Control variables.**—A literature review led to adjusting the analytic model for several other facility-level and market-level characteristics. Number of beds was measured by categorical groups (Harrington et al., 2000), with mid-sized homes (60–119 beds), the largest group, as the reference group. Profit status, which may make a difference in organizational philosophy and mission (O'Neill et al., 2003), was represented by a dichotomous variable indicating nonprofit nursing homes. Three payer mix variables defined in the COSHPD cost report were included: the percentage of Medicare, Medicaid ("Medi-Cal" in California), and self-pay resident days. Occupancy rate, defined as the percentage of licensed beds occupied during the reporting period, was calculated by dividing resident census days by bed days (COSHPD, 2004). We used the average CMI score reflecting overall resident care needs in a nursing home as the risk adjustment variable. The average CMI score is an aggregate resource use groups (RUGs) score from the MDS (Anderson et al., 1998; Fries et al., 1994). Chain affiliation was represented by a dummy variable in the analysis (Konetzka, Spector, & Shaffer, 2004). For the missing values in chain status, if the chain status was missing in a given year but present and consistent in the years just before and after the missing year, the missing variable

was coded as the same chain status for the missing year. The differences in Medi-Cal reimbursement rates among the Bay, Los Angeles, and other areas in California (O'Neil et al., 2003) were controlled for by using dummy variables for the areas (Table 1).

### *Estimation Procedure*

Several nursing home deficiency studies have adopted a linear regression model using ordinary least-squares estimators (Dellefield, 2006; Harrington et al., 2000; Johnson-Pawson & Infeld, 1996). However, this approach ignores the nature of nonnegative, integer-valued, count-dependent variables, and may produce biased estimates (Greene, 2003). This study, in contrast, adopted the Poisson random-effects (REs) model with maximum likelihood estimators (Wooldridge, 2002).

The RE model includes the following: a constant term, a vector of nursing home characteristics (nursing staffing levels and all facility and market covariates), a vector of time fixed effects (year dummy variables), and a random parameter allowing a separate intercept for each respective nursing home. The random effects control for the heterogeneity that comes from unobserved, time-invariant, individual nursing home-specific traits (Wooldridge, 2002). The time-invariant covariates that appear in the model embody a part of the heterogeneity that is correlated with the included variables; the random effects pick up what remains. We assumed the random parameter ( $\psi_i$ ) had a gamma distribution ( $\theta, \alpha$ ) so that  $E[\exp(\psi_i)]$  had a mean of 1 and a variance of  $1/\theta = \alpha$  (Econometric Software, 2002). To estimate the relationship of nursing staffing levels to serious deficiencies, a dichotomous dependent variable, we used the Probit RE model with maximum likelihood estimators (Wooldridge, 2002).

Many of our variables were time invariant. Thus, we were unable to fit a fixed-effects Poisson model or carry out a Hausman test (Econometric Software, 2002; Greene, 2007). The negative binomial (NB) model, meanwhile, is a commonly used alternative to the Poisson. Its use is generally motivated by a desire to account for overdispersion in the data. Because the random-effects Poisson specification already accounts for overdispersion, we eschewed the NB formulation as this would have led to overspecifying the model (Greene, 2007). A second natural extension of our model might have been a dynamic panel data specification. Standard approaches to this model for continuous dependent data did not apply to these nonlinear models for discrete data. Conceivably, an alternative approach based on the generalized method of moments and the method of instrumental variables could have been used, but these methods are not well developed (Blundell, Griffith, & Windmeijer, 2002).

More importantly, however, we were not convinced that a truly dynamic model was applicable for this study. The

random-effects model we adopted already takes into account potential autocorrelation (that is, correlation across observations) across years of data. Correlation of the deficiencies (outcomes) across time arises from two sources. The simpler source is the persistence of the observed variables in the model, the independent variables. The observed outcomes are conditioned on these variables, so autocorrelation of the outcome variable arises because of correlation in the inputs. The second source of correlation across observation is persistence of effects not in the model. These persistent unobserved effects influence the outcome in every time period. The random parameter in the RE model, which is constant across time, picks up these persistent effects. In other words, the random effects pick up the correlation across time of the latent effects (Greene, 2003, 2007). However, it does not seem to convincingly follow that the number of deficiencies in a given year is a policy decision conditioned on the previous year's count.

In summary, using the Poisson random-effects model and the Probit random-effects model, we estimated the relationship between the three sets of nursing staffing variables and the three sets of deficiencies (Table 1), while adjusting for all observed covariates and time fixed effects, as well as for unobserved, time-invariant nursing home-specific heterogeneity. All data management was conducted with SAS 9.1; data analyses were with NLOGIT 4.0.

## **RESULTS**

Table 1 provides descriptive statistics for the variables in the analysis. On average, the nursing homes in the sample received 15.6 total deficiencies annually, of which approximately 43.7% (6.8) were QoC deficiencies. Almost 19% of homes received one or more deficiencies that may cause harm or jeopardy. On average, the nursing homes provided a mean total of 3.23 nursing HPRD (median = 3.17), but there was large variation: only about 47% of nursing homes met the state staffing standard between 1999 and 2003. Mean RN hours was 0.35 HPRD (median = 0.31) in the observation years.

### *Total Nursing Staffing*

Table 2 illustrates the estimated results of the relationship of total nursing hours to deficiencies. Hypothesis 1—that a higher total nursing staffing level would be negatively related to deficiencies—was supported by the data. Adjusting for organizational and market covariates, a higher total nursing staffing level was consistently related to lower total deficiencies ( $p < .001$ ), QoC deficiencies ( $p = .001$ ), and serious deficiencies ( $p = .046$ ). The marginal effects of total nursing staffing level (the effects of a one-unit change in total nursing staffing level) on all three deficiencies were negative and significant, and the extent of the marginal effects was a decrease

Table 2. Estimation Results of the Relationship Between Total Nursing Hours and Deficiencies ( $N = 4,933$ )

	Total Deficiencies, Coefficient (SE)	QoC Deficiencies, Coefficient (SE)	Serious Deficiencies, Coefficient (SE)
Constant	3.056*** (0.069)	2.184*** (0.109)	0.539 (0.345)
Total nursing hours	-0.027*** (0.006)	-0.041*** (0.012)	-0.096* (0.048)
Bed <60 <sup>a</sup>	-0.205*** (0.012)	-0.266*** (0.033)	-0.138* (0.066)
Bed 120+ <sup>a</sup>	0.156*** (0.020)	0.199*** (0.027)	0.060 (0.059)
Nonprofit (yes = 1)	-0.105*** (0.016)	-0.167*** (0.033)	0.092 (0.090)
% Medicare days	-0.002* (0.001)	-0.0004 (0.001)	0.006 (0.005)
% Medi-Cal days	0.0002 (0.0004)	0.001* (0.0005)	0.005** (0.002)
% Self-pay days	-0.003*** (0.0004)	-0.002* (0.0007)	0.002 (0.002)
Occupancy rate	-0.003*** (0.0002)	-0.004*** (0.0005)	-0.012*** (0.002)
Chain (yes = 1)	0.119*** (0.010)	0.141*** (0.018)	0.059 (0.051)
Resident care needs	0.057*** (0.017)	0.122*** (0.033)	0.025 (0.102)
Per capita income <sup>b</sup>	0.001 (0.001)	-0.003 (0.002)	-0.009 (0.004)
Population 85+ <sup>b</sup>	-0.007*** (0.001)	-0.001 (0.001)	0.007* (0.003)
Competition (HI) <sup>c</sup>	-0.307** (0.116)	-0.091 (0.148)	0.670* (0.276)
Region Bay (yes = 1)	0.122** (0.038)	0.238*** (0.047)	0.190 (0.099)
Region Los Angeles (yes = 1)	0.462*** (0.066)	-0.076 (0.101)	-1.066*** (0.284)
Year 2000 <sup>d</sup>	0.084*** (0.006)	0.021 (0.012)	-0.286*** (0.067)
Year 2001 <sup>d</sup>	0.159*** (0.007)	0.080*** (0.013)	-0.543*** (0.072)
Year 2002 <sup>d</sup>	0.143*** (0.007)	0.033* (0.014)	-0.693*** (0.076)
Year 2003 <sup>d</sup>	0.110*** (0.009)	-0.013 (0.016)	-0.559*** (0.077)
Alpha/rho	0.165*** (0.008)	0.171*** (0.009)	0.086** (0.025)
Log-likelihood	-21,677.94	-15,034.53	-2,258.28

Notes: HI = Herfindahl index; QoC = quality of care; SE = standard error.

<sup>a</sup>Nursing homes with 60–119 beds are the reference.

<sup>b</sup>For scaling purposes, these variables were divided by 1,000 and added into the analytic model.

<sup>c</sup>Higher HI score refers to lower competition.

<sup>d</sup>Year 1999 is the reference.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

of 0.419 in the mean number of total deficiencies, 0.276 in the mean number of QoC deficiencies, and 0.024 in the likelihood of receiving serious deficiencies.

#### RN Staffing

Hypothesis 2—that a higher RN staffing level would be negatively related to deficiencies—was supported. RN staffing was negatively related to total ( $p < .001$ ) and QoC ( $p = .005$ ) deficiencies and also marginally related to serious deficiencies ( $p = .051$ ) (Table 3). In contrast, LPN staffing was positively related to total ( $p < .001$ ) and QoC ( $p < .001$ ) deficiencies but not related to serious deficiencies ( $p = .254$ ). When we examined licensed nurse staffing by combining RN and LPN staffing, we found it was positively related to total deficiencies ( $p < .001$ ) and not related to either QoC ( $p = .156$ ) or serious deficiencies ( $p = .769$ , data not shown). NA staffing levels were negatively related to all three deficiencies, whether RN and LPN staffing were entered into the equations separately or combined ( $p < .05$ ).

#### State Staffing Standard

Hypothesis 3—that meeting California's nursing home staffing standard would be negatively related to deficiencies—was partially supported. Meeting the standard was associated with a lower number of total deficiencies ( $p = .001$ ) and QoC deficiencies ( $p = .042$ ) but not with the

probability of receiving serious deficiencies ( $p = .085$ ) (Table 4). Upon further analysis, we found no difference in the probability of receiving serious deficiencies between nursing homes that consistently met the current California nursing staffing standard ( $n = 201$ , mean = 0.54,  $SD = 1.43$ ) and those that consistently failed to meet the standard ( $n = 210$ , mean = 0.52,  $SD = 1.42$ ). Meeting the CMS-recommended staffing standard, 4.1 or more total nursing HPRD, however, was negatively associated with receiving serious deficiencies ( $p = .023$ ).

#### DISCUSSION

This panel data study on the relationship between nursing staffing and deficiencies employed data over a 5-year period from California after the state passed legislation in 1999 on the new nursing home staffing standard. We conceptualized nursing staffing levels, structural quality indicators, as a nursing home's commitment to its nursing HRs. The study supports our hypotheses that a higher nursing staffing level would be associated with fewer deficiencies. The study strengthens the existing evidence, most of which comes from cross-sectional studies, for the relevance of nursing staffing levels to nursing home outcomes. Nursing staffing levels remain important factors in nursing homes' regulatory compliance, even when adjusting for unobserved, individual nursing home-specific heterogeneity.

Table 3. Estimation Results of the Relationship Between Meeting the State Nursing Home Staffing Standard and Deficiencies ( $N = 4,933$ )

	Total Deficiencies, Coefficient (SE)	QoC Deficiencies, Coefficient (SE)	Serious Deficiencies, Coefficient (SE)
Constant	2.971*** (0.063)	2.056*** (0.098)	0.244 (0.309)
Meeting state staffing standard (yes = 1)	-0.016*** (0.005)	-0.020* (0.010)	-0.009 (0.057)
Bed <60 <sup>a</sup>	-0.210*** (0.024)	-0.273*** (0.033)	-0.158* (0.066)
Bed 120+ <sup>a</sup>	0.156*** (0.020)	0.199*** (0.027)	0.055 (0.059)
Nonprofit (yes = 1)	-0.112*** (0.016)	-0.181*** (0.033)	0.049 (0.090)
% Medicare days	-0.002** (0.001)	-0.001 (0.001)	0.004 (0.004)
% Medi-Cal days	0.0002 (0.0004)	0.001* (0.001)	0.005* (0.002)
% Self-pay days	-0.003*** (0.0004)	-0.002* (0.001)	0.001 (0.002)
Occupancy rate	-0.003*** (0.0002)	-0.003*** (0.001)	-0.011*** (0.002)
Chain (yes = 1)	0.119*** (0.010)	0.142*** (0.018)	0.067 (0.051)
Resident care needs	0.055*** (0.017)	0.115*** (0.033)	-0.015 (0.102)
Per capita income <sup>b</sup>	0.0009 (0.001)	-0.003 (0.002)	-0.009* (0.004)
Population 85+ <sup>b</sup>	-0.007*** (0.001)	-0.001 (0.001)	0.007* (0.003)
Competition (HI) <sup>c</sup>	-0.309** (0.116)	-0.093 (0.149)	0.666* (0.279)
Region Bay (yes = 1)	0.121** (0.038)	0.237*** (0.047)	0.189 (0.100)
Region Los Angeles (yes = 1)	0.470*** (0.066)	-0.067 (0.101)	-1.059*** (0.284)
Year 2000 <sup>d</sup>	0.083*** (0.006)	0.019 (0.012)	-0.296*** (0.068)
Year 2001 <sup>d</sup>	0.157*** (0.007)	0.075*** (0.013)	-0.565*** (0.073)
Year 2002 <sup>d</sup>	0.140*** (0.007)	0.027* (0.013)	-0.723*** (0.078)
Year 2003 <sup>d</sup>	0.108*** (0.009)	-0.019 (0.016)	-0.593*** (0.081)
Alpha/rho	0.166*** (0.008)	0.172*** (0.009)	0.086*** (0.025)
Log-likelihood	-21,678.95	-15,036.37	-2,260.54

Notes: HI = Herfindahl index; QoC = quality of care; SE = standard error.

<sup>a</sup>Nursing homes with 60–119 beds are the reference.

<sup>b</sup>For scaling purposes, these variables were divided by 1,000 and added into the analytic model.

<sup>c</sup>Higher HI score refers to lower competition.

<sup>d</sup>Year 1999 is the reference.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

That total nursing staffing level was inversely related to all three deficiency measures strengthens the existing evidence of the importance of overall capacity of nursing care (Bates-Jensen et al., 2004; CMS, 2000, 2001; Harrington et al., 2000; Schnelle et al., 2004). The California nursing home staffing standard, 3.2 total nursing HPRD, may decrease the number of total deficiencies or QoC deficiencies, but it does not decrease the likelihood of receiving serious deficiencies. The findings inform us that although the current California nursing home staffing standard is higher than many other states, it may not be a meaningful staffing standard, unlike the CMS-recommended standard that can decrease serious harm or jeopardy to residents. Further studies on the California nursing home staffing standard are needed.

Nursing homes with higher RN staffing levels received significantly fewer total and QoC deficiencies. Higher licensed (RN and LPN) nurse staffing had either no relationship with or a positive relationship with the deficiencies. When RN and LPN staffing were examined separately, however, only RN staffing was negatively related to deficiencies. These findings imply that combining RN and LPN hours confounds their individual effects and that the real positive driving force for improving QoC is RN staffing (Anderson et al., 1998; Castle & Engberg, 2007; Weech-Maldonado et al., 2004). The effects of LPN staffing on quality are inconclusive: some studies report a positive

relationship (Zhang & Grabowski, 2004); others find a negative relationship (Castle & Engberg, 2007); still others find no relationship (Anderson et al., 1998; Arling, Kane, Mueller, Bershadsky, & Degenholtz, 2007; Harrington et al., 2000). Few studies explain why LPN staffing is not or negatively associated with quality, even when RN and NA staffing are adjusted for.

Considering that the current federal and state regulations often regard RN and LPN as one category, that is, licensed nurses (CMS, 2000, 2001; Mueller et al., 2006), nursing homes might be using LPNs not to complement RN staffing but rather to substitute for RNs. As such, nursing homes might fill most licensed nurse positions with LPNs to save on labor costs and hire only the minimum number of RNs required by regulations. If such substitution persists, higher LPN staffing may contribute to decreasing quality rather than increasing quality. Given that RNs have more leadership and assessment skills than LPNs (Anderson et al., 1998; Weech-Maldonado et al., 2004), further study is needed to examine whether and to what extent such substitution exists and what effects, if any, it has on quality and cost of care.

As with RN staffing levels, NA staffing levels were also negatively related to all three types of deficiencies. Approximately 70% of direct care is provided by NAs, including assisting with activities of daily living (ADLs) such as bathing, eating, dressing, and other nonskilled care needs (CMS, 2000,

Table 4. Estimation Results of the Relationship Between RN Staffing Level and Deficiencies ( $N = 4,933$ )

	Total Deficiencies, Coefficient (SE)	QoC Deficiencies, Coefficient (SE)	Serious Deficiencies, Coefficient (SE)
Constant	3.023*** (0.070)	2.148*** (0.108)	.462 (0.339)
RN hours	-0.066*** (0.015)	-0.087** (0.031)	-0.245 (0.126)
LPN hours	0.119*** (0.012)	0.110*** (0.024)	0.121 (0.106)
NA hours	-0.059*** (0.008)	-0.075*** (0.016)	-0.139* (0.071)
Bed < 60 <sup>a</sup>	-0.204*** (0.024)	-0.264*** (0.033)	-0.127 (0.066)
Bed 120+ <sup>a</sup>	0.159*** (0.020)	0.202*** (0.027)	0.068 (0.059)
Nonprofit (yes = 1)	-0.101*** (0.016)	-0.162*** (0.033)	0.109 (0.090)
% Medicare days	0.002* (0.001)	-0.0002 (0.001)	0.007 (0.005)
% Medi-Cal days	0.0001 (0.0004)	0.001* (0.001)	0.005* (0.002)
% Self-pay days	-0.003*** (0.0004)	-0.002* (0.001)	0.002 (0.002)
Occupancy rate	-0.003*** (0.0002)	-0.003*** (0.001)	-0.011*** (0.002)
Chain (yes = 1)	0.121*** (0.011)	0.143*** (0.019)	0.066 (0.052)
Resident care needs	0.046** (0.017)	0.108** (0.034)	0.012 (0.103)
Per capita income <sup>b</sup>	0.002 (0.001)	-0.002 (0.002)	-0.006 (0.004)
Population 85+ <sup>b</sup>	-0.007*** (0.0006)	-0.001 (0.001)	0.006 (0.003)
Competition (HI) <sup>c</sup>	-.281* (0.116)	-.067 (0.149)	.687* (0.277)
Region Bay (yes = 1)	0.128** (0.039)	0.239*** (0.048)	0.188 (0.101)
Region Los Angeles (yes = 1)	0.507*** (0.066)	-0.015 (0.101)	-0.938** (0.289)
Year 2000 <sup>d</sup>	0.083*** (0.007)	0.020 (0.013)	-0.291*** (0.067)
Year 2001 <sup>d</sup>	0.156*** (0.007)	0.077*** (0.013)	-0.552*** (0.073)
Year 2002 <sup>d</sup>	0.140*** (0.008)	0.030* (0.014)	-0.702*** (0.078)
Year 2003 <sup>d</sup>	0.106*** (0.010)	-0.017 (0.017)	-0.571*** (0.080)
Alpha/Rho	0.165*** (0.007)	0.171*** (0.009)	0.085** (0.025)
Log-likelihood	-21,661.62	-15,025.52	-2,254.82

Notes: HI = Herfindahl index; QoC = quality of care; SE = standard error.

<sup>a</sup>Nursing homes with 60–119 beds are the reference.

<sup>b</sup>For scaling purposes, these variables were divided by 1,000 and added into the analytic model.

<sup>c</sup>Higher HI score refers to lower competition.

<sup>d</sup>Year 1999 is the reference.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

2001). The findings from this study suggest that nursing home quality may be improved by a team of RNs and NAs, the former playing a significant role in assessing, directing, and monitoring in order to prevent significant and precipitous deterioration of residents' health and functionality, and the latter delivering care to the residents under RN supervision (Anderson et al., 1998; Brannon et al., 2007; Rantz et al., 2004). Further studies are needed on the effects of RN-to-NA mix, NA caseload, the maximum number of NAs that can be monitored by an RN, and the role of the LPN as co-team leader.

Limitations of the study include sole examination of deficiencies noted from nursing home survey inspections. Properly risk-adjusted patient outcomes may be more sensitive quality measures. Deficiency use may vary by geographical location, but this study focused only on data from California. The study took steps to improve the reliability of the deficiency and nursing staffing data by counting state as well as federal deficiencies and obtaining staffing data from the cost report instead of the OSCAR. However, as with any secondary data analysis, reliability remains an issue. Nurse turnover and agency-nurse use, potentially important to QoC, were not included; and potential interaction effects between nursing staffing and other staffing characteristics, such as turnover, stability, and agency-nurse use were also not observed (Arling et al., 2007; Castle & Engberg, 2007).

Our findings do not confirm a causal relationship between nursing staffing levels and deficiencies. The potential dynamic nature of the relationship between nursing staffing and deficiencies was not fully explored. The study findings, based on California nursing home data, may not be able to be generalized to the rest of the nation.

In conclusion, the findings of this study suggest that total nursing staffing level is a predictor of deficiencies and that the current federal and state nursing home staffing standards, which are lower than the standard recommended in an Abt study for the CMS (4.1 total nursing HPRD) (2001), may not prevent serious harm to residents. An important question for future research would be whether there is a point between 3.2 and 4.1 total nursing HPRD that could lead to a significant reduction in serious deficiencies. The study findings also suggest that not only the total nursing staffing standard but also the current RN staffing standard should be examined for effectiveness. The current federal staffing standard requires an RN for only eight consecutive hours a day; however, many homes have a waiver for this requirement (Harrington, 2005b; Mueller et al., 2006). Only 12 states require an RN on duty 24 hr a day, with or without a bed number requirement. Given the latitude permitted to nursing homes with regard to RN staffing, the regulatory standards may be providing nursing homes with a disincentive to hire RNs and permitting them to substitute RNs with

LPNs. The findings of this study suggest that the practice of substituting LPNs for RNs may be efficient in cutting labor costs but is not effective in maintaining or improving QoC. Despite concerns about the 25% decrease in average RN staffing levels in nursing homes since 1997 (Harrington, 2005a), the pressure to reduce Medicaid expenditure in nursing homes and doubts about the effectiveness of higher staffing standards on QoC may be inhibiting discussion of strengthening RN staffing from moving forward (CMS, 2001; Konetzka and Yi, 2004; Zhang & Grabowski, 2004). Given the complex nature of staffing and quality, further research on the relationship of RN staffing level to nursing home resident outcomes is needed.

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# Developing scaled tools for residential and nursing home inspection: feasibility study

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## Abstract

**Purpose** – This study explored the feasibility of developing scaled inspection tools for use during external inspection of health and social care facilities to give improved accuracy in identifying facilities “at risk”, a tool for risk-adjusted frequency of inspection, and greater consistency of judgements.

**Design/methodology/approach** – This paper summarises the development through working groups and workshops involving 20 experienced inspectors (nurses and social workers) of the Regulation and Quality Improvement Authority who inspect the 206 nursing and 182 residential care homes in Northern Ireland. A brief evaluation survey, including response to a case vignette, gathered inspectors’ views after using the tools for six months.

**Findings** – Eight two-dimensional Scaled Inspection Tools were created, each embodying a scale of performance (seriousness of risk issue) and a scale of the ability of the facility to manage that issue, each axis comprising four points. The Scaled Inspection Tools were used for on-site inspections during 2017–18. Evaluative comments were generally positive. The case vignette seemed to highlight greater risk aversion amongst newer inspectors.

**Research limitations/implications** – The creation of scaled inspection tools adds credibility to the potential for developing risk-based governance in service regulation. Further testing of domains and their scope is required.

**Practical implications** – Prompts for each domain were found essential to guide inspectors. Despite the challenge of change, inspectors became enthusiastic about use for evaluating risks, and managers about improvements in consistency of inspection.

**Social implications** – Knowledge derived from statistical approaches needs to be incorporated into inspection and regulation, just as in other aspects of professional practice.

**Originality/value** – Scaled inspection tools, with two orthogonal axes corresponding to seriousness of risk and ability to manage the risk (inverse of likelihood of harm), proved acceptable and intuitive in use. The study gives credibility to the possibility of developing screening and surveillance approaches to risk-based governance in service regulation.

**Keywords** Benchmarking, Community care, Governance, Government regulation, Health and care quality, Inspection standards, Licensure, Northern Ireland, Nursing homes, Quality assurance, Quality improvement, Regulation of health and social care, Residential care, Risk management, Social care services

**Paper type** Case study

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## Plain language summary

As the complexity of health and social care services increases, increasingly sophisticated approaches to regulating and ensuring standards of services is required. This feasibility study developed scales to assist in appraising quality and risk during inspections of nursing and residential homes.

## Introduction

The development of effective and efficient ways to ensure the provision of safe and compassionate care is a priority for policy makers and managers in health and care services (MacVane Phipps, 2020). The knowledge and skills of professionals in making decisions about complex needs, risks and contexts need to be matched by organisational systems that support this essentially human endeavour. It is no longer regarded as sufficient for professions to regulate themselves (Dixon-Woods *et al.*, 2011), and external regulatory systems are developing to promote quality. External regulatory systems are now viewed generally as an essential aspect of health and social care systems to complement staff training and internal management systems of provider organisations (MacVane Phipps, 2019). In relation to the long-term care of older people, the World Health Organisation highlights that: “Ensuring the quality and effectiveness of . . . care requires appropriate guidelines, protocols and standards. It . . . [needs] mechanisms to accredit care providers (both institutional and professional) . . .” (World Health Organisation, 2017, p. 20; para 87).

### *Regulation and inspection of services*

External regulation of health and care services is designed to ensure quality and create public confidence in services (Flodgren *et al.*, 2016). As the number, diversity and complexity of health and social care services grows, increasingly sophisticated processes are required by regulators to monitor standards, improve quality and manage risks (Sparrow, 2000; O'Dwyer, 2016). Despite some agreement on principles such as accountability, transparency and proportionality in the design of regulatory systems (Schewepenstedde *et al.*, 2014), operationalising these presents challenges such as in defining good care, creating useful standards and designing effective regulatory processes (Braithwaite *et al.*, 2019). In particular, there are demands to streamline regulatory approaches (Hampton, 2005) and to “predict harm” so as to prevent the occurrence of adverse events, requiring the development of statistical approaches to support professional judgements (Søbjerg *et al.*, 2020). These developments fit within initiatives towards *risk-based governance* in public services (Rothstein *et al.*, 2012). The time is ripe for broader governance approaches in health and social care (Arah *et al.*, 2003; Donabedian, 1996; Taylor and Campbell, 2011) to be applied more systematically to regulatory systems. In relation to the long-term care of older people, regulation is an important dimension in the development of robust risk management and quality assurance systems (Davies *et al.*, 2020; Frost *et al.*, 2020; Taylor and Donnelly, 2006).

### *Risk detection in regulation*

Three overarching approaches to statistical methods in health and social care regulation have been outlined by David Spiegelhalter and colleagues (Spiegelhalter *et al.*, 2012):

- (1) *Rating*: creating a composite score or ranking from risk factors, facilitating comparison between services in terms of an overall quality measure, although general measures may mask specific risk issues and the approach may prove contentious to private providers who do not score well (Griffiths *et al.*, 2017).
- (2) *Screening*: identifying data outliers that indicate risk and quality issues, although identifying these requires a “norm” of similar services against which to measure variation (Bardsley *et al.*, 2009; Proudlove *et al.*, 2019).

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- (3) *Surveillance*: monitoring service data “continuously” to enable risk factor analysis and methods such as statistical process control from other industries to be applied, although this will inevitably give some false positive errors (Bardsley and Sherlaw-Johnson, 2016; Swets, 1986).

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#### *Scaled inspection tools*

All of the above statistical approaches require reliable scaled (interval) data for optimum effectiveness. This presents challenges, particularly in community health and social care services (Smithson *et al.*, 2018, p. 35). One promising approach is to build on the expertise of inspectors by creating scaled inspection tools to supplement or give structure to the conventional narrative record of inspection findings as reported in a recent literature review which has been used to inform this project (Cunningham *et al.*, 2020). That review by Cunningham *et al.*, using robust search methods, identified the limitations of the existing knowledge base on the topic. Despite the robust search methodology, no papers were retrieved in that review on the use of scales during external inspection processes of community health and social care facilities. The development of inspection scales should improve transparency of inspection, as well as providing quantitative data to support governance informed by statistical methods.

#### *Northern Ireland context*

This paper reports on a feasibility study (as part of a wider organisational transformation process) to develop scaled inspection tools for inspectors of residential and nursing homes who work at the *Regulation and Quality Improvement Authority* (RQIA) for Northern Ireland. The RQIA is an “arms-length” body accountable to government, with statutory duties and powers to review and regulate public, not-for-profit and private sector health and social care services. The services that are inspected include hospitals; mental health and learning disability services; health care services in justice settings; and – in community settings – nursing homes; residential homes (including those for children and people with mental ill-health or disability); day and domiciliary support schemes; nursing agencies; voluntary adoption agencies; and adult placement agencies. RQIA carries out inspections of services that are required to be registered based on minimum care standards, and also reviews public health and social care services. No scaled inspection tools were in use at the start of the project, and the concept was novel within the organisation.

#### *Developing risk-based governance*

At the start of the project it was determined that the data held by the regulatory body was predominantly nominal data (such as location and categories of establishment) and narrative inspection reports. There was a limited amount of interval data such as occupancy levels and counts of notifiable incidents such as accidents. Additional interval-scale data was required to inform the development of statistical approaches to regulation. Developing the *Scaled Inspection Tools* (SIT) described here is a part of RQIA’s developing *Risk-Adjusted, Dynamic and Responsive* (RADaR) approach to regulation, which aims not only to be responsive to signals of concerns, but also (over time) to develop risk-adjusted frequency of planned inspections based on wider risk measures. This paper focuses on a project to create scales for inspection factors that might indicate concern about harm occurring, as required for a *screening* or *surveillance* approach, rather than quality in general as would be required for a *rating* approach (Allan and Forder, 2015).

#### **Aim**

The aim of the feasibility study described in this paper was to develop tools for gathering scaled data during inspection of residential and nursing homes to: (1) enable inspection data

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to be incorporated within a dynamic *surveillance* approach to identifying facilities *at risk*; (2) improve the consistency of inspection; and (3) inform the development of risk-adjusted frequency of inspection.

### Method

An organisation development approach was used, embodying change management activities such as: external facilitation of the process; establishing a vision and sense of urgency; generating short-term wins; and linking this project to the broader organisation strategy which in this case included an anticipated change in statutory regulatory requirements (Crawford and Nahmias, 2010; Pollack and Algeo, 2014). Given the central role of human inspectors in the process, particular attention was paid to the interplay between change leadership and organisational change processes (Griffiths-Cooper and King, 2007). Project stages were devised using learning from well-established models of change management (Mento *et al.*, 2002).

#### *Stage 1: identifying risk domains*

Seven experienced inspectors, including two senior inspectors and two more senior managers, were facilitated in a series of Working Group sessions to give their views on which inspected factors they perceived as most likely to have undesirable outcomes, and how these domains were best conceptualised in terms of risk of harm. The inspectors were selected as having substantial experience in the inspection of nursing and residential care homes, as well as availability and being perceived by managers as able to articulate their experiences. The outcomes from these Working Group sessions were taken to Workshops comprising all of the 20 nurses and social workers of the *Care Homes Team* (whose role is the inspection of residential and nursing homes), as well as appropriate managers. These sessions were informed by published literature (Chen and Grabowski, 2015; Cunningham *et al.*, 2020; Kim *et al.*, 2009) and by quantitative information on risk factors from an audit of the organisation's administrative data.

#### *Stage 2: development of two-dimensional scales*

As the Workshop series progressed, a view gained ground that to judge the regulatory significance of a risk, it was important to consider not only the severity of possible impact on service users, but also the capacity of the facility to manage or improve the situation. This was developed initially for one domain and then extended to others. It was confirmed to the group by the external facilitator that this two-dimensional structure for risk factors was equivalent to the standard "risk matrix" used for risk management purposes. In this regulatory situation, the concept of "likelihood of the problem occurring" translates into an inverse measure: appraisal of the robustness of measures in place in the establishment to manage or prevent dangerous situations where harm may occur.

#### *Stage 3: development of guidance prompts*

During later Workshops a need was identified for prompts on the completion of scales to aid clarity. Guidance prompts were developed by a subgroup of senior inspectors, and refined when implementation was reviewed.

#### *Stage 4: measures of outcomes*

Data on formal "undesirable outcomes" as defined by regulations made under statute (i.e. *Serious Concern Meetings* with home managers or owners, and *Enforcement Notices*) is

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limited, so a proxy measure was used for developmental purposes. Inspectors were asked at the end of the inspection how long a time interval there should be before the next inspection: 3, 6, 9 or 12 months (the current regulations provide for a minimum of two inspections per year).

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#### *Stage 5: implementation of scaled assessment tools*

From April to September 2017 (six months), the Scaled Inspection Tools were completed in respect of 206 of 248 (83%) Nursing Homes and 182 of 227 (80%) Residential Care Homes in Northern Ireland, in addition to completion of the standard inspection documentation.

#### *Stage 6: consistency of inspection standards*

The interim findings were appraised in October 2018. A summary was presented to a group of 19 inspectors who attended a facilitated Workshop which gathered feedback on use of the scales. The Workshop sought to learn also from outlier inspections where the indicated proposed time to next inspection was more than two standard deviations from the mean as predicted by the aggregate of the eight risk scales (multiplying the scores on the orthogonal axes to give the score for that domain).

#### *Stage 7: evaluation of use of scaled inspection tools*

A brief evaluation questionnaire was sent to the 20 inspectors of residential and nursing homes after the first year of use. This included an anonymised inspection report (vignette), on the basis of which inspectors were asked to complete SIT scores.

#### *Ethical approval*

Ethical and operational approval was granted by the senior management of RQIA.

### **Method of analysis**

The findings of the earlier stages were analysed by the change facilitator in discussion with senior managers and information staff of the organisation at suitable time intervals. Simple counts were used for survey analysis as this involved a small number of respondents.

### **Findings**

#### *Organisational context*

Despite the usual challenges of organisation change processes within a busy working environment, the inspectors became enthusiastic about the use of scales for key inspection domains. In general they found that the use of the scales supported rather than undermined professional judgement. The iterative development process involving managers and front-line inspectors was generally viewed as a successful approach.

#### *Identification of risk areas*

In order to create interval-scale inspection data on the most important risks, the Working Group considered first domains that are clearly regulated such as: care risks, fire risks, individualised care, medicines management, notifiable events; record keeping, and provision of a safe environment. The discussion then focused on factors that might indicate residents coming to harm such as falls, choking or hospital admission. The discussion was broadened to identify additional domains that might correlate with serious concerns, based on participants' experiences of conducting inspection processes, such as: end-of-life care; infection control and wound management; nutrition and food management; pain

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management; staffing; leadership; change of manager or owner; a new service; repeated inspection recommendations; whistleblowing; and issue of an *Enforcement Notice*.

For this feasibility study, these domains were then narrowed to factors that could be operationalised in an inspection tool with clear indicators of levels of concern. This happened in tandem with re-considering the conceptualisation of factors. For example, should nutrition and hydration be treated as one domain or as two? With an emphasis on risk rather than on quality in general, this process led to the identification of eight factors:

- (1) Care Documentation
- (2) Falls
- (3) Infection Prevention and Control
- (4) Management Arrangements
- (5) Nutrition
- (6) Restrictive Practices
- (7) Staffing Arrangements
- (8) Wound Management

In terms of scaling, it was agreed that long scales would give limited standardisation due to issues in defining the points, and a three-point scale would be only marginally better than the normal two-point dichotomisation into “good enough” or “not good enough”. A four-point scale for levels of seriousness of possible harm was decided upon, and was developed for each of the eight domains. The language for scale points was harmonised across domains as the project progressed rather than being imposed on the domain working groups at the start.

#### *Two-dimensional scales*

As the inspectors considered more closely how the scales would be used in practice, two-dimensional scales were suggested. These were created, the y-axis relating to seriousness of concerns and the x-axis relating to the capacity to manage or improve the situation. The result was eight two-dimensional inspection scales, each axis having four points. An example is shown in [Figure 1](#).

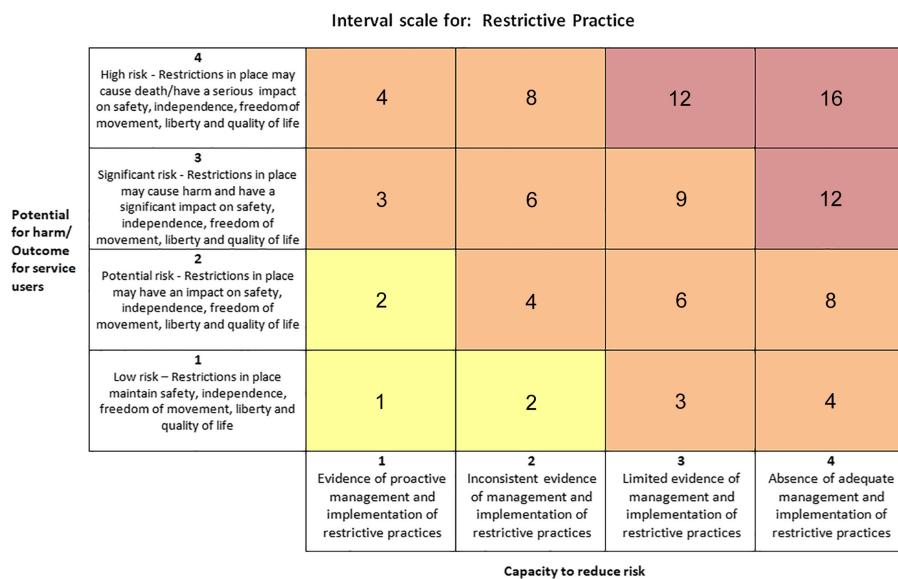
#### *Guidance*

It became apparent during the project that guidance prompts would help to standardise interpretation of the scales. These were developed by the working groups, and an example of the prompts in relation to restrictive practice is illustrated in [Figure 2](#). These were found to be a key component in supporting consistent use of the scales.

#### *Improving consistency of inspection*

At the interim review in November 2018 the 123 inspections carried out to that time were reviewed by the team responsible for information and statistics. Individual inspection scores were plotted against the proposed time to next inspection. Ten inspections (8%) by five inspectors were identified where the indicated proposed time to next inspection was more than two standard deviations from the mean as predicted by the aggregate of the eight risk scales (see [Figure 3](#)).

These outlier inspections were discussed by the responsible inspectors, each with a small group of colleagues at the interim review Workshop. Issues identified were the level of imminent risk to residents; the level of confidence in the ability of the service to effect the required change; and the ability of the inspector to validate the service’s response to the required improvement without having to visit the service. This process led to refinement of



**Figure 1.**  
Example of two-dimensional scale for restrictive practice

<b>Restrictive Practice</b>	
<b>Evidence sources</b>	<b>Best Practice Guidance</b>
<ul style="list-style-type: none"> <li>✓ Misapplication, misuse, lack of training, environment institutional restrictions, attitudes, approach</li> <li>✓ Multidisciplinary input to decision making quality of life</li> <li>✓ Risk assessments/ care plans are in place</li> <li>✓ There is evidence of continued review of the need for restrictions</li> </ul>	<ul style="list-style-type: none"> <li>• Adult Safeguarding – Prevention and Protection in Partnership</li> <li>• NIASP Guidelines</li> <li>• DOH Guidance – Deprivation of Liberty</li> <li>• RCN – Principles of consent guidance for nursing staff</li> <li>• RCN – Restrictive Practice</li> </ul>

**Figure 2.**  
Example of prompts for restrictive practice domain

the language of some scales and guidance prompts. These Workshops were a valuable learning process and helped the team of inspectors to move towards greater consistency of knowledge and inspection practice.

### *Usability*

Eight (six nursing home, two residential home) inspectors completed the usability questionnaire. Respondents reported that the time taken to complete the Scaled Inspection Tools (having completed their normal inspection) were (in intervals of 5 min) 20, 15, 10 (three respondents) and 5 min (three respondents). Comments by inspectors were predominantly positive, highlighting such aspects as:



**Figure 3.**  
Distribution of Scaled Inspection Tool scores against the proposed inspection frequency for (a) nursing homes; and (b) residential care homes

- (1) more easily identifying substantial risks and areas of concern;
- (2) identifying aspects of the facility that are well managed;
- (3) helping to inform the conduct of the next inspection and scheduling of inspections;
- (4) identifying areas for improvement to review at next inspection; and
- (5) the value of an evidence base to support regulatory activities.

About two-thirds of respondents thought that the Scaled Inspection Tools would enable inspectors to predict undesirable outcomes more accurately. Suggested improvements included making provision for qualitative statements to contextualise the SIT scores; amending wording where scaling was difficult; and highlighting the anticipated benefits when the data were incorporated into the computer system on which other inspection data are managed. Through the development process, it was recommended that the proxy outcome measures (3, 6, 9 and 12 months to next inspection) might be better amended in future to three categories: *low, medium and high*, similar to more intuitive understandings of “risk” in other health and care contexts (Taylor and Moorhead, 2020).

A vignette was completed (anonymously) as part of the evaluative survey by six inspectors who had used the Scaled Inspection Tools completed. Findings are illustrated in Table 1. The number of respondents was too small for meaningful statistical analysis, but on a number of domains the scores of recently appointed inspectors seemed to rate the risks more seriously than did inspectors with longer experience.

Inspector	1	2	3	4	5	6	Scaled inspection tools: feasibility study
Years experience	<1	<1	<1	<1	14	3	
Completed risk assessments	1	2	2	2	10	39	
Falls – Capacity	1	1	1	1	1	1	
Falls – Outcome	1	1	1	1	1	1	
IPC – Capacity	1	1	1	1	1	1	
IPC – Outcome	1	1	1	1	1	1	
Nutrition – Capacity	2	3	3	3	2	2	
Nutrition – Outcome	3	3	2	3	1	2	
Restrictive Practice – Capacity	1	1	1	1	1	1	
Restrictive Practice – Outcome	1	1	1	1	1	1	
Staffing Arrangements – Capacity	1	1	1	1	1	1	
Staffing Arrangements – Outcome	1	1	1	1	1	1	
Care Documentation – Capacity	3	4	3	3	2	2	
Care Documentation – Outcome	4	3	3	3	1	2	
Wound Management – Capacity	2	3	2	3	2	2	
Wound Management – Outcome	3	3	2	3	1	3	
Management Arrangements – Capacity	1	1	1	1	1	1	
Management Arrangements – Outcome	1	1	1	1	1	1	
Falls Score	1	1	1	1	1	1	
IPC Score	1	1	1	1	1	1	
Nutrition Score	6	9	6	9	2	4	
Restrictive Practice Score	1	1	1	1	1	1	
Staffing Arrangements Score	1	1	1	1	1	1	
Care Documentation Score	12	12	9	9	2	4	
Wound Management Score	6	9	4	9	2	6	
Management Arrangements Score	1	1	1	1	1	1	
Total Score	29	35	24	32	11	19	
Average RADaR Score	30				15		

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**Table 1.**  
Consistency of  
inspectors' ratings of a  
facility based on a  
written inspection  
report

## Discussion

The development of structured inspection tools for regulatory bodies parallels the development of structured assessment tools to support decision making in other domains of health and social care (Taylor, 2012a, b). Although human (professional) judgement has to be recognised for its ability to conceptualise situations and manage complexity, approaches are required to address variance in professional judgement in governance contexts (Taylor, 2017b). Despite the challenges in seeking to quantify risks relating to human behaviour (Schrödter *et al.*, 2020), greater structure should lead to increased consistency by the inspectors as well as facilitating communication with service providers and within supervisory and governance processes. The identification of the domains of risk confirmed findings in the literature that management and governance processes were a key aspect of quality care (Furnival *et al.*, 2018), good management correlating with fewer problems in other domains.

It was delightful that the Working Groups, based primarily on their experience of inspection work, developed the idea of two-dimensional scales for each risk domain. This parallels the now standard approach of considering risk in terms of orthogonal axes incorporating both consequences (seriousness) and likelihood of (re-)occurrence (Huihui *et al.*, 2010; Taylor, 2017a). In this case the *likelihood* scale was expressed as its inverse: the capacity to manage the risk effectively, i.e. reduce the likelihood of occurrence. The identification of the capacity to manage risks as a key feature of assessing each risk domain confirmed the current interest in self-regulatory mechanisms and improvement capability within provider

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organisations. For statistical modelling, the two dimensions of each scale might be added or multiplied.

The Scaled Inspection Tools have been used by inspectors for two years at the time of writing and were found useable in practice beyond the initial period on which this paper focuses. The scales typically took about 10 min to complete, following a “normal” narrative inspection report. The team of inspectors found the scales valuable to assist in consistent judgement of levels of risk. There remains, of course, the need for professional judgement (based on the training and expertise of inspectors) and supervisory processes to contextualise and make effective use of the scores.

In terms of limitations, the scales were developed to cover both residential and nursing homes. This promoted common understanding between inspectors from nursing and social work professions, and was beneficial for team building and developing consistency of approach. However separate scales might give greater precision. The iterative process suited the organisational environment. Facilitating use of the expertise of these experienced professionals proved an effective development process. The challenge in the process was to keep the wider team informed whilst doing focused work in the smaller Working Groups. The eight factors included six factors focusing primarily on safety and two factors focusing primarily on services being well-led, omitting factors focusing on effectiveness or compassionate services. This reflected the conscious focus on risk rather than overall quality, but may also reflect the statutory regulatory context in which the study was conducted. Arguably, the focus on the possibility of harm might bias inspectors towards risk-aversion when their overall task is to improve the quality of services, although the orthogonal scale gave recognition to “capacity to improve”. The scope might usefully be extended to include domains relating to medicines management and admission processes.

To date the scales have been used following the usual narrative report, but a next step will be to integrate these. Their use for statistical purposes will depend, of course, on whether they are considered as interval or as ordinal scales. There was no weighting of domains; their use was to inform the inspectors’ judgements. Weighting is an area for future development, although this is not a limitation if the only purpose is to highlight outliers on individual risk factors. Generalisability may be limited by the extent to which other jurisdictions have defined care standards, although the risk factors considered went beyond these to include domains common to the care of older people.

As professionals and managers seek evidence to inform health and social care decisions, the potential of statistical data within regulation needs to be recognised. However there are challenges as well as potential benefits in statistical approaches to predicting harm through risk factor statistics, both increased through the use of “big data” and machine learning approaches. This feasibility study demonstrated the potential for including statistical data from scaled inspection tools as part of screening and surveillance approaches to regulation, giving a clear connection between the data and the observed realities reported by inspectors in their daily work.

The Working Group sessions and Workshops were a very worthwhile process for helping the inspectors to move towards greater consistency of inspection by providing a forum and tools to facilitate discussion. In particular the discussion of outlier inspections (with a supervisor or colleagues) was facilitated in a more objective manner than could occur with purely narrative inspection reports. The active engagement created ownership, and the approach seemed more effective than trying to create standardisation through ever-tighter procedural rules (Munro, 2010). The need for training of inspectors was perhaps highlighted by differences in scoring between novice and experienced inspectors, although the results on this are tentative. This result, however, confirms findings elsewhere in health and social care that workers with less experience are more risk averse than those with more experience (Hennessy, 1993).

This initiative provides some evidence for the viability and usefulness of developing screening and surveillance approaches to the use of statistical methods in health and social care regulation (Spiegelhalter *et al.*, 2012). In particular the project indicates a way forward for strengthening the potential of risk-adjusted frequency of inspection as an aspect of risk-based governance. The study highlighted the scope for developmental research in areas such as: confirmation of domains that best indicate *risk*, and the differing conceptualisations of this term; the use by inspectors of more structured assessment tools; the use of risk statistics by care professionals; the effect on risk communication of the development and use of scaled inspection tools; and the use of such tools within supervisory processes.

As with all structuring of assessment using tools, attention needs to be paid to the potential de-skilling effect on inspectors (Taylor, 2020), although that did not present as a problem in this study. The scaled inspection tools seemed to facilitate rather than undermine professional judgement. This perhaps reflected the level of experience of the professional inspectors using the tools. It may be that newly qualified workers are more inclined to let their judgement be dominated by the structure of an assessment tool, having less confidence to make use of the tool appropriately (Devaney *et al.*, 2017). The tools also provided a useful platform to facilitate discussion of key issues in supervision and with colleagues (such as in learning sets), paralleling encouraging aspects of use of assessment tools with patients and clients (Taylor and McKeown, 2013). Such developments might usefully be linked to the Dreyfus model of skill acquisition (Benner, 2004) to generalise our understanding of the use of inspection tools.

In principle, society should welcome the application of “science” (knowledge) to a field of human endeavour such as care home inspection. More sophisticated methods are required to address the increasing complexity of our society. However there are challenges to the use of risk factors, particularly when statistical approaches develop towards predictive analytics using “big data” and machine learning. The implementation of regulatory methods requires a consideration of the perspectives of various stakeholders, although the scientific rigour of the methods must remain the key issue.

## Conclusion

Scaled inspection tools, with seriousness of possible harm and potential to manage the risk as two orthogonal axes, proved acceptable and intuitive in use in relation to regulation of nursing and residential homes. Prompts for each domain were found essential to guide inspectors. These two aspects will be useful for future scale development initiatives. The developmental process illustrated the potential for engaging inspectors in scale development through an iterative process. Despite the usual challenges of organisation change processes, inspectors became enthusiastic about their use for evaluating risks, and managers about the potential for improving consistency of inspection. The feasibility study demonstrated the possibility of attaining scaled data relating to inspection visits as one data source to inform screening or surveillance approaches to regulation, thus starting to address one key challenge to such developments. On this project, the scaled inspection tools seemed to facilitate rather than undermine professional judgement, giving encouragement to the use of assessment tools with experienced professionals. Overall this initiative provided positive evidence to support the development of risk-based governance in inspection and regulation of residential and nursing homes for the benefit of older people and society in general.

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# Subverting Administrative Oversight: Campaign Contributions and Nursing Home Inspections

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## ABSTRACT

I study the consequences of interest group campaign contributions for administrative oversight. Contributions have been linked to a number of political outcomes of concern to organized interests, but almost exclusively in the legislative branch or electoral arena. I therefore join an emerging literature that demonstrates that campaign contributions and lobbying may also influence actions taken by the administrative branch. Unlike previous studies, however, I study influence in state bureaucracies and at the level of individual groups. Specifically, I test whether campaign contributions to state elected officials influence the outcomes of annual state inspections of skilled nursing facilities in sixteen states. I also consider the differing effects of contributions to the legislative and executive branches. Regression analysis of inspection results with controls for facility characteristics provides evidence that contributing facilities receive better overall inspection results, but there is strong evidence that they are cited for fewer severe problems. Further, contributions to legislators reduce overall problems while those to the governor reduce severe ones.

# 1 Introduction

The expansion of the interest group universe in Washington, D.C. and in state capitols over the last decades has led to persistent concerns about the potential influence that organized interests might have over government policymaking. Groups mobilize, lobby, and make campaign contributions for a variety of reasons, but most scholars agree that a crucial motivation for their actions is influence on government decisions. Tens of thousands of groups spend billions of dollars to lobby various levels of government; it would not be surprising, then, if these groups succeeded in getting something, at least on average, in return for their efforts.

Historically, political science research in this area has focused on the potential for actions by organized interests to undermine the link between representatives and their constituents by determining whether and under what conditions lobbying or campaign contributions influence legislators' actions. While the findings of this literature can best be described as heterogeneous, it appears to be reasonable to conclude that, at least under some circumstances, lobbying and campaign contributions do influence legislators. In particular, campaign contributions may occasionally increase the chance that legislators vote in accordance with the wishes of contributing groups, increase the chance that the legislator grants the group access for face to face lobbying opportunities, or increase the amount of time the legislator spends working towards ends the group prefers.<sup>1</sup>

Yet the legislature is not the only branch of government that organized interests might wish to influence. Once legislation is passed, it is often filled in and, ultimately, enforced by agents in the administrative branch. Groups therefore have strong incentives to attempt to influence administrative decision-making as well. Consistent with these incentives, groups report that lobbying the bureaucracy is very important (1991) and lobbying reports indicate that the majority of them do lobby it (Boehmke, Gailmard and Patty 2006). Relative to its legislative cousin, though, the study of interest group influence on administrative actions

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<sup>1</sup>See Baumgartner and Leech (1998, Ch. 7) for a review of the literature on campaign contributions and legislators' actions.

remains in its infancy.

There are a number of different mechanisms by which scholars in this emerging field have argued that groups can influence administrative actions. In the context of notice-and-comment rulemaking, for example, Yackee and Yackee (2006) and Golden (1998) provide evidence that comments submitted by interested parties can shape the content of final rules. Gordon and Hafer (2005) constructs a formal model in which campaign contributions signal strength that administrators take note of when performing oversight. Finally, Hall and Deardorff (2006) rely on the legislative connection, arguing that groups lobby legislators to take actions targeting bureaucrats; empirical evidence (Hall and Miler 2006) confirms that these efforts by legislators do take place.

In this paper I contribute to our emerging understanding of interest group influence on the administrative branch by studying the effect of campaign contributions on oversight of skilled nursing facilities. These data include results from three recent inspections for all six thousand nursing homes from sixteen states supplemented with data on campaign contributions from each nursing home. While regulation occurs mainly at the Federal level, inspections remain under the purview of state officials. With a common regulatory standard, I am not only able to extend findings on bureaucratic influence by individual interests at the Federal level (e.g., Gordon and Hafer 2005) to the state level for the first time, but also to leverage differences across states to better understand the mechanism behind such influence.<sup>2</sup> In particular, I build on previous studies by considering the differential effects of contributions to legislators and those to members of the executive branch. Finally, I argue that the effect of contributions to legislators depends on their ability to successfully subvert the oversight process for individual constituents, which varies across the states with legislative capacity.

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<sup>2</sup>See de Figereudo and Edwards (2006) for an aggregate-level study demonstrating such a relationship.

## 2 Pathways to Influence in the Bureaucracy

Before discussing possible mechanisms of influence in the administrative branch, I briefly review theories of interest group influence in the legislature for context.<sup>3</sup> The basic argument holds that legislators essentially trade their votes for contributions and other support that they can spend pursuing reelection. In addition to the fact that empirical tests of this proposition are quite mixed, a variety of reasons suggest that the process is not that simple. At the very least, legislators face a variety of competing pressures when deciding to cast any single vote. Interest group contributions are just one of those factors and their effect is likely to vary with characteristics of the issue, constituents' preferences, etc.

A second argument is that contributions do not just represent influence in the form of monetary resources, but that they signal information about constituents' preferences or policy consequences of a proposed policy change to relatively uninformed legislators (see, e.g., Austen-Smith and Wright 1994). A variant on this argument is that interest groups make contributions in order to obtain access to legislators or staff and that they use that access to persuade or pressure legislators to take actions that may benefit the group (Wright 1990).

A third perspective holds that interest group contributions serve as subsidies that encourage or reward legislative effort and time spent working on a group's behalf (Hall and Wayman 1993; Hall and Deardorff 2006). Legislators are faced with a variety of options for how to allocate their scarce time and groups, realizing this, may wish to offer incentives to increase the reward of spending time on their issues rather than other matters. Groups, of course, realize that the most effective way to accomplish this goal is to encourage legislators that have preferences consistent with their own. The empirical evidence is consistent with this argument, with contributions from groups to like-minded legislators provoking legislators to engage in costly actions that may benefit the group.

While these approaches were developed in the context of influence in the legislative arena,

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<sup>3</sup>See Baumgartner and Leech (1998, esp. Ch. 7) for a review of the theoretical and empirical arguments relating campaign contributions and lobbying to legislative votes and behavior.

few studies have adapted them to bureaucratic decisions. Given that the locus of contributions and lobbying is the former, this is not surprising. Yet research demonstrating the pervasiveness and importance of bureaucratic lobbying to interests suggests that it warrants more attention: almost two-thirds of groups filing lobbying disclosure reports in Washington, D.C. and in Minnesota indicate that they contacted members of the administrative branch (Boehmke, Gailmard and Patty 2006). So while almost every group that lobbies targets the legislature, these data make it clear that a solid majority also directly seek influence in the administrative branch. Surveys of groups also indicate that they perceive administrative lobbying as more important than legislative lobbying: three-quarters of the groups surveyed in 2002 by Furlong and Kerwin (2005) indicated that participating in rulemaking is more important than lobbying Congress (see also Walker 1991).

Studying the consequences of campaign contributions to elected officials on actions taking in the bureaucracy requires the former to have some influence over administrative agents.<sup>4</sup> Scholars have suggested a number of ways through which organized interests can use campaign contributions to influence administrative actions. Perhaps most directly following this line of reasoning is Hall and Deardorff's (2006) theory that extends Hall and Wayman's (1993) lobbying as legislative subsidy approach to the bureaucracy. In short, they argue that organized interests make campaign contributions and lobby friendly legislators in order to encourage or subsidize time spent working on issues of concern to the group. Legislators use the time bought through the group's efforts on costly actions that signal their willingness to intervene in bureaucratic decisions of concern for the group, perhaps by making statements on the floor of Congress, writing letters to administrative officials, or participating in Congressional hearings to demonstrate their support for the group's position.<sup>5</sup> Bureaucrats,

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<sup>4</sup>There is a large literature devoted to understanding the ability of Congress to control bureaucratic decisions; see, for example, McCubbins, Noll, and Weingast (1987) or Moe (1989). Extensions of these theories include attempts to incorporate interest groups directly into the process as monitors of bureaucratic actions (e.g., Boehmke, Gailmard and Patty 2006; McCubbins and Schwartz 1984).

<sup>5</sup>See Hall and Miler (2006) for empirical evidence that lobbying by groups does, in fact, lead to these actions.

presumably, might modify their actions to mollify members of Congress.

Gordon and Hafer (2005) present an alternative argument by developing a model of bureaucratic responsiveness to campaign contributions. In this account, groups make contributions with the intent of signaling their willingness to contest bureaucratic action. Bureaucrats observe these contributions and, in response, go easier (but not too easy) in their oversight of those groups. Evidence is provided for the case of the nuclear power industry, with plants making greater contributions experiencing shorter inspections.

While developed in the context of the federal government, these arguments about organized interests' ability to influence administrative oversight should apply at the state level as well. Further, studying this process at the state level affords the opportunity to gain insight into the mechanism through which subversion may occur. Here I focus on two different mechanisms: contributions to members of the executive branch as distinct from contributions to legislators and the relationship between legislative professionalism and the effectiveness of contributions to its members.

First, while the theories cited above focus on contributions to legislators, administrative officials work in the executive branch and groups might attempt to gain leverage by making contributions to governors instead of or in addition to legislators. Whereas legislative influence may operate somewhat indirectly through the purse and oversight hearings, governors' position in the chain of command affords them the opportunity to have more direct control over bureaucrats as they implement their regular oversight duties. Organized interests seeking influence may therefore also want to contribute to executives in order to encourage them to pressure administrative agents to ease up on them. To this point, there is little research on the ability of executives to exert influence over administrative decisions; studies of agency actions often assume that its ideal point is identical to that of the executive (see, e.g., Shipan (2004) at the Federal level or Huber and Shipan (2002) at the state level). Contributions to executives may therefore lead to different oversight standards for contributing organizations. An infamous example of this kind of control emerged when Kentucky governor Paul Patton

admitting that he had an extramarital affair with the owner of a nursing facility. During the affair, Patton's staffers allegedly would tip her off about upcoming inspections; after it ended, he supposedly used his position to "sic regulators on her facility" (Kinney 2002).

Secondly, in addition to these multiple pathways to influence, the effectiveness of contributions to legislators might depend on the ability of legislators to influence bureaucratic actions. For example, Huber and Shipan (2002) argue that since more professionalized legislatures have more resources, they are more able to write detailed legislation that constrains agency rulemaking. Variation across states in institutional characteristics like legislative professionalism (see, e.g., Squire 1992) mean that legislators in different contexts may have differing abilities to influence oversight activities.

The relationship may be different in the context of organized interests seeking favors from individual members, however. Rather than using legislative resources to collectively direct bureaucratic actions to desired goals (e.g., McCubbins, Noll, and Weingast 1987), the subversion argument involves a single legislator intervening on behalf of a single constituent with regards to a single instance of bureaucratic oversight. For this intervention to succeed, it must either be consistent with the will of the legislature in general, or it must occur under the radar in opposition to this will. Therefore, the ability of an individual legislator to intervene may be greater in less professional legislatures, since there is less overall control exerted by the legislature as a whole and less monitoring of other legislators and specific bureaucratic actions. Individual interventions are intended to encourage the bureaucracy to deviate from the will of all legislators for the benefit of a single legislator. The potential for this is greater when the legislature is less able to monitor administrative actions, which corresponds to lower professionalism.

Pulling together these different arguments, this paper tests whether campaign contributions from skilled nursing facilities lead to better outcomes on their annual inspections. Further, it tests whether contributions to governors matter as well as contributions to legislators. Finally, I test whether legislative professionalism conditions the effect of contributions

to legislators. Before moving to the analysis, I first discuss the nursing home industry and the oversight process in more detail.

### 3 Oversight of Nursing Facilities

With over 1.3 million residents and \$100 billion spent per year, nursing home care constitutes a critical part of the U.S. health care economy. Further, with over \$60 billion of that coming from government sources through Medicare and Medicaid, there are strong incentives for government regulation. Combined with a lengthy history of poor performance and mistreatment of residents, then, it is not surprising that the nursing home industry is subject to extensive government oversight.

The rules governing standards in nursing facilities that wish to accept payments from Medicare or Medicaid are set by the Federal government. The general guidelines were put in place by the Omnibus Budget Reconciliation Act of 1987 (Public Law 100-203) and responsibility for setting the precise standards was given to the Centers for Medicare and Medicaid Services (CMS, formerly the Health Care Financing Administration). In 1995, CMS implemented an on-site survey system to ensure compliance and penalize poorly performing facilities.<sup>6</sup>

All skilled nursing facilities receiving Medicare or Medicaid payments are subject to regular surveys. These surveys must be conducted every nine to fifteen months, with the interval not to exceed eighteen months. A team of surveyors, which may include nurses, social workers, or dietitians (Harrington, Mullin and Carillo 2004) spends a few days in each facility examining resident care and characteristics and determining whether specific federal requirements are met. If a requirement is not met, this results in a citation, or deficiency; there are currently about 181 separate items on the surveyors' checklist. Deficiencies are rated based on their scope and severity; in combination these produce a twelve-item scale

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<sup>6</sup>See Harrington, Mullin and Carillo (2004) for an extended discussion of these regulations.

(A-L) corresponding to the severity of each deficiency. Deficiencies rated G or above, which involve actual harm to residents, are commonly referred to as severe deficiencies. These deficiencies cover a wide range of concerns, including nutrition, access to medical records, standards of care, and safety and security of residents. Facilities with deficiencies at the D-level or above are considered out of compliance and face a host of potential penalties, including denials of payment for new admissions, civil and monetary penalties (CMPs), or termination (Harrington, Mullin and Carillo 2004). In addition to regular surveys, surveyors are responsible for investigating resident complaints, which can also result in citations and penalties.

While the Federal government sets the standards for these nursing facilities, implementation of the survey process falls upon state survey agencies, which contract with CMS to conduct inspections, among other duties. Importantly for the empirical analysis, then, it is the actions and decisions of state survey agencies that nursing facilities might wish to influence: certification, inspection, and recommendation for punishments are all largely determined at the state level.

The delegation of oversight and enforcement to the state level has, not surprisingly, produced what appear to be fairly divergent outcomes across the states. While states all operate under the same minimal standards and requirements, there is likely to be a fair amount of variation in the desire and ability of state legislators to interpret and enforce CMS's regulations. Studies of state survey agencies confirm this possibility. While the federal government pays for most of the cost of licensing and inspections, the amount that states kick in – often to receive matching funds – varies widely. For example, Walshe and Harrington (2002) note that while California reports a Federal-state funds ratio of 1.25, Montana's is closer to 7. There is also great variation in the number of surveyors relative to the number of beds or facilities in the state (Walshe and Harrington 2002). In response to the authors' survey, members in 39% of state survey agencies reported that "their use of [available Federal] funding was being impeded at a state level by legislatures and/or administrations that had

imposed hiring caps or moratoriums or were not supportive of increased regulation” (Walshe and Harrington 2002, p. 481). Further, studies have found some evidence that overall level of enforcement depends on political variables like gubernatorial partisanship and the proportion of a state’s population over eighty-five years old (Harrington, Mullin and Carillo 2004).

In the end, these differences in resources and potential differences in the strictness of the application of CMS’s regulations have produced great variation across states in common measures of the stringency of state oversight. Besides nursing home citations, which I will discuss shortly, commonly examined measures include the proportion of regular surveys completed within the required eighteen month window since the previous survey, the proportion that are considered predictable (i.e., conducted twelve months after the previous one or conducted in the fifteenth month), and the proportion of resident complaints that are investigated (GAO 2000, GAO 2005). Again, there is wide variation across states in their success at meeting CMS’s requirements.

The most common measures of the quality of state enforcement mechanisms are based on the deficiencies issued during a regular survey. These include the average number of deficiencies per survey, the average number of severe (level G and above) deficiencies, the proportion of surveyed facilities that receive no deficiencies, and the average number of state and federal CMPs issued (see, e.g., GAO 2005; Harrington and Carillo 1999; Harrington, Mullin and Carillo 2004; Walshe and Harrington 2002). Following these studies, I focus on the number of deficiencies and severe deficiencies per inspection.

Differences in enforcement across states have almost certainly contributed to variation in common measures of the quality of care offered in nursing homes, including mortality rates, the presence of facility-acquired pressure sores (which are generally avoidable with standard care procedures), the use of catheters, feeding tubes, and physical restraints (Grabowski and Castle 2005; Spector, Selden and Cohen 1998).<sup>7</sup> Proper state oversight can have important

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<sup>7</sup>See Hillmer, Wodchis, Gill, Anderson, Rochon (2005) for an overview and a meta-analysis of the literature studying quality of care indicators in nursing home research.

consequences for quality of care, as evidenced by the fact that government investigations into a sample of sixty-two deaths in California nursing homes in 1993 found thirty-four cases in which residents received unacceptable care that “endangered residents health and safety” (GAO 1998, p. 4).

## **4 Surveyors Often Feel Pressure from Above**

Nursing homes care about these deficiencies for a number of reasons, giving them incentives to try to manipulate their survey results. First, of course, there is the direct motivation arising from the fact that excessive or severe deficiencies can result in punishments, including denial of payment for new residents and civil and monetary penalties. Second, nursing homes are required to post the results of their most recent survey for residents, potential residents, and their families to see. Third, the information is widely distributed, particularly on the Internet, through public and private sources. CMS has a website called Nursing Home Compare on which anyone can find information about licensed facilities, including survey results. Most states have similar resources. In addition, many private companies sell evaluations and report cards for nursing homes; these are generally based on the information contained in the surveys themselves.

It is not surprising, then, that facilities may attempt to find government officials sympathetic to their desire to keep the number of reported deficiencies as low as possible. While no systematic evidence of this kind of influence yet exists, government investigations of the nursing home industry have turned up a wealth of anecdotal evidence. Federal interviews with state surveyors reveal that at least some of them feel pressure from their superiors and elected officials to overlook or downgrade deficiencies and go easy on favored facilities.<sup>8</sup> For

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<sup>8</sup>For a summary of these findings and some quotes along these lines, see the letter written by Senator Charles Grassley to the administrator of CMS in 2004 after a series of independent interviews and investigations into the survey process by the U.S. Senate Committees on Finance and Aging. The letter, along with other related documents, can be downloaded from <http://www.senate.gov/finance/press/Gpress/2004/prg071404.pdf>.

example, surveyors report that “among those allegedly pressuring [them] are state lawmakers acting on behalf of facility administrators” (Grassley letter, p. 3); others report that “high level state bureaucrats, ‘tie their hands’ routinely” (*ibid.*, p. 4).

This pressure appears to pay off for some facilities. In one case, a surveyor, who had to be accompanied by a police escort, witnessed nursing home staff members using drugs and ignoring patients. Despite these clear problems, the surveyor was told not to return and “the nursing home owner’s friend, who served in a state legislature, called requesting that the facility continue with ‘business as usual’ and not be bothered by further review” (*ibid.*, p. 4). While this is clearly an extreme example, many surveyors seem to feel that writing up facilities for some severe deficiencies may be a waste of time: “it was considered ineffective to ‘rock the boat’ because high level deficiencies would be omitted from the final report anyway” (*ibid.*, p. 4). More systematic evidence is drawn from a government report (OEI 2003, p. 19):

state agencies report that an average of 6 percent of scope and severity determinations are downgraded from draft surveyors reports before they become final. This ranges from one state that reports 38 percent of deficiencies are downgraded to two states that say no deficiencies are downgraded. In addition, our analysis shows that the states with lower deficiency rates removed more deficiencies, on average, from draft survey reports than states with higher rates.

In short, many surveyors clearly perceive political pressure, originating from both legislators and their superiors, encouraging them to go easy in general and on specific facilities. Further, there appears to be specific pressure put on surveyors to overlook or downgrade more severe deficiencies, suggesting that these deficiencies should receive specific attention in the empirical analysis to come. In the next section I conduct statistical analysis to test whether this backing off occurs more generally and in response to political contributions.

## 5 Contributions and Inspection Outcomes

In this section I discuss the data and statistical models that I use to test whether contributions from nursing homes influence the outcomes of their regular and complaint surveys. The data include information on nursing home inspection results as well as facility characteristics. I also amassed data on state-level campaign contributions for the same time period; these contributions are associated with the different surveys in a number of ways based on their timing and recipient. Finally, I present estimates for statistical models of the number of deficiencies and severe deficiencies received during regular surveys.

### 5.1 Data on Survey Outcomes and Campaign Contributions

The federal government makes available information on the results of state surveys of skilled nursing facilities through its Online Survey, Certification, and Reporting (OSCAR) database.<sup>9</sup> The database includes current data on nursing home residents and staffing (i.e., from the most recent survey) along with inspection results from the three most recent regular surveys, which took place between late 2002 and the end of 2005.

These data were supplemented with campaign contributions data obtained in February, 2007 from the National Institute for Money in State Politics ([www.followthemoney.org](http://www.followthemoney.org)). Specifically, I obtained a list of all contributions for all fifty states for the Institute's Nursing Home category (a subset of its Hospitals and Nursing Homes category). Each entry constitutes a single contribution with information that includes the name of the contributor and recipient, the date and amount of the contribution, the elected office for which the recipient was a candidate, and the occupation and employer of the contributor. These data include a total of 20,623 contributions from individual nursing homes, chains of facilities (i.e., a group of homes under common ownership or a common brand name), and associations of nursing

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<sup>9</sup>The url for the OSCAR database is <http://www.medicare.gov/NHCompare/Static/Related/DownloadDB.asp>. I use data downloaded on February 17, 2006.

homes.

In order to study the relationship between survey outcomes and contributions, I focus on contributions from individual nursing homes to state officials. Because chains and associations contain many members – in some cases over one hundred — it would be difficult to specify how and isolate whether their contributions influence survey results for individual facilities. The link between contributions from individual homes and their inspections is relatively more direct. Unfortunately, many of the contributions do not list the specific nursing home that the contributor owns or administers, just that the individual is employed by a nursing home or that their occupation is related to the industry. For these cases I attempted to match contributors to facilities in a number of ways, including matching the listed address to the list of facility addresses, information gleaned from other contributions made by the same individual, and, ultimately, information gathered from Internet searches.

To reduce the scope of the task, contributions data were matched for sixteen states selected for geographic and political diversity and also with regards to the stringency of oversight. Particular attention was paid to the average number of deficiencies, elapsed time between surveys, survey predictability, and the professionalism of the state's legislature. These state characteristics, along with a variety of characteristics of nursing homes, state survey outcomes and campaign contributions are presented in Table 1. A total of 8182 contributions were made in the four years studied; I matched eighty-seven percent of these contributions to facilities (1276), chains (1720), or associations (4116). Only contributions originating from and received by individuals in the same state are subsequently considered.

**[Insert Table 1 Here.]**

These sixteen states represent a fairly wide range of survey outcomes. The national average for deficiencies in the survey results data set is 6.06, ranging from 3.07 to 9.66; states in my sample range from 3.07 (WI) to 8.28 (AR). The average for the proportion of surveys with no deficiencies ranges from two to twenty-eight percent, with an average of ten percent; the included states range from two percent (WV) to twenty-three percent

(WI). The number of facilities ranges from fourteen to 1296, with an average of 319.<sup>10</sup> The number of complaints also varies widely, from one for every three homes in Minnesota to 4.4 in Washington, with a national average of 1.7 nationally. In terms of contributions, the average total contributions (in 2002 dollars) from all sources in the data is \$339,335 for the four-year period covered; this figure is \$436,832 in the sixteen states studied. Of the latter total, about \$50 thousand comes from contributions attributed to individual facilities, which is eleven percent of the total in those states.

There are a number of ways to match contributions made over time to surveys that, as noted before, should occur on random dates within a few month window. Rather than consider total contributions made over the time period studied, I associate each contribution with either the previous, subsequent or closest regular or complaint survey. The analysis focuses on regular surveys, but contributions may be motivated by either type.<sup>11</sup>

First, in order to determine temporal effects, I divide contributions into those made before and after the unannounced, regular survey. The first approach considers all contributions made since the last survey and all contributions made after the current survey. Alternatively, I only consider contributions made within a 180 window before or after each survey. This window divides the annual survey into about half; the results did not vary much with shorter windows, so I stick with the broader 180 day window in order to include the greatest number of contributions. Note that in the first division, contributions are counted twice whereas in the second one they are only considered once. These divisions reflect the fact that contributions made before and after a survey might have different motivations. Groups may make contributions after poor survey outcomes with the hope that elected officials will intervene to limit the damage, perhaps by signaling their intention to contest the results

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<sup>10</sup>Because facilities can enter and exit the data, the number of surveys is not always precisely three times the number of facilities.

<sup>11</sup>Because the survey results data set only includes the last three regular surveys, I omit contributions that occur more than 240 days before the first survey in the data set. This cutoff is chosen since surveys are supposed to occur at most every 16 months, so those more than 240 days away almost certainly would be closer to a regular survey not included in my data set.

to bureaucrats as in Gordon and Hafer (2005). Contributions made before the survey may produce a general level of protection by placing elected officials on their side, which could lead bureaucrats to go easy from the start of the survey.<sup>12</sup>

Second, I separate contributions by the recipient's branch of government. To do this, I identified the recipient of each contribution and determined whether it goes to a member of the assembly or senate (791 cases out of 1276) or to a governor or lieutenant governor (301 cases). I then associated contributions with the closest survey and aggregated to generate totals for each type of elected official before and after each survey. These data show broad variation in the strategies that groups adopt, with twenty-one percent of the groups donating just to governors and forty-six percent donating just to legislators. Put differently, a little over half the groups that donate to the governor do not contribute to the legislature and two-thirds of the groups that donate to the legislature do not contribute to the governor.

## 5.2 Empirical Model

To test whether campaign contributions given by nursing homes have an effect on state oversight, I construct a series of statistical models to explain the number of deficiencies cited in each survey with contributions as the key independent variable. There is therefore one observation for each regular survey of a given facility, producing about three observations per facility over the period analyzed. Since the dependent variable is a count of the number of deficiencies reported in a survey, I estimate a negative binomial model.

In order to develop a thorough baseline model for survey deficiencies, I include a number of control variables measuring characteristics of the nursing home related to the quality of care. These variables are commonly employed in the nursing home literature to explain variation in deficiencies across facilities (see, e.g., Grabowski and Castle 2005; Harrington, Zimmerman, Karon, Robinson, and Beutel 2000; Walshe and Harrington 2002). These variables include

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<sup>12</sup>The process is perhaps not likely to be quite so transparent, of course. Groups are likely giving for other reasons as well, which would muddy the waters a bit.

the number of beds; occupancy rates (the proportion of beds that are occupied); the number of registered nurse hours worked per day per resident; and certified nurse assistant hours similarly measured. I control for ownership characteristics of each facility with indicator variables for whether it is for-profit, nonprofit, or government-owned (the omitted category) and whether it is located within a hospital or part of a nursing home chain. I also control for patient mix by including indicator variables for whether the home accepts Medicare or Medicaid patients or both, with Medicare as the omitted category. These variables provide a wide array of information that should help determine the quality of care offered by each facility as well as the types and number of patients it admits, both of which should influence deficiencies and help isolate the effect of campaign contributions. Because of the way that CMS reports these data, characteristics of nursing homes are available only from the latest survey and must be treated as constant over time in the analysis.

[Insert Table 2 Here.]

Summary statistics for the variables used in the analyses are reported in Table 2. Because the outcomes of the survey process are likely to depend on the priorities of the states overseeing them, I include a set of fixed effects for each state; similarly, I include year fixed effects. In addition, I cluster the standard errors by facility. The following equation summarizes the empirical model, in which  $i$  indexes facilities,  $j$  indexes states,  $t$  indexes time,  $y_{ijt}$  is a count of either total or severe deficiencies,  $C_{it}$  is a matrix of contributions variables,  $Z_i$  is a matrix of facility characteristics,  $S_j$  is a matrix of state fixed effects, and  $T_t$  is a matrix of time indicators:

$$E[Y_{ijt}|X_{ijt}] = \exp(\beta_0 + C_{it}\beta_1 + Z_i\beta_2 + S_j\beta_3 + T_t\beta_4). \quad (1)$$

### 5.3 Contributions Overall and By Timing

The results for the negative binomial models of survey deficiencies are reported in Table 3. I consider the effect of contributions both on total and on severe deficiencies. As noted

previously, severe deficiencies can have important consequences for nursing homes, including triggering withholding of reimbursement and the imposition of civil and monetary penalties, and surveyors have reported specific pressure to avoid them. Results are reported for three different measures of contributions: the first considers all contributions associated with the closest survey; the second uses contributions made since the previous or before the subsequent survey; the third uses contributions made within 180 days before or after a survey.<sup>13</sup> In order to enhance presentation, contributions are measured in tens of thousands of dollars in the regression analyses and coefficients are not presented for the year and state fixed effects (which are each jointly significant).

**[Insert Table 3 Here.]**

Overall, these results produce evidence that contributions decrease the total number of deficiencies cited per survey and strong evidence that contributions decrease severe deficiencies. Further, there is also evidence that the timing of contributions matters. First, consider the results for total deficiencies. Contributions associated with the closest survey have a coefficient of -0.18 that nearly obtains weak significance ( $p = .12$ ). When contributions are considered by timing relative to the survey, the coefficient for contributions given since the previous and before the current survey is significant at the .10 level ( $p = .055$ ) whereas contributions given after a survey have no effect. Now consider the results for severe deficiencies. While total contributions associated with the closest survey do not produce a significant coefficient, both measures of contributions made before the survey are negative and highly significant. Further, contributions made in the 180 days after a survey also significantly decrease severe deficiencies.

To put these effects in substantive terms, I performed a series of first difference calculations for the contributions variables. In each case I held each variable at its mean (for

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<sup>13</sup>The model that associates contributions to the prior or subsequent survey includes contributions made between two surveys in two different ways since they are made after the first survey and before the second survey. The results are virtually identical to those obtained when these variables are included separately, so I combine them into one model for parsimony.

continuous) or median (for dichotomous) value, set the contributions variables to zero, and then calculate the expected number of deficiencies. I then separately increase each contributions variables from zero to its mean value given that it is nonzero (i.e., the average amount of contributions if any are given) and calculate the expected number of deficiencies with contributions. Contributions given since the last survey are estimated to reduce total deficiencies by 0.35, or five percent, and severe deficiencies by 0.16, or thirty-seven percent. While the effect for total deficiencies is relatively modest, there is clearly a large substantive effect on severe deficiencies.

The results for the other variables are almost identical across the different models for the two different dependent variables. Staff levels as measured by registered nurse hours per resident or certified nurse assistant hours per resident have a negative and significant effect. Occupancy rates, another potential measure of quality, also have a strong negative effect on deficiencies. Perhaps not surprisingly, larger nursing homes have more deficiencies, as they may have more opportunities to receive them. In terms of ownership, hospital-based and for-profit facilities have more deficiencies, though the coefficients for severe deficiencies are not significant; non-profit homes have fewer deficiencies with coefficients that are not quite significant at the .10 level.

## **5.4 Contributions by Office of Recipient**

In this section I consider the effect of contributions by the office of the recipient. In particular, I include measures of contributions to legislators and governors to determine which branch is able to exert control over the decisions of state survey administrators and the final evaluation of each skilled nursing facility. To the extent that the legislature is able to control the bureaucracy, then contributions to legislators should result in fewer deficiencies per survey. Additionally, if the governor's office is willing and able to pressure bureaucrats, then contributions to its members should result in fewer deficiencies. For parsimony, I only present results in which contributions are associated to the most temporally proximate survey; other

than considering contributions by recipient, the rest of the analysis is as before.

Finally, I study whether institutional context matters by interacting contributions to legislators with state legislation professionalism (King 2000) in order to test whether the ability of legislators to influence the bureaucracy moderates the effects of contributions. As noted previously, the states included in the study were chosen in part based on their values of this variable, so the sixteen included states are spread across the entire range of this variable.<sup>14</sup> A variable for legislative professionalism is not included in its own right since its values are constant for each state and its effect is therefore subsumed by the state fixed effects.

**[Insert Table 4 Here.]**

The results are presented in Table 4. A number of interesting patterns emerge. First, consider the results in the first column for all deficiencies. Contributions to legislators have a negative and strongly significant effect ( $p = .004$ ) while those to the governor's office have no discernible effect. The second set of columns for severe deficiencies produces almost opposite conclusions. Contributions to legislators have a positive but insignificant effect while those to the governor have a negative and significant effect ( $p = .01$ ). First difference calculations indicate that contributions to the legislature reduce total deficiencies by 0.24 (3%) while those to the governor reduce severe deficiencies by 0.24 (55%).

These findings persist after I include the interaction between legislative contributions and professionalism, with the constitutive term for legislative contributions significant in both models and that for executive branch contributions significant for severe deficiencies. Note that the coefficient for legislative contributions in the severe deficiencies equation was not

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<sup>14</sup>I utilize the King measure for 1993 since it was the most recent available measure when this project began and it specifically formed the basis for choosing the states included in the analysis. I have also used the more recent measure by Squire (2007) which contains measures for 1996 and 2003. The results are similar with both of these alternate measures, though not quite as strong. In particular, the difference appears to result from a difference in the relative coding for Wisconsin: when it is included in models with the Squire measures, the interaction term loses a little significance for total deficiencies, but when Wisconsin is excluded, the results are similar to those presented below. Importantly, however, in all cases the marginal effect of contributions is negative and significant for a majority, or occasionally a plurality, of the observations in the analysis (i.e., for states with relatively low professionalism).

significant without the interaction term. More importantly, both interaction terms produce significant coefficients. The positive coefficient on the interaction term indicates that the effect of contributions to legislators becomes smaller in more professional states, supporting the idea that legislators are able to wield more individual influence in a less professional setting. Of course, the important question is how these two effects combine, and these results are depicted in Figure 1.

[Insert Figure 1 Here.]

The graphs show the marginal effect of contributions for different values of legislative professionalism. In addition, they include 90% confidence intervals to assess for which values of the latter the effect of contributions significantly differs from zero. Finally, they also include a kernel density estimate of legislative professionalism, which shows how much of the data fall into the different regions (i.e., positive or negative effect, significant or not significant). These two graphs show that campaign contributions to legislators correspond to significantly fewer total and severe citations and that their effect is greatest in less professionalized legislatures. Note that in both cases the effect becomes insignificant as professionalism increases; in fact, it becomes positive for severe deficiencies. Importantly, though, the effect is negative and significant for 90% of the data for total deficiencies and 43% of the data for severe deficiencies, though it does become positive and significant for severe deficiencies once legislative professionalism exceeds 0.43, which includes one-quarter of the observations.

## 6 Discussion

What do the above results imply about the effect of campaign contributions on oversight of nursing facilities? Overall, there is a an indication that nursing homes that give campaign contributions receive significantly fewer deficiencies. In particular, the relationship is most robust for severe deficiencies, which are potentially more costly for nursing facilities since they can lead to various penalties including fines and denial of new admissions. Thus nursing

home contributions appear to have their greatest effect precisely where facilities may need it the most.

In addition to these broad findings, which are consistent with previous research at the federal or aggregate state level (e.g., de Figereudo and Edwards 2006; Gorden and Hafer 2005), the ability to consider the effects of contributions by timing, office, and state characteristics adds some nuance to the results and also raises some questions for future research. In terms of timing, the effects were more consistently significant for contributions given before a survey. Because surveys are administered somewhat randomly, this suggests that facilities take an insurance approach to contributions by building up relationships to call on when they need them. Perhaps survey outcomes are more easily influenced if survey administrators receive signals before they enter a home.

When contributions are considered by office, the results suggest a couple of interesting variations. First, contributions to both legislators and the governor's office influence survey outcomes. Interestingly, though, they appear to do so in different ways. Contributions to legislators reduce the total number of deficiencies, albeit modestly, while contributions to governors only reduce severe deficiencies, but much more substantially. This could arise if the two branches have different abilities to influence the survey process. For example, legislators may be able to signal to survey administrators to go easy on particular homes in advance of surveys, but their influence may dwindle once the survey report has been drafted. Governors, on the other hand, may be able to intervene after the survey but before the final report is prepared or during the appeals process. Legislators therefore appear to have lower level influence in that contributions to them reduce the number of less important citations while governors' influence is over severe citations. Legislators' influence is further reduced in more professionalized states, perhaps due to greater oversight on the part of their colleagues.

Interestingly, given these different types of influences that legislators and governors appear to have, nursing facilities seem to pick their friends and stick with them. Recall that sixty-seven percent of facilities give to either the governor or the legislature, but not to both

over the entire four-year period studied. The results are even more striking at the survey level, with only fourteen percent of surveys with contributions to either branch featuring contributions to both.

In order to investigate the mechanism of influence even further, I gathered detailed data about the 2003-2004 Wisconsin legislature.<sup>15</sup> I then matched contributions to recipients to compare them based on various characteristics such as partisanship and committee assignments; the results are presented in Table 5. Three notable patterns occur. First, nursing homes are more likely to give to Republican members than to Democrats: while the former constitute about two-thirds of each chamber, they constitute over eighty percent of contribution recipients. Second, recipients are not more likely to be members of relevant oversight committees since the proportion of recipients on each committee almost identically matches the proportion of members on that committee (though members of the Aging committees do receive significantly greater amounts than non-members). Third, contributions are most likely to go to a facility's own representative: about two out of five contributions are given locally, which is much greater than random assignment would suggest.<sup>16</sup>

**[Insert Table 5 Here.]**

These results are consistent with an interpretation that contributions to the legislature are a form of insurance rather than atonement. They suggest a service-in-the-district story rather than a legislative oversight story: facilities give to their own representatives in order to intervene on their behalf rather than to more powerfully positioned members who might have more institutional sway over the bureaucracy. Facilities appear to contact their own representatives and ask them to put pressure on the state survey agency to go easy on them during the survey process. Legislators, in turn, respond in order to support one of their constituents. This explanation may work particularly well in the nursing home industry,

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<sup>15</sup>Data on legislators were obtained from madison.com and supplemented with data from the Wisconsin Blue Book.

<sup>16</sup>Facilities were matched to districts by entering their addresses into the Wisconsin legislator lookup web page's query field. Some failed to turn up using this search; these were determined using the district maps and searching for the facility's address using the Wisconsin Interactive Map Server.

which is characterized by a great number of relatively small facilities that are geographically dispersed.

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Table 1: Measures of State Nursing Home Surveys in the Sixteen States Used in the Analysis and Summary Statistics for all Fifty States

	Deficiencies	Severe Def.	Surveys w/ no Def.	Surveys w/ no Sev. Def.	Days Between Surveys	Predictable Surveys	Total Surveys	Complaint Surveys	Facilities	Total Contributions	Attributed Cont.
AR	8.28	0.45	3%	81%	350	9%	692	457	236	\$548,037	\$74,185
CT	7.19	0.79	5%	54%	390	12%	733	508	246	\$81,418	\$18,091
GA	6.90	0.41	6%	82%	378	11%	1043	705	362	\$1,073,272	\$160,781
IN	4.85	0.36	17%	77%	369	18%	1513	1179	511	\$447,916	\$14,483
LA	8.15	0.32	8%	87%	356	14%	872	571	305	\$478,201	\$130,476
MA	4.54	0.41	22%	79%	372	27%	1364	531	456	\$146,938	\$22,354
MI	7.35	0.34	5%	78%	352	23%	1279	1120	430	\$230,033	\$3,496
MN	7.83	0.27	5%	85%	366	8%	1202	145	401	\$43,090	\$3,168
MS	4.03	0.35	12%	83%	410	31%	600	139	205	\$578,598	\$27,265
NC	4.94	0.37	12%	79%	343	14%	1255	823	423	\$396,086	\$1,226
OH	4.70	0.18	15%	85%	383	4%	2867	1449	970	\$1,337,641	\$199,901
OK	8.05	0.37	6%	78%	378	14%	995	554	349	\$243,760	\$42,454
OR	4.58	0.39	22%	83%	377	37%	409	162	138	\$986,677	\$10,717
WA	6.44	0.46	7%	76%	359	16%	736	1082	247	\$260,893	\$32,262
WI	3.07	0.18	23%	87%	363	24%	1184	568	400	\$69,169	\$32,075
WV	8.07	0.14	2%	88%	385	23%	390	322	132	\$67,579	\$17,891
<i>All States:</i>											
Average	6.06	0.28	10%	84%	368	20%	943	551	319	\$339,335	\$49,426
Minimum	3.07	0.00	2%	54%	330	4%	42	3	14		\$476
Maximum	9.66	0.79	28%	100%	482	45%	3853	2498	1296	\$1,699,063	

*Notes:* Statewide skilled nursing facility data from OSCAR, the Federal government's reporting system. Campaign contributions data from Institute for Money in State Politics, coded by author. Total Contributions includes contributions from facilities, owners of chains, and associations of facilities. Attributed contributions are those we were able to assign to specific facilities.

Table 2: Summary Statistics for Variables Used in Analysis (Regular Surveys)

	Mean	SD	Min.	Max.
Deficiencies	5.93	5.30	0	59
Severe Deficiencies	0.34	0.92	0	25
Contributions - Closest	30.44	575.60	0	45881
Contributions - Since Prior Survey	24.83	497.02	0	48576
Contributions - Until Next Survey	33.03	700.99	0	48576
Contributions - Closest 180 Days Before	10.72	204.36	0	13396
Contributions - Closest 180 Days After	11.35	400.03	0	45881
Contributions - Governor	8.85	183.39	0	9974
Contributions - Governor Before	5.10	140.60	0	9974
Contributions - Governor After	3.76	111.78	0	7334
Contributions - Legislature	13.83	309.42	0	29526
Contributions - Legislature Before	6.87	165.27	0	16668
Contributions - Legislature After	6.96	248.82	0	29526
RN Hours per Resident	0.63	0.57	0	6.84
Certified Nurse Assistant Hours per Resident	2.32	0.55	0	5.24
Proportion of Beds Occupied	0.86	0.14	0.05	1
Medicaid Only	0.05	0.23	0	1
Medicare and Medicaid	0.91	0.28	0	1
Hospital-Based	0.07	0.25	0	1
Part of a Chain	0.56	0.50	0	1
Number of Residents (1,000s)	0.09	0.05	0	0.55
For Profit	0.68	0.46	0	1
Nonprofit	0.05	0.22	0	1
Legislative Professionalism	0.29	0.12	0.03	0.50

Notes: N=16,132.

Table 3: Negative Binomial Model of Nursing Home Deficiencies, Regular Surveys (2002-2005)

	All Deficiencies			Severe Deficiencies		
	All	Pre/Post	180	All	Pre/Post	180
Contributions	-0.18 (0.11)			-0.55 (0.94)		
Contributions Before		-0.34* (0.18)	-0.01 (0.27)		-3.10*** (1.17)	-3.07** (1.42)
Contributions After		0.02 (0.08)	-0.09 (0.08)		-0.06 (0.24)	-4.00** (1.84)
RN Hours per Resident	-0.26*** (0.03)	-0.26*** (0.03)	-0.26*** (0.03)	-0.58*** (0.08)	-0.58*** (0.08)	-0.58*** (0.08)
Nurse Assistant Hours	-0.07*** (0.02)	-0.07*** (0.02)	-0.07*** (0.02)	-0.11** (0.05)	-0.10** (0.05)	-0.10** (0.05)
Beds Occupied (%)	-1.15*** (0.07)	-1.15*** (0.07)	-1.15*** (0.07)	-2.18*** (0.20)	-2.17*** (0.20)	-2.17*** (0.20)
Medicaid Only	0.17** (0.07)	0.17** (0.07)	0.17** (0.07)	0.19 (0.21)	0.19 (0.21)	0.19 (0.21)
Medicare and Medicaid	0.18*** (0.06)	0.18*** (0.06)	0.18*** (0.06)	0.26 (0.19)	0.26 (0.19)	0.26 (0.19)
Hospital-Based	0.13*** (0.04)	0.13*** (0.04)	0.13*** (0.04)	0.16 (0.11)	0.16 (0.11)	0.16 (0.11)
Part of a Chain	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.05)	0.01 (0.05)	0.01 (0.05)
Number of Residents	3.33*** (0.21)	3.34*** (0.21)	3.33*** (0.21)	4.69*** (0.51)	4.70*** (0.51)	4.71*** (0.51)
For Profit	0.14*** (0.02)	0.14*** (0.02)	0.14*** (0.02)	0.07 (0.06)	0.08 (0.06)	0.08 (0.06)
Nonprofit	-0.07 (0.04)	-0.07 (0.04)	-0.07 (0.04)	-0.14 (0.11)	-0.14 (0.11)	-0.14 (0.11)
Constant	2.65*** (0.11)	2.64*** (0.11)	2.65*** (0.11)	0.91*** (0.33)	0.90*** (0.33)	0.90*** (0.33)
Dispersion ( $\alpha$ )	0.50 (0.01)	0.50 (0.01)	0.50 (0.01)	2.97 (0.12)	2.96 (0.12)	2.96 (0.12)

Notes: N=16,132. State and year fixed effects included in all models. \* indicates  $p \leq .10$ , \*\*  $p \leq .05$ , \*\*\*  $p \leq .01$ .

Table 4: Negative Binomial Models of Total or Severe Nursing Home Deficiencies with Effect of Contributions by Office of Recipient, Regular Surveys (2002-2005)

	All Def.	Severe Def.		
Cont. to Legislators	-0.49** (0.17)	-2.64** (1.07)	0.25 (0.22)	-7.36* (4.14)
Cont. to Governor	0.05 (0.36)	0.34 (0.40)	-5.36** (2.11)	-4.48** (2.03)
Cont. to Leg. × Leg. Prof.		5.37** (2.58)	17.98* (9.59)	
RN Hours per Resident	-0.26** (0.03)	-0.26** (0.03)	-0.58** (0.08)	-0.58** (0.08)
Nurse Assistant Hours	-0.07** (0.02)	-0.07** (0.02)	-0.11** (0.05)	-0.11** (0.05)
Beds Occupied (%)	-1.15** (0.07)	-1.15** (0.07)	-2.18** (0.20)	-2.17** (0.20)
Medicaid Only	0.17** (0.07)	0.17** (0.07)	0.19 (0.21)	0.19 (0.21)
Medicare and Medicaid	0.18** (0.06)	0.18** (0.06)	0.26 (0.19)	0.26 (0.19)
Hospital-Based	0.13** (0.04)	0.13** (0.04)	0.16 (0.11)	0.16 (0.11)
Part of a Chain	0.01 (0.02)	0.01 (0.02)	0.01 (0.05)	0.01 (0.05)
Number of Residents	3.33** (0.21)	3.33** (0.21)	4.69** (0.51)	4.69** (0.51)
For Profit	0.14** (0.02)	0.14** (0.02)	0.08 (0.06)	0.08 (0.06)
Nonprofit	-0.07 (0.04)	-0.07 (0.04)	-0.14 (0.11)	-0.14 (0.11)
Constant	2.65** (0.11)	2.65** (0.11)	0.91** (0.33)	0.91** (0.33)
Dispersion ( $\alpha$ )	0.50 (0.01)	0.50 (0.01)	2.96 (0.12)	2.96 (0.12)

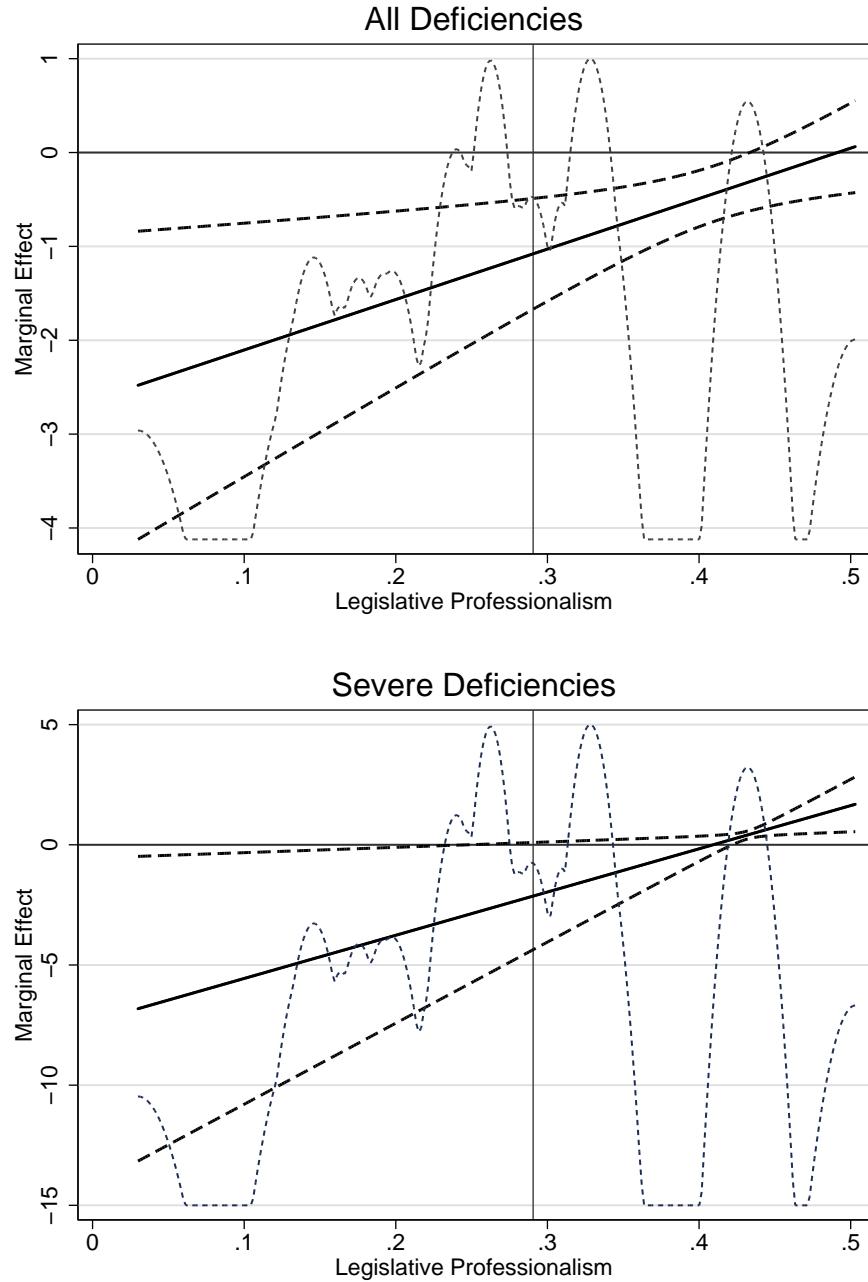
Notes: N=16,132. State and year fixed effects included in all models (which subsumes legislative professionalism). \* indicates  $p \leq .10$ , \*\*  $p \leq .05$ , \*\*\*  $p \leq .01$ .

Table 5: Characteristics of Recipients in the Wisconsin Legislature, 2003-2004 Session

	Rep. Party	Aging	Public Health	Health	Same District
	<b>Percent Receiving Contributions</b>				
Assembly	81%*	14%	13%	9%	38%*
Senate	89%*	19%			42%*
<b>Average Amount of Contributions Received</b>					
Assembly	\$151	\$217*	\$156	\$133	\$128
Senate	\$130	\$212*			\$122

*Notes:* \* indicates  $p \leq .10$  for two-tailed t-test. In tests for those receiving contributions, the null hypothesis is that contributions are given randomly; for the amount of contributions the null hypothesis is that the average for legislators in the listed category is the same as for those not in that category in the same chamber. Average contributions received are for legislators receiving at least one contribution. Legislator data from madison.com, supplemented with data from the Wisconsin Blue Book.

Figure 1: Marginal Effect of Campaign Contributions by State Legislative Professionalism Score, by Deficiency Type



*Notes:* Effects represent the derivative of  $X\beta$  with respect to legislative professionalism. Long, thick, dashed lines correspond to 90% confidence intervals. Vertical line indicates mean of legislative professionalism; short, thin, dashed lines represent kernel density plot of legislative professionalism (density values not shown).



# Unannounced, compared with announced inspections: A systematic review and exploratory study in nursing homes



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## ABSTRACT

Politicians and regulators have high expectations of unannounced inspections. Unannounced inspections, unlike announced ones, would, they believe, lead to a clearer insight into the risks and a reduction of the regulatory burden. In order to verify these assumptions, a systematic review of the scientific literature and an exploratory study were conducted. In the systematic review only three relevant articles were found concerned with research into the difference between unannounced and announced inspections. In the exploratory study, Dutch nursing homes were inspected, unannounced, and later announced, in order to compare the risks detected during the inspections. It is concluded that unannounced inspections did not reveal more or different risks, but provided a better insight into the quality of care delivered. Announced inspections are the best option for the assessment both of the organization and of its preconditions for good care. Evidence was found that an unannounced inspection leads to a reduction of the regulatory burden.

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## 1. Introduction

The formation in September 2010 of the previous Dutch government, saw demands for swifter action on abuses of any kind being translated into policy [1,2]. The policy paper contains a separate section for elderly care, which states clearly that the government expects the Dutch Health Care Inspectorate to monitor, strictly, poorly performing institutions: '*Inspections of the workplace will also include unannounced visits, in which, for example, mystery guests can be deployed*' [1, p. 36].<sup>1</sup> Now the latest Dutch government, installed in November 2012, has reinforced this commitment to unannounced inspections [3] while being

supported too in this by other political parties outside of the governing coalition.

In practice the Dutch Health Care Inspectorate usually announces the inspections of nursing homes in advance. The announcing of inspections is derived from the relationship between the inspector and the institutions. This relationship is based on consultation, co-operation and trust in the efforts of the institutions to deliver quality care. Unannounced inspections seem, at a first glance, not to fit in with this trust. Instead, it suggests an inspectorate whose aim is simply to expose the deficiencies of the institution in complying with the regulations [4]. Another reason for the announcement of an inspection is purely practical: the files and protocols are waiting, people have time for an interview and departments are ready for an inspection round.

The call for unannounced inspections is not in itself new. Both in the Netherlands and internationally the past years have witnessed an increasing social, political and internal pressure to introduce unannounced inspections [5–9]. There appears to be two main arguments for this.

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<sup>1</sup> This quotation is translated from Dutch.

Firstly, the real risks will only be revealed to the inspector with an unannounced inspection. This is because one of the side-effects of the announced inspections is 'window dressing' [10]. This means that the institution has all the time and the opportunity to make things better than they really are. They can sweep the abuses under the carpet beforehand. This assumes that an announced inspection gives no real reflection on the level of care. By contrast, an unannounced inspection means that the institution is not prepared, so that the inspector will find more situations as they really are.

The second reason concerns the assumption that an unannounced inspection leads to a reduction of the regulatory burden. This is the burden the institutions being inspected experience in order to meet the requirements for regulation [11].

The Dutch Health Care Inspectorate started a study designed to test whether the method of regulation in nursing homes, unannounced or announced, affects the risk assessments given during the inspections. To achieve this aim, a systematic review of the scientific literature was performed (Section 2), followed by an exploratory study (Section 3). Finally, we discuss the results in relation to each other in the overall conclusion (Section 4).

## 2. Systematic review

### 2.1. Research questions

The systematic review of the scientific literature was conducted in order to examine whether research exists on the difference between unannounced and announced inspections. The approach was specific. It focused on quantitative and qualitative research on the difference between the two types of inspections.

### 2.2. Method

The data was collected until October 2011. We introduced the following three criteria for inclusion: (1) The article describes quantitative and/or qualitative research in which unannounced inspections were compared with announced inspections; (2) The article is published after the 1st of January 1995; (3) The article is written in the English, German or Dutch.

Our search strategy consisted of three parts. Firstly, given that inspections take place in many different areas, we searched two medical databases (MEDLINE and CINAHL), a psychological database (PsycINFO), a sociological database (SocINDEX), an economic database (EconLit) and a database for educational research (ERIC). The databases were searched using the combination of the following terms: [Inspection or Inspection Program]<sup>2</sup>, and [Unannounced, No-notice, Unexpected or Surprise]. This resulted in 48 articles. In the second step we used a combination of the following terms: [Inspection or Inspection Program], and [Announced or Expected] and not

[Unannounced, No-Notice, Unexpected or Surprise], which resulted in 202 articles. These two steps resulted in 250 articles, of which 51 occurred in both steps so, eventually, there are 199 individual articles. Subsequently, the first author scanned all the titles, the authors and the keywords, and excluded studies which clearly did not comply with the inclusion criteria. Of the remaining twenty articles summaries were read by all three authors. The articles were included if it was an article on research into the difference between unannounced and announced inspections. Ultimately there was only one article which was deemed relevant [12]. The reference section of this article was checked to locate additional articles, but without result.

The second part consisted of a free search on Google Scholar according to the terms Unannounced, Announced, Inspection and Research, and published after the 1st of January 1995. The result was a list of more than three thousand hits, ranked by relevance.<sup>3</sup> The first two hundred hits contain at least three of the four terms. The first author scanned these hits looking at the title and the summary. When this information suggested a relevant article, which was the case with five articles, then the summary was read by all three authors. Ultimately, one article was found as relevant, however the article was not peer reviewed [13]. Also the reference section of this article was checked to locate additional articles, but without result.

Finally, we called for research on the difference between unannounced and announced inspections through a discussion group of Dutch regulators<sup>4</sup> on LinkedIn. The result was a research report from the Dutch Inspectorate of Education [14]. Again this was not peer reviewed and this research report lacks a reference section.

### 2.3. Results

**Table 1** shows the specifications of the three articles found through research into the difference between unannounced and announced inspections.

#### 2.3.1. Food safety

Reske et al. evaluated an inspection program in which the restaurant facilities received an announced and an unannounced inspection, instead of just one unannounced inspection [12]. The first inspection, the announced one, started with an interview to provide the restaurant operators with the information, tools and support they need to ensure they can meet the challenges of food safety and prevent food-borne illness. A standard inspection followed the interview. Within a year, an unannounced inspection was conducted to ensure that the problems identified with food safety during the first inspection had been adequately addressed.

The research question of the study was: Could announced inspections improve the results for food safety

<sup>2</sup> Alternative concepts such as Inspector(s) Visit, Spot Checks and External Supervision did not lead to additional articles.

<sup>3</sup> <http://scholar.google.nl/> In Google Scholar search results are ranked by relevance. The ranking take account of the author, the publication and how often the article has been cited in scientific literature.

<sup>4</sup> <http://www.linkedin.com/groups?gid=151601&trk=myg.grp.ovr>.

**Table 1**  
Specifications of the articles.

Specification	Food safety [12]	Primary education [14]	Child care programs [13]
Title	Beneficial effects of implementing an announced restaurant inspection program	Unannounced inspections in primary education, an inspection report	Unannounced vs. Announced Licensing Inspections in Monitoring Child Care Programs
Author(s)	Reske K, Jenkins T, Fernandez C, VanAmber D, Hedberg C	Dutch Inspectorate of Education	Fiene R
Journal	Journal Of Environmental Health	–	National Association of Regulatory Administration
Year	2007	2007	1996
Country	US, Minnesota	The Netherlands	US, Pennsylvania
Peer reviewed	Yes	No	No
MSMS-level <sup>a</sup>	MSMS-2/3	MSMS-1/2	MSMS-2

<sup>a</sup> The Maryland Scientific Methods Scale (MSMS) for internal validity [17].

and restaurant inspection? To answer this question a retrospective cohort study was carried out on the results of 1314 routine inspections from June 2001 through to August 2003. The researchers concluded that the announced inspections were focused on helping the restaurant operator identify and manage problems with food safety. They also concluded that the performance of restaurants that had undergone an announced inspection, had improved by the time of the subsequent unannounced inspection with regard to two food safety measures.

### 2.3.2. Primary school education

In 2006, the Dutch Inspectorate of Education conducted a project to determine whether unannounced inspections could reduce the regulatory burden on schools [14]. The three research questions of the study were: How do primary schools regard an unannounced inspection, compared with an announced one? How do the inspectors regard the unannounced inspections? Is there a difference between judging the quality of schools where the inspection was unannounced, and the judgments on schools where the inspection was announced?

Only 33% of the 69 schools which were inspected unannounced, completed the evaluation ( $N=23$ ). Of the 1104 schools which received an announced inspection, 45% completed the evaluation ( $N=499$ ). The results showed that both groups were satisfied with the manner in which the Inspectorate prepared, carried out, and reported the inspection. The unannounced inspection scored more positively with regard to the amount of time invested.

Apart from the practical problems, such as a lack of documentation and the absence of management, the inspectors also evaluated the unannounced inspection as positive. The analysis of the quality assessments showed no clear difference between the scores from both inspections. The researchers concluded, therefore, that there is no reason to believe that an unannounced inspection, compared to an announced inspection, results in a milder or stricter assessment of quality.

### 2.3.3. Child care programs

Fiene's article reports on a study, conducted in 1995 that examines whether licensing and monitoring inspections of child care programs should be announced or unannounced

[13]. An argument for announced inspections, according to Fiene is that a service provider should have the opportunity to put their best foot forward, so to speak, prior to the inspection. An argument for unannounced inspections, by contrast, is whether this should not be the case at all times, not just when inspections are pending.

The two research questions posed in the study were: Is there a difference between announced and unannounced inspections with regard to the resulting records of violations? If so, is there a difference between highly compliant and low compliant providers? To answer these questions 191 child care programs were inspected twice, firstly in an announced fashion, and in the six months afterwards, in an unannounced inspection.

The researcher concluded that conducting unannounced inspections is a worthwhile endeavor. But given the limited resources for inspections, he finds conducting an extra unannounced inspection of all providers of child care programs a bad idea. A balance must be found based on the compliance history of the providers. In this way, problem providers are penalized, while others are left alone.

## 2.4. Discussion

Despite the strong political calls for unannounced inspections and the choice that several inspectorates make to inspect unannounced, very little research has been carried out into the difference between unannounced and announced inspections. None of the three studies was conducted in nursing homes. Knowledge is lacking on the difference, advantages and disadvantages, between announced and unannounced inspections. We argue that the call for unannounced inspections seems primarily motivated by political unease over the performance of regulators. The call in itself may seem a powerful signal but it is also a symbolically political one.

If we take an overall view of the results and conclusions of the three studies, we note that unannounced inspections can be used in different ways and in areas where the standard is announced inspections. For example, an unannounced inspection can be used to determine whether the number of reported violations, determined during the previous announced inspection, has fallen in the meantime [13]. An unannounced inspection can also replace the

**Table 2**

Themes and sub-themes of the tool used to evaluate the risks.

Themes	Sub-themes	Number of risk factors
1. Individual care plans	1a. Individual care plan system 1b. Individual care plan implementation	8 9
2. Communication	2a. Communication and approach 2b. Provision of information	6 3
3. Physical well-being		6
4. Client safety	4a. Decubitus prevention and treatment 4b. Fluid intake and nutrition 4c. Fall prevention 4d. Infection prevention and treatment 4e. Incontinence diagnostic and treatment 4f. Clients with problem behavior	7 9 9 8 6 6
5. Housing and living conditions		4
6. Participation and social independence		8
7. Mental well-being	7a. Mental well-being 7b. Support by depressions and mood disorders	6 5
8. Safe living and staying	8a. Safe living 8b. Safe materials and devices	3 6
9. Sufficient and competent staff	9a. Staff adapted to target group 9b. Quality of staff	8 8

announced inspection, for instance to reduce the regulatory burden. It seems to make no difference to the outcome of the inspection, whether the inspection was announced or unannounced [14]. By contrast unannounced inspections are the norm in several areas. In order for regulation to trigger improvements in care, these unannounced inspections may be preceded by an announced inspection in which education is central.

### 3. Exploratory study<sup>5</sup>

#### 3.1. Research questions

The exploratory study was conducted to see if inspectors detect similar risks during an unannounced, and an announced, inspection of the same institution. We also wanted to know how managers of nursing homes and inspectors, evaluate the unannounced inspections compared to the announced ones.

#### 3.2. Method

The exploratory study consisted of two parts, both conducted between June and September 2010. In the first part, eighteen nursing homes were inspected unannounced, and, two to eight weeks later, received an announced inspection. The same tool was used to score the risks detected during both inspections. After the first inspection no recommendations for improvement were given. In the second part of the study both the managers of nursing homes and the inspectors were interviewed in order to identify how each evaluates the unannounced inspections compared to the announced ones.

#### 3.2.1. Part I

It was impossible to select at random the eighteen nursing homes inspected because we could not intervene in the regular inspection process. The institutions were selected from the annual list of the nursing homes which were to be inspected. Two criteria were applied. Firstly, the nursing home offers multidisciplinary medical care. Secondly, no announced inspection, using the same tool, has been conducted in the nursing home during the past year. We did not use a control group because the research was focused on the difference between an announced and unannounced inspection within one institution. To reduce the possibility that the second inspection is influenced by the first, the inspectors were swapped over. Thus only one inspector was present at both inspections.

The tool used to evaluate the risks in institutions is based upon the instrument that is currently used by the Dutch Health Care Inspectorate. Table 2 shows the nine themes of the tool and with the sub-themes. Each theme or sub-theme reflects a number of risk factors. Examples of risk factors are: 'No individual care plans were available' (sub-theme 1b); 'Decubitus is not registered' (sub-theme 4a); and, 'A lack of expertise evident among the staff' (sub-theme 9b). Each risk factor could be scored: present, not present, insufficient information available or could not be scored.

Both inspections were made by two inspectors. On each occasion, each inspector independently completed the tool. After the inspection they came to a consensus about the final score per risk factor. Some risks factors could not be scored due to the insufficient information available, for example, nurses said they were using a protocol, but could not hand it over during the inspection (theme 1, Table 2). Sometimes the risk factor was not scored at all because it was not applicable to a specific nursing home, for example if the nursing home did not have patients suffering from decubitus (sub-theme 4a, Table 2).

To determine whether the inspectors detect similar risks at the same institution, during an unannounced and an announced inspection, the data was analyzed using Excel.

<sup>5</sup> About this exploratory study the Dutch Health Care Inspectorate wrote an technical report [15] and a part of the results of this study were previously published otherwise as a part of a scientific article in a Dutch Journal of Regulation [16].

For each institution, a comparison is made between the scores for the risk factors of the unannounced inspection and those of the announced inspection. For each institution three different calculations were made:

1. The number of risk factors that were scored differently during the unannounced inspection, compared with the announced inspection.
2. The difference between the number of risk factors scored as present during the unannounced inspection and those scored as present during the announced inspection.
3. The number of risk factors that could not be assessed during both types of the inspections due to a lack of information.

### 3.2.2. Part II

In the second part of the study we wanted to know in which way the managers of the nursing homes and the inspectors evaluate the unannounced inspections compared to the announced ones. In total semi-structured interviews were carried out among nine managers and fourteen inspectors.

The interviews were conducted by a trained interviewer. The managers and the inspectors were asked questions on the following topics: (1) The experiences of, the inspectors, the manager and the staff of the institutions, to the unannounced inspections compared with the announced inspections; (2) the advantages and disadvantages of the unannounced inspections compared with the announced inspections; and (3) the impression that has been gained during both inspections.

The managers of the nursing homes were interviewed individually by phone, after both inspections took place. The inspectors were interviewed in groups consisting of two to four participants. All transcriptions of the interviews were submitted to the persons interviewed for approval.

In the interviews the respondents put forward their experiences and opinions. The interview reports are analyzed with the software program MAXQDA 10.<sup>6</sup> The analysis process can be described as a cyclical one which moves back and forth between four different steps. This creates a continuous sharpening of the descriptions and definitions; and also of the revisions and the choices made. The four steps require the following: the labeling of text fragments; the categorization of the labels in themes and sub-themes which creates a code tree; analyzing the text fragments per theme and; quantifying the text fragments categorized by the themes.

## 3.3. Results

### 3.3.1. Part I

The number of the risk factors that were scored differently during the unannounced inspection, compared with the announced one, was first calculated for each institution. This formed the first part of the exploratory study. Fig. 1 shows the results for each institution. The percentage represents the difference in the assessment of the risk

factors between inspections. A low percentage indicates that there is little difference; a high score represents a large difference.

The results show that during the unannounced inspections, 6% of the risk factors, on average, were assessed differently than during the announced inspection (std. 4%). The difference is not significant. It is important to note that during the unannounced inspection at institution 6, 19% of the risk factors were scored as present, which were absent during the announced inspection.

Further analysis shows that overall the score of 91% of the risk factors during the unannounced inspection was similar to the score during the announced inspection. During the unannounced inspections, only 3%, on average, were scored as absent which had appeared to be present during the announced inspections. The largest difference was seen in two risk factors from the sub-theme, 'Individual care plan implementation' (sub-theme 2b, Table 2): These risks factors were: 'there are serious shortcomings in the care plan, regarding evaluations and revision', a difference of 40%, and 'there are serious shortcomings in the care plan regarding reporting', a difference of 30%. On the other hand, 6% of the risk factors were scored as present during the unannounced inspections, which were absent during the announced inspection. The largest difference was seen in a risk factor from sub-theme 9b, 'there is no training policy', a difference of 21%.

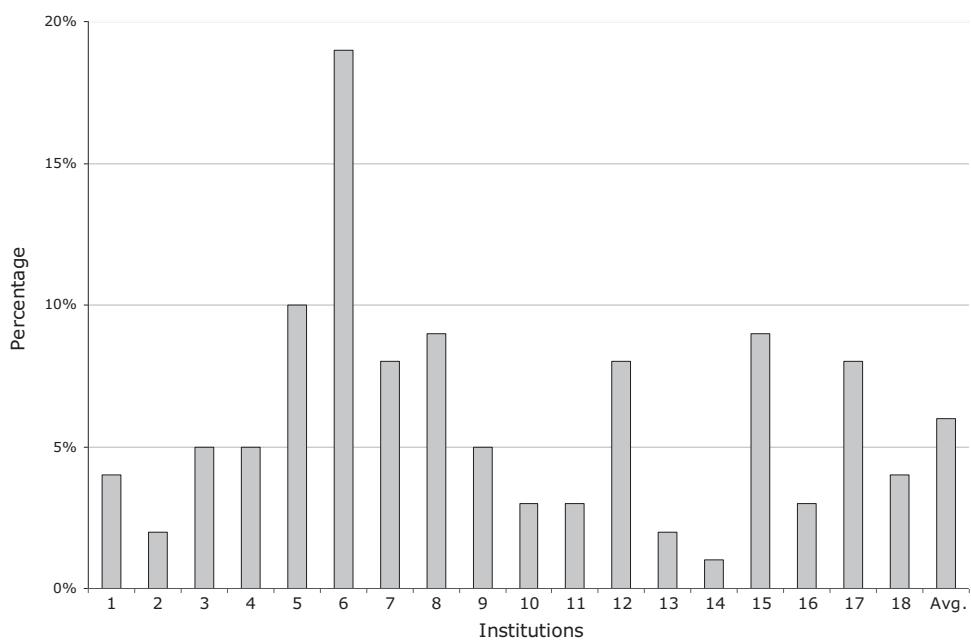
Secondly, the difference between the number of risk factors scored as present during the unannounced inspection and those scored as present during the announced inspection, was calculated for each institution. Fig. 2 shows the results for each institution. The percentage represents the magnitude of the difference in the number of risk factors which were scored as present. A positive percentage means that in the unannounced inspection more risk factors were assessed as present than during the announced inspection.

On average, there is a small non-significant difference of 0.1% (std. 13%). Both during announced and unannounced inspections, inspectors scored around 27% of the risk factors as present. It is notable that in two institutions, 6 and 15, above 20% more risk factors were found during the unannounced, than during the announced, inspection. The reverse also occurred. With institution 16, the inspectors scored 23% fewer risk factors during the unannounced inspection than during the announced inspection. At ten institutions, the difference between the number of risks in unannounced and announced inspections, is fewer than, or equal to, 6%.

Finally, the number of risk factors that could not be assessed during the inspections due to lack of information was calculated for each institution. Fig. 3 shows the results for each institution. The percentage represents the difference in the assessment of the risk factors between inspections. A positive percentage means that, in the unannounced inspection, more risk factors could not be assessed due to the lack of information than during the announced inspection.

In some instances there was insufficient information to assess risk factors. Yet even here, inspectors scored, on average, 12% more of the risk factors (std. 9%) during the unannounced as compared with the announced

<sup>6</sup> <http://www.maxqda.com/products/maxqda10>.

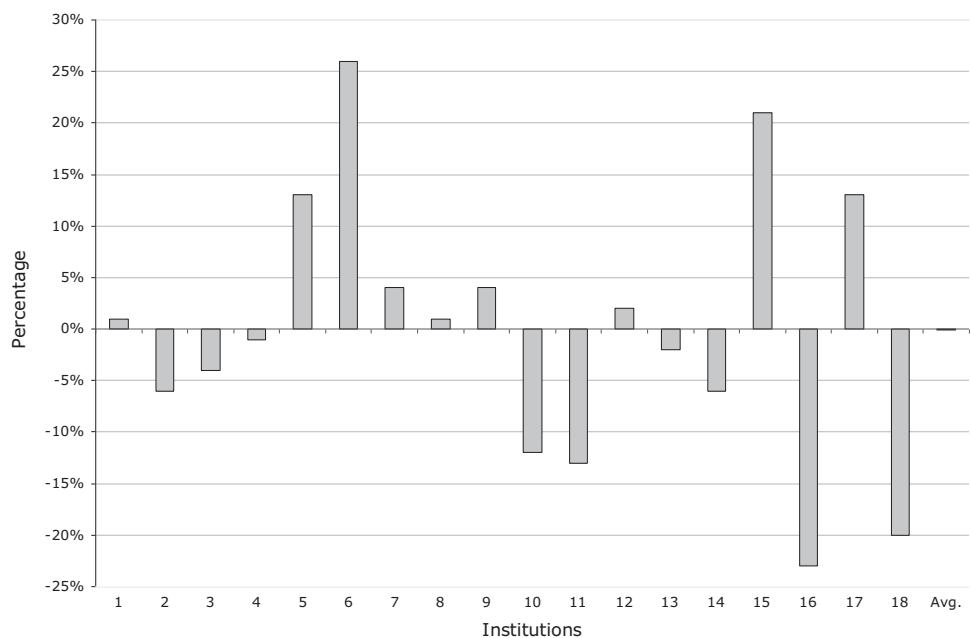


**Fig. 1.** For each institution the percentage difference between the unannounced and announced inspection for the risk factors which were scored differently.

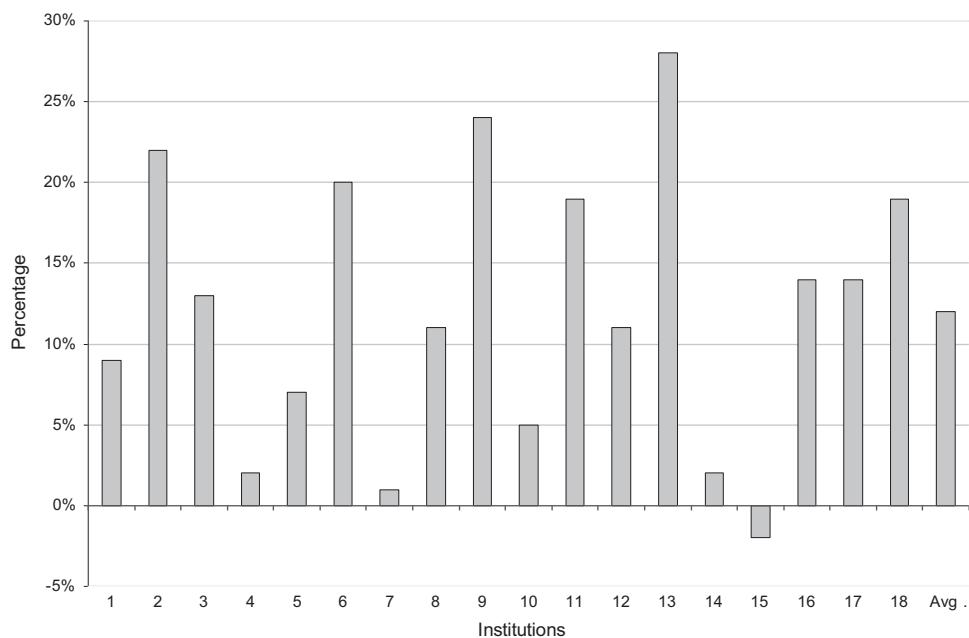
inspections. The difference is significant ( $p < 0.01$ ). This was most common in the following theme and sub-themes: 'Provision of information' (sub-theme 2c, Table 2); 'Fall prevention' (sub-theme 4c); 'Participation and social independence' (theme 6) and; 'Quality of staff' (sub-theme 9b). The largest difference, 22%, was found with two different risk factors: (1) 'information for the continuity of the daily care is not included in the care plan' derived from the sub-theme, 'Individual care plan implementation' (sub-theme 1b, Table 2); and, (2) 'the use of medication

was not a no consideration in the evaluation of fall incidents' from the sub-theme, 'Fall prevention' (sub-theme 4c).

It is worth noting that in institution 13, the inspectors reported a large difference of 28% between the information that was available to assess the risk factors during unannounced and announced inspections. Among four other institutions, 4, 7, 14 and 15, the inspectors could, during both inspections, assess almost the same amount of risk factors due to the lack of information.



**Fig. 2.** For each institution the percentage difference between the unannounced and announced inspection for the risk factors which were scored as present.



**Fig. 3.** For each institution the percentage difference between the unannounced and announced inspection for the risk factors that could not be assessed.

### 3.3.2. Part II

In the second part of the exploratory study we asked managers of nursing homes and inspectors how they evaluate the unannounced inspections, compared to the announced ones. The results show that eight out of the nine managers of the nursing homes did not regard the unannounced inspection as any different from the announced one. The unannounced inspection was for most managers less stressful compared with an announced one, because they did not have to make preparations such as laying out files and protocols and scheduling staff. Almost all the managers thought that the inspectors got a better idea of everyday practice during the unannounced inspection. They did not expect the inspectors to receive a different view of the institution during the unannounced inspection, than during the announced one.

By contrast the responses show that the experiences vary among the inspectors. Five out of fourteen interviewed found the unannounced inspection produce more anxiety than the announced one. These inspectors were concerned whether or not the inspection was suitable and whether the staff would be willing to co-operate. During the unannounced inspection, three inspectors felt rushed or uncomfortable. Five inspectors found the unannounced inspection more challenging than the announced one.

The staff of the institutions responded largely positively to the unannounced inspections, as illustrated by the following quotation from an inspector: '*Everyone I spoke to said: "It's good that you do this, and very logical too, these things should happen much more often. You are welcome at any time."*'<sup>7</sup> But they also say: '*We always have to behave in a manner in which we can be assessed*'.<sup>7</sup> Four

inspectors found that the unannounced inspection disrupted the daily routine of the institution, because such an inspection makes demands on staff time, which the institution has not prepared for. An inspector put it like this: '*I think it's really unfair to ask people for two hours of their time [...] I feel uncomfortable. If they have so much time to spend with me, then the client suffers*'.

Six inspectors found that the unannounced inspections had an added value, because they lead to a positive impression of the inspection service both among politicians and in broader society. They feel that conducting more unannounced inspections gives the Dutch Health Care Inspectorate more authority. Because of the 'threatening' effect it assumes, it makes the inspectorate look as if it is more serious about its work. Twelve inspectors also found a significant limitation in the unannounced inspection. During an announced inspection, an inspector speaks with the clients and representatives from various levels of the organization. This results each time in a different view of a particular subject and the inspector is then able to verify information through different people. This is not possible during the unannounced inspection, so the inspectors found that the assessment of the risk factors could not be well substantiated.

One half of the inspectors found the additional information collected during the unannounced inspection, improved the impression of the institution. The other inspectors did not share this view. They argued that the context of observations of the performance of care, during the unannounced inspection, is not always clear and that the observations are nothing more than a snapshot. They also found that the real risks to responsible care are more visible in the organization, structures, or preconditions for good care and that these cannot be investigated properly during an unannounced inspection.

<sup>7</sup> This quotation and also the following are translated from Dutch.

Thirteen out of fourteen inspectors interviewed believed that the announced inspection cannot be completely replaced by an unannounced one. They found that during an announced inspection the risks identified can be supported better. Seven inspectors thought that an unannounced inspection is suitable as it focuses on the performance of the care.

### 3.4. Discussion

The results showed a small, though not significant, difference in how the risk factors were assessed during the unannounced inspections compared to the announced ones. Therefore we argue that at the same institution, the inspectors detect similar risks during the unannounced, and the announced, inspection. It should be noted that during the unannounced inspections, the inspectors assessed, on average, slightly more than 10% fewer risk factors than during the announced inspections. This indicates that during an unannounced inspection it is less easy to assess the organization of care and the preconditions for good care. In further research, consideration should be given to what subjects are appropriate for unannounced inspections.

We note that managers of the nursing homes and inspectors do see benefits in unannounced inspections. Almost all managers expect that the inspectors get a better view of the performance of the care during the unannounced inspection. They also find unexpected inspections less stressful because they have to prepare less. The inspectors, in turn, find that the staff appreciated the unannounced inspection.

The tool used to score the risk factors is not entirely suitable for unannounced inspections. The evaluation of the inspectors with this instrument could not achieve a complete view of the institution during an unannounced inspection. An appropriate instrument, and a good instruction to equip inspectors better for unannounced inspection, is necessary.

We should note that the exploratory study tried to be consistent with existing procedures. This was in order to develop practice-based evidence on the desirability of deploying unexpected regulation. However, due to limitations in the regulatory practice, we could not choose a design with a control group and the sample of the eighteen nursing homes could not be selected randomly. The consequence is that the results of the exploratory study cannot be extrapolated to all nursing homes in the Netherlands and that the conclusions should be drawn with care.

The choice of performing an unannounced inspection first, followed by an announced inspection, later, can influence the results of the announced inspection. This allows the difference between announced and unannounced inspections to be larger or smaller than really are. For example, if during the unannounced inspection certain imperfections are noted, then the institution has the opportunity to eradicate them before the announced inspection. Even so, it may be that the institution decides to do nothing because the inspectors, during the unannounced inspection, were already aware of the true situation. Agreements were made with the inspectors in advance about how the unannounced inspections had to be carried out. Some

differences, however, may have occurred. Some inspectors showed more reluctance during the unannounced inspection, because they did not want to burden the institutions too much.

It is also possible that during the interviews the managers of the care and nursing homes gave socially acceptable answers, because the interviewer was employed by the Dutch Health Care Inspectorate.

### 4. Conclusion

The Dutch Health Care Inspectorate has felt an increasing social and political pressure to carry out unannounced inspections. This pressure was the reason for our review and study. To our knowledge this is the first study which investigated the difference between announced and unannounced inspections in nursing homes. We conclude that, there is no reason to believe that an unannounced inspection, compared to an announced inspection, results in a milder or stricter risk assessment. We must note, however, that if the Health Care Inspectorate is to give an opinion about the organization, structures, or preconditions for good care, then an announced inspection is the best option. If the regulation focuses on the performance of the care, then the unannounced inspection seems the most appropriate method.

The assumption in the calls for more unannounced inspections is that it leads to a reduction in the regulatory burden. We saw that in the systematic review and in the exploratory study, the unannounced inspection scored more positively in terms of the investment in time by the institution being inspected. Thus, reducing the regulatory burden might be a legitimate reason for unannounced inspections.

A combination of announced and unannounced inspections offers the best overall view of the care in the nursing homes. The option in which the announced inspection is followed up an unannounced inspection is the most obvious. There are at least two more ways of using unannounced inspections. Inspectors can integrate unexpected elements into announced inspections, or they can alert institutions to the possibility that the Health Care Inspectorate is carrying out unannounced inspections. Research must follow in order to find a good balance in the use of both types of inspection and different combinations of both instruments.

In the systematic review, and in our exploratory study, there is no explicit attention given to the side effects of unannounced or announced regulation. The Dutch regulatory system is based upon a consultative model rather than an approach based on punitive surveillance. The unannounced inspections did not evoke distrust from the managers and the staff of the institutions. They responded largely positively, possibly because they have confidence in the positive contribution of the inspectors to the safety and quality of care, even if they inspect unannounced. It is worth noting that inspectors have more objections to unannounced inspections than the institutions. A possible explanation is that the inspectors make the connection too quickly between distrust and unannounced inspections [4].

The result of our review and study is an initial insight into the conditions under which unannounced inspections of elderly care are effective. This insight can only be increased and become more evidence-based with further research into the effects and side effects of unannounced, compared with the announced, inspections. We believe that before new regulations are introduced, the scientific literature should be scrutinized, in order to determine what is known about these concepts. New regulations should be introduced through pilot studies accompanied by research. Proper understanding of what scientific literature has been applied, in combination with studies into the effects of inspections, helps to ensure that new concepts of regulation are properly thought out and are more likely to succeed.

## Conflicts of interest

The authors declare that they do not have any conflict of interest.

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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%.<sup>2-4</sup>

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.<sup>5</sup> 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.<sup>4,6</sup>

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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).<sup>1</sup> However, why some facilities have been more successful at limiting the spread of infection than others



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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.<sup>2</sup> 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<sup>a</sup>

Nursing home characteristics	Nursing homes with ratings		Health inspection <sup>b</sup>		Quality measures <sup>c</sup>		Nurse staffing <sup>d</sup>	
	All	High performing			High performing	Low performing	High performing	Low performing
			High performing	Low performing				
No. of nursing homes <sup>e</sup>	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.

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

<sup>b</sup> 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.

<sup>c</sup> 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 have 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.

<sup>d</sup> 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.

<sup>e</sup> 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.<sup>3,4</sup> 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 <sup>a</sup>	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.

<sup>a</sup> 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.<sup>5,6</sup>

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.

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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.<sup>1</sup> Some US pediatricians dismiss children from their practice whose parents refuse vaccination.<sup>2</sup> 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.<sup>3</sup>

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  $\chi^2$  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).<sup>4</sup> 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).

# Mapping Nursing Home Inspections & Audits in Six Countries

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**Abstract** International quality concerns regarding long-term residential care, home to many of the most vulnerable among us, prompted our examination of the audit and inspection processes in six different countries. Drawing on Donabedian's (*Evaluation & Health Professions*, 6(3), 363–375, 1983) categorization of quality criteria into

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structural, process and outcome indicators, this paper compares how quality is understood and regulated in six countries occupying different categories according to Esping Andersen's (1990) typology: Canada, England, and the United States (liberal welfare regimes); Germany (conservative welfare regime); Norway, and Sweden (social democratic welfare regimes). In general, our review finds that countries with higher rates of privatization (mostly the liberal welfare regimes) have more standardized, complex and deterrence-based regulatory approaches. We identify that even countries with the lowest rates of for profit ownership and more compliance-based regulatory approaches (Norway and Sweden) are witnessing an increased involvement of for-profit agencies in managing care in this sector. Our analysis suggests there is widespread concern about the incursion of market forces and logic into this sector, and about the persistent failure to regulate structural quality indicators, which in turn have important implications for process and outcome quality indicators.

**Keywords** Long-term residential care · Quality indicators · Marketization · Regulation

## Introduction

Growing concern about the quality of long-term residential care is an international phenomenon, and is reflected in reports from governments and advocacy organizations (cf. Armstrong et al. 2009; Jansen 2010; Lloyd et al. 2014; U.K. Care Quality Commission 2010; US Government Accountability Office [U.S. GAO] 1987, 2009; US Office of the Inspector General [US OIG] 2014; Wagner and Rust 2008). These quality concerns are only deepened because this sector is home to many of our most vulnerable individuals (WHO 2002). In view of these international quality concerns, it is important to understand the ways in which different jurisdictions audit or regulate quality within this sector. Accordingly, this paper examines the approaches taken by seven jurisdictions (in six countries), occupying different categories within Esping Andersen's (1990) welfare state typology: Manitoba Canada, Ontario Canada, United States (US), and England (liberal welfare regimes); Germany (conservative welfare regime); Norway, and Sweden (social democratic welfare regimes). We begin with a review of the literature on quality indicators, audits and inspections, and extract from this review the factors and approaches to quality that inform our comparison.

## Considering Quality Indicators

Donabedian (1983) categorizes quality criteria into structural, process, and outcome-related indicators. Within this typology, structural indicators include factors such as educational preparation of staff, staffing levels and ratios, and physical plant and building characteristics (Idvall et al. 1997; Stolt et al. 2011). For example, higher

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staffing levels and resident-staff ratios have been linked to better quality in this sector (Castle 2008; Harrington et al. 2012b; Spilsbury et al. 2011). While not often listed as a structural quality indicator, ownership type is a structural factor also related to quality, with for-profit agencies linked to more quality problems than not-for-profit agencies (cf. Comondore et al. 2009; McGregor et al. 2006; McGregor and Ronald 2011).

Process indicators include practices or procedures of care, such as formalized practice guidelines and standards that inform how and what care is provided, as well as the relations among providers and between providers and residents (Higashi et al. 2005; Zimmerman et al. 1995). Outcome indicators capture changes in status, such as pressure ulcer rates, falls, mobility levels, or mortality rates (Stolt et al. 2011; Zimmerman et al. 1995). The literature cautions against ignoring the interrelated nature of these indicator types, arguing, for example that an exclusive focus on process indicators detracts from the importance of individualizing care needs (Mor 2007; Werner and Asch 2007). The literature also suggests that reliance only on process and outcome indicators ignores influential structural factors such as staffing levels and intensity (US CMS 2001; Harrington et al. 2012b) or ownership type (McGregor et al. 2006) that are linked to quality care.

Social and political contexts also influence which quality indicators are used and how they are used. The global trend in marketization, New Public Management (NPM) or Neoliberal-influenced reforms has led to the export of market principles or logic into quality assessments, manifesting as a preference for standardized, measurable process and outcome quality criteria (Erlandsson et al. 2013; Woolford and Curran 2011). The dominance of standardized and measurable outcome indicators facilitates the benchmarking and comparison of results, which is in turn compatible with market notions of competition and consumer choice (Anttonen and Meagher 2013). Quality improvements have been linked to process and outcome indicators, including reductions in restraint use, pressure ulcers, catheterizations, as well as improved infection control (Colón-Emeric et al. 2010; Sutherland and Leatherman 2006; Werner and Konetzka 2010). The literature suggests that in highly privatized jurisdictions, including the U.S., England and some Canadian provinces, for-profit long-term care agencies prefer the regulation of process indicators, such as conducting resident surveys, or standardized outcome quality criteria. Their more extensive human and financial resources enable them to better manage these requirements (Szebehely and Meagher 2013). In spite of the strong links between quality and structural indicators such as staffing levels, types and intensity (Harrington et al. 2012a; Park and Stearns 2009), for profit agencies have effectively lobbied against jurisdictions moving to regulate these factors (Szebehely and Meagher 2013).

## Considering Quality Inspections/Audits

The literature on inspections and audit processes differentiates between deterrence approaches that emphasize formal, legalistic regulations, and compliance approaches that are characterized by more supportive methods to assist the home in improving quality (Walshe 2001). While there are reports citing the preference by managers (Furness 2009) and by health care aides (Chung 2012; Kontos et al. 2010) for more compliance-based approaches to inspections, others argue that in highly privatized long-term care environments, such as the US, compliance approaches are not effective.

When it comes to regulating for-profit nursing homes and especially chains, there is literature suggesting that deterrence approaches are necessary because compliance initiatives fail to influence those who actually make the key quality of care decisions (Harrington et al. 2012a, 2014a; Mukamel et al. 2012).

The influence of market-based or neoliberal forces is evident in the shift of governance and accountability processes from trust and cooperation-based to standardized, highly quantifiable audits (Evans et al. 2005), more reflective of a deterrence approach. Market-based forces are also evident in the form of public reporting of quality findings and pay for performance initiatives (which compensates for specific outcome achievements, e.g., avoiding resident hospitalizations). Konetzka and Werner (2010), while generally supportive of market-based approaches, acknowledge that only a 1 % quality improvement is attributable to public reporting, while pay-for-performance effectiveness has yet to be demonstrated. There are arguments that a narrow, standardized regulatory focus can lead to problems with non-regulated quality issues (Bowblis and Lucas 2012), can increase the potential for gaming by nursing home administration in order to appear more compliant than is actually the case (Bowen and Kreindler 2008; Braithwaite et al. 2007; Sutherland and Leatherman 2006), can siphon money away from actual care (Bowen and Kreindler 2008), and can download the responsibility or accountability for quality to the workers rather than those making the resource decisions (Evans et al. 2005). Others argue that the enforcement of standardized regulations is key to ensuring quality, adding that problems in effectiveness are largely because the nursing home industry has weakened and blocked the implementation of strong enforcement policies (Harrington et al. 2014b).

The following comparison of the long-term residential care audit/inspection processes in seven jurisdictions (Ontario Canada; Manitoba Canada; England; Germany; Norway; Sweden; United States) draws on this background literature. We begin with a profile of facility ownership in each jurisdiction, including recent trends in each. We then describe how quality is assessed, audited and enforced on an ongoing basis in these jurisdictions. Our review seeks to understand how quality is understood, including to what degree structural, process and outcome quality criteria are included in audits/inspections. Our review considers the audit process in each jurisdiction, whether findings are publicly reported, and what enforcement mechanisms are utilized. Overall we seek to better understand how inspection/audit processes compare in these various jurisdictions as well as identify any trends in quality regulation.

## Methodology

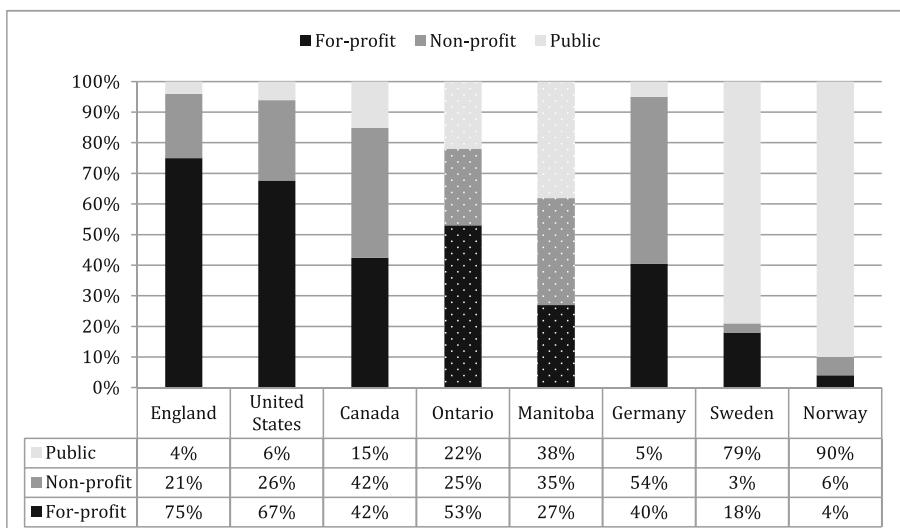
As part of an international study of long-term residential care entitled, *Reimagining Long-Term Residential Care: An International Study of Promising Practices*, descriptive data were collected on facility ownership, trends in ownership as well as the processes and practices of audit/inspection in each of the six countries between 2011 and 2014. These data collection methods included Internet surveys of government and professional association documents and reports, in addition to academic publications. In each jurisdiction the researchers collected relevant policies/regulations and practices regarding the requirements for long-term residential care agencies. As much as possible we have attempted to collect comparable data, but it was not always possible to do so.

## Findings

### Facility Ownership

Graph 1 presents the long-term facility ownership profile, depicting England (75 %) and the US (67 %) with the highest proportion of for-profit and Norway (4 %) with the lowest. While Canada has 42 % for-profit ownership overall, there is considerable provincial variation. Ontario's 53 % for-profit ownership is the highest in the country, while Manitoba has about half of that at 27 %. The two provinces are presented in a dotted pattern, signifying they are also included in the Canadian data. Germany has 40 % for-profit ownership overall, varying between 25 and 65 % from one state to another (Statistisches Bundesamt, Pflegetatistik, March 2013 update), and Sweden is much lower at 18 %. While this snapshot illustrates the broad range in current long-term care ownership, most jurisdictions are trending towards greater for-profit ownership and/or involvement in this sector. The number of private, for-profit-owned facilities in England has grown rapidly, particularly since the late 1980s (Drakeford 2006; Godden and Pollock 2010; Laing 2014). A dramatic increase in the number of care homes during the 1990s abated after changes were made to the system of funding individual placements. In the past ten years, private equity companies became more involved and ownership more consolidated, with the top 5 providers accounting for over 20 % of available care home places in 2010 (Allan and Forder 2012).

In spite of the considerable variation in levels of for-profit ownership, most of these jurisdictions are experiencing upward trends in for-profit ownership and/or involvement. Canadian nursing homes are trending towards more private for-profit ownership (Canadian Union of Public Employees (CUPE) 2009; Statistics Canada 2011), particularly in the province of Ontario with two-thirds of the new beds since 1998 going to



**Graph 1** Facility ownership (%). References – England (Laing and Buisson 2012; Godden and Pollock 2010), US (Harrington et al. 2011), Canada (Statistics Canada 2011), Ontario (CUPE 2009), Manitoba (Douce et al. 2006, Statistics Canada 2012), Germany (Arfwidsson and Westerberg 2012; Stolt et al. 2011), Sweden (Erlandsson et al. 2013), Norway (Vabo et al. 2013)

for-profit agencies (CUPE 2009). Sweden and Norway, with much lower for-profit involvement than the other jurisdictions studied, are also experiencing an upward for-profit trend. Sweden has moved from less than 1 % for-profit ownership to current levels since the early 1990s (Stolt et al. 2011). In addition, two large private equity-owned corporations currently run half of the private nursing homes (Arfwidsson and Westerberg 2012). In Norway, where more than 95 % of nursing homes remain owned and managed by non-profits, there has been increased involvement of the for-profit sector in nursing home management (Vabo et al. 2013). In the US, over half of the for-profit nursing homes are owned by nursing home chains (Harrington et al. 2011, 2012a).

## Survey Audit Process

### *U.S. and Ontario, Canada*

Audits/inspections in the US and in Ontario, Canada are complex processes. On a continuum stretching from the most to least deterrence-based, standardized and codified audit/inspections, the US and Ontario reflect the most deterrence-based and standardized. All US nursing homes receiving Medicare and Medicaid funding (98 %) are regulated (OBRA 1987), with mandated standards and regulatory procedures overseen by the US Centers for Medicare and Medicaid Services (CMS) (US GAO 1987), with inspections carried out by state agencies. Long-term residential care is a provincial responsibility in Canada, regulated in Ontario through the *Long-Term Care Homes Act* (2007), with the inspections overseen by Performance Improvement & Compliance Branch, Health System Accountability and Performance Division, Ministry of Health & Long-Term Care (MOHLTC) (MOHLTC 2010).

In both jurisdictions, unannounced inspections/audits are performed regularly (annually in Ontario and at least every 15 months in the US), and in response to complaints (MOHLTC 2012; US CMS 2012a). Inspections are also triggered in the US in response to substantial facility changes (US CMS 2012a) and in Ontario following a mandatory critical incident reporting or prior non-compliance finding (MOHLTC 2010). Both jurisdictions focus primarily on outcome and process indicators of quality. The US state surveyors assess a home's compliance with 170 federal outcome and process regulations (US CMS 2012a), specifying resident, family and staff interviews, and record and document reviews (Saliba et al. 2008). Surveyors also assess whether staffing standards are met. There is no US-wide 'minimum hours of care' standard (except to have a registered nurse director 8 h/day, 7 days/week and licensed staff 24 h/day), and while direct care standards exist in several individual states, experts have cited these as too low (Harrington et al. 2012a, b). Ontario inspectors are empowered and guided by very specific, regulated protocols to assess 136 Quality of Care and Life Indicators (QCLI) in 34 care areas. Each protocol closely specifies questions and probes to use while conducting observations, resident, family and staff interviews, and record and policy reviews (MOHLTC 2010, 2012). In spite of these prescriptive inspection regulations, Ontario actually removed a minimum hours of care regulation that guaranteed 2.25 h daily of direct care for each resident. Currently, there is no 'minimum hours of care' standard in the province (Harrington et al. 2012b).

In both jurisdictions, inspectors are trained and mandated to follow standardized processes. In the US, standard forms, and detailed sampling, survey and data recording procedures are identified by CMS (US CMS 2012a). In Ontario, inspectors' assessments of resident QCLIs are determined utilizing defined numerator, denominator and specified exclusions. Findings of non-compliance are plotted on judgment matrices to determine action. In the US and Ontario inspectors are not allowed to provide consultation or convey the results to nursing home staff during the inspection process (MOHLTC 2011; US CMS 2012a), but in the US, summary findings are given to the staff at the end of the survey (US CMS 2012a).

### England

In England, nursing homes (known as care homes) are registered with the Care Quality Commission (CQC), responsible for regulation and inspection, by the *Health and Social Care Act 2008* (Regulated Activities) Regulations 2010 No. 781. In 2013, in response to serious lapses in standards and evidence of abuse and cruelty, the Care Quality Commission was overhauled, a new Chief Executive was appointed and extra funds were made available to change the inspection process. A new care home inspection and regulation programme ([www.cqc.org.uk/content/adult-social-care-providers](http://www.cqc.org.uk/content/adult-social-care-providers)) was initiated in 2014 (still in progress). The new process pursues the following five questions and key lines of enquiry for all inspections: 1. Are they safe? People are protected from abuse and avoidable harm; 2. Are they effective? The care provided achieves good outcomes, promotes good quality of life and is evidence based where possible; 3. Are they caring? Staff involve and treat people with compassion, kindness, dignity and respect; 4. Are they responsive? Services are organised to meet people's needs; 5. Are they well-led? The leadership, management and governance of the organisation assure the delivery of high-quality, person-centred care, support learning and innovation and promote and open and fair culture (UK Care Quality Commission (UK CQC) 2014).

The inspection process draws on four sources of information: review of complaints and other key information from residents, carers and staff; review of national datasets, CQC records and information from commissioners and care home providers; observations of care, facility inspections and documentary reviews on site; interviews with service users, families, staff and other professionals. Following inspection, services are rated as outstanding, good, require improvement or inadequate. Ratings are given for each of the five questions as well as overall, with an aggregate rating. Inspections are usually unannounced, and can be comprehensive (cover all five questions) or focused (responding to specific concerns). The frequency of comprehensive inspections will depend on how well-rated the service was at the last inspection. The teams will typically include one experienced inspector and an 'expert by experience' (with personal experience of the care system). Inspectors, while guided by principles, are also able to exercise their judgement. For example, there might be a specific concern about leadership and management, which has a low impact on the residents and which would not necessarily lead to an 'inadequate' rating (UK CQC 2014).

## *Germany*

In Germany, a mandatory, universal, social Long-Term Care Insurance system (LTCI) was introduced in 1995, mandating that providers and purchasers (LTCI-companies) of LTC services negotiate and agree on the principles and measures for quality assurance and quality control (cf Büscher 2010 p. 4ff). The approach reflects the general principle of self-regulation between the purchasers and the providers based on the assumption that all stakeholders<sup>1</sup> are responsible for the availability and quality of care. (cf Büscher 2010 p. 4ff). The legislation sets the framework and only takes further action if no agreement is achieved between the stakeholders. In 2001 the LTC Quality Assurance Law (Pflege-Qualitätssicherungsgesetz - PQsG) introduced a system of quality contracts, obliging providers to establish internal quality management for service facilities, staff, equipment and use of expert standards. Staff-to-resident ratios are required, but vary due to resident care needs and region (federal states).

The Medical Advisory Board of the LTC insurance Funds (MDK) is responsible for regulatory oversight and conducting audits in all nursing homes. Since 2011 audits are conducted annually, in response to a complaint, or in follow-up to prior insufficiencies. Inspections are based on detailed assessment guidelines for reviewing documents, interviews of the care facility head, nurse in charge, quality manager and other relevant persons, and a satisfaction survey of 10 % of residents. These assessments include: structure indicators (e.g., compliance with staff qualification requirements, quality of living space); process indicators (e.g., staff opportunities to attend regular training sessions, use of nursing/care standards); and, outcome indicators (e.g., fall prevention, pain management, pressure ulcer prevention,<sup>2</sup> resident satisfaction).

In general, two MDK nurses, who must be RNs or elderly care workers with professional experience and quality management training, conduct the facility inspections. While the actual assessment details are the result of negotiations between the various stakeholders, there is a considerable reliance on the judgment and interpretation of the inspector, resulting in inspections that are not conducted in identical ways. A closing interview is held with facility representatives at the end of the 1-to-4-day audit. An online “Critical Incident Reporting System” (CIRS) was recently introduced, enabling employees to anonymously report critical incidents in their daily work. Thus, important information regarding errors is discussed publicly, with the goal of receiving advice from experts and establishing or moving towards a culture of Failure Management (*Kuratorium der deutschen Altenpflege*).

<sup>1</sup> These stakeholders include: Central Federal Association of LTCI, Federal Association of Supra-local Social Welfare Associations, Federation of Municipal Associations and Associations of Providers of Care Institutions at the federal level, Medical Service of the Central Federal Association of Health Insurances, Association of Private Health Insurances, Federal Associations of Nursing and Elderly Care Professions, and relevant organizations representing the interests and self-help of dependent and disabled people.

<sup>2</sup> This use of the expert standards of the German Network for Quality Development in Care (Deutsches Netzwerk für Qualitätsentwicklung in der Pflege – DNPQ) concerns technical nursing care and prevention measures. Expert standards include wound care, prevention of pressure sores, pain management, prevention of falls, discharge management and malnutrition.

*Manitoba, Canada*

The provincial Department of Health & Healthy Living regulates nursing homes (NHs, also called personal care homes (PCHs)) in Manitoba, Canada. The Continuing Care Branch of the Regional Affairs Division ensures compliance with the Provincial Personal Care Home (PCH) standards and oversees the annual licensing of nursing homes (Office of the Auditor General Manitoba 2009). The standards for these nursing homes were developed collaboratively with key stakeholders (provincial and regional government officials, the Manitoba Nursing Home Association, and the Non-Profit Long Term Care Administrator's Group) and field-tested before use. There are five core standards occupying the continuum from structural (e.g., availability of pharmacy services, safety & security<sup>3</sup>), to process and outcome indicators (e.g., use of integrated care plans, staff education, use of restraints). Twenty-one non-core standards include some structural indicators (person in charge and qualified staff) and mostly process indicators (e.g., resident [or representative] participation in care planning, organized dietary services and infection control) (Office of the Auditor General Manitoba 2009). These seem to be less specific outcome indicators than in the US or Ontario. While there is a minimum standard of care in the province of 3.6 h of care per resident day (hprd), this is based on paid, not worked hours and is not formally assessed during inspections (Office of the Auditor General Manitoba 2009).

In contrast to Ontario, there is explicit reliance in Manitoba on inspectors' prior expertise in nursing or other health care fields. The 1-day inspection is completed at minimum every 2 years on every nursing home. While unannounced inspections are conducted in approximately 1/3 of homes annually, the majority is given 48-h notice of the inspection, including information about which of three possible inspection tools will be utilized. Each tool assesses the five core standards plus seven of the 21 non-core standards, but the review team has the right to assess all 26 standards if necessary (Office of the Auditor General Manitoba 2009: 50). Inspections include resident files and document reviews (e.g., medication audits, staff training records), and interviews with staff and residents. The standards, measures (core and non-core) and scoring methodology are listed in each assessment tool. Inspection teams also use their professional judgment to determine each rating. If the core (essential) measures are not met, the standard is not met. Homes can receive a 'met' rating ('pass' all core measures and 80 % of non-core measures), a 'partially met' rating (pass all core measures and 60 to 80 % of the non-core measures), or 'not met' (failed to pass a core measure and more than 60 % of the remaining measures). The review also assesses compliance with the Provincial Restraint Policy (documentation of all restraint decisions) (Manitoba Government 2012a, b; Office of the Auditor General Manitoba 2009). Findings are initially shared with staff on review completion.

<sup>3</sup> E.g., the safety and security core standard mandates all call systems to be in proper working order, all open stairwells are safeguarded, windows cannot be exits, and all outside and stairwell doors are alarmed, with approved locking devices under the Manitoba Fire Code (Manitoba Government 2012b).

## Sweden

In Sweden, eldercare, from home care to nursing homes, is regulated by the Social Services Act (Social Services Act 1980:620 and 2001:453), requiring that services be provided when needs cannot be otherwise met to ensure a reasonable living standard. Staffing levels are not specifically mandated (Erlandsson et al. 2013). The responsibility for oversight of residential care mainly rests with the municipalities, but the state is increasingly active in advising the municipalities on how to follow up on care services, particularly when they are contracted out (*Ibid*). For instance, in 2013, a new national institution, the Health and Social Care Inspectorate (IVO), was given responsibility for monitoring and evaluating elder care services, compiling information from the municipalities, developing standards, supervising compliance with the law, and when needed, licensing privately-owned residential care. The Inspectorate carries out both announced and unannounced inspections (the frequency is not regulated), as well as inspections in response to complaints (Erlandsson et al. 2013). The majority of inspections are caused by complaints or deficiencies reported by staff (IVO 2015).

National inspectors are guided by the national evaluation criteria, which do not have legal status. Similar to Manitoba, the Swedish national guidelines stress the professional expertise and experience of the inspectors (NBHW 2012). During a 3-year period (2010–2012), all 290 municipalities, but by no means all facilities, were inspected. The inspection process includes interviews with staff, residents and family members and document analysis. The goal of inspections is mainly to identify problems and areas for improvement, and the results are reported back to the homes and to local authorities to address (IVO 2013). The National Inspectorate recently argued that both hard (e.g., fines or closure) and soft tools (e.g., recommendations and consultation) should be utilized during inspections. “Available research suggests that hard tools can work well in the short-term... but can have limited effect in the long-term. Softer tools ... seem to have a more long-term effect on changing provider behaviors. Yet, the latter requires a provider who is serious about improvements” (IVO 2015:12). The national inspection process provides a general picture of the problems and areas for improvement in order “to enable systematic learning and prevent the repeat of deficiencies and malpractice” (Inspectorate website, English presentation ([www.ivo.se](http://www.ivo.se))). The main responsibility to follow up on the quality of individual nursing homes, whether private or public, rests with local politicians.

## Norway

In Norway, municipalities are required to provide nursing home services to those who need it (Ministry of Health and Care Services 1982, 1983, 1989), with the Norwegian Board of Health Supervision (NBHS) responsible for supervising nursing homes (NHs). Organizations are mandated to monitor risks and to ensure that health and safety are maintained and that problems are corrected for both residents and staff (Nakrem 2011). National legislation also determines when and how coercion or restraints can be used (NBHS 2011). In contrast to California and Ontario, and more similar to Manitoba and Sweden, there is a relatively low degree of formalization or standardization in the audit/inspection/regulation of nursing homes in Norway. Informal inspections of selected NHs in each municipality are performed annually, and in response to complaints (NBHS

2011). The inspection focus varies each year (e.g., in 2011 the focus was to ensure that nursing homes identified whether the capability to consent was adequately assessed for residents refusing care) (NBHS 2011; p. 7). The offices of the Governor in each county, as well as the municipal authorities, have key supervisory roles in ensuring the safety of residents and staff. While the Norwegian Association of Local and Regional Authorities (KS) proposes guidelines, municipalities differ in what and how they investigate. In some cases, the NBHS may ask a municipality to follow up with individual nursing homes regarding problematic performance.

The number and range of quality indicators is limited, with a greater reliance on the opinions of the inspection team during the inspection processes, rather than a focus on the reliability of indicators (Nakrem 2011). Inspectors also convey their views to staff and management during the inspection process, overall suggesting more of a compliance than a deterrence approach. The indicators focus on some structural factors (physician and physiotherapy hours/week/resident; proportion of skilled personnel and level of preparation), process factors (such as the proportion of staff taking sick leave and the use of resident satisfaction surveys) and few outcome indicators (Kise 2004; Kommunenes sentralforbund 2004). There is growing pressure to develop comprehensive systems of standardized, measurable outcome indicators. (Borge et al. 2012).

## Enforcement

Enforcement mechanisms and approaches in these jurisdictions also reflect similarities and differences. In the US, sanctions (fines or civil money penalties (CMPs)), denial of payment for new or current admissions, and the institution of temporary managers (US CMS 2012b; US GAO 2000) are issued for potentially harmful violations, and for those resulting in actual harm, immediate jeopardy or substandard care. Many states collect state CMPs for violations of state nursing home regulations. Only about 2 % of violations are issued CMPs, with broad enforcement variations across states (Harrington et al. 2008; US GAO 2009). CMS may terminate an agreement with a nursing home if there is non-compliance, but this is extremely rare (US CMS 2012b; Harrington et al. 2008). Although the US has a structured survey and enforcement system and issues sanctions, the actual enforcement of the regulations has been described as weak, and sanctions are considered not strong enough to ensure compliance with the regulations (Harrington et al. 2014a; US GAO 2000, 2009; US OIG 2014).

In Ontario, the inspection report to the home lists the identified areas of non-compliance, the actions/orders determined by inspectors (utilizing the judgment matrix and grounds for selection), whether corrective action is required, and the time frame. The actions can include the issuing of written notification, request for a written plan of correction (voluntary), or a compliance order. If the non-compliance is extremely serious, the orders can include a reduction or withholding of funds, appointing a temporary manager, or revoking the license. There are processes in place to appeal any judgments (MOHLTC 2012).

In England, non-compliance is judged as minor, moderate or major (Care Quality Commission (CQC) 2012). The Commission requires providers to keep the CQC informed of the progress in addressing deficiencies within an agreed time frame. If

the CQC is not happy with the action taken, a warning notice is issued and inspectors visit the site to assess efforts to address the non-compliance. If problems persist, providers' activities could be restricted or their registration suspended. The CQC might also take action through the criminal law and, depending on the severity of the offence, could impose a fine, caution the provider or seek prosecution.

In Germany the Medical Service publishes the results of the inspections. In the case of poor results the MDK advises on possible quality management improvements and respective measures and sets a time frame for deficiencies to be addressed and improvements made. If the requirements are not fulfilled, the LTCI is informed and can reduce reimbursement for the services or cancel contracts with the provider (Gesetz zur strukturellen Weiterentwicklung 2008).

In Manitoba, a formal assessment report, including an action plan, is issued to the nursing home within 6 to 8 weeks of the inspection. An action plan for responding to any problems and progress reports must be completed by the home and returned to the Department within 50 days following the action plan submission. Homes that receive poorer scores on any given inspection are revisited more frequently compared to those receiving higher inspection scores (Office of the Auditor General Manitoba 2009).

In Sweden, when the municipality has contracted out the running of a nursing home, the municipality is responsible for the quality of care provided. If a provider does not meet the quality criteria stipulated in the contract, the local authority can end the contract if it can be proved that the home violates the quality requirements in the tender documents. On average there are 215 requirements in such documents (2/3 on processes and 1/3 on structure, though very rarely on staffing ratios), and only half of the requirements are deemed possible to monitor (Erlandsson et al. 2013 p. 74). The local politicians are often criticized for not properly following up on the contracts, and the seizing of a contract is usually preceded by a *media scandal* (Lloyd et al. 2014). While the responsibility to control quality rests with the municipalities, The National Inspectorate (IVO) can impose a fine or even close down a private or a public facility if they find residents are not receiving safe care, but this rarely happens. In 2014 no care homes were closed down but a fine of around SEK 800,000 was imposed in at least two cases where the Inspectorate found that dementia units were lacking staff at night (IVO 2015).

Given the relative autonomy of municipalities in Norway, other than the clear rules and regulations such as having RNs and auxiliary nurses as staff members and ensuring physician services are available, most national guidelines are formulated in very general terms and are broad in scope. The guidelines are mostly intended by national authorities and perceived by municipal authorities and agencies as recommendations. The tradition of respecting the autonomy of the municipalities is very strong in Norway, and national agencies like the Health and Care Department (HOD) and the Directorate of Health are very hesitant to enforce local standards (Lian 1996). Hence most of the guidelines are not strictly enforced.

## Public Reporting of Inspections/Audits

As previously mentioned, public reporting of certain quality aspects is a market-based approach that most jurisdictions have moved to adopt in some form. In the US, *Nursing Home Compare*, an internet-based site, was created by CMS to publicly convey quality

information in three major areas: staffing, deficiencies and quality measures for each certified nursing home. The information is gleaned from data reported from the state inspections and includes 19 quality measures for each certified nursing home. In 2008, CMS developed a Five-Star Nursing Home Quality Rating System, rating nursing home quality on a scale from five (much above average) to one (much below average), based on inspections, staffing and quality measures (US CMS 2014). This system has been improved over time but still relies heavily on nursing home self-reported data.

In Ontario, inspection reports are issued to Long-Term Care Homes and posted on a public website about 2 months later (MOHLTC 2012). The website, a searchable database of long-term care facilities displays information such as home administrator and ownership type, presence of family and resident councils, accreditation status, as well as inspection reports conveying the inspection purpose, findings and required actions (MOHLTC 2012).

In England, homes are given an opportunity to comment on reports before publishing. The reviewed inspection data are available on the CQC website, although not in full. A summary report with tick-boxes showing compliance or not against all the standards is publicly available on the web pages of each individual care home. The CQC also provides some aggregate data (CQC 2012).

There is growing interest in Manitoba to strengthen the accountability for nursing home standards and quality of care through public reporting. A recent report by the Manitoba Office of the Auditor General challenged the province to move to more public reporting of key nursing home performance measures. Increased public reporting is also one component of Manitoba's recent Aging in Place Blueprint for Change. To date no such public reporting has been developed (Office of the Auditor General Manitoba 2014).

The *Long-Term Care Development Act* (Pflege-Weiterentwicklungsgezetz – PfWG (2008) in Germany mandates MDK to publicize aspects of the assessment through the Internet. After some adjustments of the grading system each nursing home is now graded or rated from 1 to 5 on the basis of 77 individual criteria grouped into the following five quality areas: Nursing and medical care (32 criteria); Dealing with dementia residents (9 criteria); Social care and everyday design (9 criteria); Accommodation, food, housekeeping and hygiene (9 criteria); Resident survey (18 criteria). The score for an area is derived from the average of ratings of the individual home criteria, drawn from inspections/observations, staff and resident interviews as well as reviews of charts and other organization documents. The results of the quality tests are centrally collected and processed by an agency (Daten Clearing-Stelle, DCS) and made available to the nursing homes via internet. They have 28 days to clarify important questions and provide additional information. After having examined this information, the agency releases the transparency report that can be published by the LTCI-Company (Gesetz zur strukturellen Weiterentwicklung 2008). There are complaints that this system fails to accurately differentiate between levels of quality, as most residential care facilities receive very good grades. In 2014 a new evaluation system was developed by some of the stakeholders (Vereinbarung nach § 115 Abs. 1a Satz 6 SGB XI 2014; GKV Spitzenverband. Änderungen der Pflegetransparenzvereinbarung (stationär), gültig seit 01 2014 [Changes in the care transparency agreement]). In spite of these recent revisions, ongoing criticisms identify that many criteria are evaluated as either 'not satisfied' or 'fully met', making it impossible to distinguish good from

average care facilities. Experts and care associations are demanding further revisions. (Cf e.g. Sozialverband VdK Rheinland-Pfalz 2014).

In Sweden, the Health and Social Care Inspectorate reports the findings from inspections in narrative form in web-published reports, but not related to specific municipalities or facilities. Instead Sweden publishes an online *Elderly Guide* as well as online and hard copy of *Open Comparisons – Eldercare*. The former, containing information on a combination of structure-, process- and outcome-indicators collected through surveys conducted with nursing homes and care users, is aimed at facilitating choice for older people and their families. The indicators change over time, and currently (2014) 15 individual facility indicators are reported, 7 are based on user surveys (e.g. the proportion of residents reporting general satisfaction with the facility, the possibility to get outdoors, or if staff have enough time for their needs), and 6 are reported by the nursing homes (e.g. structure measures such as the number of care workers or RNs in daytime according to the roster or the proportion of staff with adequate training, and process measures such as whether residents participate in drawing up their care plans or can decide when to go to bed) ([www.socialstyrelsen.se/jamfor/aldreguiden/](http://www.socialstyrelsen.se/jamfor/aldreguiden/)). Only two of these indicators are the same as those reported just 2 years earlier. Also, there is resistance from both private providers and the public employers' organization (Swedish Association of Local Authorities & Regions) to focus on structure indicators, although staffing ratios are currently reported. Conversely, process indicators are currently being promoted (Erlandsson et al. 2013). At the municipal level, a larger number of indicators are reported in the *Open Comparisons – Eldercare*, aimed at local politicians in order to benchmark quality at the municipal level.

In Norway, statistics on eight indicators are publicly reported. These include structural factors such as physician and physiotherapy hours/week/resident as well as the proportion of each of the following: skilled personnel; personnel with health/social service education from high school; personnel with health/social service education from university/university college. Process indicators include the proportion of sick leave registered by a physician (more than 3 work days) of total municipal care staff; and, evidence of a system of user satisfaction surveys. These indicators are presently being revised, with reports that neither satisfaction surveys nor physiotherapy hours/week/resident will be used in the near future (Norwegian Health Directorate 2013). Information is not available on how each individual nursing home is performing relative to other nursing homes on any of the indicators.

## Discussion

Our snapshot of long-term care facility ownership compares jurisdictions located at different points according to Esping Andersen's (1990) welfare state typology. In our review, and in line with Esping Andersen's analysis, the liberal welfare regimes of the US and England have higher rates of privatization and marketization influences. In Canada, another liberal welfare regime, results are mixed with high rates of for-profit ownership in Ontario, and much lower in Manitoba. The for-profit ownership in Germany, a conservative welfare state, is about half of that in England, while both Norway and Sweden (social democratic welfare regimes) have much lower rates of for-profit ownership. Yet in spite of great differences in levels of for-profit ownership, these

jurisdictions are all experiencing a growing trend of for-profit ownership and/or involvement in this sector. Even Sweden and to a lesser extent, Norway, with comparatively very low rates of for-profit ownership, are facing a growing involvement of for-profits in managing long-term residential care (Szebehely and Meagher 2013).

Those jurisdictions with greater for-profit ownership tend to have more rigorous quality regulatory systems. The audit/inspection approaches in the US, Ontario, Canada, in particular, and to a lesser extent, Germany, emphasize standardized outcome and process quality indicators. Our review also suggests that this same rigor has not extended to the regulation of structural indicators such as staffing levels or staffing intensity, a concern given research linking these to quality (c.f., Armstrong 2013; Harrington et al. 2008, 2012a, b). In Germany there are defined staff-resident ratios, depending on care level and region. Conversely, all quality indicators (structure, process and outcome) utilized in England, Manitoba, Sweden and Norway are less specific, without the same emphasis on standardized, measurable process and outcome indicators as in the US and Ontario. Although Manitoba does have minimum hours of care, these include more than direct care and are not comprehensively monitored during inspections. England appears as somewhat of an outlier, with the highest percentage of for-profit ownership, and yet a less standardized inspection process. Further, in Norway and Sweden, with the lowest rates of for-profit ownership, there are calls to increase the use of standardized process and outcome-based quality criteria (Erlandsson et al. 2013; Norwegian Health Directorate 2013). Our analysis also suggests that for profit agencies are actively lobbying against the regulation of structural indicators, outcome indicators and the overall enforcement of regulatory regimes (Harrington et al. 2014a; Szebehely and Meagher 2013), preferring instead to promote less costly process indicators.

We also see the inspection processes within these jurisdictions located at different places along the deterrence to compliance continuum, considering issues such as: reliance on inspector's expertise versus standardized inspections and judgment matrices; announced inspections versus unannounced; and, inspector information sharing during the inspection versus only communicating results through official report after the inspection is completed. Our findings indicate that two of the jurisdictions with the highest for-profit ownership, US, and Ontario, Canada, are much more deterrence-based, with prescribed, unannounced inspections. Almost all inspectors in the US are RNs with nursing home experience, and it is expected that they rely on this experience as they apply the standard assessment of each regulatory area. Ontario also utilizes those with relevant experience, such as RNs as inspectors, but all inspectors undergo considerable training to promote the use of inspection tools in a standardized manner. In contrast to the US and Ontario, where inspectors use standardized judgment matrices to make determinations, Germany and England encourage inspectors to use their own judgment during assessments. Inspectors in Germany also hold a closing interview with agency representatives following the inspection. This contrasts with the mandate in Ontario that inspectors not share findings prior to their final report and cautions homes to no longer expect it (MOHLTC 2012). In the US, there has been pressure to maintain a separation between quality improvement programs and regulatory activities. As such, inspectors are not expected to provide consultation or advice to nursing homes during the inspection process (OBRA 1987).

Conversely, inspections in the less privatized jurisdictions of Manitoba, Sweden and Norway are closer to the compliance end of the continuum. Inspections

in Manitoba are not necessarily annual and inspectors are strongly encouraged to use their judgments rather than rely only on closely standardized inspections and judgment matrices. While unannounced inspections are conducted on one-third of homes, the rest are given advanced notice of inspection dates and which assessment tool combination will be used. In Norway, homes are aware beforehand of the current inspection focus. In Sweden, inspectors are guided by national evaluation criteria to identify problems and report to local authorities to address. In both Norway and Sweden, the responsibility to oversee the quality of residential care rests with the highly independent municipalities resulting in large variation within the countries.

When it comes to enforcement, including public reporting of quality inspections, we have also observed differences. The US, Ontario and England have more complex systems of sanctions from fines or withholding of funds, appointing a temporary manager (Ontario), revoking licenses or terminating agreements, or seeking prosecution (England). In spite of this complexity, reports in the US describe enforcement as weak and infrequent (US GAO 2000, 2009; US OIG 2014). Furthermore, scandals sparked by significant problems in quality of care persist in all of these jurisdictions (Lloyd et al. 2014).

The US, Ontario, Canada and England, with the highest proportion of for-profit ownership, offer online public reporting of certain inspection results. In Germany, nursing home quality ratings are publicly available, yet concerns remain that the ratings fail to accurately capture quality differences. Manitoba is currently discussing the possibility of public reporting. In Manitoba, Sweden and Norway, with lower proportions of for-profit ownership and less complex or specific enforcement processes, local authorities can end contracts in all three jurisdictions. Concerns are raised in Norway that municipalities enforce few national guidelines. In Sweden recent scandals in nursing homes run by private equity corporations have led to increasing calls for stricter regulation of ownership and binding staffing ratios (Lloyd et al. 2014), but no political decisions have yet been made in this direction.

In Sweden several process and outcome quality indicators are available to the public to assist in nursing home choice and the government has expressed strong hopes that this information will make users so well informed that their choices will improve quality. However, whether the information is actually used in this way is not known (Erlandsson et al. 2013, p. 42). Even if some users can make use of such information in a consumerist approach, it is unlikely that user choice can safeguard the quality of care. Providers have an interest in presenting a positive image. Accordingly, the fact that providers report staffing ratios and other structural measures raises questions about the reliability of the information. In Norway, the eight publicly reported quality indicators include structural criteria (e.g., physician hours per resident per week, educational background of staff) and some outcome indicators (e.g., satisfaction survey results). However, in contrast to Sweden, comparison of specific nursing home performance is not publicly available (Norwegian Health Directorate 2013).

Considering the evidence citing quality problems in for-profit nursing homes, the move to stringently regulate quality in jurisdictions with a high proportion of for-profit providers is understandable. Yet there are ongoing concerns that recent moves to strengthen regulations have not extended to structural factors, such as the amount and type of staffing, staffing intensity and staff education and training. Ontario actually removed a minimum resident hours of care standard, apparently ignoring that effective process and outcome indicators rely on staffing levels, intensity and training to be realized. One implication of

this uneven regulatory focus is a shift in accountability or burden of responsibility for quality from administration (increasingly for-profit organizations) to those who are providing the majority of daily care. Thus, direct care workers are pressured to provide specified aspects of care, without the benefit of regulated staffing levels or resource support (Evans et al. 2005; Jansen 2010; Kontos et al. 2010).

## Conclusion

Our paper illustrates the significant quality implications of the global incursion of market forces and logic into the long-term residential care sector. Our comparison suggests that jurisdictions with the highest level of for-profit ownership also have the most standardized, complex and deterrence-based regulatory systems, and stronger regulatory enforcement. Regulating for quality is critical in this sector. However, the failure by many jurisdictions to regulate structural indicators such as staffing levels, staffing intensity and staff training, means that front-line workers, rather than administrators shoulder most of the accountability burden to fulfill process and outcome regulatory demands. Those making the resource decisions that enable staff to engage in the processes of care and ultimately achieve desired outcomes for residents are less closely scrutinized for the implications of their decisions, which also serves to de-politicize these decisions (Evans et al. 2005; Mulligan 2010; Petrovskaya et al. 2009). There is urgency in our need to more effectively address quality in this sector, as we continue to witness too many scandals in all jurisdictions in addition to reports of poor quality of life by these most vulnerable individuals (Lloyd et al. 2014).

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### Compliance with Ethical Standards

**Conflict of Interest** The authors have no conflict of interest.

**Informed Consent** As there is no person or personal data appearing in the paper, there is no one from whom a permission should be obtained in order to publish personal data.

**Ethical Treatment of Experimental Subjects (Animal and Human)** This article does not contain any studies with human or animal subjects performed by any of the authors.

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# Nursing Home Staffing and Quality Under the Nursing Home Reform Act

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**Purpose:** We examine whether the Nursing Home Reform Act (NHRA) improved nursing home staffing and quality. **Design and Methods:** Data from 5,092 nursing homes were linked across the 1987 Medicare/Medicaid Automated Certification System and the 1993 Online Survey, Certification and Reporting system. A dummy-year model was used to examine the effects of the NHRA on pressure ulcers, physical restraints, and urinary catheters, and a first-difference approach to fixed-effects regression analyses was used to estimate the effects of time-varying staffing on the quality of care. **Results:** Overall, we found a significant increase in nursing home staffing levels from 1987 to 1993. Moreover, after controlling for other facility, resident, market, and state factors, there was a significant decrease in the proportion of residents with pressure ulcers, physical restraints, and urinary catheters following the implementation of the NHRA. Across all facilities, the increase in staffing was not directly related to the improvement in quality over the period of our study, but there was a positive relationship between registered nurse staffing and quality for facilities that were particularly deficient prior to the NHRA. **Implications:** Following the NHRA, quality improvements were found in nursing homes nationwide, and these results suggest that part of this improvement was due to the quality and staffing regulations within the NHRA.

**Key Words:** Regulation, OBRA 87, Long-term care

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The nursing home sector is one of the most heavily regulated industries within the U.S. economy. The government is the dominant purchaser of nursing home care by means of the Medicaid and Medicare programs, with state Medicaid programs covering approximately 50% of all nursing home expenditures and 70% of all bed days. The government is also a regulator and overseer of care in placing a number of restrictions on nursing homes that accept Medicaid and Medicare recipients. Any home that admits Medicare and Medicaid residents must be annually certified by means of a Centers for Medicare & Medicaid Services (CMS) survey. Several alternative remedies may be imposed on facilities that receive a high number of deficiencies. These punishments include civil money penalties of up to \$10,000 a day, denial of payment for new admissions, state monitoring, temporary management, and immediate termination. In spite of the high degree of government involvement within the industry, quality has generally been perceived to be substandard over the past three decades (e.g., Institute of Medicine [IOM], 1986, 2001; U.S. General Accounting Office, 1998; U.S. Senate, 1974).

In 1987, Congress passed the Nursing Home Reform Act (NHRA) as part of the Omnibus Budget Reconciliation Act of 1987 with the goal of improving the quality of care in nursing homes through greater government regulation. Implemented in part in October of 1990, the NHRA mandated the most comprehensive legislative requirements to date in terms of the provision of nursing home care (IOM, 1996). The last regulations associated with the NHRA, related to certification and enforcement of standards, became effective on July 1, 1995 (IOM, 2001). The NHRA sought to improve nursing home quality by establishing a singular set of conditions for certification of all nursing homes. Although the NHRA was quite broad in nature, aspects of the regulations adopted in 1990 related directly to staffing and to particular quality issues.

The NHRA mandated a reduction in the use of unnecessary drugs, unnecessary physical restraints, any significant medication errors, pressure ulcers, and incontinence. The staffing regulations established

under the NHRA required that Medicaid and Medicare certified nursing homes have licensed practical nurses (LPNs) on duty 24 hours a day; a registered nurse (RN) on duty at least 8 hours a day, 7 days a week; and an RN director of nursing in place (Omnibus Budget Reconciliation Act of 1987, 1987). The NHRA also mandated that nurse's aides (NAs) receive a minimum of 75 hr of training and pass a competency test. Furthermore, the NHRA required nursing homes to provide "sufficient" staff and services to help their residents attain or maintain the highest possible level of physical, mental, and psychosocial well-being (Health Care Financing Administration, 1991).

There is a large empirical literature examining the relationship between staffing and nursing home quality. Davis (1991) reviewed five early studies in this area and found inconclusive evidence regarding the effect of staffing on quality. However, more recent literature reviews conducted by the IOM (1996; 2001) argue that a number of studies have shown a positive association between nurse staffing levels and the processes and outcomes of nursing home care (e.g., Cherry, 1991; Cohen & Spector, 1996; Munroe, 1990; Spector & Takada, 1991; Zinn, 1993). In addition, Harrington, Zimmerman, Karon, Robinson, and Beutel (2000) found that higher staffing hours, particularly of RNs, were associated with fewer nursing home deficiencies. There are also clinical studies documenting that labor-intensive exercise and incontinence interventions can improve the quality of care (e.g., Fiatarone et al., 1994; Morris et al., 1999). On the basis of the IOM's (2001) review of the literature, the panel recommended that the CMS require a 24-hr RN presence within the nursing home. It further recommended that the CMS develop minimum staffing levels (number and skill mix) for direct care based on case-mix adjusted standards.

Perhaps the most comprehensive evidence to date regarding the relationship of staffing and quality is in a report by Abt Associates (2001) commissioned by the CMS under the Omnibus Budget and Reconciliation Act of 1990 to study the appropriateness of establishing minimum caregiver standards. The Abt report argues that RN, LPN, and NA staffing improves quality up to some threshold at which point there is no further significant quality improvement. For the long-stay nursing home population, these thresholds were 0.75 RN hr/resident day, 1.3 LPN hr/resident day, and 2.78 NA hr/resident day. If these thresholds were instituted as minimum staffing standards, 52% of all nursing homes would fail to meet all three standards and 97% would fail to meet one or more. On the basis of a detailed review of the available evidence, an expert panel has also argued in support of a higher minimum nurse staffing standard (Harrington, Kovner, et al., 2000).

It is important that much of the empirical evidence to date examining nursing home staffing and quality has been based on somewhat limited

econometric specifications. That is, the direct evidence regarding the relationship between staffing and quality has been identified solely by cross-sectional variation in staffing and quality. Thus, the finding that residents in homes with higher staffing, for example, receive better quality is observationally equivalent with two alternative interpretations. One interpretation is that this correlation reflects the responsiveness of nursing home quality to higher staffing. However, it is equally reasonable to suppose that this cross-facility relationship merely reflects the presence of unobserved home-specific attributes that influence both the level of staffing and the quality of care. For example, it may be that high-quality facilities with better care practices also choose to hire more staff. Although the estimation strategy will be discussed in detail in the paragraphs that follow, this study uses a first-difference approach to fixed-effects regression analyses, which exploits within-home variation in the regressors and outcomes, and, as a result, automatically controls for time-invariant factors that differ across homes.

In addition to the literature examining the direct association of staffing and quality, there is also previous work evaluating whether the NHRA has brought about a positive change in the nursing home industry. However, the evidence to date is mixed and incomplete. The U.S. Office of the Inspector General (1993) reported positive improvement in quality of care because of the government regulations. The average number of deficiencies per facility declined from 8.8 in 1991 to 7.9 in 1993, and to 6.1 by the end of 1995; the percentage of facilities with no deficiencies has increased from 10.8% in 1991 to 11.4% in 1993, and to 15.3% in 1995 (Harrington, Swan, Nyman, & Carillo, 1997; Harrington, Thollaug, & Summers, 1995). The most common changes in quality were thought to be the decreased use of restraints (Janelli, Kanski, & Neary, 1994; Marek, Rantz, Fagin, & Krejci, 1996a). Moseley (1996) studied the effect of the NHRA on catheterization among 3,149 pre-NHRA and 5,073 post-NHRA Virginia residents and found that a higher proportion of residents were catheterized before the NHRA than after the NHRA. Marek, Rantz, Fagin, & Krejci (1996b) observed an increase in nursing staff as a result of the NHRA. However, Janelli and colleagues (1994) found no increase in nursing staff following the enactment of the NHRA in October of 1990.

Although these studies have provided important information regarding the implications of the NHRA, the existing literature is limited in several ways. First, many of the studies to date have only used data in the post-NHRA period. Thus, there is no means of identifying quality in the period prior to the regulation. Second, few studies have examined outcomes outside of staffing. Third, no study to date has attempted to link the staffing requirements under the NHRA with quality measures to determine whether the increased staffing requirements have translated

into higher quality. Although the NHRA staffing standards may be nonbinding or insufficiently low for certain facilities (IOM, 2001), the staffing requirement provides additional information on the potential relationship between staffing and quality. Thus, this study addresses all three of these limitations through the use of a novel data linkage. As part of the NHRA, the federal government changed the surveying system that was utilized to monitor nursing homes. Researchers have generally focused their analyses only on the more widely available post-NHRA data. In this current study, we have linked federal certification data from the pre- and post-NHRA periods for over 5,000 facilities in 22 states. Thus, to our knowledge, this study represents the first large-scale, multistate study of the NHRA and quality.

Using this unique data file, in this study we addressed the following two questions: first, what was the effect of the NHRA on staffing and quality of care? Second, were any observed changes in quality related to changes in staffing under the NHRA?

## Methods

### Data Sources

This study used secondary data sets from several sources. Home-level quality and facility information were drawn from two sources: the 1987 Medicare/Medicaid Automated Certification System (MMACS) and the 1993 Online Survey, Certification, and Reporting (OSCAR) system. The MMACS is the predecessor to the OSCAR system. The MMACS and the OSCAR both contain information from state surveys of all federally certified Medicaid (nursing care) and Medicare (skilled nursing care) facilities in the United States. Certified homes represent almost 96% of all facilities nationwide (Strahan, 1997). Collected and maintained by the CMS, these data are used to determine whether homes are in compliance with federal regulatory requirements. Every facility is required to have an initial survey to verify compliance. Thereafter, states are required to survey each facility no less often than every 15 months, and the average is approximately 12 months. Although there are some significant differences in the content of the MMACS and OSCAR files, the fields used within this study remained constant across the two instruments. As a note, we only had access to the 1987 MMACS file for 22 states. Thus, the analyses presented within this study contain nursing home data from the following states: Arkansas, Arizona, California, Delaware, Idaho, Louisiana, Maryland, Minnesota, New Jersey, New Mexico, Nevada, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Virginia, Washington, Wisconsin, and West Virginia.

Two other data sources were utilized to supplement the MMACS and OSCAR nursing home data.

First, the nursing home data were merged with aggregate county-level demographic, socioeconomic, and health status data from the Bureau of Health Professions' Area Resource File (ARF). Second, state-level Medicaid reimbursement rates were obtained from data collected by Harrington, Swan, and colleagues (Harrington et al., 1993; Swan, Harrington, Grant, Luehrs, & Preston, 1993).

### Data Cleaning

Originally, the 1987 MMACS file contained data for 7,221 homes, whereas the 1993 OSCAR file contained data for 8,332 nursing homes from the 22 study states. Previous studies have documented data-quality issues with the staffing fields in the OSCAR (Harrington, Woolhandler, Mullan, Carrillo, & Himmelstein, 2001; Harrington, Zimmerman, et al., 2000; Health Care Financing Administration, 2000). Because the staffing data for both data sets had skewed distributions with a number of outliers that appeared to be erroneous, we used a rule of mean  $\pm 3$  standard deviations to exclude potentially erroneous outliers. On the basis of this rule, we excluded 466 nursing homes from the MMACS file and 500 nursing homes from the OSCAR file. Nursing homes with 15 or fewer residents (especially those with only 1 resident) had extremely higher staffing hours than other homes (Harrington, Zimmerman, et al., 2000). In addition, some nursing homes had questionable resident count information in that the homes reported more total residents than total beds (Health Care Financing Administration, 2000). On the basis of these exclusion rules, we eliminated an additional 3 nursing homes from the MMACS file and 216 nursing homes from the OSCAR file. When there were multiple surveys of the same home within a calendar year, the most recent survey was utilized. Ultimately, 6,752 certified nursing homes from the MMACS file and 7,616 from the OSCAR file remained, and we were able to match 5,092 facilities across the two files for our final analytic file.

### Staffing and Quality Measures

Given the mandated staffing changes under the NHRA, we transformed full-time equivalents (FTEs) for each nursing staff type (RNs, LPNs, and NAs) into hours per resident day by multiplying the FTEs reported for a 2-week period by 70 hr and dividing by the total number of residents and by the 14 days in the reporting period (the procedure used by the CMS). Hausman tests indicated that the staffing measures could be treated as exogenous in the quality models.

In this study, three separate quality measures were used to represent the quality of care in nursing homes. The outcome-oriented measure of quality was the number of residents with pressure ulcers (or decubitus

ulcers), commonly associated with immobility in elderly persons. Pressure ulcers are areas of the skin and underlying tissues that erode as a result of pressure or friction or lack of blood supply. Pressure ulcers can often be prevented or resolved by frequently repositioning the immobile resident. The proportion of residents with catheters and the proportion of residents with physical restraints were also used as procedural measures of quality. Because labor constitutes 60–70% of nursing home costs, these procedures may be used as labor-saving practices on the part of nursing homes with potential negative consequences for resident health (Zinn, 1993). Immobility resulting from the use of physical restraints may increase the risk of pressure ulcers, depression, and mental and physical deterioration; it may increase the risk of mortality as well. Urethral catheterization places the resident at greater risk for urinary tract infection, which may result in hospitalization. Other long-term complications include bladder and renal stones, abscesses, and renal failure.

### *Model Covariates*

We included a number of facility-, county-, and state-level factors as control variables within the model. Given prior findings showing a relationship between the organizational factors and quality of care, facility size (Ray, Federspiel, & Schaffner, 1980) and ownership (Graber & Sloane, 1995) were included as covariates within the analysis. In general, the raw rates of the outcomes may be a function of both quality and case mix if they are not risk adjusted (Mukamel, 1997). Thus, we included the home's average activities of daily living (ADLs) based on the need for assistance or complete dependence in the areas of bathing, eating, toileting, dressing, or walking as a covariate in the model. We also included the proportion of residents with Medicare as their primary payer source as a proxy for the amount of skilled care provided within the facility. Finally, we included both the proportion of individuals that were bedfast and the proportion of individuals who were chairbound as additional case-mix adjusters.

An important potential limitation of the ADL index is that lower quality within a facility may lead to greater ADL dependency. However, the nursing home case-mix literature has generally argued that need-based factors such as ADLs are sufficiently invariant to provider influence (e.g., Fries et al., 1994). The ADL most likely to be influenced by quality of care is toileting. That is, homes providing more extensive bladder and bowel retraining programs are likely to have fewer residents dependent in toileting. All of the results presented within this study are robust to the inclusion of a modified ADL measure that did not include toileting. There has also been recent experimental evidence suggesting that nursing home patients exposed to aggressive re-

habilitative programs such as weight-bearing exercises have achieved significant improvements in the ADLs that have historically been thought of as exogenous such as walking and transferring (e.g., Schnelle et al., 2002). However, very few facilities have instituted these experimental programs. Thus, the ADL index is treated as an exogenous covariate within this study.

The county was used to approximate the market for nursing home care within this study. Most economic studies have used the county as a proxy for the nursing home market (e.g., Cohen & Spector, 1996; Nyman, 1985). As noted by Banaszak-Holl, Zinn, and Mor (1996), the county may be a reasonable approximation of the market for nursing home care, given patterns of funding and resident origin. At the county level, we controlled for the number of nursing homes, the number of elderly individuals per square mile (e.g., Grabowski, 2001a), and the average real per capita income (e.g., Grabowski, 2001a). Finally, given the importance of Medicaid as a payer of nursing home services (e.g., Cohen & Spector, 1996; Grabowski, 2001b), we included the real state-level Medicaid payment rate within the model.

### *Estimation Strategy*

In order to examine the effect of the NHRA on the quality measures, we initially estimated models of the general form

$$Y_{it} = X_{it}\gamma + \alpha_t + \mu_{it}, \quad (1)$$

where  $Y_{it}$  is the level of quality for home  $i$  in year  $t$  and  $X_{it}$  is a vector of control variables. Parameter  $\alpha_t$  is a time-specific intercept (a dummy variable equal to 1 if the year equals 1993) and  $\mu_{it}$  is a mean-zero random error. This year dummy  $\alpha_t$  was included to capture the effect of the NHRA on quality. By utilizing data roughly 3 years prior to the adoption of the NHRA and 3 years after the NHRA, we can examine whether homes modified their quality leveling following the implementation of the NHRA. One potential limitation of this dummy-year approach is that this fixed effect will also capture other factors that are common across all states over this time period, such as other Federal nursing home policies and the progress of health care technology. Nevertheless, this model provides the most comprehensive evidence to date regarding the effect of the NHRA on quality. We estimated the parameters of Equation 1 by using a least squares model. It is important that all the results presented within this study were found to be robust to a series of alternative model specifications available upon request from the authors. In particular, we experimented with a binomial model (with a logit link) for the quality equations.

A second set of analyses examine whether changes in staffing have been related to changes in quality under the NHRA. Interfacility differences in quality are likely to be influenced by differences in difficult to observe characteristics such as the organizational

culture of the facility, the qualifications of the administrative staff, and the average tenure of nursing home staff. Many previous studies of staffing and quality have ignored this heterogeneity, resulting in biased estimates if the unobserved factors are correlated with cross-facility variations in staffing. For example, if those facilities with a poor organizational structure (and thus, worse quality) also had the lowest staffing, we would systematically overestimate the effect of staffing on quality. Other researchers have attempted to control for the heterogeneity by including an unusually large set of explanatory variables. Although this approach has the advantage of providing a more fully specified model, the measured differences are unlikely to account for all the disparities between facilities. The alternative and, we argue, preferred approach used in this study is to estimate first-difference fixed-effects models. This approach exploits within-facility variation in the regressors and outcomes, and, as a result, it automatically controls for all time-invariant factors that differ across homes. Within the nursing home literature, this methodology has been previously used by Davis, Freeman, and Kirby (1998) to examine changes in facility performance stemming from the adoption of case-mix adjusted Medicaid payment in Kentucky.

Thus, we estimate a set of first-difference fixed-effects models of the general form

$$\begin{aligned} Q_{it} - Q_{i,t-6} = & (S_{it} - S_{i,t-6})\beta + (X_{it} - X_{i,t-6})\delta \\ & + (\varepsilon_{it} - \varepsilon_{i,t-6}), \end{aligned} \quad (2)$$

where  $Q_{it}$  is the level of quality,  $S_{it}$  is the level of staffing,  $X_{it}$  is a vector of covariates, and  $\varepsilon_{it}$  is a mean-zero random error for home  $i$  in year  $t$ . This first-difference approach allows us to remove the effects of latent unobserved variables by subtracting lagged variable values from each observation to determine whether those facilities that increased their staffing levels over the 1987–1993 period were those facilities that experienced an increase across the three quality measures (Hsiao, 1986). Thus, the basic identification strategy implicit in Equation 2 purges the unobserved and potentially confounded cross-sectional heterogeneity by relying on the within-facility variation in staffing and by using homes that did not change their staffing as a control for unrelated time-series variation.

In addition to examining a first-difference model for our entire sample, we also present results for those facilities in the lowest and highest quartiles of each of the staffing measures in 1987. For the lowest quartile model, we alternatively restrict the model to those facilities with less than 0.090 RN hr/resident day in 1987, those facilities with less than 0.323 LPN hr/resident day, and those facilities with less than 1.338 NA hr/resident day. For the highest quartile model, we alternatively restrict the model to those facilities with more than 0.366 RN hr/resident day in 1987, those facilities with more than 0.550 LPN hr/

resident day, and those facilities with more than 1.927 NA hr/resident day. These model specifications are used to explore possible nonlinear relationships between staffing and quality. A nonlinear relationship may persist for several reasons. First, it may be that only those facilities that were particularly deficient prior to the adoption of the NHRA would increase staffing (i.e., the regulation is only binding for these facilities); second, it may be that greater staffing improves quality only up to some threshold at which point greater staffing will not affect quality; or third, it may be that staffing may not improve quality until staffing reaches some minimal threshold. The first two explanations would point toward a stronger effect in the bottom quartile of the distribution, and the final explanation would support a stronger response within the top quartile.

## Results

### Descriptive Statistics

Table 1 provides means, standard deviations, and the results of *t*-test statistics comparing the 1987 MMACS data to the 1993 OSCAR data. Over this time period, there was a statistically significant increase in all of three of the staffing measures, and two of the three nursing home quality measures. RN hours per resident day increased 18% from 0.26 in 1987 to 0.30 in 1993. LPN hours per resident day increased 30% from 0.46 in 1987 to 0.60 in 1993. Finally, NA hours per resident day increased 24% from 1.61 in 1987 to 1.99 in 1993. Once again, the NHRA only mandated minimum staffing standard for RNs and LPNs, which implies that the increase in NAs was driven by other features of the NHRA or a more disabled census of residents in 1993 relative to 1987.

Under the NHRA, nursing homes also showed some improvement in two of the three quality measures during the period between 1987 and 1993. The proportion of residents with urinary catheters decreased from 10% to 8%, whereas the proportion of residents with physical restraints declined from 39% to 23%, an almost 41% decrease. Both of these differences were statistically significant ( $p < .001$ ). However, the proportion of nursing home residents with pressure ulcers increased 8% ( $p < .001$ ). This increase may be related to the more chronically ill nursing home population in 1993 relative to 1987. The average number of ADLs for which residents required assistance or were completely dependent increased significantly from 3.90 to 3.98 during this time period. Similarly, there was a statistically significant increase in the proportion of individuals who were bedfast (18.6%) and chairbound (6.2%). Given the incentives underlying the Medicare prospective payment system for hospitals, there was also a 124% increase in the proportion of Medicare residents within facilities over this period.

**Table 1. Descriptive Statistics: Means With Standard Deviations**

Variables	1987	1993	T	Change (%)
<b>Quality measures</b>				
Prop. of residents with pressure ulcers	0.065 (0.073)	0.070 (0.051)	3.42***	7.7
Prop. of residents with physical restraints	0.386 (0.203)	0.229 (0.167)	-42.55***	-40.7
Prop. of residents with catheters	0.098 (0.096)	0.079 (0.064)	-12.20***	-19.4
<b>Staffing measures</b>				
RN (hours/resident day)	0.258 (0.221)	0.304 (0.252)	9.83***	17.8
LPN (hours/resident day)	0.458 (0.233)	0.596 (0.259)	28.19***	30.1
NA (hours/resident day)	1.614 (0.690)	1.993 (0.581)	30.00***	23.5
<b>Facility factors</b>				
Total no. of beds in the NH	114.05 (77.208)	118.92 (79.023)	3.15***	4.3
For profit	0.682 (0.466)	0.686 (0.464)	0.38	0.6
Not for profit	0.257 (0.437)	0.252 (0.434)	-0.59	-1.9
Government owned	0.061 (0.240)	0.063 (0.242)	0.33	3.3
Prop. of Medicare residents	0.021 (0.085)	0.047 (0.088)	15.16***	124
<b>Resident factors</b>				
Avg. no. of ADLs	3.895 (0.826)	3.981 (0.545)	6.18***	2.2
Prop. of bedfast residents	0.043 (0.079)	0.051 (0.072)	5.40***	18.6
Prop. of chairbound residents	0.487 (0.291)	0.517 (0.191)	6.11***	6.2
<b>Market factors</b>				
No. of NHs in the market	44.50 (85.85)	44.65 (97.26)	0.08	0.3
No. of elderly persons (65+)/mile <sup>2</sup> in the market	186.35 (617.07)	189.90 (616.70)	0.29	1.9
Per capita income in the market (in 2000 dollars)	22,227 (5,512)	23,303 (5,860)	9.55***	4.8
<b>State factor</b>				
Medicaid payment rate (in year 2000 dollars)	85.89 (24.05)	91.62 (25.05)	11.78***	6.7

*Notes:* Standard deviations are shown in parentheses. N = 5,092. Prop. = proportion; RN = registered nurse; LPN = licensed practical nurse; NA = nurse's aide; NH = nursing home; ADL = activities of daily living.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

In terms of other key variables in the model, there was a statistically significant increase in the mean size of the facilities from 114 beds to 119 beds. Both the average number of nursing homes and the number of elderly persons per square mile in each county increased, but these changes were not statistically significant. After inflation was adjusted for, the average per capita income in the market increased significantly by \$1,076 (in year 2000 dollars) from 1987 to 1993, a 4.8% increase. Finally, the average state Medicaid reimbursement rate increased significantly by 6.7% in real terms over the period of study.

### Dummy-Year Model

In the first set of regressions, we tested the association between a dummy variable representing the NHRA and nursing home quality, controlling for facility, resident, market, and state factors (see Table 2). The NHRA had a negative and statistically significant effect (*p* < .05) on all three quality measures. That is, the NHRA was associated with a 0.2 percentage point decline in the pressure ulcer rate, a 16.8 percentage point decrease in the rate of physical restraints, and a 2.5 percentage point decrease in the catheter use rate. In sum, the dummy-year model shows that the NHRA was associated with higher quality as measured by fewer

pressure ulcers, physical restraints, and lower catheter use. These results also highlight the importance of adjusting for risk factors associated with the particular quality measures. For example, in the unadjusted descriptive statistics, the pressure ulcer rate increased by 0.5 percentage points over the period from 1987 to 1993. However, after facility, resident, market, and state factors were controlled for, the pressure ulcer rate was found to decrease by 0.2 percentage points.

### First-Difference Model

We next used a first-difference approach to examine whether changes in staffing over the 1987–1993 period were associated with changes in quality over this period (see Table 3). The results from this model are somewhat counterintuitive in that an increase in 1 RN hr/resident day led to a statistically significant increase in pressure ulcers (1.9 percentage points), physical restraints (3.4 percentage points), and catheters (1.8 percentage points). Similarly, an increase in 1 LPN hr/resident day was significantly associated with a 0.9 percentage increase in the pressure ulcer rate and a 1.6 percentage point increase in the catheter rate. An increase in 1 NA hr/resident day was associated with a statistically significant decrease in pressure ulcers (0.3 percentage points)

Table 2. Dummy-Year Regression Results

Variables	Pressure Ulcers	Physical Restraints	Catheters
Nursing Home Reform Act	-0.002* (0.001)	-0.168*** (0.003)	-0.025*** (0.002)
No. of beds (100s)	0.002** (0.001)	0.011*** (0.002)	0.008*** (0.001)
ADL score	0.007*** (0.001)	0.082*** (0.003)	0.015*** (0.001)
Prop. of bedfast residents	0.109*** (0.008)	-0.003 (0.022)	0.207*** (0.010)
Prop. of chairbound residents	0.061*** (0.003)	0.155*** (0.007)	0.057*** (0.003)
Prop. of Medicare residents	0.113*** (0.007)	-0.046* (0.020)	0.145*** (0.009)
Not for profit	-0.006*** (0.001)	-0.004 (0.004)	-0.010*** (0.002)
Government owned	-0.002 (0.002)	0.026*** (0.007)	-0.010** (0.003)
No. of nursing homes (100s)	0.007*** (0.001)	0.001 (0.002)	0.010*** (0.001)
Elderly persons/mile <sup>2</sup> (1,000s)	-0.0004 (0.001)	-0.014*** (0.003)	-0.002 (0.001)
Real per capita income (\$1,000s)	0.0004*** (0.0001)	0.001*** (0.0003)	-0.0005** (0.0001)
Real Medicaid payment rate (\$10s)	-0.0001 (0.0003)	-0.002* (0.001)	-0.005*** (0.0004)
Intercept	-0.010* (0.004)	-0.032** (0.012)	0.047*** (0.005)
R <sup>2</sup>	0.15	0.31	0.19
N	10,179	10,179	10,179

Notes: Standard errors are shown in parentheses. ADL = activities of daily living; Prop. = proportion.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

and physical restraints (1.1 percentage points). Thus, in the overall model, there are negative effects of RN and LPN staffing and a positive effect of NA staffing on nursing home quality.

There exists the possibility of a nonlinear association between staffing and quality. That is, initial units of staffing may have a strong influence on quality, but there may be diminishing returns to additional staffing units after some threshold. An alternative explanation is that initial units of staffing may not be productive until some minimum staffing threshold is achieved. We test for this first nonlinear relationship by isolating the model to those nursing homes among the lowest quartile of the RN, LPN, or NA measures (see Table 4). Within this model, an increase in 1 RN hr/resident day was associated with a statistically significant 12.8 percentage point decline in the physical restraint rate. Similarly, an additional 1 LPN hr/resident day was associated with a 1.6 percentage point decline in pressure ulcers, which is statistically significant at the 10% level. However, an additional 1 LPN hr/resident day was associated with a 2.4 percentage point increase in the catheter rate. Finally, an additional 1 NA hr/resident day was associated with a statistically significant 5.7 percentage point decline in the physical restraint rate. Although the results are not statistically significant, greater numbers of RNs, LPNs, and NAs were associated with fewer pressure ulcers and greater numbers of RNs and NAs were associated with fewer catheters for homes in the bottom quartile of these staffing measures. It is important that these quartile models may lack meaningful precision relative to the overall results within the full sample. Thus, there is some support for a nonlinear relationship between nursing home staffing and quality.

We also test the second nonlinear relationship by examining whether staffing is important for quality within those facilities that start at a high baseline (see Table 5). In this model, we isolate the analysis to

those facilities in the top quartile of the three staffing measures in 1987. On the basis of this model, there is only limited support for the idea that staffing must achieve some minimal threshold before a positive relationship between staffing and quality can be achieved. The only result that supports this hypothesis is the relationship between NA staffing and physical restraints. For those nursing homes in the top quartile of the NA measure in 1987, we found that an additional 1 NA hr/resident day had a statistically significant 2.4 percentage point decrease in the use of restraints.

## Discussion

The existing literature has yielded little in the way of consistent findings regarding the effect of the NHRA on staffing and quality of care. By using a novel linkage of data files before and after the implementation of the NHRA for nursing homes from 22 states, this study provides the most comprehensive evidence to date regarding these issues. We found that the NHRA was associated with an increase in quality, as measured by presence of pressure ulcers, physical restraints, and catheters. The overall variation in staffing across the pre- and post-NHRA periods was not directly related to the variation in quality over time across all facilities, but there was an effect for those homes in the bottom quartile of the staffing measures in 1987.

From a policy perspective, the observed increase in quality under the NHRA is an important finding. Although an estimation of the costs of the NHRA was not within the scope of this study, an obvious area for future research is to link the public expenditures associated with the NHRA with the findings of this current study. Calculating how much additional cost is associated with the NHRA is not straightforward. The NHRA mandated greater government monitoring and oversight of nursing

**Table 3. First-Difference Regression Results**

Variables	Pressure Ulcers	Physical Restraints	Catheters
RN (hr/resident day)	0.019*** (0.005)	0.034* (0.016)	0.018** (0.006)
LPN (hr/resident day)	0.009* (0.004)	0.015 (0.013)	0.016** (0.005)
NA (hr/resident day)	-0.003* (0.001)	-0.011* (0.004)	-0.002 (0.002)
No. of beds (100s)	-0.002 (0.004)	-0.003 (0.012)	-0.002 (0.004)
Average ADL score	0.004** (0.001)	0.073*** (0.004)	0.010*** (0.002)
Prop. of bedfast residents	0.095*** (0.012)	0.053 (0.034)	0.106*** (0.013)
Prop. of chairbound residents	0.055*** (0.004)	0.109*** (0.011)	0.042*** (0.004)
Prop. of Medicare residents	0.038*** (0.011)	-0.061 (0.032)	0.024* (0.012)
No. of nursing homes (100s)	0.006 (0.006)	-0.010 (0.016)	-0.027*** (0.006)
Elderly persons/mile <sup>2</sup> (1,000s)	0.027 (0.067)	-0.764*** (0.201)	-0.042 (0.075)
Real per capita income (\$1,000s)	-0.0001 (0.001)	-0.002 (0.002)	0.001 (0.001)
Real Medicaid payment rate (\$10s)	-0.001 (0.001)	-0.013*** (0.003)	-0.002 (0.001)
Intercept	-0.00004 (0.002)	-0.152*** (0.005)	-0.025*** (0.002)
R <sup>2</sup>	0.06	0.10	0.05
N	5,081	5,081	5,081

Notes: Standard errors are shown in parentheses. RN = registered nurse; LPN = licensed practical nurse; NA = nurse's aide; ADL = activities of daily living.

\*p < .05; \*\*p < .01; \*\*\*p < .001.

facilities by means of the survey and certification process. It was recently estimated that the total survey and certification process costs the government nearly \$400 million dollars annually, which equates to approximately \$22,000 per nursing home or \$208 per nursing home bed (Walshe, 2001). In relative terms, these totals constitute less than one half of 1% of the total expenditures on nursing home care in the United States (Walshe & Harrington, 2002). However, these dollar totals do not include any indirect costs to the facility associated with the certification process such as interacting with the regulatory agency, preparing for and hosting survey visits, gathering and providing data, and responding to complaint investigations. Experience from other sectors of the economy suggests that the indirect costs of the certification process to the nursing home are likely greater than the direct costs to the government (Walshe, 2001). Moreover, there has been some concern about the enforcement of certain provisions within the NHRA (U.S. General Accounting Office, 1999), which raises the question of whether greater enforcement of the NHRA would raise costs even further (and, of course, also potentially increase quality further).

Another important link is the one between staffing and quality. As noted in our literature review, most recent empirical and clinical studies have argued that staffing and quality are positively associated with one another. We were not able to find a positive association between staffing and quality except in certain cases for which facilities were in the bottom quartile for the staffing measures in 1987. This lack of a finding may be due to several factors. First, it may be the case that the ADL index and the other control variables did not fully capture a facility's case mix, which led to some omitted variable bias within the study. Second, the NHRA staffing provisions were only binding for those facilities that exhibited low

RN and LPN staffing in 1987. Thus, it may not be surprising that we mainly found a positive effect of staffing on quality in these instances. Interestingly, however, the increase in staffing following the NHRA still did not meet the standards prescribed by the recent CMS-Abt study (Abt Associates, 2001). In 1993, the mean staffing hours per resident day were 0.30 RNs, 0.60 LPNs, and 1.99 NAs. The CMS-Abt study called for 0.75 RNs, 1.3 LPNs, and 2.78 NAs. Finally, it should be noted that staffing may be a *necessary*, but not *sufficient*, input toward achieving greater quality. Many desirable outcomes may require not only additional staff but better care practices in general.

All of these issues underlie the recent call for a more stringent minimum staffing standard for nursing home care. A minimum staffing standard has the potential to be an important step toward remedying quality in those facilities with substandard staffing. Several recent reports have recognized that Medicaid payment levels would have to be reevaluated in the context of a staffing standard. For example, the IOM (2001) report recommended that "Congress and state Medicaid agencies adjust their Medicaid reimbursement formulas for nursing homes to take into account any increases in the requirements of nursing time to meet the casemix-adjusted needs of residents" (p. 19). Two recent economic developments make this call for increased spending particularly challenging. First, given current state budget shortfalls caused by the recent economic recession, there is concern that states will choose to substantially decrease Medicaid payment levels for nursing homes as a means to lower state expenditures. A June, 2002 survey of state Medicaid directors found that 16 states plan actual cuts in their Medicaid spending for nursing homes in 2003, whereas 41 states plan to reduce the rate of growth in Medicaid spending (Kaiser Family Foundation,

Table 4. First-Difference Regression Results: Facilities in the Lowest Staffing Quartile of 1987

Variables	Pressure Ulcers	Physical Restraints	Catheters
Lowest quartile of RNs			
RN (hr/resident day)	-0.020 (0.016)	-0.128** (0.043)	-0.017 (0.017)
LPN (hr/resident day)	-0.010 (0.009)	-0.031 (0.025)	0.007 (0.010)
NA (hr/resident day)	0.002 (0.003)	-0.003 (0.009)	-0.005 (0.004)
R <sup>2</sup>	0.08	0.07	0.04
N	1281	1281	1281
Lowest quartile of LPNs			
RN (hr/resident day)	0.024** (0.008)	0.038 (0.027)	0.007 (0.010)
LPN (hr/resident day)	-0.016 (0.008)	0.016 (0.028)	0.024* (0.010)
NA (hr/resident day)	-0.002 (0.002)	-0.009 (0.009)	-0.003 (0.003)
R <sup>2</sup>	0.09	0.08	0.04
N	1266	1266	1266
Lowest quartile of NAs			
RN (hr/resident day)	0.017 (0.011)	0.033 (0.028)	0.009 (0.011)
LPN (hr/resident day)	0.011 (0.008)	0.017 (0.021)	0.025** (0.008)
NA (hr/resident day)	-0.001 (0.003)	-0.057*** (0.008)	-0.006 (0.003)
R <sup>2</sup>	0.09	0.21	0.07
N	1270	1270	1270

Notes: Standard errors are shown in parentheses. All models include variables measuring the total number of beds in the facility, an activities of daily living score, the proportion of bedfast residents, the proportion of chairbound residents, the proportion of Medicare residents, the number of nursing homes in the market, the number of elderly persons per square mile, real per capita income in the market, and the real state Medicaid payment rate. Full regression results are available upon request. RN = registered nurse; LPN = licensed practical nurse; NA = nurse's aide.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

2002). Second, a serious shortage exists in the nursing work force, which would severely compromise efforts to recruit and retain additional nurses within the nursing home sector. The obvious economic answer is to simply pay higher wages to recruit additional staff, but clearly this would be difficult in the context of the first issue. Thus, any additional nursing staff will have to come out of an already diminished Medicaid budget and from a fairly tight labor market.

As the study of staffing and quality moves forward, a critical next step will be the link between the costs and quality benefits of a minimum staffing standard. Harrington, Kovner, and colleagues (2000) noted that the overall cost increases necessary to meet a minimum staffing standard proposed by the authors would range between \$1.4 billion and \$6 billion dollars (in 1996 dollars). Of this total, Medicaid would be responsible for approximately two thirds of the costs (\$938 million to \$4 billion). The authors also note that some savings may occur as a result of higher staffing, including fewer hospitalizations, fewer on-the-job injuries that result in higher worker compensation costs, lower spending on supplies and drugs that often substitute for staff time, lower staff turnover resulting in lower training and hiring costs, and, finally, fewer poor resident outcomes that can result in costly treatment protocols. For example, the costs associated with treating a pressure ulcer can be far greater than the additional staff time necessary to prevent the pressure ulcer from occurring in the first place. Given the different staffing levels currently present in

high Medicare homes, the CMS-Abt report estimates only a small cost increase for the Medicare program (Abt Associates, 2001).

An interesting follow-up study would attempt to directly estimate the costs to the U.S. nursing home industry of complying with the NHRA. Clearly, this type of analysis is complicated in that some of the observed staffing increase between 1987 and 1993 was not due to the NHRA, but rather such factors as an increased case mix, liability risks, and consumer demand for higher quality. Moreover, the current federal requirements are nonbinding for a number of facilities that operate at levels far above the mandated level. As this line of research moves forward, a better link between the costs and benefits of higher staffing will facilitate policymakers in making an informed decision regarding whether further regulations in the nursing home industry are warranted.

### Limitations

Our study was limited in several ways. First, although the three quality indicators are quite distinct in nature, these measures cannot fully encompass the multidimensional construct of nursing home quality. Moreover, these three measures focus on the technical aspects of care, but they do not capture the quality of life within the facility, an important dimension of nursing home quality. It may indeed be the case that the NHRA improved other unmeasured dimensions of quality and that the observed increase in staffing may be related to such dimensions. Second, the OSCAR system is collected

Table 5. First-Difference Regression Results: Facilities in the Highest Staffing Quartile of 1987

Variables	Pressure Ulcers	Physical Restraints	Catheters
Highest quartile of RNs			
RN (hr/resident day)	0.019* (0.008)	-0.002 (0.025)	0.017 (0.009)
LPN (hr/resident day)	0.003 (0.008)	0.029 (0.024)	0.023* (0.009)
NA (hr/resident day)	-0.0002 (0.002)	-0.028*** (0.007)	-0.002 (0.003)
R <sup>2</sup>	0.09	0.14	0.07
N	1272	1272	1272
Highest quartile of LPNs			
RN (hr/resident day)	0.020* (0.009)	0.049 (0.028)	0.019 (0.011)
LPN (hr/resident day)	0.018* (0.007)	0.007 (0.022)	0.014 (0.008)
NA (hr/resident day)	-0.006** (0.002)	-0.022** (0.007)	-0.001 (0.003)
R <sup>2</sup>	0.12	0.11	0.13
N	1270	1270	1270
Highest quartile of NAs			
RN (hr/resident day)	0.023* (0.009)	0.017 (0.031)	0.018 (0.012)
LPN (hr/resident day)	-0.001 (0.008)	0.006 (0.026)	-0.003 (0.010)
NA (hr/resident day)	-0.002 (0.003)	-0.024* (0.010)	0.005 (0.004)
R <sup>2</sup>	0.12	0.09	0.05
N	1270	1270	1270

Notes: Standard errors are shown in parentheses. All models include variables measuring the total number of beds in the facility, an activities of daily living score, the proportion of bedfast residents, the proportion of chairbound residents, the proportion of Medicare residents, the number of nursing homes in the market, the number of elderly persons per square mile, real per capita income in the market, and the real state Medicaid payment rate. Full regression results are available upon request. RN = registered nurse; LPN = licensed practical nurse; NA = nurse's aide.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

for the purposes of provider certification, which may raise concerns about the accuracy and interstate reliability of the measures for the purposes of research. The data are generally not audited. Third, we have used data roughly 3 years before and 3 years after the adoption of the NHRA. It is possible that there may have been other trends unassociated with the NHRA over this 6-year time period that we do not account for in these analyses.

Fourth, the staffing data within the MMACS and OSCAR files have been known to be problematic. As we already described, we have spent considerable effort cleaning the data and removing outliers, but we recognize there still may be erroneous staffing totals for particular facilities. The staffing data are collected during a 2-week period and they are not audited by surveyors. Thus, it may be the case that facilities misreport their staffing or increase their staffing during this period in anticipation of a survey. However, Harrington, Zimmerman, and colleagues (2000) compared the OSCAR staffing data with staffing totals collected from California Medicaid cost reports, and the two sources provided almost identical estimates. Fifth, there may be a variant of observer bias present in the data collected in the post-NHRA period. One of the primary goals of the NHRA was better surveying and oversight of facilities. Thus, homes and surveyors may be more likely to accurately report staffing and quality under the OSCAR system relative to the MMACS. This bias could help to explain part of the increase in pressure ulcers following the adoption of the NHRA. Sixth, the data utilized within this study were

collected at the facility level, which prohibits resident-level risk adjustment. Thus, as we already stated, we must acknowledge the potential for omitted variable bias caused by inadequate risk adjustment across facilities.

Finally, even though we measured the effects of the NHRA in 1993, some provisions of the regulation had yet to be fully implemented at that time. For example, the NHRA increased the sanctions available to enforce compliance with Medicare and Medicaid program standards, but the enforcement regulations covering sanctions did not become effective until July of 1995 (U.S. General Accounting Office, 1999). Given the incremental implementation of the NHRA, the 1996 IOM report argued that it is unreasonable "to expect overnight changes that would drastically reduce deficiencies or improve the nursing homes across the nation" (pp. 140–141). Moreover, in the early years of the NHRA, states were allowed to waive the requirements for 24-hr licensed nursing service as well as the 8 hr/day RN presence if certain criteria were met. The IOM (1996) reported that a large number of facilities obtained waivers. For example, governments in 13 states granted waivers—predominantly for the 8-hr RN requirement—to 518 of the 5,302 facilities certified for Medicaid only in 1993.

## Conclusions

This study found some support for higher staffing and quality under the NHRA adopted in 1990. However, we were unable to link higher staffing

under the NHRA to better quality except in certain cases where homes had substandard staffing in the pre-NHRA period. In light of the continued quality of care problems within the nursing home industry, these results are quite important for policymakers considering further actions such as increased regulatory oversight and a minimum staffing standard. Future research will be necessary to examine this issue and link the increased costs of such policies with the perceived quality gains and other potential benefits.

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# **Governmental Efforts to Improve Quality of Care for Nursing Home Residents and to Protect Them from Mistreatment**

## **A Survey of Federal and State Laws**

*Josephine Gittler, JD*

### **ABSTRACT**

There are many federal and state laws addressing, directly and indirectly, the quality of care provided to nursing home residents and the protection of residents from mistreatment. They include: (a) state laws that govern the licensing of nursing homes, (b) federal laws that govern the certification of nursing homes for participation in the Medicare and Medicaid programs, (c) elder abuse laws prohibiting mistreatment of older adults in nursing homes and other settings, (d) health care fraud abuse laws that are increasingly being used to combat the provision of substandard care to Medicare and Medicaid beneficiaries in nursing homes, and (e) laws that have established long-term care ombudsman programs to promote the health, safety, well-being, and rights of nursing home residents. While these laws are generally viewed as having improved the care and treatment of nursing home residents, much remains to be done, particularly with respect to the implementation of these laws.

The body of law related to the quality of care provided to nursing home residents and the protection of residents from mistreatment is large and complicated, and it includes both federal and state statutes and regulations. This article summarizes the results of a survey of these statutes and regulations. It also summarizes the results of a review of the literature regarding the implementation of these statutes and regulations. It is derived from a report prepared for the Nursing Home Collaborative (NHC), consisting

of five Hartford Centers of Geriatric Nursing Excellence (HCGNEs) (Gittler, 2008). **Table 1** lists the sources consulted in the survey of statutes and regulations, and **Table 2** lists the sources consulted in the review of literature.

### **BACKGROUND**

The NHC survey addressed five main kinds of laws:

- State licensing laws.
- Medicare/Medicaid certification laws.

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**TABLE 1**  
**Sources Consulted for Survey of Laws**

Statutes and Regulations	Sources Searched
<b>FEDERAL</b>	<b>FEDERAL</b>
<ul style="list-style-type: none"> <li>• United States Code</li> <li>• United States Code Annotated</li> <li>• United States Statutes at Large</li> <li>• Code of Federal Regulations</li> <li>• Centers for Medicare &amp; Medicaid Services, State Operations Manual</li> </ul>	<ul style="list-style-type: none"> <li>• Law Library, College of Law, The University of Iowa</li> <li>• Lexis/Nexis® database (electronic)</li> <li>• Westlaw® database (electronic)</li> <li>• U.S. Code Collection</li> <li>• Cornell University Law School (electronic)</li> <li>• Electronic Code of Federal Regulations</li> <li>• Centers for Medicare &amp; Medicaid Services Web site</li> </ul>
<b>STATE</b>	<b>STATE</b>
Arkansas	<ul style="list-style-type: none"> <li>• Law Library, College of Law, The University of Iowa</li> <li>• Lexis/Nexis database (electronic)</li> <li>• Westlaw database (electronic)</li> <li>• NH (Nursing Home) Regulations Plus (electronic database of federal and state nursing home regulations)</li> <li>• National Center on Elder Abuse Web site</li> <li>• National Citizen's Coalition for Nursing Home Reform Web site</li> <li>• National Long Term Care Ombudsman Resource Center Web site</li> </ul>
California	<ul style="list-style-type: none"> <li>• West's Annotated California Code</li> <li>• Deering's Annotated California Code (Health and Safety; Welfare and Institutions)</li> <li>• California Code of Regulations</li> </ul>
Iowa	<ul style="list-style-type: none"> <li>• Code of Iowa</li> <li>• West's Annotated Iowa Code</li> <li>• Iowa Administrative Code</li> </ul>
Oregon	<ul style="list-style-type: none"> <li>• Oregon Revised Statutes</li> <li>• Oregon Administrative Rules</li> </ul>
Pennsylvania	<ul style="list-style-type: none"> <li>• Pennsylvania Consolidated Statutes</li> <li>• Pennsylvania Consolidated Statutes Annotated</li> <li>• Pennsylvania Code</li> </ul>

- Elder abuse laws.
- Health care fraud and abuse laws.
- Long-term care ombudsman laws.

Because state licensing laws and Medicare/Medicaid certification laws are the basis for much of the regulation of nursing homes, the majority of this article examines these laws. The article also examines, albeit briefly, elder abuse laws, health care fraud and abuse laws, and long-term care ombudsman laws. Because the focus of the NHC survey was federal laws and state laws in Arkansas, California, Iowa, Pennsylvania, and Oregon—states in which the HCGNEs comprising the NHC are located—these are the focus of this

article. (Please note that citations to the specific statutes and regulations referenced in this article can be found in the report from which the article is derived: Gittler [2008].)

#### **STATE LICENSING LAWS AND MEDICARE/ MEDICAID CERTIFICATION LAWS**

The principal components of the legal framework for nursing home regulation are state licensing laws and Medicare/Medicaid certification laws. Nursing home licensing laws are defined for the purpose of this article as the state laws that govern the licensure of nursing homes, which is a prerequisite for their operation. Medicare/Medicaid certifi-

<b>TABLE 2</b>	
<b>Sources Consulted for Literature Review</b>	
<b>Government</b>	
• U.S. Department of Health and Human Services	
U.S. Administration on Aging Web site	
Centers for Medicare & Medicaid Services Web site	
Office of Inspector General Web site	
• U.S. Congress	
U.S. House of Representatives Web site	
Government Accountability Office Web site	
U.S. Senate Web site	
Thomas (Library of Congress) Web site	
<b>Scholarly</b>	
• Google Scholar	
• Lexis/Nexis database	
• PubMed (including Medline)	
• Public Affairs Information Services (PAIS)	
• Westlaw database	
<b>Resource Centers and Clearinghouses, Foundations, and Advocacy Organizations</b>	
• AARP Policy and Research Web site	
• Clearinghouse on Abuse and Neglect of the Elderly Web site and database	
• The Commonwealth Fund Web site	
• Henry J. Kaiser Family Foundation Web site	
• National Center on Elder Abuse Web site	
• National Citizen's Coalition on Nursing Home Reform Web site	
• National Long Term Care Ombudsman Resource Center Web site	
<b>Other</b>	
• Google	
• National Health Law and Policy Resource Center, College of Law, The University of Iowa	

cation laws are defined for the purpose of this article as the federal laws that govern the certification of nursing homes for participation in the Medicare program, the Medicaid program, or both, without which they cannot receive payments from these programs.

### Historical Perspective

Historically, the licensing of nursing homes has been a state prerogative and a matter of state law. Therefore,

states were the original source of nursing home regulation through their licensing authority.

The Social Security Act Amendments of 1965 dramatically altered states' historical role in nursing home regulation (Gittler, 2008). This legislation created Title XVIII of the Social Security Act authorizing the Medicare program, the federal health insurance program for all individuals age 65 and older, and Title XIX authorizing the Medicaid program, the joint federal-state health insurance program for low-income individuals. The former pays for skilled nursing care for a limited time in a Medicare-certified facility, and the latter pays for long-term care in a Medicaid-certified facility. An estimated 95% of nursing homes are certified to participate in the Medicare program, the Medicaid program, or both (Fogge, 2007). In 2005, the Medicare and Medicaid programs accounted for 60% of nursing home expenditures, with the Medicaid program accounting for the majority (nearly 40%) of these expenditures (Catlin, Cowan, Hefler, Washington, & National Health Expenditure Accounts Team, 2007).

During the past several decades, the federal government has assumed an ever-larger role in the *de facto* regulation of nursing homes by conditioning their participation in the Medicare and Medicaid programs on their compliance with certain requirements. In the 1970s and 1980s, it became apparent that inadequate care of older adults and elder mistreatment were serious problems in nursing homes (Capitman, Leutz, Bishop, & Casler, 2004; Coleman, 1991; Walshe, 2001; Weiner, Freiman, & Brown, 2007). Thus, a 1986 Institute of Medicine (IOM) report declared that in many Medicare/Medicaid certified nursing homes, residents "receive very inadequate—sometimes shockingly deficient—care" and that "they also are likely to have their rights ignored or violated, and may even be subject to abuse" (IOM, Committee on Nursing Home Regulation, 1986, p. 3). Recognition of their plight led to the enactment of the Nursing Home Reform Act of 1987, as part of the Omnibus Budget Reconciliation Act of 1987 (Gittler, 2008). This landmark legislation brought about sweeping reforms in Medicare/Medicaid nursing home certification requirements, the monitoring of nursing homes for compliance with these requirements, and enforcement of these requirements.

Despite the current predominant role of the federal government in regulating nursing homes through Medicare/Medicaid certification requirements, these regulations set a floor, not a ceiling, for nursing home regulation. States retain independent power to regulate

nursing homes by virtue of their licensing authority, and state licensing requirements may be more stringent than requirements for Medicare/Medicaid certification.

### **Quality of Care Requirements**

The Social Security Act's Medicare and Medicaid provisions and their implementing regulations pertaining to the certification of nursing homes for Medicare/Medicaid participation contain numerous substantive conditions (Gittler, 2008). These conditions encompass many aspects of nursing home care, staffing, operations, administration, and physical plant. Conditions related to the quality of care provided to nursing home residents are among the core certification requirements for Medicare/Medicaid participation.

The quality of care requirements revolve around resident outcomes, rather than facility capacities and characteristics. Their overall aim is to ensure each resident receives and each facility provides the necessary care and services "to attain or maintain the highest practicable physical, mental, and psychological well being" of the resident in accordance with the resident's comprehensive assessment and plan of care (42 U.S.C. § 1395i-3(b) (4); 42 U.S.C. § 1396r (b) (4); 42 C.F.R. § 483.25). They cover activities of daily living, vision and hearing, pressure sores, urinary incontinence, range of motion, mental and psychosocial functioning, nutrition, hydration, nasogastric tubes, special needs, unnecessary drugs and antipsychotic drugs, medication errors, and accidents. **Table 3** provides a description of each of these requirements. The central thrust of the quality of care requirements is to ensure a resident does not develop certain enumerated problems (e.g., malnutrition, dehydration, pressure ulcers) unless unavoidable due to the resident's clinical condition and to ensure a resident who does develop these problems receives appropriate care and services.

The quality of care requirements are closely tied to requirements for resident assessments and care plans. Facilities periodically must conduct a "comprehensive, accurate, standardized, reproducible" assessment of a resident's functional capacity and needs, using a standardized resident assessment instrument (42 U.S.C. § 1395i-3(b) (2); 42 U.S.C. § 1396r (b) (2); 42 C.F.R. § 483.20). On the basis of the resident's assessment, facilities must then develop a comprehensive care plan for the resident, which reflects the quality of care requirements in terms of the areas assessed and the needs addressed (Gittler, 2008).

In addition to Medicare/Medicaid certification requirements, nursing homes must meet and adhere to state licensing requirements. A recent analysis of state licensing regulations found that the California, Iowa, Oregon, and Pennsylvania regulations, as well as many other state regulations, have quality of care requirements that go beyond the federal quality of care requirements (Gittler, 2008; NH Regulations Plus, 2007). However, the analysis found that some regulations, such as those in Arkansas, do not explicitly address quality of care (NH Regulations Plus, 2007).

### **Nursing Home Staffing Requirements**

Under Medicare/Medicaid certification laws and state licensing laws, nursing homes must comply not only with quality of care requirements but also with staffing requirements. Extensive literature indicates that insufficient nurse staffing levels, nursing staff without needed qualifications, and high nursing staff turnover rates contribute to the provision of inadequate care to nursing home residents. For a current comprehensive review of this literature, see Maas, Specht, Buckwalter, Gittler, and Bechen (2008a) and Collier and Harrington (2008). Similarly, there is literature indicating that staffing shortages, staff burnout, and a lack of staff training contribute to the mistreatment of nursing home residents (Lindblom, Brandt, Hough, & Meadows, 2007; Maas et al., 2008a; U.S. Senate, Committee on Finance, 2002).

The Medicare/Medicaid statutes and regulations enunciate as a general standard that nursing homes must have "sufficient nursing staff to attain or maintain the highest practicable well-being of each resident as determined by resident assessments and plans of care" (42 C.F.R. §483.30). Under these statutory provisions and regulations, there are several specific staffing standards for nursing homes. They must provide nursing services by an RN, licensed practical nurse (LPN), or licensed vocational nurse (LVN) to residents on a 24-hour basis; designate a licensed nurse (RN, LPN, or LVN) to serve as a charge nurse on each tour of duty; use the services of an RN for 8 consecutive hours per day, 7 days per week; and designate a full-time director of nursing who is an RN and who is prohibited from serving as a charge nurse, unless the home has an average daily occupancy of 60 or fewer residents (Gittler, 2008).

These specific staffing requirements are viewed as minimal in nature for three main reasons (Harrington et al., 2000; IOM, Committee on the Adequacy of Nurse Staffing in Hospitals and Nursing Homes, 1996; IOM, Com-

**TABLE 3**  
**Federal Quality of Care Requirements**

Statutes and Regulations	Requirements
42 U.S.C. §1395 (b)(4); 42 U.S.C. §1396 (b)(4); 42 C.F.R. § 483.25	<i>General:</i> Each resident shall receive and each facility shall provide necessary care and services "to attain or maintain the highest practicable physical, mental, and psychological well-being" of the resident in accordance with the resident's comprehensive assessment and plan of care.
42 C.F.R. § 483.25 (a)	<i>Activities of Daily Living:</i> Facilities must ensure that the ability of residents to engage in activities of daily living does not diminish unless unavoidable because of their clinical condition. Activities of daily living include the ability to bathe, dress and groom, transfer and ambulate, toilet, eat, and use speech, language, or other functional communication systems. If residents cannot carry out activities of daily living, they must receive the services necessary for maintenance of good nutrition, grooming, and personal and oral hygiene.
42 C.F.R. § 483.25 (b)	<i>Vision and Hearing:</i> Facilities must ensure residents receive proper treatment and assistive devices to maintain their vision and hearing. If necessary, facilities must help residents make appointments with and arrange for transportation to and from a provider of vision and hearing services.
42 C.F.R. § 483.25 (c)	<i>Pressure Sores:</i> Facilities must ensure residents admitted without pressure sores do not develop them unless it is unavoidable. Facilities must ensure residents with pressure sores receive the necessary treatment to promote healing and to prevent infections and new sores.
42 C.F.R. § 483.25 (d)	<i>Urinary Incontinence:</i> Facilities must ensure residents receive treatment to prevent urinary tract infections and to restore normal bladder function to the extent possible. Catheterization is permissible only if it is necessary because of a resident's clinical condition.
42 C.F.R. § 483.25 (e)	<i>Range of Motion:</i> Facilities must ensure residents maintain range of motion unless reductions are unavoidable because of their clinical condition. Residents with limited range of motion must receive appropriate treatment and services to increase their range of motion and/or prevent further deterioration in their range of motion.
42 C.F.R. § 483.25 (f)	<i>Mental and Psychosocial Functioning:</i> Facilities must ensure residents receive appropriate treatment and services to prevent and/or improve a mental or psychosocial adjustment difficulty.
42 C.F.R. § 483.25 (i)	<i>Nutrition:</i> Facilities must ensure residents maintain acceptable nutritional status unless this is impossible because of the resident's clinical condition. Facilities must ensure residents receive a therapeutic diet when they have a nutritional problem.
42 C.F.R. § 483.25 (j)	<i>Hydration:</i> Facilities must ensure residents receive sufficient fluids to maintain hydration and health.
42 C.F.R. § 483.25 (g)	<i>Nasogastric Tubes:</i> Facilities must ensure residents who can eat independently or with assistance are not fed by nasogastric tubes unless their use is unavoidable because of a resident's clinical condition. Residents with nasogastric tubes must receive appropriate treatment and services to prevent vomiting, dehydration, metabolic disorders, and nasal-pharyngeal ulcers, and to restore, if possible, normal eating skills.
42 C.F.R. § 483.25 (k)	<i>Special Needs:</i> Facilities must ensure residents receive proper treatment and care for injections; parenteral and enteral fluids; colostomy, ureterostomy, or ileostomy care; tracheostomy care; respiratory care; foot care; and prostheses.
42 C.F.R. § 483.25 (l)	<i>Unnecessary Drugs and Antipsychotic Drugs:</i> The facility must ensure residents do not receive unnecessary drugs, defined as a drug used in excessive dosage, for excessive duration, without adequate monitoring, without adequate indications for use, or with adverse consequences. Facilities must ensure residents are not started on antipsychotic drugs unless clinically necessary and that if a resident receives such drugs, efforts are made to discontinue their use.
42 C.F.R. § 483.25 (m)	<i>Medication Errors:</i> The facility must ensure residents are free of any significant medication errors and that the facility medication error rate is 5% or less.
42 C.F.R. § 483.25 (h)	<i>Accidents:</i> Facilities must ensure residents' environment is as free as possible of accident hazards and that residents receive supervision and assistive devices to prevent accidents.

mittee on Improving Quality in Long-Term Care, 2001; IOM, Committee on the Work Environment for Nurses and Patient Safety, 2004; Mass et al., 2008b; Zhang, Unruh, Liu, & Wan, 2006). First, these requirements do not establish minimum nursing staff-to-resident ratios or minimum nursing supervisor-to-nursing staff ratios. Second, the requirements do not reflect the case-mix of the residents. Third, the requirements do not address staffing by nursing assistants (NAs), who provide the bulk of direct personal care to residents.

Since the promulgation of the existing Medicare/Medicaid staffing requirements 2 decades ago, the requirements have been repeatedly criticized as insufficient to ensure nursing home residents receive appropriate quality of care or to protect them from mistreatment (Harrington, 2001, 2004; Harrington et al., 2000; IOM, Committee on the Adequacy of Nurse Staffing in Hospitals and Nursing Homes, 1996; IOM, Committee on Improving Quality in Long-Term Care, 2001; IOM, Committee on the Work Environment for Nurses and Patient Safety, 2004; Mueller et al., 2006; National Citizen's Coalition for Nursing Home Reform, 1995, 1998; U.S. Senate, Committee on Finance, 2003b; U.S. Senate, Special Committee on Aging, 2007f, 2007h; Wells, 2004; Zhang et al., 2006). Although there is widespread agreement that federal staffing standards for Medicare/Medicaid facilities should be raised, there is an ongoing debate about just what these standards should be. Some prominent and influential organizations have recommended, or endorsed, standards that include specific minimum staff-to-resident ratios (Harrington et al., 2000; IOM, Committee on Improving Quality in Long-Term Care, 2001; IOM, Committee on the Work Environment for Nurses and Patient Safety, 2004; National Citizen's Coalition for Nursing Home Reform, 1995, 1998).

During the period 2000-2001, the U.S. Department of Health and Human Services (USDHHS) submitted two reports to Congress describing the results of a congressionally mandated study, conducted under the auspices of the Centers for Medicare & Medicaid Services (CMS), that examined the appropriateness of establishing minimum nursing staff-to-resident ratios for nursing homes certified by Medicare and Medicaid (CMS, 2001; Health Care Financing Administration, 2000). This CMS study identified staffing level thresholds below which improvements in the quality of care and resident outcomes occurred and above which no further improvement was observed. The study found that a large proportion of facilities failed to meet these thresholds (CMS, 2001).

The study findings provided an empirical basis for new federal Medicare/Medicaid staffing level standards with minimum nursing staff-to-resident ratios (Feuerberg, 2001). Nevertheless, the Secretary of the USDHHS, on behalf of the USDHHS, took the position that the study was "insufficient for determining the appropriateness of staffing ratios" (Thompson, 2002a, 2002b, 2002c, p. 1). The USDHHS position also reflected concern that adoption of these ratios would increase the overall costs of nursing home care by increasing the costs of nursing staff, which in turn would generate pressure for increasing Medicaid reimbursement rates (Feuerberg, 2001; Harrington, 2001). It should be noted in this regard that the Medicare and Medicaid programs pay the costs of a substantial amount of nursing home care.

In response to the findings of the USDHHS study and other studies showing a strong positive relationship between nursing home quality of care and staffing, bills periodically have been introduced in Congress to amend the Social Security Act so as to establish higher minimum nursing staffing standards for nursing homes certified by Medicare and Medicaid (Library of Congress, 2003a, 2003b, 2005). However, to date, attempts to enact legislation establishing more stringent federal standards have been unsuccessful.

The staffing requirements to which nursing homes must conform are not confined to those in Medicare/Medicaid certification laws. Nursing homes also must meet staffing requirements in state licensing laws. These laws usually reiterate some form of the general federal staffing standard that calls for nursing homes to employ staff sufficient to meet the needs of residents, as set forth in residents' assessment and care plans (Gittler, 2008).

Specific federal staffing requirements, which it has been pointed out are minimal in nature, are exceeded by the staffing requirements of most state licensing statutes and regulations (Gittler, 2008; NH Regulations Plus, 2007). In Arkansas, California, Iowa, Oregon, Pennsylvania, and 32 other states, state licensing statutes and regulations, unlike the Medicare/Medicaid certification statutes and regulations, mandate minimum staff-to-resident ratios (Gittler, 2008; NH Regulations Plus, 2007). However, considerable variation exists among states in the actual ratios required (Gittler, 2008).

Some state laws also link staffing level requirements to kinds of nursing staff (RNs, LPN/LVNs, and NAs) and specify the ratio of staff to residents by kind of staff (Gittler, 2008). Here again, considerable variation exists among states in the kinds of nursing staff required (Git-

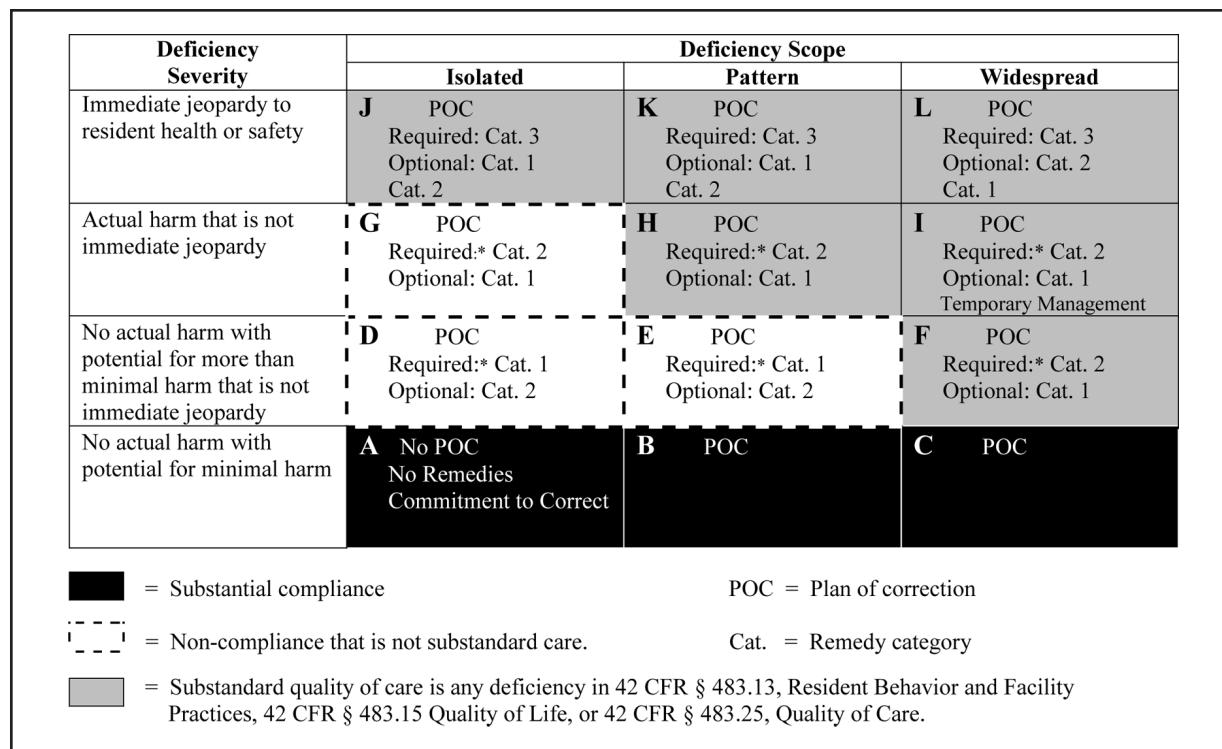


Figure 1. Scope and severity grid and remedy categories used to rank nursing home deficiencies.

\*These remedy categories are required only when a decision is made to impose alternative remedies in lieu of or in addition to termination.

Adapted from Centers for Medicare & Medicaid Services (2004).

tler, 2008). During the past decade, a few states, most notably Florida and California, have significantly raised their minimum nursing home staffing standards (Harrington & O'Meara, 2006; Hyer, 2007; NH Regulations Plus, 2007; Polivka, Salmon, Hyer, Johnson, & Hedgecock, 2003).

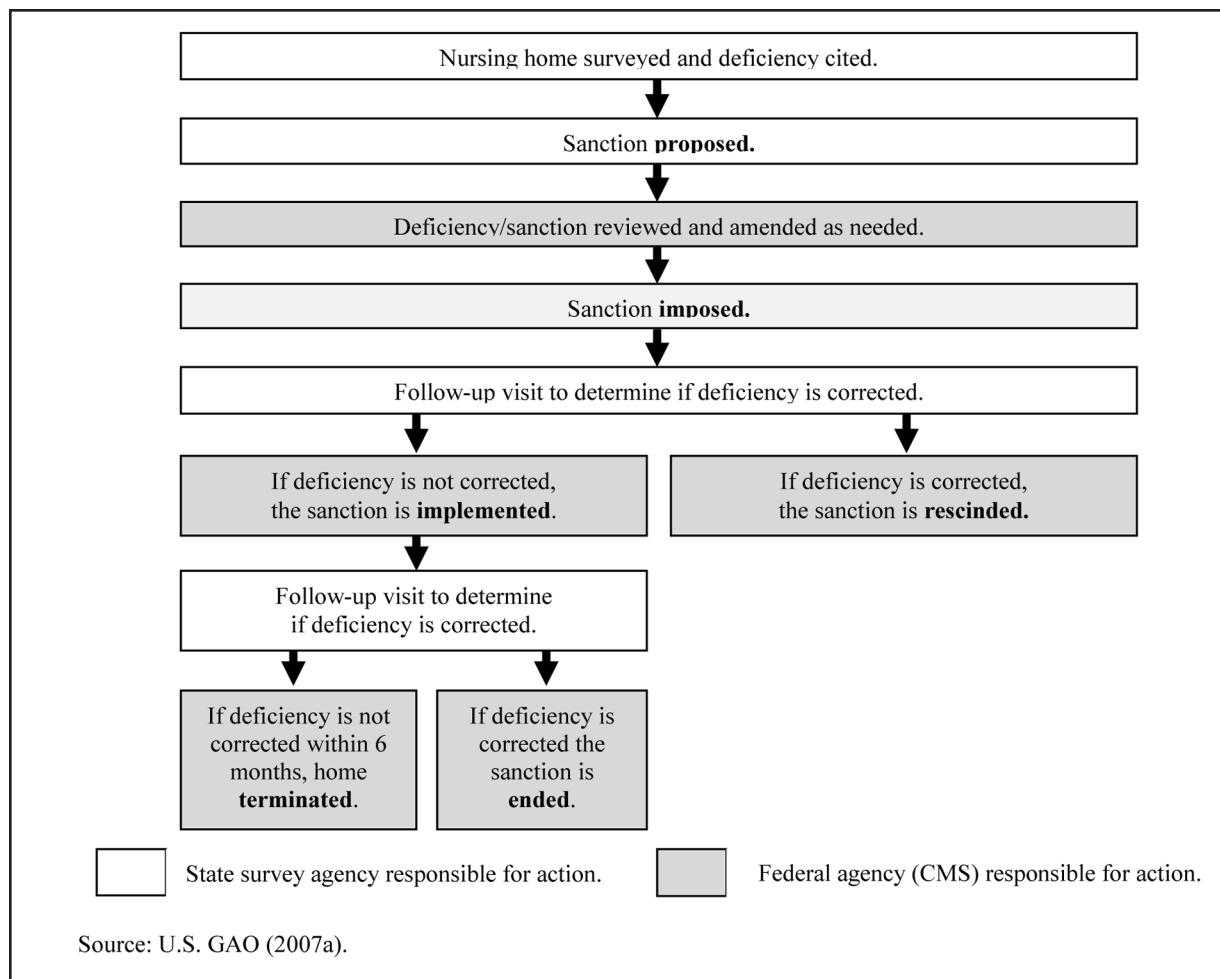
### Monitoring of Nursing Home Compliance

The Medicare/Medicaid statute and regulations set forth a detailed process, known as the survey process, to monitor whether nursing homes are in compliance with quality of care, staffing, and other substantive requirements for Medicare/Medicaid participation. The federal and state governments share responsibility for the survey process (Gittler, 2008). CMS, which is part of the USDHHS, issues regulations and interpretive guidelines and protocols pertaining to the survey process and contracts with state agencies, known as state survey agencies, to implement the survey process.

State survey agencies must conduct an unannounced standard survey, or inspection, of every facility participating in the Medicaid and Medicare programs at least once every 15 months, and the average statewide time interval

for these surveys must not exceed 12 months. In conducting these surveys, the state surveyors must follow CMS survey protocols and interpretative guidelines, which are detailed, complex, and prescriptive (Gittler, 2008). Survey agencies also must conduct investigations of specific complaints about inadequate nursing home care by residents, their relatives, and others (Gittler, 2008).

In the course of surveys or complaint investigations, nursing homes may be cited for a deficiency, which is defined as a failure to meet a Medicaid or Medicare participation requirement (Gittler, 2008). When state surveyors identify deficiencies, they must determine their seriousness. CMS provides guidance to state survey teams for determining the seriousness of identified deficiencies in accordance with a scope and severity scale (Gittler, 2008). The scope scale ranks a deficiency on the basis of the number of residents affected (i.e., whether it is isolated, a pattern, or widespread), and the severity scale ranks a deficiency on the basis of the degree of resident harm (i.e., whether it creates a risk of minimal harm, creates a risk of more than minimal harm, causes actual harm, or poses immediate jeopardy to the health or safety of a facility resident). This scale groups deficiencies into 12 categories from A to L,



Source: U.S. GAO (2007a).

Figure 2. Federal and state responsibilities in the nursing home compliance enforcement process.

with A-level deficiencies being the least serious and L-level deficiencies being the most serious. **Figure 1** provides the CMS grid of scope and severity rankings.

A determination of substantial compliance allows the state or CMS to approve a nursing home's initial certification or renewal of certification (Gittler, 2008). As indicated in **Figure 1**, nursing homes are deemed to be in substantial compliance if the highest deficiency for which they are cited is a C-level deficiency, and they are deemed not to be in substantial compliance when the highest deficiency for which they are cited is a D-level deficiency or higher.

States may establish their own process for the licensing of nursing homes and the enforcement of licensing requirements under their independent licensure authority. State survey agencies also serve as state licensing agencies, and states typically follow the survey process, or some variant thereof, in licensing nursing homes (Gittler, 2008).

### Process for Enforcing Nursing Home Compliance

The Medicare and Medicaid provisions of the Social Security Act and their implementing regulations specify the process for enforcement of nursing home compliance with Medicare/Medicaid participation requirements. This process is intended to ensure prompt correction of deficiencies to protect residents from actual or potential harm and to deter future noncompliance (Gittler, 2008). The enforcement process, like the survey process, is a joint federal and state responsibility (Gittler, 2008). **Figure 2** provides a flow chart illustrating the respective federal and state responsibilities in the enforcement process.

If nursing homes are not in substantial compliance with Medicare/Medicaid participation requirements, statutory and regulatory provisions authorize several kinds of federal remedies, ranging from a directed plan of correction to termination of participation in the Medicare/Medicaid programs (Gittler, 2008). The most frequently used rem-

**TABLE 4**  
**Remedy Categories Used When Nursing Homes Are Cited for Deficiencies by State Survey Agencies**

Category 1	Category 2	Category 3
• Directed plan of correction	• Denial of payment for new admissions	• Temporary management
• State monitor	• Denial of payment for all residents	• Termination
• Directed inservice training	• Civil monetary penalties (\$50 to \$3,000 per day or \$1,000 to \$10,000 per instance)	• Optional: Civil monetary penalties (\$3,050 to \$10,000 per day or \$1,000 to \$10,000 per instance)

Adapted from Centers for Medicare & Medicaid Services (2004).

edy is the civil monetary penalty (CMP), an intermediate sanction, consisting of a fine for each day or instance of noncompliance (U.S. GAO, 2007b).

When nursing homes are cited for deficiencies by state survey agencies, they are usually required, at a minimum, to develop and implement a plan of correction (Gittler, 2008). In addition to a plan of correction, other remedies must or may be imposed. These remedies are grouped in three categories in accordance with the severity of the remedy (Gittler, 2008). **Table 4** contains the remedy categories. After the seriousness of deficiencies is determined, the enforcement authority selects one or more remedies from the applicable remedy category (Gittler, 2008). The more serious the deficiency, as measured by the scope and severity scale, the more severe the remedies in the applicable remedy category (**Figure 1**).

Nursing homes cited for deficiencies normally have a grace period during which they can avoid the imposition of sanctions if they correct the deficiencies (Gittler, 2008). As a result of criticism that undue delays were occurring between the findings of serious deficiencies involving harm to residents and the imposition of sanctions, CMS instituted the immediate sanctions policy, under which state survey agencies must refer nursing homes for immediate sanctions when they are cited for G-level deficiencies or higher on successive surveys (Fogge, 2007; Gittler, 2008; U.S. GAO, 2007b).

States have the authority to establish their own remedies for violations of state licensing laws, and these laws do, in fact, provide remedies for violations of quality of care, staffing, and other licensing requirements. Under state licensing laws, including those of Arkansas, California, Iowa, Oregon, and Pennsylvania, the primary remedies for such violations are CMPs (Gittler, 2008). In theory, substandard care in a nursing home could lead to the imposition of both federal and state remedies; in

practice, most states impose either one or the other (Fogge, 2007). Although some states favor use of federal remedies, others prefer use of state remedies (Fogge, 2007; Hawes, 2002a; U.S. GAO 2007b).

#### **Weaknesses in Governmental Monitoring and Enforcement Efforts**

Persistent weaknesses in federal and state monitoring of the compliance of nursing homes with quality of care, staffing, and other requirements for Medicare/Medicaid certification and state licensing have been well documented. The U.S. Government Accountability Office (GAO) (formerly the U.S. General Accounting Office), the USDHHS Office of Inspector General (OIG), and congressional committees have played a leading role in the documentation of such weaknesses at the federal level (USDHHS OIG, 1993, 1999a, 1999b, 1999c, 2003, 2006a; U.S. GAO, 1998, 1999a, 1999c, 2000, 2002a, 2002b, 2003, 2004, 2005, 2007a, 2008; U.S. Senate, Committee on Finance, 2003a; U.S. Senate, Special Committee on Aging, 1998, 1999a, 1999b, 2000, 2007f, 2007g). In addition, state audit agencies and legislative bodies have played a leading role in the documentation of such weaknesses at the state level (California Legislative Analyst's Office, 2006; California State Auditor, Bureau of State Audits, 2007; Minnesota Management Analysis Division, 2004; Minnesota Office of the Legislative Auditor, 2005). Public policy think tanks and researchers have also identified problems with the monitoring of nursing home compliance (Harrington & Carrillo, 1999; IOM, Committee on Improving Quality in Long-Term Care, 2001; Johnson & Kramer, 1998; Lee, Gajewski, & Thompson, 2006; Louwe, Parry, & Kramer, 2007; Miller & Mor, 2008; Walshe & Harrington, 2002; Wright, 2001, 2005). Furthermore, both consumer advocacy organizations and the nursing home industry have been critical of compliance monitoring, although for somewhat different reasons (American

Association of Homes and Services for the Aging, 2007, 2008; American Medical Directors Association, 2002; California Advocates for Nursing Home Reform, 2006; Levenson & Crecelius, 2002; Rudder, Mollot, & Sobel, 2005; Rudder & Shineman, 2006).

Weaknesses in the monitoring of nursing home compliance have raised several specific concerns about the survey process that revolve primarily around its consistency and accuracy. A number of studies and reports have lent support to these concerns (Abt Associates, 1996; American Association of Homes and Services for the Aging, 2008; Harrington & Carrillo, 1999; Harrington, Mullen, & Carrillo, 2004; IOM, Committee on Improving Quality in Long-Term Care, 2001; Johnson & Kramer, 1998; Lee et al., 2006; Louwe et al., 2007; Miller & Mor, 2008; USDHHS OIG, 2003; U.S. GAO, 1998, 2003, 2004, 2005, 2007a, 2007b, 2008). These studies and reports have shown considerable variation in the way in which survey teams conduct surveys between and within some states and significant understatement of the existence and seriousness of deficiencies by state surveyors in some states.

Just as weaknesses in the monitoring of compliance with Medicare/Medicaid and state licensing requirements have been well documented, so too have weaknesses in the enforcement of these requirements (American Association of Homes and Services for the Aging, 2008; Edelman, 1998; Harrington & Carrillo, 1999; Harrington et al., 2004; Hawes, 2002a; IOM, Committee on Improving Quality in Long-Term Care, 2001; Miller & Mor, 2008; Tsoukalas et al., 2006; USDHHS OIG, 2005a, 2005b, 2005c, 2006b; U.S. GAO, 1999b, 1999d, 2000, 2007b; U.S. Senate, Special Committee on Aging, 2007f, 2007g, 2007i, 2007j; Wood 2002; Wright, 2001, 2005). Studies and reports have disclosed significant interstate variation in the level of enforcement activities. Studies and reports also have disclosed that the use of CMPs as a remedy for noncompliance differed considerably between states, that a significant proportion of CMPs imposed nationwide were not collected or were collected after their due date, and that CMPs often were imposed at the lower end of the permissible dollar range. Particularly troubling are studies detailing persistent problems in the enforcement of quality of care requirements related to nursing homes with a history of repeatedly harming residents that cycle in and out of compliance.

The aforementioned monitoring and enforcement weaknesses have been attributed to a variety of factors. One set of such factors relates to the staffing of state agencies that are responsible for Medicare/Medicaid certifi-

cation and licensing. For example, the U.S. GAO (2008) recently reported that state survey teams nationwide were missing quality of care deficiencies because surveyors lacked investigative skills and the ability to integrate and analyze information collected during surveys. It likewise has been reported that inadequate staffing levels, high staff turnovers, and insufficiently trained and experienced staff may negatively affect the performance of survey and licensing agencies (American Association of Homes and Services for the Aging, 2008; Louwe et al., 2007; U.S. GAO, 2003, 2005, 2007a; USDHHS OIG, 2003; Wright, 2005).

Factors related to the funding made available to state survey and licensing agencies may also contribute to monitoring and enforcement weaknesses. Thus, funding constraints may make it difficult for an agency to establish and maintain appropriate staffing levels and to recruit and retain qualified staff to carry out monitoring and enforcement activities (American Association of Homes and Services for the Aging, 2008; Louwe et al., 2007; U.S. GAO, 2005, 2007b; Walshe & Harrington, 2002).

Still other factors have been cited as contributing to monitoring and enforcement weaknesses. They include shortcomings in some aspects of CMS survey methodology and a lack of clarity with respect to some CMS survey guidelines and protocols; the predictability of the timing of "unannounced" standard surveys, which enables facilities to prepare for surveys and conceal problems; inadequate quality assurance processes to detect understatement in the scope and severity of deficiencies at the state level, and inadequate CMS oversight of the state survey process (Louwe et al., 2007; U.S. GAO, 2003, 2005, 2007a, 2007b, 2008; USDHHS OIG, 2003; Wright, 2005).

Although the influence of factors of a political nature on monitoring and enforcement activities have received little attention from researchers, it has been suggested that the political environment adversely impacts these activities. More specifically, there is evidence that some state survey and licensing agencies have been subjected to political pressure, generated by nursing homes, to overlook or downgrade deficiencies, and there is some evidence that the nursing home industry in some states has lobbied against legislative attempts to strengthen monitoring and enforcement activities (Consumer Reports, 2006; Grassley, 2004; Meitrodt, 2005; O'Connor & Schneider, 2002).

Relates to principal agent theory.

How predictable are the survey?

Potential political pressures is another weakness

## ELDER ABUSE LAWS

Laws prohibiting mistreatment of nursing home residents are another important component of the legal frame-

work within which nursing homes must operate. These laws are commonly referred to as elder abuse laws. The National Center on Elder Abuse (NCEA) generally defines elder abuse as “any knowing, intentional, or negligent act by a caretaker or other person that causes harm or serious risk of harm to a vulnerable adult” (2007a, p. 1). According to the NCEA (2007a), the main kinds of elder abuse are physical abuse, sexual abuse, emotional or psychological abuse, neglect, abandonment, and financial or material exploitation. A variety of legal definitions of the term elder abuse appear in numerous state statutes and a few federal statutes (American Bar Association Commission on Law and Aging, 2005a, 2005b; Bonnie & Wallace, 2002; Gittler, 2008; NCEA, 2007b, 2007c).

The true prevalence and incidence of elder abuse is unknown. However, available evidence dictates the conclusion that elder abuse in nursing homes and other institutional and domestic settings is a serious, widespread, and largely hidden problem (Bonnie & Wallace, 2002; Hawes, 2002b; Lindblom et al., 2007; Loue, 2001; NCEA, 2005; Teaster et al., 2006; U.S. House of Representatives, Committee on Government Reform, Special Investigations Division, Minority Staff, 2001; U.S. House of Representatives, Select Committee on Aging, Subcommittee on Human Services, 1991; U.S. Senate, Committee on Finance, 2002, 2003b; U.S. Senate, Special Committee on Aging, 2007a).

It is well established that states can exercise their inherent police power to protect vulnerable populations, such as elder abuse victims. One approach to elder abuse on the part of states is the provision of state protective services (Adult Protective Services, or APS) to older adults who have been or are at risk of being abused. The National Association of Adult Protective Services defines APS as “services provided to older people and people with disabilities who are in danger of being mistreated or neglected, are unable to protect themselves, and have no one to protect them” (Teaster et al., 2006, p. 9). APS laws have been enacted in all 50 states (American Bar Association Commission on Law and Aging, 2005a, 2006; Gittler, 2008).

A key element of the APS approach to elder abuse is to increase the identification of older adults who are in need of protection from abuse and who might otherwise not come to the attention of the authorities through reporting statutes. These statutes require certain classes of individuals, called mandatory reporters, to report known or suspected cases of elder abuse to the authorities, and they authorize other individuals, called voluntary reporters, to make reports. The Arkansas, California, Iowa, Oregon, and Pennsylvania reporting laws are typical of such laws in that

they designate physicians, nurses, other health professionals, and specified nursing home personnel as mandatory reporters (American Bar Association Commission on Law and Aging, 2005a, 2005b; Gittler, 2008).

Disagreement exists about the effectiveness of mandatory reporting statutes as a case-finding method (Daly, Jogerst, Brinig, & Dawson, 2003; Glick, 2005; Rodriguez, Wallace, Woolf, & Mangione, 2006; Rosenblatt, Cho, & Durance, 1996; Silva, 1992; U.S. GAO, 1991; Velick, 1995). Underlying these statutes are the assumptions that older adults, especially those with cognitive impairments and those who rely on their abusers for care, may be unable or unwilling to reveal their situation and that individuals designated as mandatory reporters have the necessary expertise to identify actual or potential victims of abuse (Fulmer, Guadagno, Bitondo Dyer, & Connolly, 2004). However, if an older adult does not report being abused, it can be difficult to identify abuse, in part because its signs and symptoms may be mistaken for illnesses or changes normally associated with aging.

Progress has been made in developing elder abuse screening and assessment instruments and forensic markers of abuse, but more work must be done in this area (Anonymous, 2002; Dyer, Connolly, & McFeeley, 2002; Fulmer et al., 2004; Hunsaker & Hunsaker, 2005; McNamee & Murphy, 2006). In addition, mandatory reporters who know or suspect elder abuse may not necessarily file a report. Several studies have indicated significant underreporting of elder abuse and noncompliance with mandatory reporting requirements (Clark-Daniels, Daniels, & Baumhover, 1990; Daly & Jogerst, 2005; Jogerst, Daly, & Ingram, 2001; Peduzzi, Watzlaf, Rohrer, & Rubenstein, 1997; Rodriguez et al., 2006; Rosenblatt et al., 1996).

State reporting statutes vary as to what agency receives and investigates reports, how reports are investigated, and what occurs when an investigation is completed (American Bar Association Commission on Law and Aging, 2005a; Gittler, 2008). In general, when a report of abuse in a nursing home is substantiated, the state agency responsible for licensure and certification of the nursing home will determine what action to take against the nursing home; if the employee who committed the abuse is a licensed health professional, the relevant state professional licensure agency will determine what action to take against the employee (Gittler, 2008).

Another approach that states have taken related to elder abuse is to criminalize it. A number of states, such as Arkansas, California, Iowa, Pennsylvania, and Oregon, have enacted statutes making abuse of older adults a specific crime, and some of these statutes explicitly state that

elder abuse in a nursing home or other institutional setting is a criminal offense (Buchwalter, 2003/2007; Gittler, 2008; Loue, 2001). Other states have statutes that authorize enhanced penalties for the commission of a criminal offense against an elderly victim (Bremer, 1999/2007; Gittler, 2008). Still other states have sentencing guidelines under which the fact that the victim of a crime is elderly may be an aggravating factor for the purpose of sentencing the offender (Ramares, 1989/2007). Even in the absence of a specific elder abuse criminal statute, conduct constituting elder abuse may be prosecuted under generic state criminal laws applicable to both elderly and non-elderly victims (American Bar Association Commission on Law and Aging, 2005b; American Prosecutors Research Institute, 2003a; Davidson, 2004; Moskowitz, 2003).

It is the responsibility of local law enforcement officers and prosecutors to enforce elder abuse criminal laws, and state attorney generals sometimes also play a role in enforcement of these laws (Gittler, 2008). Law enforcement and prosecution agencies historically treated elder abuse as a civil matter, rather than as a crime to be investigated and prosecuted like other crimes against individuals (Blakely & Dolon, 2000; Heisler, 2000; Heisler & Stiegel, 2004). As awareness of the problem of elder abuse has increased, it has begun to receive more attention from law enforcement and prosecution agencies (American Prosecutors Research Institute, 2003b; Greenwood, 1999; Heisler, 2000; Heisler & Stiegel, 2004; Moskowitz, 2003; National District Attorneys Association, 2003; State of California Department of Justice, Bureau of Medi-Cal Fraud and Elder Abuse, 2004; U.S. Senate, Special Committee on Aging, 2007d).

When law enforcement and prosecution agencies do decide to pursue elder abuse cases, they frequently encounter difficulties (American Prosecutors Research Institute, 2003a, 2003b; Davidson, 2004; Heisler, 2000; U.S. GAO, 2002b; Zahner, 1999). A major impediment to the effective investigation and prosecution of alleged abuse cases of nursing home residents is a failure to report these cases altogether or to report them promptly to law enforcement authorities, thereby compromising the availability and integrity of evidence. Effective investigation and prosecution of these cases may also be hindered, or precluded, by the diminished mental and physical capacities of many elder abuse victims and their reluctance to cooperate, together with the lack of other witnesses to incidents of abuse.

Although state elder abuse laws traditionally have been the source of legal protections for nursing home residents who are actual or potential victims of abuse, the Medicare/ Medicaid statutes and regulations also

attempt to protect nursing home residents from abuse. Nursing homes certified by Medicare and Medicaid must develop policies and procedures to prevent elder abuse, and state survey agencies must put into place processes for the receipt, timely review, and investigation of allegations of resident abuse (Gittler, 2008). In addition, state Medicaid Fraud Control Units (MFCUs) are charged with investigating and prosecuting not only cases of fraud by Medicaid providers but also cases of abuse of Medicaid recipients in nursing homes and other settings (USDHHS OIG, 2006c).

## **HEALTH CARE FRAUD AND ABUSE LAWS**

Health care fraud and abuse laws supplement and reinforce Medicare/Medicaid certification laws, state licensing laws, and elder abuse laws. Broadly defined, health care fraud is an intentional deception or misrepresentation leading to unauthorized reimbursement for health services, and health care abuse is billing for services that are not medically necessary, that do not reflect professional standards for health care, or that result in unnecessary costs (Gittler, 2008).

The existing federal statutory scheme, which can be used to combat Medicare and Medicaid fraud and abuse by nursing homes, consists of general fraud statutes, health care-specific fraud statutes, and Medicare and Medicaid-specific fraud statutes (Baumann, 2002; Loucks & Lam, 2002; McGuire & Schneider, 2007). States also have fraud and abuse statutes that are applicable to nursing homes (Baumann, 2002; Loucks & Lam, 2002).

The Civil False Claims Act (FCA), a general federal fraud statute, has been one of the primary governmental weapons against Medicare and Medicaid fraud by nursing homes (Gittler, 2008). FCA liability requires proof that a party knowingly presented a false or fraudulent claim to the federal government. FCA violators are subject to heavy civil sanctions—fines of \$5,500 to \$11,000 per false claim plus treble damages. A unique feature of the FCA is that it permits private citizens, who the FCA refers to as *qui tam* relators and who are more familiarly known as whistleblowers, to bring suit on behalf of the United States and to retain 15% to 25% of any damages recovered. Consequently, if nursing home employees or other individuals know a nursing home has defrauded the Medicare or Medicaid programs, they have a financial incentive to file a FCA suit against the nursing home.

The FCA has customarily been used in cases in which providers have billed for services that were not actually provided and those in which providers have manipulated the

coding of claims to maximize reimbursement. In the 1996 Geri-Med case, the federal government filed a complaint against a nursing home and its management company alleging for the first time that billing Medicare for substandard care of residents constituted a false claim under the FCA (Hoffman, 1997). This case marked the beginning of FCA "failure of care" cases involving nursing homes (Connolly, 2001).

Although some courts have rejected the validity of legal theories developed to support FCA failure of care cases, others courts have been more receptive to these theories (Blackwood & Daniels, 2003; Connolly, 2001; Davidson, 2004; Hoffman, 1997; Mustokoff, 2007; Mustokoff, Werner, & Yecies, 1997). But failure of care cases that are actually tried before a court are just the proverbial tip of the iceberg. The government has brought many actions alleging failure of care that were never litigated because of settlement agreements (Connolly, 2001; Hoffman, 1997; U.S. Senate, Special Committee on Aging, 2007b, 2007c).

Government failure of care cases have resulted in the imposition of multiple and substantial civil and administrative sanctions on nursing homes (Connolly, 2001; U.S. Senate, Special Committee on Aging, 2007b, 2007c). In failure of care case settlements, the government also typically requires nursing homes to correct quality of care problems in a specified manner and sometimes requires them to employ government-selected independent monitors, who have unrestricted access to facilities, staff, residents, and records, and who make recommendations to improve the quality of care (Connolly, 2001; Hoffman, 1997; U.S. Senate, Special Committee on Aging, 2007b, 2007c).

FCA failure of care cases may be the harbinger of things to come in terms of a nexus between government efforts to both control and prevent health care fraud and abuse and to improve health care quality, which were stimulated, at least to some extent, by an intensive national health care quality initiative launched by the IOM in the 1990s (IOM, Committee on Quality of Health Care in America, 2000, 2001). Some experts predict that provision of care by nursing homes and other providers that do not meet evidence-based quality of care standards increasingly will become the focal point of government enforcement of health care fraud and abuse laws (Gosfield, 2003, 2007; Sheehan, Wagohurst, & Smithline, 2007).

### **LONG-TERM CARE OMBUDSMAN LAWS**

Long-term care ombudsman laws, like health care fraud and abuse laws, supplement and reinforce Medicare/Med-

icaid certification laws, state licensing laws, and elder abuse laws. The Older Americans Act makes federal financial assistance available to states for long-term care ombudsman programs (LTCOPs) (Gittler, 2008). Under the Older Americans Act, state LTCOPs have an extremely broad general mandate to promote the health, safety, well-being, and rights of residents of nursing homes and other long-term care facilities (Gittler, 2008).

The Act more specifically provides that the state LTCOPs are to act as advocates for individual nursing home residents. One of their chief responsibilities related to individual advocacy is the investigation and resolution of complaints, including complaints pertaining to quality of care brought by, or on behalf of, nursing home residents (Gittler, 2008). The most common complaints are related to inadequate care due to insufficient staff (U.S. Administration on Aging, 2007a). Although LTCOPs can investigate complaints against nursing homes, they cannot compel nursing homes to take needed corrective actions, and in the event they discover a failure on the part of nursing homes to comply with quality of care requirements or to protect residents from abuse, they must rely on other agencies and authorities for any needed enforcement actions. Therefore, it is important for LTCOPs to have links and good working relationships with these agencies and authorities (Estes, 2006; Estes, Zulman, Goldberg, & Ogawa, 2001, 2004).

The Older Americans Act also gives state LTCOPs other responsibilities. They are charged with conducting systemic advocacy to improve long-term care, promoting the development of citizens' organizations to participate in program activities, assisting in the development of family and resident councils in nursing homes, and educating consumers, providers, and the public about long-term care (Gittler, 2008).

All 50 states have enacted enabling statutes establishing LTCOPs (Gittler, 2008; National Association of State Units on Aging, 2002). Most of these state-enabling statutes and their implementing regulations track the provisions of the Older Americans Act and usually state that the LTCOPs shall engage in individual advocacy, systemic advocacy, and the development of citizens' organizations, family and resident councils, and educational activities.

In some states, statutes and regulations permit or require LTCOPs to assume additional duties. For example, in some states, long-term care ombudsmen are authorized to serve as investigators of alleged violations of elder abuse laws in long-term care facilities (Gittler, 2008; National Association of State Units on Aging, 2002).

Although the Older Americans Act delineates the specific functions of LTCOPs, states have a great deal of discretion in determining their organization and structure. State-enabling statutes designate a variety of organizational entities to administer these programs at the state level. Many programs are located within a state unit on aging, which may be an independent agency or part of a larger agency; some programs are located within another state agency; and a few programs are located outside of the state government agency structure and are operated by entities such as legal service organizations and non-profit organizations (Gittler, 2008). The many programs located within the state government bureaucracy may lack the organizational autonomy for systemic advocacy and individual advocacy (Estes et al., 2001, 2004).

The Older Americans Act also gives considerable discretion to states in the staffing of their LTCOPs. The LTCOPs have full-time paid staff, but most programs rely heavily on volunteers to staff the regional and local offices that provide ombudsman services (Gittler, 2008; U.S. Administration on Aging, 2007b). The number of full-time paid ombudsmen varies widely among states. The generally accepted minimum staffing standard for LTCOPs of one full-time paid ombudsman per 2,000 long-term care beds is one that some programs do not meet (IOM, Committee to Evaluate the State Long-Term Care Ombudsman Programs, Division of Health Care Services, 1995; U.S. Administration on Aging, 2007b). An inadequate number of full-time paid staff and trained volunteers due to insufficient federal and state funding has hampered the ability of state and local LTCOPs to fulfill their mandates under the Older Americans Act and state-enabling statutes and implement regulations (Estes, 2006; Estes et al., 2001, 2004; Gittler, 2008; IOM, Committee to Evaluate the State Long-Term Care Ombudsman Programs, Division of Health Care Services, 1995).

### **COMPLEXITY OF THE STATUTORY AND REGULATORY SCHEME AND FRAGMENTATION OF IMPLEMENTATION EFFORTS**

Multiple separate but overlapping nursing home statutes and regulations pertinent to the care and treatment of nursing home residents have created a statutory and regulatory scheme that is highly complex. Moreover, multiple governmental entities at the federal, state, and local levels are involved with the implementation of these statutes and regulations. **Table 5** lists the pertinent governmental entities with implementation responsibilities in Arkansas, California, Iowa, Pennsylvania, and

Oregon. The involvement of so many different entities produces fragmentation of governmental efforts to ensure nursing home residents receive appropriate quality of care and are protected from mistreatment, and such fragmentation can in turn produce gaps in and duplication of such efforts.

There are several consequences of the complexity of the statutory and regulatory scheme and the fragmentation of implementation efforts. One consequence is that nursing homes must cope with what are, or what seem to be, unclear, confusing, and inconsistent requirements. Another consequence is that when nursing home residents receive substandard care or mistreatment, they, their families, and their friends must negotiate a maze of government agencies and authorities to obtain assistance. It is important to minimize, to the extent possible, these problems by creating processes for effective communication between the governmental entities that implement nursing home statutes and regulations and by developing mechanisms for coordination and integration of their activities.

### **CONCLUSION**

The 20th anniversary of the enactment of the Nursing Home Reform Act of 1987 provided an opportunity to evaluate the effectiveness of governmental efforts to improve the quality of care for nursing home residents and to protect them from mistreatment (U.S. Senate, Special Committee on Aging, 2007a, 2007b, 2007c, 2007d, 2007e, 2007f, 2007g, 2007h, 2007i, 2007j; Weiner et al., 2007). The Nursing Home Reform Act as well as other laws are widely credited with having improved the care and treatment of nursing home residents; yet, serious problems related to the provision of inadequate care to residents and mistreatment of residents persist. In short, much has been accomplished, but many challenges remain.

Among the many individuals who have a direct stake in more effective regulation of nursing homes are public policy makers, nursing home regulators, nursing home owners and operators, and nursing home staff. The most important stakeholders, however, are nursing home residents themselves—many of whom are not in a position to act as their own advocates—and their families and friends. Ultimately, members of the general public are stakeholders inasmuch as there is, or at least should be, a broader societal obligation to ensure nursing home residents receive appropriate care and are able to live their lives in safety and with dignity.

**TABLE 5**  
**Nursing Home Statutes and Regulations: Entities Responsible for Implementation**

State	Federal Agency	Federal Medicare/Medicaid Certification Laws	State Licensing Laws	Elder Abuse Laws			Health Care Fraud and Abuse Laws			LTC Ombudsman Laws			
				State Adult Protective Service Laws	Elder Abuse Reports & Investigations	State Criminal Laws	Federal Medicare/Medicaid Certification Laws & State Licensing Laws	Federal False Claims Act & Federal Statutes	State Statutes	State Agencies	Local Agencies	Federal Agencies	
Arkansas	CMS, CMS regional offices	Dept. of Human Services, Div. of Medical Services, Office of LTC	State Licensing Agency	Dept. of Human Services, Office of LTC	• Dept. of Human Services, Office of LTC • Local law enforcement	State Criminal Laws	• Attorney General's office • Dept. of Human Services, Div. of Medical Services, Office of LTC • State medical examiner/county coroners	• OIG • DOJ/U.S. Attorney's offices • Federal investigative agencies (e.g., FBI, U.S. Postal Service)	Attorney General's office, MFCU	Attorney General's office, MFCU	• Local law enforcement • Local prosecuting agencies (prosecuting attorneys)	• OIG • DOJ/U.S. Attorney's offices • Federal investigative agencies	AoA
California	CMS, CMS regional offices	Dept. of Public Health, Licensing & Certification Div.	State Licensing Laws	Dept. of Public Health, Licensing & Certification Div.	• Local LTCOPS • Local law enforcement • Attorney General's office, MFCU See also LTC ombudsman laws	State Criminal Laws	• Attorney General's office • State & local medical examiners/concerners	• OIG • DOJ/U.S. Attorney's offices • Federal investigative agencies	Attorney General's office, Bureau of Medi-Cal Fraud & Elder Abuse	Attorney General's office, MFCU	• Local law enforcement • Local prosecuting agencies (district attorneys)	• OIG • DOJ/U.S. Attorney's offices • Federal investigative agencies	AoA
Iowa	CMS, CMS regional offices	Dept. of Health Facilities	State Licensing Laws	Dept. of Inspections & Appeals	• Dept. of Inspections & Appeals See also LTC ombudsman laws	State Criminal Laws	• Local law enforcement • State/county medical examiners	• OIG • DOJ/U.S. Attorney's offices • Federal investigative agencies	Dept. of Inspections & Appeals, MFCU	Attorney General's office	• Local law enforcement • Local prosecuting agencies (county attorneys)	• OIG • DOJ/U.S. Attorney's offices • Federal investigative agencies	AoA
													Resident advocates, Dept. of Elder Affairs
													Resident advocate committees are appointed for each LTC facility

**TABLE 5 (CONTINUED)**  
**Nursing Home Statutes and Regulations: Entities Responsible for Implementation**

State	Federal Agency	Federal Medicare/Medicaid Certification Laws	State Licensing Laws	Elder Abuse Laws		Health Care Fraud and Abuse Laws			LTC Ombudsman Laws		
				State Adult Protective Service Laws	State Criminal Laws	Federal Medicare/Medicaid Certification Laws & State Licensing Laws	Federal False Claims Act & Federal Statutes	State Statutes	Federal Agencies	State Agencies	Local Agencies
Oregon	CMS, CMS regional offices	Dept. of Human Services, Seniors & People with Disabilities, Office of Licensing & Certification	State Survey Agency	State Agencies	•Area agencies on aging •Dept. of Human Services, Seniors & People with Disabilities, Office of Licensing & Certification	•Attorney General's office •Local law enforcement •State/county medical examiners See also LTC ombudsman laws	•Dept. of Human Services, Seniors & People with Disabilities •Attorney General's office, MFCU	•OIG •DOJ/U.S. Attorney's offices •Federal investigative agencies	Attorney General's office, MFCU	Attorney General's office	•Local law enforcement •Local prosecuting agencies (district attorneys)
Pennsylvania	CMS, CMS regional offices	Dept. of Health, Bureau of Facility Licensure & Certification		State Agencies	•Area agencies on aging •Local law enforcement See also LTC ombudsman laws	•Attorney General's office, Elder Abuse Unit •County coroners/medical examiners	•Dept. of Health, Div. of Nursing Care Facilities •Attorney General's office, Elder Abuse Unit	•OIG •DOJ/U.S. Attorney's offices •Federal investigative agencies	Attorney General's office, MFCU	Attorney General's office	•Local law enforcement •Local prosecuting agencies (county attorneys)

Note. AoA = US, Administration on Aging; CMS = Centers for Medicare & Medicaid Services; Dept. = Department; Div. = Division; DOJ = U.S. Department of Justice; FBI = Federal Bureau of Investigation; LTC = long-term care ombudsman programs; MFCU = Medicaid Fraud Control Units; OIG = U.S. Department of Health and Human Services, Office of Inspector General.  
 Local law enforcement encompasses police and sheriffs.

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# **State Nursing Home Enforcement Systems**

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**Abstract** This study presents interview and statistical data from a telephone and fax survey of state agency officials and statistical data from the Centers for Medicare & Medicaid Services' Online Survey Certification and Reporting (OSCAR) system. State survey activities for nursing facilities were reviewed and the number and types of intermediate sanctions issued by states in 1999 were reported, along with barriers to the use of such sanctions. Using five selected enforcement measures to create a summary score, states were classified by quartiles based on the stringency of their nursing facility enforcement activities. Controlling for the number of complaints as a proxy for quality, the predictors of a summary of state enforcement actions were: percentage of population at age eighty-five and above, Democratic governors, higher percentages of chain facilities, and lower facility occupancy rates. Regional differences in enforcement patterns also were shown. Many federal policies and resource constraints were identified as barriers to effective regulation. The findings identified nursing facility survey and enforcement issues that need to be addressed by policy makers.

Poor nursing facility quality of care has been a national concern since the U.S. Senate Special Committee on Aging first began hearings in 1963 (this study follows hearing reports from 1963 to 1974; also see U.S. GAO 1987). Reports about poor quality continued into the 1980s and led to an

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Institute of Medicine (IOM) (1986) report on widespread quality problems and recommendations for stronger federal regulations. The IOM report, as well as the active efforts of many consumer advocacy and professional organizations, resulted in Congress passing a major reform of nursing facility regulation in the Omnibus Budget Reconciliation Act of 1987 (Public Law 100–203) (OBRA 1987). OBRA 1987 strengthened the quality standards, the survey process, and the enforcement mechanisms for nursing facility regulation. OBRA and its subsequent regulations mandated uniform comprehensive assessments for all nursing facility residents and required the survey process to focus on resident outcomes. The overall goal of the survey and enforcement process under OBRA 1987 was to achieve facility compliance with federal quality requirements.

The Centers for Medicare & Medicaid Services (CMS) (formerly the Health Care Financing Administration [HCFA]) is responsible for setting the standards, establishing survey and monitoring procedures, and enforcing the law (U.S. HCFA 1995a, 1995b, 2000b). The 1995 HCFA guidelines required nursing facility deficiencies to be rated by surveyors based on their scope and severity and linked to intermediate sanctions (U.S. HCFA 1995a). The CMS enforcement requirements include a range of new federal intermediate sanctions including civil monetary penalties (CMPs), the denial of payment for new or current admissions, and the imposition of temporary management. Ultimately, CMS can decertify (terminate) facilities from the program that fail to meet the federal standards (U.S. HCFA 1995a, 1995b). The federal enforcement procedures are complex, and the implementation process has been slow and controversial (U. S. GAO 1998, 1999a).

The implementation of OBRA shifted federal regulations from a focus on the physical plant and safety features to a focus on quality of care and quality of life for residents (Morford 1988). It could be argued that the implementation of OBRA represented a fundamental shift from a “compliance model” that emphasized encouraging providers to improve quality to a “deterrence model” in which penalties are enforced for failures to comply with requirements (Hawkins and Thomas 1984; Day and Klein 1987).

Since 1965, when the Medicare and Medicaid programs were established, nursing facility regulation has been a joint federal and state responsibility. State survey agencies are responsible for licensing nursing facilities if they meet state legal requirements and for certifying facilities that meet the conditions for participation in the Medicare and Medicaid programs. State survey agencies have contracts with and are funded by CMS

to undertake certification and enforcement activities. Even though the regulatory system is shared between CMS and states, the implementation of the regulations has been largely devolved to the states.

Although it was expected that the OBRA 1987 changes would improve the survey and enforcement system and ultimately improve quality, there are still many nursing facilities with quality of care problems. The U.S. General Accounting Office (GAO) (1998, 1999a) found that one-third to one-fourth of nursing facilities nationwide continue to be cited for deficiencies that either caused actual harm or the potential for harm and serious injury. A number of studies and reports have related the poor quality of some nursing facility care to serious ongoing problems with the survey and enforcement system (Edelman 1997, 1998; U.S. OIG 1999; Abt and U.S. DHHS 1998; U.S. GAO 1999b, 1999c, 1999d). In spite of the new regulatory efforts, the average number of deficiencies steadily declined by 44 percent between 1991 and 1997 (Harrington and Carrillo 1999). The continued widespread variation in the number and type of deficiencies issued by states suggests that states are not using the regulatory process consistently (U.S. GAO 1998, 1999a). One of the most serious findings by the U.S. GAO (1998, 1999a) was that state surveyors were often unable to detect serious quality of care problems, and often CMS and the states allowed most facilities to correct deficiencies without penalties. Only a few facilities were terminated from the program, and most of these were later reinstated and continued to have deficiencies.

The U.S. Senate Special Committee on Aging held a series of hearings between 1998 and 2000 regarding the GAO's studies and urged CMS to improve its survey and enforcement process. CMS reports to the U.S. Senate Special Committee on Aging showed some improvements in state regulatory activity (U.S. HCFA 2000a, 2001), but many problems with the regulatory system persisted (U.S. GAO 2000). A recent Institute of Medicine report recommended further reforms of nursing facility regulation to improve the survey and enforcement process (IOM 2001).

This essay examines state agency survey and enforcement activities for nursing facilities five years after the 1995 federal enforcement procedures were adopted. The study had four aims: (1) to examine the variations in the survey process and enforcement actions across states, (2) to identify the barriers to effective enforcement from the perspective of state licensing and certification (L&C) officials, (3) to classify states on the basis of their enforcement stringency, and (4) to identify some factors that predict state regulatory enforcement activity.

The study presents interview and statistical data from a telephone and

fax survey of state L&C agency officials (or their designees) and statistical data from CMS's Online Survey Certification and Reporting (OSCAR) system. State L&C survey activities are reviewed, and the number and types of intermediate sanctions issued by states in 1999 are reported, along with barriers to the use of such sanctions. Using five selected enforcement measures, states are classified based on the stringency of their enforcement activities. Predictors of state enforcement are examined including political variables, facility characteristics, a competition measure, state Medicaid generosity, and a quality indicator. Finally, state licensing and certification official reports on enforcement barriers and resource constraints are considered. The findings from the study provide an overview of nursing facility regulatory issues that need to be considered by policy makers.

## **Background**

Historically, the role of the states in the regulation of health care has been strong, even after the passage of Medicare and Medicaid in 1965, when the federal government began to prescribe requirements for providers to participate in the federal program (Litman 1997). L. D. Brown (1992: 24) argued that decentralized behavioral regulations have been popular in the United States because they let the federal government appear to be doing something about a problem, but in reality, they keep political conflicts focused away from Washington, do little to upset the system and providers, and give the appearance of using democratic decision making. S. M. Davidson (1997) has pointed out that states, with their shared responsibilities with the federal government, have certain freedoms to improvise in carrying out their mandates. Although state variation is often praised as a mechanism for developing innovations and adaptations to the special interests and needs of different population groups and regions, there are situations when variations can create inequities and problems (Lipson 1997; Leichter 1997).

Moreover, states differ in their willingness and ability to address certain policies (Davidson 1997), and these differences are related to historical and cultural attitudes (Davidson, Cromwell, and Schurman 1986) as well as politics and financial capacity. This is particularly the case where the role of the states in the nursing facility regulatory process is pivotal.

## Survey Procedures

State surveys are required for nursing facility certification between nine and fifteen months (on average every twelve months), and investigations are required when complaints are made about poor quality of care. In addition, state surveyors are required to pass a Surveyor Minimum Qualifications Test (SMQT) administered by CMS and to follow its State Operations Manual (U.S. HCFA 1995a, 1995b, 1999, 2000a). When they find that a facility fails to meet a specific federal requirement, a deficiency is issued. State surveyors are responsible for rating the scope and severity of deficiencies. State agencies have the responsibility for taking enforcement actions against Medicaid-only certified facilities, and they work with federal officials on enforcement actions for Medicare-only and combination Medicare/Medicaid-certified facilities.

Under the 1998 HCFA initiatives, states are responsible for implementing a number of new reforms in their survey procedures (U.S. DHHS 1998). These include using staggered surveys (scheduled on weekends, holidays, or nights); making survey dates less predictable; conducting timely complaint investigations; targeting the poorest performing facilities for more frequent monitoring and surveys than other facilities; tracking changes in owners and poor performing facilities; ensuring the accuracy of the resident assessment data (minimum data set); using CMS quality indicators to target potential facility problems and selected sample residents during the survey; and submitting OSCAR data in a timely fashion, along with other responsibilities (U.S. HCFA 2000a, 2001; Walshe and Harrington 2002).

## Classifying Deficiencies and Imposing Sanctions

In July 1995, HCFA established a graded system for classifying deficiencies by severity and scope in one of twelve categories labeled “A” through “L” depending on the extent of patient harm (severity) and the number of patients adversely affected (scope). Facilities with deficiencies at the C level or below are considered to be in “substantial compliance” with the regulations and are not subject to sanctions (U.S. HCFA 1995a). Facilities with higher deficiencies are “not in substantial compliance” and are subject to intermediate sanctions or termination from the program, depending on the severity of the problem. Facilities with deficiencies that have a potential for more than minimal harm (D or E level) are required to provide a plan of correction (U.S. GAO 1999b: 8). Facilities with deficiencies

rated as F through I are required to receive a denial of payment for new admissions or CMPs of \$50 to \$3,000 per day of noncompliance. Deficiencies that cause actual or potential for death or serious injury (at the J to L levels) are categorized as causing immediate jeopardy and are subject to such sanctions as temporary management, termination, and/or civil monetary penalties of \$3000 to \$10,000 per day of noncompliance.

### Substandard Quality of Care

Substandard quality is defined as one or more deficiencies related to participation requirements under resident behavior and facility practices (42 Code of Federal Regulations Section 483.13), quality of life (*ibid.* at Section 483.15), or quality of care (*ibid.* at Section 483.25) that constitutes either immediate jeopardy or actual harm. The jeopardy or actual harm must be a pattern or widespread (H level or higher), or it must have the potential for more than minimal harm that is widespread (F level) (U.S. HCFA 1999). Facilities receiving a determination of substandard quality of care are subject to losing their authority to conduct nurse aide training, which, consequently, may make the hiring of nurse aides difficult.

### Procedural Issues

CMS requires a notice period before the sanction can take effect, and sanctions recommended by states must be sent to the CMS regional officials for them to review the sanctions and give fifteen to twenty days of notice for the facility to come into compliance (*ibid.*). In cases of immediate jeopardy, the sanction can be put into effect after a two-day notice. The requirement for CMS regional office approvals of CMPs and other intermediate sanctions adds another layer of bureaucracy and time delays (IOM 2001). The CMP system is seriously hampered by an increasing backlog of administrative appeals that can last for several years and the provision that prohibits collection until the appeal is resolved (U.S. GAO 1999b). Additional funds were appropriated by Congress to increase the number of hearing officers for appeals to speed the process, but the bureaucratic appeals process has continued to be cumbersome and time consuming (IOM 2001).

## Methods

### Measures of State Enforcement Stringency

There are many ways to measure the stringency of state enforcement. We examined indicators of enforcement identified by CMS, the GAO, or others (Abt and U.S. DHHS 1998; U.S. GAO 1998, 1999a, 1999b; Harrington and Carrillo 1999). For this study, five indicators of enforcement were selected: (1) the average number of deficiencies issued per facility; (2) the percentage of facilities that received a deficiency compared to those facilities that received no deficiencies; (3) the percentage of facilities that received a deficiency at the G level or above (residents experience harm or serious jeopardy that was either an isolated event, a pattern, or a widespread problem); (4) the percentage of facilities that were cited for sub-standard care; and (5) the average number of state and federal CMPs issued per facility surveyed. All state and federal CMPs issued to facilities were combined because some states exclusively used their state CMP system.

A number of other measures of enforcement activities could have been selected. The amount of federal and state funds for nursing regulation was not examined because its relationship with enforcement was explored in another study (Walshe and Harrington 2002) and complaint investigation and confirmation rates have had some data reporting problems (U.S. GAO 1999b). The average dollar value of federal CMPs was considered but not selected because the amount appears to be largely determined by CMS regional offices rather than by state officials. Other intermediate sanctions described in the findings of this study were used too infrequently to be good indicators. After reviewing the available data, the investigators considered the five selected variables to be the most accurate and interesting indicators of enforcement activities.

### Predictors of Regulatory Stringency

Although studies show wide variations in state survey and certification activities (Harrington and Carrillo 1999; U.S. GAO 1998, 1999a, 1999b, 1999c, 2000), little is known about what factors may predict greater nursing facility regulatory enforcement. Using some research literature from other studies of regulation, we identified five categories of independent variables that may be important in predicting the variation in enforcement activities across states.

## Political Variables

Politics can be an important predictor of public policy and regulation (Kronebusch 1997). The percentage of the population at age eighty-five and above may be a positive predictor because where aged populations are larger, they may represent a political constituency for policy changes (*ibid.*; Cromwell et al. 1997; Kane et al. 1998), including stronger regulation. An older population can demand more nursing facility care, but it may also be more vulnerable to poor quality, which may encourage states to increase enforcement.

Previous studies have found that liberal politics may predict regulatory initiatives (Harrington et al. 1997 examined political factors and certificate of need regulation; Lanning, Morrisey, and Ohsfeldt 1991 examined hospital regulation; Miller et al. 2001 examined waiver programs). Thus we expected that in cases where the governor of a state was a Democrat, those states would be more supportive of regulation than would be states with Republican or Reform governors.

## Facility Characteristics

Facility characteristics can also influence regulation by states. Large multifacility chains may be associated with lower staffing levels and poorer quality of care (Harrington et al. 2001). States may be more enforcement oriented if there are higher percentages of chain facilities in the state. Hospital-based nursing facilities have been found to offer higher staffing and higher quality (Harrington, Zimmerman, and Karon et al. 2000). Thus, it was expected that states with higher percentages of hospital-based facilities would initiate fewer enforcement activities.

Lower occupancy rates in nursing facilities may result in lower revenue and could reduce the quality of care in facilities. This could result in states giving more deficiencies to facilities with lower occupancy rates. At the same time, states with facilities with lower occupancy rates on average may take a stronger regulatory approach because there are other facilities available that could take the residents.

## Competition Measure

Nursing facility bed supply should be related to state enforcement activities. Where bed supply is low, less competition may occur and facilities may not be as concerned about quality (Nyman 1988). This could result in the need for states to give more deficiencies to nursing facilities.

### State Generosity Measure

States that are more generous in their Medicaid nursing facility reimbursement rate policies may be more likely to institute stronger enforcement because they have higher expectations for quality. In contrast, state survey agency officials in states with low reimbursement rates may be more sympathetic to nursing facility providers trying to provide care and less willing to institute strong enforcement actions.

### Quality of Care Indicator

The enforcement activities for nursing facilities may vary across states because of actual differences in quality among the states. No ideal independent measure of differences in quality of care was available beyond the enforcement actions. In an effort to address some of the variation due to quality of care problems, we used the number of consumer complaints per 1,000 nursing home beds in a state as a control variable, representing perceived quality of care. This quality indicator is not ideal because the measure may also reflect some differences in the collecting, recording, and reporting of complaints by state survey agencies. Other unmeasured differences in actual quality across states were expected to be a part of the residual values in our analyses.

### Unmeasured Factors

Many other factors may also be important, but we had to limit the variables in the model because we had the fifty-one states for only one year. We conducted a preliminary analysis of the data and found that other factors were not strongly related to enforcement. Two facility characteristics were unrelated to enforcement: (1) the percentage of for-profit facilities and (2) the percentage of Medicaid residents. We also examined other state factors, such as the percentage of the population living in a metropolitan area and the average per capita income of a state. In addition, regional variations were expected because federal oversight of the states is conducted by ten regional offices and considered separately in the analysis.

### Data Sources

The data for this study were collected from three sources. First, a telephone and fax survey of state licensing and certification agency directors

or their designees was conducted during the year 2000. All fifty states and the District of Columbia participated in the survey. In the telephone survey, state L&C directors were asked a series of structured questions about their enforcement program. State L&C officials were also asked to provide statistical data for 1999 and 2000 (by fax) on the number of nursing facility complaints and the number and type of enforcement actions taken. Officials were also asked to describe barriers in the use of enforcement actions including intermediate sanctions. Only data for 1999 are presented because these were the most recent complete data available at the time of the survey.

Second, statistical data from the CMS OSCAR system, on which state survey agencies record their survey activities, were used. OSCAR data from 15,724 nursing facilities with 1.6 million beds surveyed during the calendar year of 1999 were used in the analysis (Harrington, Carrillo, and Thollaug et al. 2000) (not all of the approximately 17,000 nursing facilities are surveyed annually). These data provided information on the average number of deficiencies in facilities, the percentage of facilities with deficiencies, and facilities characteristics (percentages in a chain and in hospitals and occupancy rates). OSCAR data compiled by CMS for the Senate Special Committee on Aging (U.S. HCFA 2000b) provided information on the percentage of facilities causing harm or jeopardy and cited for substandard care. Finally, other data on state characteristics were available from the U.S. Bureau of the Census (1999), the National Conference of State Legislators (NCSL 1999), and a survey of state nursing home bed supply and Medicaid reimbursement measures by Harrington, Swan, and Wellin et al. (2000).

### Data Analyses

Qualitative data from the interviews with state survey agency officials were presented by subject category. Descriptive statistics were compiled to examine overall rates and distributions of enforcement actions and to explore differences between states on selected indicators of enforcement stringency. We transformed two dependent measures to normalize their distribution: we used the log of the average number of civil monetary penalties per facility and the square root of the percentage of facilities cited for substandard care.

We created an overall index of enforcement activities per state by summing the five measures of state enforcement activities after standardizing each one using the following formula:  $(X - \text{mean}) / \text{Standard Deviation}$ .

The five standardized values were then added to create a summary score for each state. Pearson correlation coefficients among the five dependent variables were all positive indicating that they were measuring aspects of regulatory enforcement. The alpha for the five measures in the summary score was .75.

Eight independent variables were selected for the model as described above. A correlation matrix was produced to check for collinearity, but the correlations among independent variables were modest (none above .6), and in the subsequent regression analyses, tolerance tests showed that collinearity was not a problem. To examine the predictors of enforcement indicators and the summary score across states, an ordinary least squares regression analysis was conducted in SAS. This analysis used the state as the unit of analysis for 1999.

## **Findings**

In 1999, 15,724 facilities were surveyed in the United States by state agencies and 82 percent of these facilities received a total of almost 85,000 deficiencies for failure to meet federal regulations (not shown). Thirty-one percent of facilities (4,880) were given citations for violations that could or did cause harm or jeopardy to residents, and 811 facilities were classified by survey agencies as providing substandard care based on the number and type of deficiencies the facilities received. Overall, these nursing facilities had about 80,489 complaints lodged against them during 1999. These findings indicate that quality problems are substantial.

## **Use of Intermediate Sanctions**

In response to the identified quality problems in nursing facilities, state survey agencies have a wide range of intermediate sanctions that they may issue. This section shows the combined state and federal intermediate sanctions used in 1999, and that state sanctions represent a large part of the total sanctions.

### **Civil Monetary Penalties**

As seen in Table 1, a total of 3,316 state and federal CMPs were issued in 1999. Of the total CMPs, 61 percent were issued by sixteen states under their own state CMP regulations, 3 percent of CMPs were issued by states for Medicaid-only facilities, and 36 percent were issued by CMS for

**Table 1** Total State and Federal Complaints Enforcement Actions Reported for 1999

State	Total Federal and State Civil Monetary Penalties	Total Denial of Payments for New Admissions	Total Federal or State Temporary Manager or Receiver	Federal or State Decertification Notification	State License Revocation Action
AK	0	0	0	0	0
AL	56	26	0	1	0
AR	68	105	0	8	0
AZ	11	2	1	0	0
CA	835	5	0		0
CO	8	0	0	0	0
CT	0	0	6	0	0
DC	0	1	1	2	0
DE	2	0	0	0	0
FL	37	37	0	1	1
GA	36	31	0	0	0
HI	0	0	0	0	0
IA	30	2	0	0	0
ID	8	0	0	0	0
IL	691	468	1	1	1
IN	240	83	1	1	1
KS	64	27	0	0	
KY	28				
LA	0	0	0	0	0
MA	9	0		0	2
MD	11	8	0	7	0
ME	61	0	1	0	0
MI	22	45	5	7	4
MN	13	195	0	0	1
MO	30	0	0		11
MS	18	0		0	
MT	2	4		0	
NC	68	20	0	1	0
ND	1	5	0	0	0
NE	2	7	0	0	0
NH	8	0	0	0	0
NJ	6	6	0	0	0
NM	9	65	1	0	0
NV	10	5	0	1	0
NY	31	14	0	0	1
OH	118	35	0	2	0
OK	29	1	12	2	0

**Table 1** (Continued)

State	Total Federal and State Civil Monetary Penalties	Total Denial of Payments for New Admissions	Federal or State Temporary Manager or Receiver	Federal or State Decertification Notification	State License Revocation Action
OR	134	34	0	1	0
PA	70	12	0	0	1
RI	0	0	0	0	0
SC	18	92	0	1	0
SD	0	0	0	0	0
TN	63	0	0	0	0
TX	114	68	15	6	19
UT	9	6	0	0	0
VA	8	0	0	3	0
VT	5	3	1	0	0
WA	44	31	0	0	0
WI	284	11	1	0	0
WV	5	0	0	1	0
WY	0	0	1	0	0
Entire U.S.	3,316	1,454	47	46	42

Note. Data provided by state survey agencies. Blanks indicate the state did not provide data.

Medicare and/or Medicaid certified facilities (not shown). Table 1 shows that eight states did not issue any CMPs (Alaska, Connecticut, District of Columbia, Hawaii, Louisiana, Rhode Island, South Dakota, and Wyoming) and four states (Delaware, Montana, Nebraska, and North Dakota) only issued one to two CMPs in 1999. Wyoming had a statute that prohibited the use of CMPs, and the Virginia attorney general did not allow the state to impose sanctions. State officials in some of these states reported that they were philosophically opposed to CMPs. For example, one official stated it is better to have facilities with poor care use their funds to improve resident care rather than to pay fines. Minnesota had a moratorium on CMPs in 1998–1999 because of a reported political backlash by state politicians against CMPs, but they issued thirteen CMPs in 1999. Other states reported a reluctance to use CMPs with bankrupt facilities, either because state Medicaid reimbursement rates were not adequate or because enforcement would have a negative impact on the nursing facility industry and/or the facility staff.

Surprisingly only eight states (16 percent) considered CMS CMPs effective in bringing facilities into compliance, and nineteen states (37 percent) reported that CMS CMPs were not effective. The remaining states either did not use CMPs or used their own state systems for issuing CMPs. Almost every one of the sixteen states that had state CMP systems considered their state system to be more effective than the federal CMPs because it was easier and faster to use. Other problems reported by states with the federal CMP remedy were that CMS settles the fines at too low a level, CMS regional offices do not pursue collecting the fines or deny proposed CMPs, and the CMS process takes too long, especially delays in the appeal process. Most states were unable to report the number of federal intermediate sanctions issued or under appeal, including CMPs, because CMS did not keep them informed.

### Denial of Payment for New Admissions

Table 1 shows that thirty-two states used denials of payment for new admissions in 1,454 facilities in 1999. Of the total states using these sanctions, 57 percent of facilities were sanctioned under state regulations and 43 percent of facilities were sanctioned under the federal regulations (not shown). All states (except Utah) rated the denial of payments as an effective intermediate sanction, primarily because it protects the residents while it is imposed and facilities respond quickly to make corrections. States, however, reported delays when CMS was asked to implement a denial of new admissions sanction. The major drawback of this sanction was that facilities are not allowed to conduct their own internal training programs for nursing assistants, which can have a negative effect on hiring staff. Some state officials recommended removing the link between using the sanction and the loss of internal nursing assistant training. A few other states reported that they did not impose the sanction because of the thirty-day follow-up visit requirement when they had limited resources.

### Temporary Management and Receivership

Only thirteen states used either the federal or the state temporary management or receivership regulations to sanction a total of forty-seven facilities in 1999 (Table 1). Of these sanctions, only six facilities were sanctioned under the federal temporary manager provisions in 1999, and the remainder was under state provisions (not shown). Twenty-eight states (55 percent) never had used this federal sanction, while most other states had

tried to use it one or two times but were unsuccessful (four states did not report). Seventeen states (33 percent) had used their own state receiver-ship or management program in the past, but only seven states reported using it in 1999 (not shown).

### Decertification or Revocation

Decertification (termination from the Medicare and Medicaid program), as the ultimate sanction against a facility, was seldom used. In 1999, seventeen states reported issuing forty-six decertification or termination notices for the Medicare and/or Medicaid program (Table 1). Of these, thirty-nine facilities were later certified to return to the program (not shown). Fourteen states had never used decertification or had not used it for many years. Other states issued decertification notices to facilities that came back into compliance before the sanction was imposed. Some state officials recommended that decertified facilities should be kept from reentering the federal program for a specified time period, such as six months. In 1999, ten states revoked the state licenses of forty-two facilities because of poor quality of care (Table 1).

State officials expressed strong frustration with the CMS regulatory process. Most states (thirty-seven or 72.5 percent) reported inadequate federal funds to carry out their regulatory activities, while 45 percent reported inadequate state funds. They wanted additional federal funds or reductions in some state survey agency activities, such as limiting informal dispute resolution to the most serious deficiencies, shorter and more streamlined surveys, and a complaint-driven survey process. Other states described the federal system as an administrative nightmare and said they were drowning in paperwork and documentation.

## State Enforcement

### State Enforcement Indicators

Table 2 shows five indicators of state enforcement activities from the 15,724 annual surveys in 1999. The average number of deficiencies issued per facility in a state in 1999 was 5.7. A closely related measure is the percentage of facilities that received a deficiency (82.5 percent) compared to those facilities that received no deficiencies in 1999 (17.5 percent). A third measure showed that 31 percent of facilities received a deficiency at the G level or above, indicating that the facilities were judged to have

**Table 2** Five Selected Enforcement Indicators, Average Rank Score, and Overall Rank, by State, in 1999

State	1999 OSCAR	1999 HCFA	Enforcement Indicators				Rank Scores		
			Average No. Deficiencies per Facility	% Facilities with Deficiencies	% Facilities Cited for Harm or Jeopardy	% Substandard Care	Average CMPs Issued per Facility Surveyed	1999 HCFA	Average Rank Score for All 5 Measures
WA	9.7	98.5	59.8	6.3	0.16	6.3	0.32	7.3	1.0
AR	7.4	93.5	31.4	14.1	0.73	8.8	0.12	8.2	2.0
CA	11.3	95.8	31.3	6.4	0.98	9.4	0.10	9.1	3.0
OR	6.8	81.0	58.8	17.6	0.06	10.5	0.17	4.0	4.0
ID	7.3	91.0	57.3	8.5	0.28	10.5	0.10	5.0	5.0
SC	8.3	95.2	29.7	8.8	0.06	11.0	0.12	6.0	6.0
MI	9.9	97.0	47.4	6.7	0.06	11.6	0.06	7.0	7.0
AL	7.4	92.9	43.0	4.0	0.28	11.9	0.28	8.0	8.0
IN	7.4	89.7	24.5	7.5	0.45	14.6	0.10	9.0	9.0
KY	7.3	91.1	29.1	8.4	0.10	15.7	0.10	10.0	10.0
KS	6.1	85.7	43.0	6.3	0.15	16.0	0.15	11.0	11.0
NV	11.4	92.5	23.8	4.8	0.25	16.4	0.25	12.0	12.0
AZ	7.1	90.8	39.3	3.6	0.13	17.0	0.13	13.0	13.0
IL	6.1	89.5	32.3	3.7	0.79	17.2	0.15	14.0	14.0
AK	6.1	92.9	37.5	12.5	0.00	17.3	0.00	15.0	15.0
DE	7.2	82.3	50.0	5.6	0.06	18.1	0.06	16.0	16.0
NC	5.7	81.4	47.4	3.1	0.17	20.3	0.17	17.0	17.0
OH	5.3	79.7	30.3	7.1	0.14	20.6	0.14	18.5	18.5
FL	6.5	89.1	30.1	7.3	0.05	20.6	0.05	18.5	18.5

**Table 2** (Continued)

State	Enforcement Indicators						Rank Scores		
	Average No. Deficiencies per Facility	% Facilities with Deficiencies	% Facilities Cited for Harm or Jeopardy	% Substandard Care	Average CMPs Issued per Facility Surveyed	1999 HCFA	Average Rank Score for All 5 Measures	Overall Rank	
MS	5.6	86.8	31.3	5.5	0.10	20.0	21.1	20.0	
NM	5.1	79.2	29.5	7.7	0.11	21.0	22.1	21.0	
TN	4.6	85.3	23.9	4.3	0.18	22.0	25.2	22.0	
MT	5.4	92.8	43.7	1.0	0.02	23.0	25.6	23.0	
NH	3.9	66.7	35.3	7.4	0.12	24.0	26.0	24.0	
GA	4.4	81.3	30.0	4.2	0.10	25.0	26.3	25.0	
MO	5.1	79.3	25.7	6.7	0.06	26.0	27.2	26.0	
HI	6.7	92.3	17.1	4.9	0.00	27.0	27.5	27.0	
ND	5.0	87.4	37.6	3.2	0.01	28.0	27.6	28.0	
ME	3.3	75.4	20.5	7.6	0.47	29.0	28.1	29.0	
VA	5.5	89.5	27.0	2.9	0.04	30.0	28.6	30.0	
CT	4.0	87.4	60.1	3.2	0.00	31.0	28.7	31.0	
TX	4.5	77.6	23.9	5.4	0.09	32.0	30.3	32.0	
SD	4.7	89.4	37.5	1.1	0.00	33.0	30.7	33.0	
PA	4.1	81.2	32.3	1.9	0.09	34.0	31.0	34.0	
MN	3.7	78.4	34.2	3.8	0.03	35.0	31.9	35.0	
MD	2.8	58.2	29.2	7.6	0.08	36.0	32.6	36.0	
WY	4.7	88.9	26.3	2.6	0.00	37.0	33.6	37.0	
MA	4.1	67.5	33.2	3.4	0.02	38.0	35.2	38.0	

**Table 2** Five Selected Enforcement Indicators, Average Rank Score, and Overall Rank, by State, in 1999 (Continued)

State	Enforcement Indicators					Rank Scores		
	1999 OSCAR	1999 HCFA	% Facilities with Deficiencies per Facility	% Facilities Cited for Harm or Jeopardy	% Cited for Substandard Care	Average CMPs Issued per Facility Surveyed	Average Rank Score for All 5 Measures	Overall Rank
IA	4.1	79.4	24.2	2.3	0.07	39.0	35.2	39.0
UT	3.5	77.0	16.5	3.8	0.11	35.2	40.0	
WI	3.4	73.5	17.9	1.9	0.68	36.0	41.0	
OK	4.2	68.7	14.4	4.2	0.08	36.3	42.0	
NY	3.4	75.1	27.0	3.5	0.05	36.8	43.0	
LA	4.5	72.6	22.6	3.9	0.00	38.0	44.0	
NE	3.5	76.1	29.6	2.2	0.01	38.9	45.0	
NJ	2.0	51.5	26.5	4.7	0.02	39.8	46.0	
VT	2.1	54.8	14.3	2.0	0.10	40.8	47.0	
VA	3.6	69.2	19.6	2.5	0.03	41.8	48.0	
RI	3.1	71.7	15.0	4.0	0.00	42.6	49.0	
DC	4.3	78.6	0.0	0.0	0.00	43.1	50.0	
CO	2.8	72.1	10.3	1.7	0.03	45.1	51.0	
Entire U.S.	5.7	82.5	31.0	5.1	0.21			

caused residents either harm or serious jeopardy (ranging from an isolated event, a pattern, or a widespread problem). The percentage of facilities that were cited for substandard care overall was 5.1 in 1999. Finally, the average number of CMPs issued to facilities under state or federal regulations was .21 per facility surveyed in 1999.

Table 2 shows the summary ranking of all states across the five indicators. A summary score was created by standardizing each of the five dependent variables and then adding them together. The average correlation coefficient among the five variables was 0.368 (not shown). The average number of deficiencies and the percentage of facilities that received a deficiency had the highest correlation (0.79). The deficiencies at the G level or higher (rated as causing harm or jeopardy) had the lowest correlation with the number of CMPs issued (.139). The overall alpha level was .75 for the five indicators in the summary score (not shown). In Table 2, the first thirteen states are in the highest quartile on enforcement and the bottom thirteen states are in the lowest quartile on enforcement. Using the five indicators, Washington, Arkansas, California, Oregon, and Idaho were ranked as the top five enforcement states. The five states ranked as the lowest were Colorado, the District of Columbia, Rhode Island, Virginia, and Vermont.

### Predictors of Enforcement Stringency

Table 3 shows the means and the standard deviations for the five dependent and the eight independent variables used in the analysis of enforcement stringency. During 1999, the average number of complaints per 1,000 nursing home beds was 43.87 (Table 3), with a range from .42 complaints in Pennsylvania to 181.9 in Nevada (not shown). The number of complaints represents perceived quality by the public or residents and was used as a control variable in the regression model.

Table 4 shows the results of separate ordinary least square (OLS) regressions for each of the enforcement indicators and for the summary score for all five measures. Controlling for the number of nursing home complaints per 1,000 nursing home beds as a proxy for quality, states with higher percentages of the population age eighty-five and over gave more facilities at least some deficiencies. States with Democratic governors had higher summary scores on enforcement stringency.

In terms of facility characteristics, states with higher percentages of facilities with chains and higher percentages of hospital-based facilities gave higher percentages of facilities deficiencies. Higher percentages of hospi-

**Table 3** Means and Standard Deviations of Dependent and Independent Variables for 1999

	Mean	Standard Deviation	Data Source
Dependent Variables			
Average number of deficiencies per facility	5.41	2.16	OSCAR <sup>a</sup>
Percentage of facilities with deficiencies	81.85	10.81	OSCAR <sup>a</sup>
Percentage of facilities causing harm or jeopardy	31.02	12.78	HCFA <sup>b</sup>
Percentage of facilities cited for substandard care	5.16	3.29	HCFA <sup>b</sup>
Average number of civil money penalties per facility	15.18	21.79	Survey <sup>c</sup>
Independent Variables			
Political Variables			
Percentage state population age 85 and over	1.56	0.36	USBOC <sup>d</sup>
Democratic governor (Yes = 1)	34.00%	47.80%	NCSL <sup>e</sup>
Facility Characteristics			
Percentage facilities in a chain	53.75	14.10	OSCAR <sup>a</sup>
Percentage of facilities in hospitals	16.35	11.34	OSCAR <sup>a</sup>
Percentage occupancy rate of facilities	83.69	7.55	OSCAR <sup>a</sup>
Competition Measure			
Nursing facility beds per 1,000 aged population (1998)	54.77	17.39	Harrington <sup>f</sup>
State Generosity Measure			
Average state Medicaid nursing facility reimbursement rate	\$98.14	\$29.90	Harrington <sup>f</sup>
Quality indicator			
Number of complaints per 1,000 nursing home beds	43.87	35.35	Survey <sup>c</sup>

<sup>a</sup>Harrington, Carrillo, and Thollaug et al. 2000.<sup>b</sup>U. S. Health Care Financing Administration 2001.<sup>c</sup>Survey of State Licensing and Certification Officials. 2000. Author's telephone survey from Table 2.<sup>d</sup>U.S. Bureau of the Census 1999.<sup>e</sup>National Conference of State Legislatures 1999.<sup>f</sup>Harrington, Swan, and Wellin et al. 2000.

tal-based facilities led to lower average numbers of civil monetary penalties. States with more chain facilities also had higher percentages of facilities that received deficiencies for causing harm or jeopardy. States with lower facility occupancy rates gave citations to a higher number of facilities for substandard care and had higher summary scores on enforcement.

**Table 4** OLS Regressions Predicting Enforcement Indicators and Summary Enforcement Score

	Average Number of Deficiencies	% Facilities with Deficiencies	% Facilities Causing Harm or Jeopardy	% Facilities Cited for Substandard Care (square root)	Average Number of CMPs per Facility (log)	Standard Summary Score for All 5 Measures
Political Variables						
% Age 85+	1.43 (0.98)	12.53* (5.27)	15.92* (6.65)	0.12 (0.34)	-0.07 (0.77)	3.19* (1.58)
Democratic governor <sup>a</sup>	1.07 (0.54)	.58 (2.88)	3.96 (3.64)	0.36 (0.19)	0.64 (0.42)	1.85* (0.86)
Facility Characteristics						
% Chain facilities	0.02 (0.03)	0.31* (0.14)	0.43* (0.18)	0.01 (0.01)	0.02 (0.02)	0.09* (0.04)
% Hospital facilities	0.04 (0.03)	0.56** (0.14)	0.04 (0.17)	0.00 (0.01)	-0.05* (0.02)	0.03 (0.04)
% Occupancy rate	-0.08 (0.04)	-0.05 (0.22)	-0.28 (0.28)	-0.03* (0.01)	-0.04 (0.03)	-0.13* (0.07)
Competition Measure						
Nursing home beds/ 1,000 aged	-0.06*** (0.02)	-0.07 (0.11)	-0.03 (0.14)	-0.01 (0.01)	-0.02 (0.02)	-0.06 (0.03)
State Generosity Measure						
State Medicaid nursing facility rate	-0.01 (0.01)	0.01 (0.07)	0.19* (0.08)	0.01 (0.00)	-0.01 (0.01)	0.01 (0.02)

**Table 4** OLS Regressions Predicting Enforcement Indicators and Summary Enforcement Score (Continued)

	Average Number of Deficiencies	% Facilities with Deficiencies	% Facilities Causing Harm or Jeopardy	% Facilities Cited for Substandard Care (square root)	Average Number of CMPs per Facility (log)	Standard Summary Score for All 5 Measures
Quality Indicators						
NH complaints (per 1,000 NH beds)	0.13 (0.08)	0.80 (0.44)	-0.12 (0.56)	-0.01 (0.02)	0.02 (0.07)	0.13 (0.13)
F-value (N = 50)	4.74***	3.49**	1.54	2.39*	3.49**	4.03***
Adjusted R-square	0.377	0.305	-0.008	0.162	0.285	0.340

Note. Standard errors in parentheses. SAS OLS regression procedure.

<sup>a</sup>Comparison group—Republican and Reform governors

\*Significant at the 0.05 level

\*\*Significant at the 0.01 level

\*\*\*Significant at the 0.001 level

In terms of competition for beds, states with fewer nursing facility beds per 1,000 aged population gave more deficiencies per facility on average, but they did not have high summary scores on enforcement. States that had more generous Medicaid reimbursement rates had a higher percentage of facilities cited for causing harm or jeopardy to residents but did not have higher overall summary scores.

The model predicted 37.7 percent of the variance for the average number of deficiencies, 28.8 percent for the percentage of facilities that received deficiencies, 18.5 percent cited for substandard care, and 28.9 percent for the average number of CMPs per facility surveyed. But the model did not predict significant differences for the percentage of facilities causing harm or jeopardy. The model predicted 32.9 percent of the variance for the overall summary score across all measures.

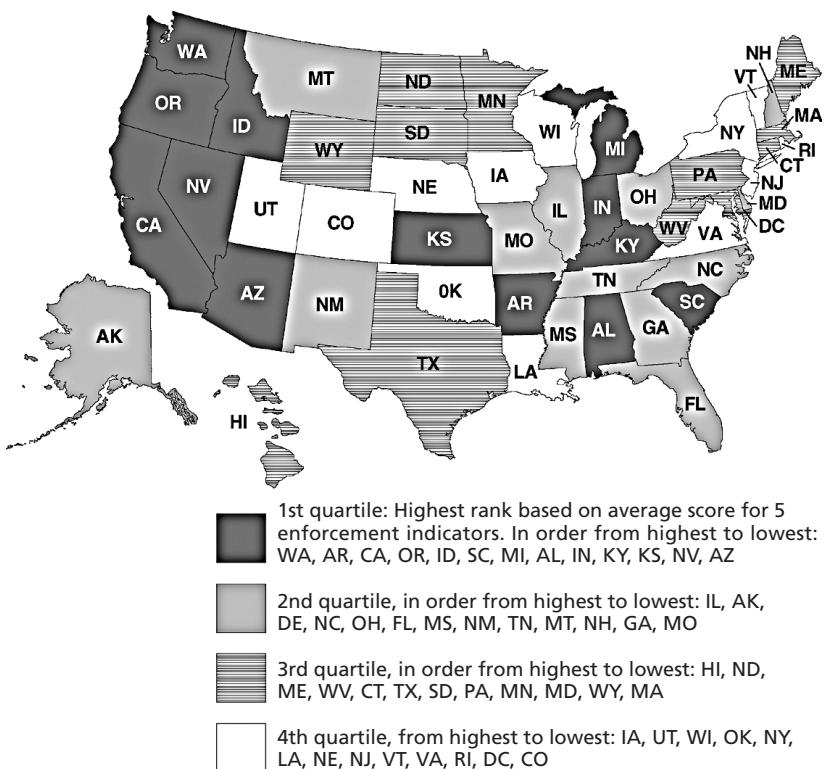
Figure 1 shows a map of the overall rank of all the states on enforcement indicators for 1999 (based on Table 2 column 7). The states in the west and southwest are in the highest quartile on overall rank on enforcement stringency. States in the lowest two quartiles tend to be in the Rocky Mountain area, the central plains (except for Kansas), and the northeastern region of the country. Federal CMS oversight of the states is administered by ten regional offices.

The states in the lowest two quartiles tend to be monitored by the CMS regional offices in the Denver, Dallas, Kansas City (except Kansas and Missouri), Boston, New York, and Philadelphia areas (six of the ten CMS regional offices). Many of the southern states (except Louisiana and Virginia) were in the first and second quartiles on enforcement stringency. Some states reported inconsistencies in procedures, policies, and processing of intermediate sanctions across regional offices as well as poor communications with some regional offices that could account for some variations in enforcement activity.

## Discussion

This study showed a substantial number of quality problems as indicated by the total number of deficiencies issued, the almost one-third of facilities with violations that could or did cause harm or jeopardy to residents, the number of facilities (811) classified as providing substandard care, and the large number of complaints made about quality (over 80,000). These findings by state survey agencies suggest serious quality of care violations across the country.

In spite of the many facilities identified as having serious deficiencies,



**Figure 1** Overall Rank on Selected State Enforcement Indicators, 1999  
Source: Table 2.

few facilities had follow-up enforcement actions or sanctions taken against them, even when all state and federal sanctions are combined. Less than 4 percent of violations were issued civil monetary penalties, 9 percent of facilities had a denial of payments issued for new admissions, and less than one-half of one percent of facilities had serious action taken against them (i.e., the imposition of a temporary manager/receiver [forty-seven facilities], the issuance of a decertification notice [forty-six facilities], or the revocation of the facility license [forty-two facilities]). The findings here are consistent with a number of earlier reports that documented the poor enforcement system and the ineffective use of both intermediate and permanent sanctions (U.S. GAO 1998, 1999a, 1999b, 1999c, 1999d; IOM 2001).

Without meaningful sanctions that serve as a deterrence to future vio-

lations, Brown's (1992) general critique of popular decentralized (state) behavioral regulations appears to be relevant. In this situation, the federal-state nursing survey process gives the appearance that government is doing something about the quality of care problems, but in reality, the enforcement system does little to change or improve the system and generally does not remove the most serious violators from the system.

With widespread quality problems identified by state agencies, the variation in enforcement actions taken by states was considered problematic in terms of compliance with federal requirements. A summary of five indicators of enforcement stringency showed the average rank scores were six times higher in the most stringent state (7.3 in Washington) compared to the least stringent state (45.1 in Colorado). Because these variations are not entirely due to quality differences, nursing facility residents do not appear to have equal access to a high quality of care and equal protection from poor quality and abuse.

Recognizing that some of the variance can be attributable to real but unmeasured differences in facility quality across states, there are many other factors that make states more likely to support regulatory enforcement for nursing facilities. Having a large aging population not only may increase the demand for nursing facilities, but it probably creates a political constituency for regulation of nursing facility quality. States with Democratic governors are associated with higher enforcement because their political views are probably more supportive of regulatory activity (Lanning, Morrisey, and Ohsfeldt 1991). The fact that political variables are factors explaining differences across states further suggests that enforcement is not being uniformly applied.

Although the political factors cannot be easily changed, federal policy makers could educate state politicians and officials about the need for and importance of standardized regulatory activity to protect the health and safety of its residents. Recent reports prepared by the U.S. House of Representatives on the poor quality of nursing facility care in local congressional districts may have a motivational impact on improving attitudes toward enforcement (U.S. House 2001).

Higher percentages of facilities in chains predicted stronger enforcement actions in states on the percentage of facilities with deficiencies, the percentage causing potential harm or jeopardy, and the summary score. A previous study found that chains are associated with higher deficiencies (Harrington et al. 2001). It may be that lower quality in chains forces more regulatory action by state surveyors and/or that large chains are more visible targets for regulators.

States with low facility occupancy rates (controlling for beds per 1,000 population) appear to be more active in regulation. Where occupancy rates are low, state L&C officials may be more willing to enforce regulations because residents could be moved to other facilities. If states with high facility occupancy rates were willing to expand the nursing home bed supply or to provide alternatives to nursing homes, perhaps this could create more competition among facilities on quality (Nyman 1988) and encourage more regulatory activity where quality problems are identified.

The generosity of state Medicaid nursing facility reimbursement rates did predict the percentage of facilities found to cause harm or jeopardy but did not predict the overall enforcement score. Perhaps a larger effect was not found because most state Medicaid reimbursement rates are low and appear to contribute to quality problems (IOM 2001; Grabowski 2001). If states had more generous Medicaid nursing facility rates, then state officials may be more demanding in terms of quality standards and/or more willing to enforce quality regulations.

As noted above, there are many unmeasured factors that cannot be examined in this model. The duration of enforcement was not measured in the study. Some states may have had a long history of strong state enforcement, and this may have resulted in improved nursing home quality in the state over time. For example, Wisconsin (in the lower quartile on enforcement stringency) has had a state system of intermediate sanctions for more than twenty years, which may result in fewer sanctions having to be imposed at the present time. Future studies of the impact of sanctions should examine enforcement actions over time.

State officials reported problems in their ability to carry out the federal enforcement activities that are related to limited federal and state resources for regulatory activities. These resources were found to be less than one-half of one percent of the total expenditures on nursing facilities in the United States in 1999 (Walshe and Harrington 2002). The federal and state resources vary widely, in part based on historical expenditures for regulation), and some state agencies reported operating under serious financial and personnel constraints. Some states invest greater state resources than others in the regulatory process to make up for limited federal funds (*ibid.*).

State officials themselves report that they are not all complying with federal regulations adopted under OBRA 1987 and that they have continued problems with the federal survey and enforcement system. In spite of recent CMS efforts to improve its procedures and systems (U.S. GAO 1998, 1999a, 1999b, 1999c, 2000; U.S. OIG 1999; U.S. HCFA 2000a, 2001),

many states identified continued problems that included an ineffective federal CMP system and federal delays and bureaucratic procedures that slow the implementation of all sanctions. Only the CMS denial of payments to new admissions sanction had widespread support as an effective sanction by state officials. Many state officials with state sanctions are clear that they generally prefer state sanctions rather than federal sanctions. These findings call for a close examination of what improvements can be made in the federal intermediate sanctions procedures to address the serious complaints by state officials and to find ways to improve the use and timeliness of CMPs.

CMS could consider new approaches to support those states that have the most stringent enforcement systems. At the same time, CMS should not ignore states that report their reluctance and/or unwillingness to implement enforcement actions against poor performing facilities (IOM 2001). For those states that do not comply with implementing federal standards, perhaps stronger sanctions are needed such as the removal of a state's regulatory authority (and replacement with a contracting organization) or state financial penalties for not meeting minimal performance standards (along with the negative publicity that would be associated with such actions). Without a more uniform approach to the implementation of enforcement policies, it can be argued that the OBRA 1987 deterrence model has been short-circuited.

Some of the states with poorest enforcement records are primarily in the plains, Rocky Mountains, and northeastern states, which are located in six of the ten CMS regional offices. The GAO (1999c) documented disparities in enforcement activities across regions and pointed to the poor oversight activities by some regional offices. In this study, some states in the lowest enforcement quartiles cited a lack of support from CMS regional offices for their failure to implement intermediate sanctions. This suggests the need to consider training and oversight mechanisms that may improve the regional office performance. Alternatively, CMS regional offices could be removed from oversight activities and a centralized federal CMS oversight system established.

Obviously, not all the regional variation should be attributed to CMS regional offices. The predictive factors in the regression analysis probably also predict regional variation. For example, states with high occupancy rates in the northeast (such as Washington, D.C., New York, and Rhode Island) may find that quality regulation is more difficult to enforce. Interestingly, some northeastern states that are low on nursing home quality enforcement have historically been active in using hospital rate regu-

lation (Connecticut, Massachusetts, New Jersey, New York, and Maryland) (Brown 1992) and certificate of need regulation, in contrast to western states. It may be that nursing home quality regulation is viewed differently from other health regulation by states or is seen as a lower priority over other regulatory activities. Or perhaps some of the state and regional variation may be attributable to factors not measured in this study, such as the availability of state alternatives to nursing homes and the political power of the nursing home industry (Kane et al. 1998; Miller et al. 2001). Regional patterns should be given further study to understand the basis for the enforcement differences and the factors that could bring about change.

In summary, CMS needs to develop approaches that bring greater standardization in the survey and enforcement process across states and to identify ways to encourage poor performing state agencies and regions to improve (U.S. GAO 2000). These issues are complex in a system that has been largely devolved to the states, with very different political and philosophical positions on regulation. Moreover, other factors such as reimbursement rates and occupancy rates suggest policy approaches that can be further studied as a means of improving regulation. Finally, ensuring adequate funding for state regulatory programs may also be a way to improve the state enforcement system.

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## The Nursing Home Minimum Data Set Assessment Instrument: Manifest Functions and Unintended Consequences—Past, Present, and Future

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The Minimum Data Set (MDS) is a uniform instrument used in nursing homes to assess residents. In January 2008, the Centers for Medicare and Medicaid Services published a draft of a new MDS—version 3.0. This article traces the instrument's development and the design decisions that shaped it, discusses the MDS's manifest functions—data collection intended to drive quality improvement and the unintended consequences of its use—paper compliance and diminished attention to resident quality of life, and examines the revised version to gauge its success in meeting the instrument's objectives. Although results of the national evaluation of MDS 3.0 are promising, the revisions, especially those pertaining to quality-of-life assessment and the use of resident interviews and standardized assessment procedures, raise questions for future consideration. Additionally, past research suggests that the MDS's impact on quality-of-care improvement will be limited unless efforts are directed toward resolving the industry's persistent struggles with staffing, survey effectiveness, and the development of feasible care processes. MDS 3.0 seems most likely to achieve its potential if

it operates within a multifaceted quality improvement framework.

**Key Words:** *Nursing home, Quality indicators, Long-term care, Medicare, Medicaid, Minimum Data Set, Resident assessment*

The Minimum Data Set (MDS) is a uniform instrument used in nearly every nursing home in the United States to assess resident condition. With its roots in the landmark Institute of Medicine (IOM) Report on Nursing Home Quality (IOM, 1987), the MDS was seen as a critical component in the needed efforts to improve the quality of care in America's nursing homes. From its inception, the MDS was intended to serve multiple purposes: to collect data to both inform care plans and describe the resident population, to generate quality indicators (QIs) to evaluate nursing homes and guide improvement interventions, and to serve as a data source for nursing home payment systems. In an effort to better inform consumers, MDS data are also now used to develop publicly reported quality measures.

To adapt to changes in the industry and improve on how the MDS is used, the instrument was recently revised. In January 2008, the Centers for Medicare and Medicaid Services (CMS) published the “final draft revision” of a new MDS—version 3.0 (CMS, 2008a). This article examines

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the MDS approach and the proposed reforms by tracing the instrument's evolution through an analysis of its manifest functions and unintended consequences. Thus, this article starts with an historical review of the instrument's development, identifying design and utilization decisions that have proven controversial. A basic premise of this article is that both the MDS's design and incentives embedded in the prescribed uses of the instrument may separately and jointly contribute to potential unintended consequences of MDS use. We examine this possibility by reviewing studies that have evaluated the extent to which the MDS has met its manifest—or intended—functions (accurate resident data collection and care improvement) and resulted in unintended consequences (paper compliance and diminished attention to resident quality of life). We then examine the newest draft in an attempt to gauge whether it is likely to meet expectations for resident assessment and care improvement.

### The MDS in Historical Context

The IOM set the stage for the development of the MDS, with its report's recommendations prompting passage of the Omnibus Reconciliation Act of 1987, which required sweeping changes in federal standards to improve nursing home quality of care, including a mandate for resident assessment, the second recommendation of 47 in total. The resident assessment was designed to formulate individual care plans, which in turn were expected to drive improvements in care quality. But the committee also recognized that the data collected could and should be used for regulatory functions (IOM, 1987). Thus, surveyors could use the data to draw their resident samples and states could use outcome data to evaluate facilities' quality of care. The data also could generate information for case mix reimbursement calculations. Such a multipurpose assessment can lead to unintended consequences, for each of these uses has embedded within it an incentive for facilities to classify residents as more impaired to receive higher payments or to show residents as less impaired to avoid possible survey deficiencies.

The assessment was to focus on "each resident's functional, medical, mental, and psychosocial status" (IOM, 1987, p. 74). Missing from this list is residents' quality of life, an omission now often cited as one of the MDS's major shortcomings (R. A. Kane et al., 2003; Ouslander, 1997; Uman, 1997). The IOM committee did not overlook this domain; their report discusses quality of life at

length, using concepts that resonate today (R. A. Kane et al., 2003). However, they viewed quality-of-life assessment as a task for surveyors, not assessment nurses.

### The First MDS

Development of the first MDS began in 1988 and included 20 major draft versions and a two-state field test (Morris et al., 1990). Certain MDS design decisions with potential for triggering unintended consequences have sparked debates that continue today. The first concerns the instrument's lack of attention to quality of life, which some now argue undermines nursing home efforts to improve in this area (R. A. Kane et al., 2003). A related debate involves the fact that the MDS does not require resident interviews. Although nurses *may* interview residents, the user manual also gives them discretion to collect data from other sources, including other staff members, medical charts, and resident observations. Critics charge that these indirect methods may lead to inaccurate assessments and underreporting, especially of such subjective states and conditions as pain, depression, and mood (Chu, Schnelle, Cadogan, & Simmons, 2004; R. A. Kane et al., 2003; Uman, 1997). The countercharge raises several concerns that many residents are too cognitively impaired to be reliable reporters, that there is no consensus protocol for identifying accurate reporters (R. A. Kane et al., 2003), that assessment results may vary from one interviewer to the next depending on how the questions are worded (Simmons & Ouslander, 2005), and that staff interviewers—as opposed to third-party assessors—may elicit socially desirable responses from residents (R. A. Kane et al., 2003).

A final controversy relates to the MDS's lack of standardized assessment protocols. Neither the instrument nor the user manual, for example, stipulates use of a standardized scale for measuring pain, although a number of these now exist. The same applies to other assessments—among them, incontinence, dementia, and mood—for which standardized reliable protocols are now widely used. Instead, nurses who complete the MDS are given discretion to assess resident outcomes and conditions by using diverse methods, including chart reviews and staff consultations, and fluid processes, such as a "conversation" to assess depression. Schnelle (2007) has argued that this absence of standardized assessment procedures compromises the reliability of MDS data.

The resident assessment protocols (RAPs), developed as an MDS adjunct to provide additional assessment items and background information when common clinical problems such as incontinence and delirium are identified, have been faulted for many of the same reasons the MDS has been criticized. A recent evaluation noted deficiencies in most RAPS—there are 18 of them—with respect to validity and reliability and recommended the use of well-established standardized clinical tools, such as the Braden Scale for pressure ulcers, to correct these problems (Dosa, Bowers, & Gifford, 2006).

### **From Debut to Present**

Nationally implemented in 1991 as a resident assessment and quality improvement tool, the MDS now serves additional purposes in an expansive agenda that could produce unintended consequences (Figure 1). In 1998, Medicare and several state Medicaid programs began using MDS data to classify residents into resource utilization groups, which reflect residents' care needs and thus their resource needs; these groups are used to calculate nursing home reimbursements under prospective payment systems (Office of the Inspector General [OIG], 2001b). In 1999, CMS started requiring surveyors to use MDS-based QIs to guide their nursing home evaluations. In 2002, CMS launched

the Nursing Home Compare Web site, a consumer information site that presents MDS-based quality ratings for virtually all nursing homes. Most recently, CMS has instituted its nursing home star rating system. As noted earlier, each of these uses provides an incentive to "doctor" MDS data to receive higher payments, by overestimating resident needs, or to avoid survey deficiencies and fare better in public reports, through underestimation.

Taking into account both the instrument's design and the system in which it operates, we assess the current MDS's strengths and weaknesses by examining the degree to which it has met its manifest functions and resulted in unintended consequences.

### *The MDS's Manifest Functions*

Manifest functions of the MDS are its foremost uses as identified by the IOM committee: (a) to assess resident condition and needs and thereby (b) improve quality of care and resident outcomes.

### *Data Collection*

MDS versions 1 and 2 were subjected to extensive reliability testing that found excellent levels of interrater reliability for most items (Casten, Powell, Parmelee, & Kleban, 1998; Lawton et al., 1998; Morris et al., 1990, 1997). Additionally, a number of studies have validated that MDS data in aggregate predict hospitalization, mortality, and functional decline (e.g., Intrator et al., 2004; Teno et al., 2002). These studies, however, tested MDS items under ideal conditions using trained research nurses, so results may vary in practice. Indeed, there is widespread acknowledgment that different facilities may use different methods to assess residents, making definitive judgments about the reliability of MDS data impossible (Mor, 2005; Sangl, Saliba, Gifford, & Hittle, 2005; Ouslander, 1997).

Beyond reliability testing, a number of studies have assessed data accuracy and found evidence of MDS errors. Chu and colleagues (2004) found that of 309 residents who reported chronic pain in interviews with research staff, only 37% had pain documented on their most recent MDS assessment. Other studies have found that facility staff tend to under-report residents' depression and pain and over-report their functional dependency (Schnelle, 2007).

Recognizing that MDS errors could potentially lead to higher payments to nursing homes, CMS in 1998 funded a data verification study. Results found MDS errors in all of the 30 participating

Year	Development
1990	First MDS introduced
1991	First MDS nationally implemented
1991	Enhanced MDS, the MDS+, developed for resource utilization group and quality indicator development project
1995	MDS 2.0 nationally implemented
1995	Zimmerman et al. (1995) report on 24 MDS-based quality indicators
1998	Medicare prospective payment system for skilled nursing homes nationally implemented
1998	Nursing homes required to electronically submit MDS data to CMS
1998	Resource Utilization Groups become basis for Medicare's nursing home prospective payment system
1999	State surveyors required to use the quality indicators to guide nursing home evaluations.
2002	Medicare's Nursing Home Compare Web site launched
2005	Development of Quality Indicator Survey initiated
2006	Nursing home Pay-for-Performance demonstration project launched
2008	MDS 3.0 final draft published
2010	Nationwide implementation of MDS 3.0 slated for October

Figure 1. Nursing home MDS time line. MDS = Minimum Data Set; CMS = Centers For Medicare and Medicaid Services.

facilities (General Accounting Office [GAO], 2002). Similarly, the OIG (2001a) compared MDS data with residents' medical charts and found that, on average, 17% of the 406 MDS fields for each resident were different from the medical record. Although MDS inaccuracies found in both studies affected payments, they did not result in *systematic* overpayments or underpayments. More recent research designed to correct some of the methodological flaws in the earlier studies have found lower MDS error rates but reveal wide variability in the data across facilities for reasons that have yet to be determined (Mor et al., 2003; Wu, Miller, Lapane, Roy, & Mor, 2005).

An additional concern about the MDS data collection process involves time frame. Residents are required to be assessed on admission and then every 90 days. Major resident changes that happen after the 7- or 14-day look-back period are supposed to trigger a new assessment. However, because of resource constraints, these reassessments rarely occur (Mehdizadeh & Applebaum, 2005). Thus, efforts by nursing home staff to use MDS data to monitor resident changes in condition and provide timely responsive care are hampered by a considerable amount of missing observations.

Given the important and myriad uses of the MDS, state surveyors are expected to audit MDS data during facility reviews. There is no evidence, however, that surveyors regularly conduct audits of the MDS for accuracy (GAO, 2002). In sum, the reports reviewed here—singly or together—are insufficient to either wholly deflate confidence in MDS data or inspire confidence in it. Consequently, questions about the data's integrity persist.

### Care Improvements

Since passage of OBRA '87, there have been undeniable improvements in some care processes (e.g., restraint use has decreased) and resident outcomes (e.g., pressure ulcer incidence has dropped), despite increases in resident acuity (Feng et al., 2006). To what extent has use of the MDS—or the MDS-based QIs—triggered such improvements?

A series of studies reported in 1997 evaluated the effect of MDS use on selected resident outcomes (Fries et al., 1997; Hawes et al., 1997; Phillips et al., 1997). On the whole, the researchers found improvement in outcome measures from pre- to post-MDS implementation. Three response editorials, however, questioned the MDS's value as a quality improvement tool, citing problems

with its reliability and its dearth of quality-of-life indicators (Ouslander, 1997; Schnelle, 1997; Uman, 1997).

Introduction of the nursing home QIs (in 1999) and quality measures (in 2002) has not settled matters. In both cases, there was hope that facilities would use these MDS-based measures to strengthen their improvement efforts, but the data are problematic on two counts. First, this quality improvement information also serves a policing function, alerting surveyors (via the QIs) and consumers (via the quality measures) to poorly performing facilities. This dual use bucks a basic tenet of continuous quality improvement that the data required to improve care should not be used to punish the service providers (Deming, 1986).

The second problem is that MDS-based QIs have sometimes proved insensitive to actual improvements in care (Lynn et al., 2007; Stone et al., 2002). Similarly, in a series of studies, facilities' QI scores bore little relationship to the quality of the care their staffs actually provided to residents, based on independent research observations (Bates-Jensen et al., 2003; Schnelle et al., 2003; Simmons et al., 2003). These results suggest that the QIs are limited in their value for quality assessment and improvement purposes.

Research has also shown that simply reporting quality information to facilities does not lead to care improvements (Rantz et al., 2001). However, subsequent research has found that QIs improve when researchers pair information with clinical consultations (Rantz et al., 2001, 2003). In recent years, CMS has adopted this model, supporting more intensive interventions for quality improvement (Lynn et al., 2007) and requiring state Quality Improvement Organizations (QIOs) to work with facilities to enhance resident care. Thus, although the MDS may have triggered improvements in resident care and outcomes immediately following its national implementation, more recently these data have proved to be an insufficient catalyst for change. Instead, more intensive multifaceted interventions appear to hold greater promise (Rantz et al., 2001, 2003; Lynn et al., 2007).

### The MDS's Unintended Consequences

Unintended consequences of the MDS's design and multipurpose use could theoretically undermine the instrument's manifest functions. As early as 1990, researchers warned that paper compliance was a potential unintended consequence of

MDS use (R. L. Kane, 1990). An additional possible unintended consequence is diminished attention to residents' quality of life.

### Paper Compliance

A number of studies have reported evidence that facilities tend to document higher levels of care (toileting, restraint release, repositioning) than they actually deliver while underestimating the prevalence of certain problem conditions such as pain, depression, and low oral intake (Bates-Jensen et al., 2003; Chu et al., 2004; Schnelle, 1997; Simmons et al., 2003). Schnelle, Ouslander, and Cruise (1997) argue that these results are indicative of a paper compliance culture that has flourished in a flawed system: Workers respond to pressure to provide quality care by underreporting problems and documenting service levels that are not met and care plans that are not honored because they lack effective feasible interventions and because surveyors rely so heavily on MDS and medical chart reviews. Critics suggest that this mindset results in MDS compliance procedures becoming the lens through which nursing home staff view resident care, replacing good clinical judgment.

This criticism is coupled with other concerns, including that many nursing homes lack sufficient numbers of staff to provide quality care (Harrington et al., 2000), that federal and state regulatory systems are limited (GAO, 2003), and that too little is known about interventions that work well (Weiner, Freiman & Brown, 2007). These are the very problems that Schnelle and colleagues (1997) have argued can lead to paper compliance. Certainly, many administrators are keenly aware of how MDS data can affect their operations (e.g., Ungar, 2007); their concerns have prompted a market response, giving rise to commercial software products designed to help facilities maximize their reimbursements while avoiding survey deficiencies.

### Resident Quality of Life

Critics have argued that quality of care, rather than quality of life, has been the dominant concern in nursing homes (R. A. Kane, 2001). MDS-related evaluations have reinforced this premise: Just 2 of the 24 original MDS-based QIs were related to quality of life (Zimmerman, 2003), and more recent research has shown that the QIs are not strongly related to residents' self-reported quality of life or satisfaction (Degenholtz, Kane, Kane, Bershadsky, & Kling, 2006; Bailer, Straker, Noble,

Hughes, & See, 2007). Based on the Lord Kelvin observation that "If you cannot (or do not) measure it, you cannot improve it," the underrepresentation of quality of life on the MDS may contribute to the lack of attention to resident life quality. In part to rectify this oversight, two states—Ohio and Minnesota—publish online reports of nursing home residents' satisfaction ratings and quality-of-life ratings, respectively (Ohio Department of Aging, 2009; Minnesota Department of Human Services, 2009).

Although critics acknowledge that the MDS has made contributions to long-term care, this review reveals questions about the instrument's reliability, validity, and usefulness for quality improvement. These questions appear to stem from the MDS's design in concert with its multipurpose use. Relying on staff discretion for some assessments, for instance, may not be problematic—unless the system includes incentives to over- or underestimate problem conditions, which may increase the likelihood that unintended consequences will result. Teasing out the separate contributions of these influences is impractical in such a complex system, and none of the numerous MDS studies—together or separately—has reported sufficient evidence to definitively confirm or refute underlying concerns. The third revision of the MDS represents an attempt to respond to these ongoing concerns.

### MDS 3.0

The draft MDS 3.0, while still undergoing refinement in anticipation of being nationally implemented in October 2010, includes major changes to version 2.0 (Figure 2). Designed to give residents voice and to improve clinical relevance, accuracy, efficiency, and clarity, draft MDS 3.0 was developed with input from MDS users, resident advocates, and subject area experts (Saliba, 2008). In the final development phase, the instrument was tested in 71 facilities in eight states using 3,800 residents. Two types of nurses collected the assessment data: "gold standard" research nurses and one nurse in each participating facility. The facility nurse data were shown to be reliable (and in comparisons, as reliable as the data collected by the gold standard nurses; Saliba). Overall Kappa values for the sections that underwent the most revision—mental status, mood, pain, behavior, and customary routines and activities—ranged from .92 to .97; item reliabilities for delirium, included in the mental status section, were lower, but still considered excellent, ranging

<b>MDS Sections Requiring Resident Interview:</b>
○ Mental status, including delirium items
○ Mood
○ Pain
○ Quality of life
<b>Sections with Significant Changes:</b>
○ Behavior
○ Revised language
○ Added operational definitions
● Pressure Ulcer
○ Eliminated reverse staging
○ Adds present on admit
● Balance
○ Refocused on movement and transitions
● Falls
○ Introduced type of injury
● Bowel & bladder
○ No longer rate catheter as continent
○ Improved toileting item
● Activities of daily living
○ Single response scale
● Goals of care and return to community items added
● Oral/dental item improved
● Swallowing item
○ Checklist of observable signs and symptoms
● Restraints
○ Separates bed and chair

Source: Saliba, D. (2008).

**Figure 2.** Summary of MDS 3.0 changes. MDS = Minimum Data Set.

from .75 to .89 (Saliba). Similarly, the vast majority of nurses who conducted assessments reviewed the MDS 3.0 positively (Saliba). Overall, the instrument reduced the assessment time by 45% to an average of 62 min (Saliba).

In the following sections, we examine whether the new MDS, with changes that directly address previous criticisms, is likely to fulfill its manifest functions while avoiding the unintended consequences associated with its predecessor.

## Manifest Functions

### Data Collection

In a departure from earlier versions, draft MDS 3.0 features resident interviews and greater use of standardized assessment procedures in an effort to improve measurement reliability, accuracy, and validity (CMS, 2008b; Saliba, 2008).

The MDS 3.0 requires resident interviews with scripted questions to assess such subjective states as pain, mood, depression, cognitive functioning, and personal preferences for services and activities (CMS, 2008b). The pilot evaluation found high completion rates and good to excellent reliability results for these items, demonstrating that most residents can participate meaningfully in interviews

(Saliba, 2008). Additionally, instructions for these items are designed to prevent possible selection and response biases. Thus, nurses are directed to ask *all* residents standardized questions that are scripted word for word (e.g., "Ask resident: 'Have you had pain or hurting at any time in the last 5 days?'"). Exceptions apply only if the resident is rarely or never understood, fails to complete the section, or needs an interpreter but none is available (CMS, 2008a; Saliba). In these cases, nurses assess the items.

There are two interrelated concerns. The first is that nurses could sidestep the intended protocol because professional discretion is needed to determine whether some exceptions apply. For example, there is no standardized protocol within the MDS 3.0 for assessing a resident's communication abilities. Similarly, there is little guidance for nurses to determine what is meant by "(resident) unable to complete" the section. The second concern is that many nurses in the pilot evaluation were initially hesitant to attempt resident interviews because they viewed the questions as too personal (Saliba, 2008). Both concerns raise questions about whether assessment nurses will circumvent MDS protocol.

Compared with previous versions, MDS 3.0 makes greater use of standardized assessment procedures, a change that in the pilot evaluation resulted in increased measurement reliability, validity, and accuracy (Saliba, 2008). The delirium items, for example, have been previously validated for frail adults. The pain assessment uses resident ratings on the commonly used 0–10 scale. Depression is assessed with the Patient Health Questionnaire (PHQ-9), based on the widely used *Diagnostic and Statistical Manual of Mental Disorders-IV* criteria (Saliba). Pressure ulcer items draw from the National Pressure Ulcer Advisory Panel's PUSH tool (Saliba). Additionally, the highly structured interviews for the new preference assessment tool (PAT) and the cognitive assessment constitute standardized procedures.

There has been some concern that standardized procedures will require more staff time and training to implement reliably and regularly than many nursing homes can commit to. Evaluation findings, however, suggest that the 3.0 procedures are feasible to implement: Nurses completed the items reliably; and, again, the average assessment time dropped (Saliba, 2008). If these findings hold true following national implementation of the MDS 3.0, then the revised instrument may indeed increase measurement reliability and validity.

## *Quality Improvement*

At the same time, nursing homes could face increased scrutiny by surveyors and consumers if the use of standardized assessments leads to increased prevalence rates for common but heretofore underreported conditions. Such was the case in the national evaluation, where the MDS 3.0 assessments found higher prevalence rates for delirium (7% vs. 3%) and pain (64% vs. 50%) when compared with the MDS 2.0 assessments. As noted earlier, this detection quandary arises when the same data are used to punish providers and improve care and could unintentionally prompt providers to thwart the new assessment procedures.

Despite the potential improvements included in MDS 3.0, implementation questions have been raised in a number of areas. For example, will facility nurses exclude too many residents from the interview process? Will prevalence rates for certain conditions, such as pain, be underreported? Many of these challenges can be addressed through the development of a sound audit process involving an independent validation assessment of a sample of residents using external staff. Such a system could be implemented on a state or national basis on a sample of facilities.

## **Unintended Consequences**

### *Paper Compliance*

Even if MDS 3.0 performs as well in practice as it has in the pilot evaluation, some providers may still resort to paper compliance rather than actual care improvements in the absence of other industry reforms. The new MDS will inherit the old system, with its incentives to use MDS data for purposes other than assessment and quality improvement. It will also not increase staffing levels, strengthen the survey process, or identify new care processes that are both effective and feasible to implement—all reforms that some say are

necessary to improving care and combating paper compliance.

## *Quality of Life*

MDS 3.0 attempts to directly assess quality of life through a PAT, which replaces 2.0's 20-item customary routine assessment and its activities assessment (gone entirely is 2.0's psychosocial assessment). The tool includes 16 interview items divided into two categories: daily preferences and activity preferences (Figures 3 and 4). Nurses are instructed to attempt to interview all residents.

Although intended to tap into widely recognized quality-of-life domains (Degenholtz et al., 2006; R. A. Kane et al., 2003), its design is potentially problematic in three respects. First, the instrument does not assess such important quality-of-life domains as dignity, enjoyment, and comfort (R. A. Kane et al., 2003) and pays limited attention to such domains as security and relationships. Second, there is lingering concern about whether staff interviewers can elicit honest opinions from residents who are dependent on the facility's workers for their care. The PAT addresses this problem by using questions and response categories that seem likely to mitigate an acquiescence response bias. For each PAT item, residents are asked, "While you are in this facility, how important is it to you to ...?" This focus on residents' interests is in contrast to other quality-of-life instruments that use questions and response categories that reflect on facility or staff performance (e.g., by asking residents whether an activity happens often enough or whether they are satisfied with various aspects of their life; R. A. Kane et al., 2003; Straker, Ejaz, McCarthy, & Jones, 2007). Thus, the third problem with the PAT's approach is that it weakens the instrument's usefulness as a quality improvement tool: Knowing how important an item is to a resident does not tell you whether that preference is being met.

- Choose what clothes to wear
- Take care of personal items
- Choose between a tub bath, shower, bed bath, or sponge bath
- Have between-meal snacks available
- Stay up past 8 p.m.
- Have family or close friend involved in care discussions
- Use the phone in private
- Have a place to lock personal items

Response categories: important; not important; important, but can't do or no choice; no response or nonresponsive

*Source:* CMS, 2008a

Figure 3. Preference assessment tool—Daily preference items.

<ul style="list-style-type: none"> <li>○ Have books, newspapers, and magazines to read</li> <li>○ Listen to music you like</li> <li>○ Be around animals such as pets</li> <li>○ Keep up with the news</li> <li>○ Do things with groups of people</li> <li>○ Do favorite activities</li> <li>○ Go outside</li> <li>○ Participate in religious services or practices</li> </ul> <p>Response categories: important; not important; important, but can't do or no choice; no response or nonresponsive</p>
<i>Source: CMS, 2008a</i>

Figure 4. Preference assessment tool—Activity preference items.

## Looking Forward

Results of the evaluation test of MDS 3.0 are promising, with revisions that appear to yield increased measurement accuracy, reliability, and validity (Saliba, 2008). These advances could lead to more accurate resident assessments and spur more effective quality improvement efforts. But some design features may produce unintended consequences that threaten these improvements. MDS 3.0, for instance, appears to shortchange the quality-of-life assessment; nurses retain sufficient discretion to sidestep recommended interview protocols; and there remain concerns about whether facilities, under usual care conditions, can implement the standardized assessment items regularly and reliably. Looking forward, MDS training programs that provide hands-on practice with the instrument, especially with items requiring a resident interview or a standardized assessment, along with timely performance feedback will be needed to help assessment nurses adapt to the new protocols *and* detach from past practices.

Unintended consequences may also arise from the MDS's continued multipurpose use. In its efforts to serve consumers, facilities, regulators, funders, and researchers, even an improved MDS may fall short of expectations due to conflicting demands: Asking facilities to collect data that can be used to both improve and punish violates a cardinal rule of quality improvement; and asking staff to collect data from residents that affect revenues violates good data collection practice. Reforming the system will entail curtailing reliance on the MDS and employing new strategies for assessment and quality improvement.

To date, however, most CMS-sponsored efforts to improve care since OBRA '87 have centered on MDS-related assessment activities (see, again, Figure 1). In a hopeful sign of change, more recent initiatives are less MDS dependent. The Quality Indicator Survey (QIS) makes greater use of resi-

dent interviews and observations than its predecessor, which the QIS is gradually replacing. Also noteworthy is CMS's engagement of state QIOs to work with nursing homes, a quality improvement initiative that favors direct care strategies over assessment strategies. Additionally, many QIOs as well as culture change proponents are advocating that nursing homes continuously evaluate and monitor new improvement initiatives using measures (again, resident interviews and observations) that are independent of the MDS (e.g., Advancing Excellence in America's Nursing Homes, 2009; Rhode Island Quality Partners, 2009).

Even more emphasis on direct care interventions may be needed. Some long-term-care experts have called for increasing staffing levels to meet standards for quality care (Harrington et al., 2000), whereas others have called for more support to develop care processes that improve resident outcomes (Schnelle et al., 1997). Thus far, these proposals have received less attention than the assessment approaches, although assessing need may be insufficient to produce change without feasible interventions to improve care and a stable staff of sufficient size to provide service.

The question is not whether efforts to improve the MDS are important but rather that these improvements are best viewed as part of a more balanced set of intervention efforts. For MDS 3.0 to achieve its manifest functions—and sidestep potential unintended consequences—it needs to operate as originally envisioned, within a broad multifaceted quality improvement framework.

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# Regulation of Nursing Facilities in the United States: An Analysis of Resources and Performance of State Survey Agencies

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**Purpose:** This study was undertaken to examine the resources, staffing, and performance of the state survey agencies that have primary responsibility for regulating nursing facilities—licensing them at a state level and certifying them for participation in Medicare and Medicaid on behalf of the Center for Medicare and Medicaid Services (CMS; formerly the Health Care Financing Administration). **Design and Methods:** A telephone and fax survey of survey agencies in all 50 states and the District of Columbia was used, supplemented by secondary data collected from CMS's On-Line Certification and Reporting (OSCAR) system. **Results:** Total state agency expenditures on nursing facility regulation in 2000 were \$382.2 million, which is less than one half of 1% of the total expenditures on nursing facilities in the United States. About 3,000 full-time equivalent surveyors are employed to regulate more than 17,000 nursing facilities in the United States. Nursing facility licensing and certification dominates the work of state survey agencies, although they are responsible for regulating many other health care organizations. Spending has risen recently, but resource levels vary greatly across states, and most state agencies report significant funding shortfalls that impact on their ability to perform their regulatory function. On a range of indicators, the performance of state survey agencies var-

ies fivefold. Some of that state variation is explained by differences in resource levels for regulation, but most is not. **Implications:** State survey agencies probably need more funding to fulfill their responsibilities properly, but other changes are also needed to improve their performance, including more support and oversight by CMS and more effective regulatory design.

**Key Words:** *Nursing homes, Licensing and certification, HCFA, CMS, Long-term care*

More than 1.6 million Americans, mostly seniors, live in nursing facilities. The United States spent \$90 billion in 1999 on nursing facility care, or about \$55,900 per resident per year, most of which (60%) came from public funds through the Medicaid and Medicare programs (Heffler et al., 2001). There were more than 17,000 nursing facilities, with a total of over 1,834,000 beds in 1998 (AHCA, 1999). About 65% of nursing facilities are in the for-profit sector, and 56% are owned or operated by multifacility corporations, some of which have become very large and control many thousands of beds in hundreds of facilities (Harrington, Carrillo, Thollaug, Summers, & Wellin, 2000).

The quality of nursing facility care has been a recurrent matter of public policy concern in the United States for at least 30 years. A succession of reports in the 1970s and 1980s highlighted long-standing, widespread, serious quality of care problems, including some horrific instances of the mistreatment and abuse of highly vulnerable nursing facility residents (Mendelson, 1974; USGAO, 1987; Vladeck, 1980). In 1987, following the publication of a highly critical Institute of Medicine report (Institute of Medicine 1986), Congress enacted a wholesale reform of the federal regulatory arrangements for nursing facilities participating in Medicare and Medicaid. Those reforms were gradually implemented between 1988 and 1995, but quality problems have persisted, and the effectiveness of the current system of regulation has been repeatedly questioned (USGAO, 1998, 1999a, 1999b; USOIG, 1999). Although some argue that

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nursing facilities are more heavily regulated than other health care organizations, the numerous public scandals associated with poor nursing home care and the vulnerability of residents continue to result in calls for improved oversight of the industry by the U.S. Senate Special Committee on Aging (1998, 1999). Although there is rather limited evidence of the effectiveness of current regulatory arrangements (Walshe, 2001), a second report from the Institute of Medicine concluded that regulation has brought some improvements in the quality of nursing facility care, but that further reforms were needed in the survey and enforcement process to make the regulatory process more effective (Wunderlich & Kohler, 2001). The Institute of Medicine Committee also recommended that a study should be undertaken on whether more funding for nursing facility regulation was required (Wunderlich & Kohler, 2001).

This study examines the resources, staffing, and performance of the state survey agencies, which have primary responsibility for regulating nursing facilities—licensing them at a state level and certifying them for participation in Medicare and Medicaid on behalf of the Center for Medicare and Medicaid Services (CMS; formerly known as the Health Care Financing Administration). It provides an overview of the development of the current arrangements for regulating nursing facilities and summarizes concerns about state survey agency performance. This article then describes and analyzes the results of a study that collected quantitative and qualitative data on resources, staffing, and performance directly from state survey agencies through a telephone and fax survey of state licensing and certification agency directors. These data are supplemented by secondary data from CMS's On-Line Survey Certification and Reporting (OSCAR) system. The relationships between state survey agency resources and performance are examined, controlling for nursing facility characteristics at a state level, using a backward stepwise regression model. This article concludes by discussing the policy implications of its findings for future funding and management of state survey agencies.

### *The Development of Nursing Facility Regulation*

Congress passed a major reform of nursing facility regulation in the Omnibus Budget Reconciliation Act of 1987 (OBRA, 1987) to address the long-standing concerns about quality of care. The Omnibus Budget Reconciliation Act (OBRA) and the subsequent regulations (USDHHS, 1988, 1989, 1994, 1995a, 1995b) mandated uniform comprehensive assessments of all nursing facility residents after admission and periodically thereafter; developed quality indicators that were more outcome-oriented than process-oriented; and changed federal survey procedures to make them more oriented toward the residents through interviews and assessments of residents rather than simply reviewing medical records. Deficiencies found during surveys of nursing facilities were required to be rated based on their scope and severity for the purposes of

enforcement, and a range of new enforcement mechanisms were created, including the authority to impose intermediate sanctions (civil money penalties, the denial of payment for new admissions, and the imposition of temporary management), as well as the ultimate sanction of decertification (USDHHS, 1995a, 1995b).

State survey agencies are responsible both for licensing nursing facilities that meet state legal requirements, and for certifying those that meet the conditions for participation in the Medicare and Medicaid programs. Nursing facilities must be licensed to operate under state rules, but only have to meet the federal certification requirements if they wish to participate in the Medicare and Medicaid programs, although almost all do. State survey agencies have contracts with CMS to undertake the certification process and are funded by CMS to do so. Under federal regulations, the federal government pays for all of the certification activities for Medicare facilities at the state level and for 75% of the certification activities for Medicaid facilities, and states must fund the remainder (USGAO, 2000). States must bear the entire costs for state-level licensing activities.

State agencies survey nursing facilities on average every 12 months and conduct additional surveys when complaints are made about poor quality of care. State surveyors are trained to follow federal regulations for surveying facilities and to record deficiencies using procedures laid down by CMS in its *State Operations Manual* (USHCFA, 2000c). State agencies are also responsible for investigating complaints about the quality of nursing facility care within federal guidelines. When they find that a facility fails to meet a specific federal requirement, a deficiency notice is issued. State surveyors are responsible for rating the scope and severity of deficiencies. State survey agencies are responsible for taking enforcement actions for Medicaid-certified facilities, and they work with federal officials on enforcement actions for Medicare-certified facilities. Thus, the federal nursing facility regulatory system is largely decentralized or devolved to states and relies on state agencies for all the first-line regulatory activities.

### *Survey and Enforcement of Regulations*

Implementation of the OBRA 1987 regulatory reforms has not been straightforward (Edelman, 1997, 1998). From an initial peak in 1991, the number of deficiencies found by surveyors steadily declined by 44% in 1997 (Harrington & Carrillo, 1999), a trend that was believed to reflect diminishing oversight rather than improving quality. Few deficiencies were ranked in the highest categories of scope and severity (although the proportion was rising), and sanctions were rarely applied (USOIG, 1999). There was wide variation in the numbers and types of deficiencies recorded across states, suggesting that they were not all using the regulatory process consistently. The U.S. General Accounting Office (USGAO, 1998) conducted a study of the federal and state enforcement

programs in California and reported to Congress that "nursing homes have not been and currently are not sufficiently monitored to guarantee the safety and welfare of their residents" (p. 3). Another USGAO study (1999a) found that one fourth of nursing facilities nationwide continue to be cited for deficiencies that either caused actual harm or the potential for death and serious injury. The Inspector General (USOIG, 1999) and CMS (USHCFA, 1998b) drew similar conclusions from separate studies.

One of the most serious findings was that state surveyors were often unable to detect serious quality of care problems. Using concurrent reviews (where state surveyors visited the facilities at the same time as researchers), the USGAO (1998) concluded that CMS policies were not effective in ensuring that the deficiencies are identified, corrected, and remained corrected. They found that CMS and the states allowed most facilities to correct violations without penalties. Only a few facilities were terminated from the program, and most of these were later reinstated and continued to have violations.

The U.S. Senate Special Committee on Aging held a series of hearings between 1998 and 2000 regarding the USGAO's studies, and urged CMS to improve its survey and enforcement process. President Clinton and CMS began a new initiative to improve the enforcement process (USDHHS, 1998), including strengthening regulatory enforcement and expanding the oversight of state inspections. CMS argued that additional funding was needed for the enforcement program (USHCFA, 1998a), and the Congressional budget passed some increases in funding for state programs in the fall of 1998. The most recent CMS reports to the U.S. Senate Special Committee on Aging show some improvements in state regulatory activity (USHCFA, 2000a, 2001a). Even so, the recent Institute of Medicine report recommended further reforms of nursing facility regulation, including a greater focus on dealing with poor quality providers, efforts to make state survey and enforcement activities more uniform, more use of assistance and sanctions to improve performance, and an examination of whether increased funding for regulation is needed (Wunderlich & Kohler, 2001).

## Methods

### *Research Issues and Hypotheses*

This study set out to examine the resources, staffing, and performance of state licensing and certification agencies that have primary responsibility for licensing nursing facilities at a state level and certifying them to participate in the federal Medicare and Medicaid programs. It had three main aims: (1) to describe the level, distribution, sources, uses, and adequacy of resources for nursing facilities regulation; (2) to examine variations in state survey agencies' performance across a number of performance indicators; and (3) to explore the relationship between resources and performance. With these aims in mind, we se-

lected two measures of state agency resources and seven state agency performance indicators for analysis. From the literature, we identified a number of other variables that might be expected to impact on state agency performance and that we used as control variables in our analysis. Each of these measures is described in Table 1.

### *Measuring State Survey Agency Resources*

This survey focused on the effect of state survey agency resources on agency performance. Previous studies have shown a wide variation in state agency performance by state agencies (Harrington & Carrillo, 1999). At the same time, reports have also shown a wide variation in the total funds for nursing facility regulatory activities across states (Zimmerman & Stegemann, 1999). This raises questions about whether some variation in performance is related to inadequate survey agency resources.

The new federal enforcement processes may have substantially increased the workload burdens on state survey agencies. These added requirements without sufficient agency funds may have detracted from the actual process of the detection of poor care. Perhaps, the federal funds for the enforcement effort were not sufficient at the federal and/or the state levels to maintain in-depth surveys of states. In 1998, CMS made these arguments that additional funding was needed for the enforcement program (USHCFA, 1998a), and the Congressional budget passed some increases in funding for state programs in the fall of 1998. Under the federal regulations, the federal government pays for all of the certification activities for Medicare facilities at the state level and for 75% of the certification activities for Medicaid facilities, and the states are required to pay 25% of the costs in matching funds (USGAO, 2000). States must bear the entire costs for licensing activities. States may use state general funds, state licensing fees, and other sources of state funds to meet the 25% matching requirement for the Medicaid certification activities.

Although new funds of \$8 million were appropriated by Congress and from CMS's budget in 1999 and \$23.5 million was appropriated by Congress in 2000 for nursing facility initiatives, it was not known whether these funds were sufficient to cover the new costs of the regulatory initiatives (USGAO, 2000). CMS reported a total of \$137.3 million for the Medicaid long-term care facility survey and certification activities, and about \$86 million (estimated at 59% of total Medicare survey funds) for Medicare survey and certification funds in 1995 (USHCFA, 2001b). Even with the new nursing facility initiative, the total Medicaid survey and certification funds was \$147.8 million (but the proportion for nursing home surveys was unknown), and Medicare was \$135.9 million for nursing facilities in 2000. This represents an average increase of only 5.4% annually over the 5-year period.

The hypothesis tested in this study was that the variation in the funding for nursing facility regulatory programs would explain some of the differences

**Table 1. Measures of Resources, Performance, and Control Variables Selected for Analysis**

Measure	Variable	Rationale
Resource variables	Nursing facilities licensing and certification expenditure per nursing facility bed	States' ability to implement the regulatory arrangements laid down by CMS may be affected by the overall level of resources available to them.
	% of nursing facilities licensing and certification expenditure derived from federal government sources	States that invest their own resources in licensing and certification may be both better predisposed toward regulation and more able to implement regulatory arrangements.
Performance indicators	Mean number of deficiencies issued per facility surveyed	The number of deficiencies issued varies widely across states and can be seen as an indicator of the stringency of regulation (Harrington & Carrillo, 1999).
	% of facility surveys on which no deficiencies are issued	States that issue fewer deficiencies or give more facilities no deficiencies may not be following CMS procedures properly, or may be failing to identify deficiencies or failing to record them properly (USGAO, 1998, 1999a).
	% of facility surveys on which a deficiency of level G or above is issued	Serious deficiencies (which have caused or could cause harm or immediate jeopardy to residents) are more likely to be contested, and there is evidence that some states are reluctant to record them (USGAO, 1998, 1999a, 1999d).
	Mean time between surveys	Federal requirement is for a mean of 12 months (365 days) or less, and states with a higher mean are not in compliance with CMS requirements (OBRA, 1987; USHCFA, 1998a, 2000b, 2001b).
	% of surveys that take place more than 18 months after previous survey	Despite the federal requirement for a maximum gap of 15 months, there is evidence that some states allow some facilities to go for extended periods without survey (USHCFA, 1998a, 2000b, 2001b).
	Number of complaints investigated per nursing facility bed	Management of complaints varies widely across states, and some discourage the filing of complaints (USGAO, 1999c).
	% of all complaints investigated	States vary in the priority they give to investigating complaints, despite a CMS requirement that all complaints of immediate jeopardy or actual harm be investigated (USGAO, 2000).
Control variables	% of nursing facilities operated by chains or networks	Chains of nursing facilities have potential cost and marketing advantages (Arling et al., 1987; Cohen & Dubay, 1990; Davis, 1993), but may have lower staffing levels and more deficiencies (Harrington, Swan, Mullen, & Carrillo, 2000; Harrington, Woolhandler, Mullan, Carrillo, & Himmelstein, 2001).
	% of nursing facilities operated for profit	Nonprofit facilities have better outcomes in some studies and fewer deficiencies (Aaronson, Zinn, & Rosko, 1994; Davis, 1993; Harrington, Swan, et al., 2000; Harrington et al., 2001; Harrington, Zimmerman, Karon, Robinson, & Beutel, 2000; Spector, Selden, & Cohen, 1998).
	% residents funded by Medicaid	Facilities with higher percentages of Medicaid residents have been found to have poorer quality of care (Fottler, Smith, & James, 1981; Harrington et al., 2001; Harrington, Zimmerman, et al., 2000; Nyman, 1988; Zinn, 1993).
	% of beds not certified for Medicare and/or Medicaid	Medicare-certified nursing facilities have fewer deficiencies and better staffing (Harrington, Carrillo, Mullan, & Swan, 1998; Kanda & Mezey, 1991). States with more uncertified facilities may have poorer quality and require more regulatory oversight.
	Staff hours per resident day	Facilities with more staffing have a better quality of care, fewer deficiencies, and better outcomes (Aaronson et al., 1994; Bliesmer, Kane, & Shannon, 1998; Cherry, 1991; Cohen & Spector, 1996; Harrington, Zimmerman, et al., 2000; Linn, Gurel, & Linn, 1977; Munroe, 1990; Nyman, 1988; Spector & Takada, 1991; USHCFA, 2000b).
	Mean size of nursing facilities, in beds	Larger facilities have been found to have more deficiencies (Harrington, Zimmerman, et al., 2000) and lower staffing levels (Fottler et al., 1981; Kanda & Mezey, 1991).
	Mean % occupancy of nursing facilities	Low occupancy rates can indicate financial problems for nursing facilities, which may impact on quality of care.

Note: CMS = Center for Medicaid and Medicare Services.

in regulatory performance. We compared the total state spending (federal and state) on nursing facility regulation standardized by the number of beds in a state. We also tested whether state agencies that had higher percentages of federal resources (with less state matching funds) would have poorer state agency performance. Those states that invest greater amounts in the regulatory program may place a greater importance on the program and therefore have better performance measures.

### Measuring Facility Characteristics That May Impact on Quality and State Agency Performance

It was also expected that selected characteristics of nursing facilities would impact on quality. If these characteristics were associated with decreased quality, then they may increase the workload for survey agencies. For this study, we selected seven facility variables found to be important in previous studies of

nursing facility quality and/or deficiencies as control variables: (1) if a facility was a multifacility organization, (2) if it was for-profit, (3) the percent of residents paid by Medicaid, (4) the percent of beds not certified for Medicare and Medicaid, (5) the average staff hours per resident day, (6) the size of the facility, and (7) facility occupancy. See Table 1 for the rationale for each and the related literature. All of these variables were considered to have a potential impact on the quality of care delivered by facilities; therefore, they could impact on the performance indicators for state licensing and certification agencies.

### *Measuring State Survey Agency Performance*

Short of USGAO or CMS observations of state survey inspections, it is difficult to develop measures of state agency regulatory performance, and the choice of indicators is somewhat constrained by data availability. For purposes of this study, we examined seven statistical indicators of performance based on those identified by CMS, the USGAO, or others in the literature (Harrington & Carrillo, 1999; USGAO, 1998, 1999a, 1999b; USHCFA, 1998b). Since the U.S. Senate Special Committee on Aging hearings in 1998 and 1999, CMS has been providing statistical reports on some of these indicators to the Committee on its efforts to improve regulatory activities.

Two measures of performance are the average number of deficiencies issued per facility and the percentage of facilities that receive no deficiencies. A third related measure of performance is the number of facilities that are given deficiencies rated by surveyors at the G level or above, meaning that the deficiencies are serious and have caused or have the potential to cause harm or immediate jeopardy to resident health and safety (USDHHS, 1995b). The USGAO (1998, 1999a) found that surveyors sometimes fail to identify deficiencies that exist or do not issue deficiencies when problems are identified and thus may not be following CMS survey and enforcement procedures. The USGAO (1998, 1999a, 1999d) found that some agencies are reluctant to rank deficiencies at the higher levels of scope and severity because more deficiencies are contested through the informal dispute resolution process, and appealed and increased enforcement actions are then required to be taken by state agencies. Thus, state agencies with higher levels of resources should be more likely to issue deficiencies that are rated as more serious because they would not be as concerned about the cost consequences of such actions.

The quality of care may be expected to vary across states, so this can explain some of the differences in the number of deficiencies or no deficiencies issued by state agencies. It could also result in fewer facilities with the most serious deficiencies. Unfortunately, there is no way to separate these two factors in which deficiencies are used as an indicator, and no other source of data is available to make this distinction. Nonetheless, deficiencies and the severity of deficiencies represent a type of measure of stringency in regulatory activity that is used in this study to examine state differences.

Another performance measure identified by CMS is the mean time between surveys as a performance measure (USHCFA, 1998a, 2000b, 2001a). Federal requirements call for state agencies to survey nursing facilities every 9–15 months and, on average, every 12 months (or 365 days) (OBRA, 1987). Those states that survey less often than every 365 days, on average, are not in compliance with CMS requirements. CMS (USHCFA 1998a, 2000b, 2001b), has also identified some states that survey some facilities less often than the maximum federal requirement of at least every 15 months. Another performance measure was the percentage of surveys that take place more than 18 months after the last survey.

Finally, state agencies are also responsible for investigating complaints about the quality of nursing facility care within federal guidelines. The USGAO (1999c) estimated that 20% of total nursing home licensing and certification expenditures was spent on complaint investigations in 1998. CMS regulations require complaints that can cause immediate jeopardy to the health and safety of residents to be investigated within 2 days and other complaints of actual harm to be investigated within 10 days (timeframe adopted in 1999) (USGAO, 2000). The USGAO (1999c) found that some states use procedures that discourage the public from filing complaints; states use widely varying categories for prioritizing complaints; complaints are given inappropriately low investigation status by states; states often fail to investigate within federal timeframes; and the investigation procedures are weak and ineffective. These problems are compounded by differences in state reporting of the number of complaints received and investigated. These problems, however, could not be identified in this study.

Recognizing the variation in state nursing facility complaint reporting systems, we developed two survey agency performance measures related to complaints about quality. First, the mean number of complaints investigated per 100 nursing facility beds was an indicator of complaint investigation activity. Second, the percentage of total complaints investigated within a state was selected as an indicator, assuming that states with a higher percentage of total complaints investigated were performing better than those with low investigation rates.

There are many other state agency performance indicators identified by Abt and CMS (USHCFA, 1998b) and the USGAO (2000). One is the predictability of the annual surveys. CMS agreed to conducting 10% of standard surveys outside of the normal workday (weekends or early mornings or evenings). At this time, the numbers of staggered surveys are still small and do not seem to be the best indicator. Other indicators, such as determining the appropriateness of the surveyor findings and the scope and severity of determinations (USGAO, 1999b), are beyond the scope of this study.

### *Data Collection and Analyses*

Data for this study were collected from two sources. First, a telephone and fax survey of state

licensing and certification agency directors or their designees was conducted during the year 2000. All 50 states and the District of Columbia participated in the survey. In the telephone survey, state licensing and certification officials were asked a series of structured questions about resources and whether resources were adequate to meet state and federal regulatory requirements, and state survey agency staff, recruitment, and retention. State officials were also asked to provide statistical data for 1999 and 2000 (by fax) on the sources and levels of resources and staff numbers and characteristics. Where responses to the telephone survey and statistical data were unclear, follow-up telephone calls were made for clarification.

Second, statistical data from the OSCAR system, on which state survey agencies record their survey activities, were used. OSCAR data were from three sources. First, OSCAR data from 15,086 nursing facilities with 1,578,309 beds surveyed in calendar year 1999 were used in the analysis (prepared by Harrington, Carrillo, et al., 2000). These data contained about 89% of total certified nursing facilities (because not all facilities are surveyed each calendar year) and was considered representative of the total certified nursing facilities in the United States. These data included numbers and types of deficiencies recorded; numbers of complaints recorded and investigated; facility characteristics, such as ownership and affiliation; Medicaid resident rates; occupancy rates; and staffing levels—all aggregated to the state level. Second, OSCAR data summarized in the American Health Care Association's (1999) annual nursing facilities sourcebook were also used, including the numbers of nursing facilities, numbers of nursing facility beds, and the numbers of Medicaid/Medicare certified beds. The third source of OSCAR data was reports compiled by CMS for the U.S. Senate Special Committee on Aging (USHCFA, 2000b). These data included the 1999 mean time between surveys and the percentage of surveys undertaken more than 18 months after a previous survey.

These data were then analyzed to examine overall rates and distributions and to explore differences between states; results are presented later. For the purposes of the analyses, the District of Columbia was included as if it were a state. To explore the relationships between indicators of performance for state survey agencies and levels of funding, we first identified a set of independent variables, which included two agency funding variables and seven control variables measuring various characteristics of nursing facility provision. Then, a set of eight dependent variables was identified, each of which could be seen as an indicator of the performance of state survey agencies. A correlation matrix was produced to check for collinearity, but the correlations were modest and in the subsequent regression analyses, tolerance tests showed that collinearity was not a problem. Then, a stepwise backwards regression analysis using SPSS was performed for each dependent variable in turn. For each regression analysis, the model with the greatest explanatory power (the largest significant adjusted value of  $R^2$ ) was selected.

## Results

### *Resources for the Licensing and Certification of Nursing Facilities*

State survey agencies in the United States reported total expenditures on licensing and certification activities related to nursing facilities of \$382.2 million in 2000, of which the majority (60.8%) was funded by CMS, whereas 28.1% was financed by states themselves; the remaining 11.1% came from other sources, such as licensing fees charged to nursing facilities. The total expenditure on nursing facilities regulation was less than one half of 1% (.4%) of the \$90 billion (and .7% of the \$54 billion in government funds) spent on nursing facility care in the United States in 1999 (Heffler et al., 2001). State agencies reported spending an average of \$22,433 per nursing facility, or \$208 per nursing facility bed for regulatory activities in 2000, including annual surveys, complaint visits, and other oversight activities.

Nursing facility licensing and certification dominates the work of state survey agencies, taking up 64.8% of their overall funding, whereas the remaining 35.2% covers the licensing and certification of all other health care organizations (such as hospitals, clinics, home health care agencies, etc.). Spending on nursing facilities licensing and certification has been increasing, as shown by Table 2. State survey agencies reported that total spending in 2000 was 9.6% higher than that in 1999, with most of the increase coming from a rise in federal funding and fee income. However, the nature and scope of licensing and certification activities required of state survey agencies by CMS and by state legislation have been increasing too, as a consequence of the new CMS regulations in 1995 and the more recent nursing homes initiative. Many state survey agencies indicated that they did not have sufficient resources to conduct their mandates. Overall, 37 (72.5%) state agencies reported that their current level of federal resources was not adequate to meet CMS's certification requirements, and 23 (45.1%) said that their state resources were insufficient to undertake state licensing requirements. State agency officials complained that the new federal funding increases for nursing facilities certification were insufficient to cover the new work they

Table 2. Sources of Expenditures on Nursing Facility Licensure and Certification by State Survey Agencies in 1999 and 2000

Nursing Facility Licensing and Certification Activities	1999 (\$)	2000 (\$)	% Change
Federal funding from CMS	208,424,397	232,322,942	11.5
State funding	103,644,638	107,454,888	3.7
Other sources of funding (fees, etc.)	36,612,728	42,455,446	16.0
Total expenditures	348,681,763	382,233,276	9.6

Note: CMS = Center for Medicaid and Medicare Services.

Source: State survey agency telephone survey in 2000.

were being asked to do by CMS (e.g., staggered surveys, more complaint visits). In some states, the 1998–1999 funding increases had been delayed or came too late to be used during the state fiscal year.

Overall, 26 (50.9%) states said that their licensing and certification activities had been curtailed or restricted by a lack of funding, with most of those (14 states) indicating that it had particularly impacted their ability to undertake investigations of complaints about nursing facilities. Although increased federal funding for nursing facilities licensing and certification is now available, 20 (39.2%) state survey agencies reported that their use of that funding was being impeded at a state level by legislatures and/or administrations that had imposed hiring caps or moratoriums or were not supportive of increased regulation. Some states have wanted to hold down the overall number of state employees. Others reported that their state was not willing to make its matching contribution, and so they had not received the federal funding they could have had received; and some reported that the process for getting increased state funding was slow and difficult.

There were substantial differences in expenditure on nursing facilities licensing and certification across states, with some states apparently spending over eight times as much per bed as others. Although the mean level of state agency spending per bed reported for 2000 was \$208, it ranged from \$94 in West Virginia to \$770 in Alaska. (Alaska is a special case, however, because of its small number of facilities and large geographical area.) Overall, 15 (29.4%) states reported spending less than \$150 per nursing facility bed, whereas 11 (21.6%) states said that they spent more than \$300 per bed. The level of state agency spending per facility survey also varied widely from \$8,577 in West Virginia to \$80,440 in Delaware, with a mean of \$24,247. Although some of this variation might be explained by differences in geography, economies of scale in larger states, and differences in the nature and extent of state-level regulatory requirements, it is likely that it also represents significant differences in agency behavior, performance, and attitudes toward regulation. Indeed, one measure of this might be the extent to which states contribute to funding nursing facilities regulation. Federal funding covers 60.8% of the costs on average, but some states reported that they invest much more themselves than others. For example, California reported just 35.8% of funding for nursing facilities regulation from federal sources, with 28.2% coming from state revenues and 36.1% from other sources, such as licensing fees. In comparison, Montana reported 87.8% of funding from federal sources, the state provides 12.3%, and no income from other sources was reported.

### *State Survey Agency Staffing*

Much of the resources invested in nursing facilities licensing and certification were used to employ agency staff who conduct the agency's federal and state mandates to survey nursing facilities, and investigate complaints and other problems. State survey

agencies reported that they employed a total of 2,999 full-time equivalent (FTE) surveyors in 2000 to fulfill their nursing facility licensing and certification functions, of whom 71% were qualified nurses. Some states also employed specialist surveyors from other professional backgrounds, such as dietitians (44 states, 86.2%), social workers (38, 74.5%), pharmacists (29, 56.9%), therapists (14, 27.5%), and doctors (11, 21.6%), who not only provided assistance with nursing facility monitoring, but could also be assigned to the regulation of other types of providers (e.g., home health agencies). On average, across the United States, there was 1 FTE nursing facility surveyor for each 611.8 nursing facility beds, or 1 FTE surveyor for every 5.7 nursing facilities in 2000. Again, there were wide variations across states, with 1 FTE surveyor for every 102 beds in Alaska, 225 beds in Montana, 2,624 beds in Missouri, and 2,790 beds in Tennessee.

The total number of surveyor staff rose by 3.6% from 1999 to 2000, reflecting the increased resources discussed previously. This increase in staff numbers was less than the overall increase in budgetary resources, but many states (14, 27.5%) reported that they had problems in recruiting and retaining survey staff, with annual vacancy and turnover rates as high as 40%. The major reason reported was that surveyors are not well paid; the mean entry level salary reported by states for a qualified nurse surveyor was \$36,017, and the mean for a non-nurse surveyor was even lower, at \$33,416. These salaries compare poorly with the averages for nursing facility administrators (\$59,849), directors of nursing (\$49,606), and registered nurse supervisors (\$37,627) in nursing facilities (AHCA, 1999), which in turn are often lower than salaries for equivalent staff in other health care organizations. Although salary differentials between government and private sectors are not uncommon, 29 states (57%) cited low salaries as a barrier to recruitment, whereas other states reported that the current shortage of registered nurses is an important barrier. State officials reported other factors that made it difficult to recruit or retain survey staff, including the amount of travel and time away from home that the job demands; the requirement to work weekends, evenings, and nights to do "staggered" surveys; and the stressful and sometimes adversarial nature of the regulatory process, which was said to cause frustration and burnout.

Perhaps as a result, only 7 states (13.7%) said that they had ample or sufficient staff to fulfill their licensing and certification function for nursing facilities, whereas 15 states (29.4%) indicated that current staffing levels were barely adequate. The largest group—20 states (39.2%)—reported that staffing was not adequate, and a further 9 states (17.6%) described current staffing levels as seriously lacking. These staffing problems were related to the resource problems described previously.

### *Indicators of State Survey Agency Performance*

Table 3 sets out seven performance indicators for state survey agencies, and it can be seen that on each one

**Table 3.** Selected Indicators of State Survey Agency Performance

Performance Indicators	Mean	Minimum	Maximum	SD
Mean number of deficiencies per facility surveyed (1999) <sup>a</sup>	5.41	2.0	11.4	2.16
% of surveyed facilities with no deficiencies (1999) <sup>a</sup>	18.15	1.5	48.5	10.81
% of surveyed facilities with deficiencies G level or above (1999) <sup>a</sup>	25.97	5.8	53.6	11.30
% of surveys taking place more than 18 months after the last survey (1999) <sup>b</sup>	3.88	.0	33.5	6.38
Mean time (in days) between surveys (1999) <sup>b</sup>	287.3	211.1	478.0	54.66
Mean number of complaints investigated per 100 nursing facility beds (1999) <sup>c</sup>	3.10	.09	12.95	2.67
% of complaints investigated (1999) <sup>c</sup>	79.1	37.2	100.0	16.81

Note: CMS = Center for Medicaid and Medicare Services.

Source: CMS's On-Line Survey Certification and Reporting (OSCAR) system.

<sup>a</sup>Harrington, Carrillo, and colleagues, 2000.

<sup>b</sup>USHCFA, 2000a.

<sup>c</sup>CMS OSCAR unpublished complaint statistics for 1999, prepared in 2000.

the results vary widely from state to state. First, some states find relatively few deficiencies at each nursing facility during their surveys, such as New Jersey (2.0), Maryland (2.8), and Colorado (2.8); other states find up to five times as many deficiencies, such as Nevada (11.4), California (11.3), and Michigan (9.9). Similar differentials exist for the percentage of nursing facilities that are found to have no deficiencies at all (which ranges from 1.5% to 48.5%), and the percentage found to have serious deficiencies (grade G or above) that ranges from 5.8% to 53.6%. Although some of these variations between states may be caused by real major differences in the quality of care in nursing facilities, it seems likely that these variations reflect differences in the behavior of the state survey agencies themselves, their resources, agency staffing, systems, and methods.

Although all state survey agencies should be using substantially the same time scales for certification surveys, Table 3 shows wide differences between states. Some surveys are not performed on schedule—on average, 3.9% of surveys took place more than 18 months after the last survey at that facility was conducted. In some states, such as Maryland (33.5%), Arizona (23.9%), and Washington, DC (15.0%), the percentage of late surveys was much higher. Similarly, the mean time between surveys ranged from 211 days in Louisiana to 478 days in Maryland. Five states—Arkansas, Arizona, Washington, DC, Maryland, and New Jersey—had means above 365 days, which is the maximum set by the regulations.

The numbers and percentages of complaints about nursing facilities investigated also varied widely from state to state. There was a mean of 3.05 complaints investigated per 100 beds, but the rate varied from 0.09 to 18.2 across states. The proportion of complaints that were actually investigated when they were received (as opposed to be left to be addressed next time the facility was surveyed) ranged from 37.2% to 100%, with a mean of 79.1%.

#### *Relationship Between Agency Resourcing and Performance*

To explore the relationships between the indicators of performance discussed previously and survey agency

funding, a series of linear regression models were created using each performance indicator listed in Table 3 as the dependent variable. A common set of state agency funding and nursing facility characteristics was used as the independent and control variables. All independent variables used in the linear regressions are shown in Table 4, with their means and standard deviations. Table 5 shows the results of the stepwise backwards elimination regressions. For each dependent variable, backward elimination was used to find the model with the greatest explanatory power (highest value of adjusted  $R^2$ ). The table shows, for each model, which independent variables were included, their unstandardized coefficients, and whether they were significant or not.

It can be seen from Table 5 that the regression models show that a number of significant associations exist between the survey agency performance indicators and the set of independent variables tested, and that up to 30% of the variation in performance indicators may be explained by the models. As hypothesized, we found that the amount spent on licensing

**Table 4.** Descriptive Statistics for Independent Variables in Linear Regression Analyses

Variable	Mean	SD
Nursing facilities licensing and certification spending per bed in 2000 <sup>a</sup>	223.5	127.9
% of licensing and certification spending from federal sources in 2000 <sup>a</sup>	70.1	18.3
% of facilities in chain ownership in 1999 <sup>b</sup>	53.8	14.1
% of facilities in for-profit ownership in 1999 <sup>b</sup>	60.1	17.0
% of residents funded by Medicaid in 1999 <sup>b</sup>	67.2	7.8
% facility beds not certified for Medicare/Medicaid in 1998 <sup>c</sup>	5.8	6.6
Mean total staff hours per resident day in 1999 <sup>b</sup>	3.6	.33
Mean number of beds per facility in 1998 (size) <sup>c</sup>	99.0	22.6
Mean % facility occupancy rate in 1999 <sup>b</sup>	83.7	7.5

<sup>a</sup>State officials telephone survey, 2000.

<sup>b</sup>Harrington, Carrillo, and colleagues, 2000.

<sup>c</sup>American Health Care Association, 1999.

**Table 5. Summary of Backward Ordinary Least Squares Stepwise Regression Models for Indicators of State Agency Performance Indicators**

Variable	Mean Number of Deficiencies Recorded Per Facility Surveyed (1999)	% of Facilities Surveyed With No Deficiencies (1999)	% of Facilities Surveyed With Deficiencies G Level or Above (1999)	% of Surveys Over 18 Months Since Previous Survey (1999)	Mean Time (Days) Between Surveys (1999)	Mean Number of Complaints Investigated Per Bed (1999)	% of Complaints Investigated (1999)
Constant	1.05 (1.11)	47.60** (14.09)	6.78 (18.46)	7.293 (10.74)	213.96** (43.59)	6.837 (5.74)	156.37** (35.24)
Licensing and certification spending per bed (2000)	.00413* (.002)	.0147 (.012)	.0287* (.013)				
% of licensing and certification spending from federal sources (2000)	.0521** (.018)	-.305* (.119)	.113 (.096)				
% of facilities in chain ownership (1999)	.158 (.106)	.278* (.114)					
% of facilities in for-profit ownership (1999)	-.254 (.196)	-.455* (.209)					
% of residents funded by Medicaid (1999)							
% of facility beds not Medicare/Medicaid certified (1998)	.1110** (.039)	-.374 (.219)					
Mean total staff hours per resident day (1999)							
Mean number of beds per facility size (1998)							
Mean % of facility occupancy (2000)	.201* (.080)						
F statistic	8.06**	2.964*	2.601*	.132** (.036)	1.06** (.291)	-.139** (.045)	-.103 (.101)
Adjusted R <sup>2</sup>	.298	.164	.138	-.155 (.112)			
				4.879**	8.153**	6.434**	-.811* (.395)
					.300	.246	2.494*
						.130	

Note: Unstandardized coefficients (with standard errors in parentheses).  
 \* $p < .05$ ; \*\* $p < .01$ .

and certification was significantly positively associated with the mean number of deficiencies recorded per survey, and the percentage of facilities found to have a G-level deficiency or above. The licensing and certification expenditures per bed, however, did not predict the percentage of facilities with no deficiencies, the percentage of surveys over 18 months since the previous survey, the mean time between surveys, the mean number of complaints investigated, nor the percentage of total complaints investigated.

We found a number of other associations between the independent control variables and the dependent variables. For every performance indicator, there were associations with at least one (and sometimes several) control variable, suggesting that some caution should be exercised in interpreting differences between states. For example, the mean number of deficiencies per survey, as well as being positively associated with spending on licensing and certification, was also positively associated with the percentage of facilities with chain ownership or operation and the percentage of nursing facility beds not Medicaid/Medicare certified.

## Discussion

This study, although it relies on survey and other data that have significant limitations, clearly highlights the relatively limited resources that state survey agencies have in relation to the number of nursing facilities that they have to regulate. Data from our survey suggest that many of the state survey agencies responsible for implementing both state and federal nursing facility regulations are underfunded, despite having received some increase in funding in recent years. We would speculate that resource levels may not have been adequate in the past, and the workload associated with regulation has tended to increase more quickly in recent years than the resources available with the implementation of the OBRA 1987 nursing home reform. Existing federal requirements are now being followed more closely by state survey agencies, and new requirements, such as those for more enforcement activities and focused, intensive attention to poor quality providers, are expensive to implement. Because our data are not sufficient to establish a funding benchmark or target, further research to establish such a benchmark is now needed. It seems unlikely that those states at the lower end of the current wide range of spending levels, such as the 15 states who all spend less than \$150 per nursing facility bed per year on regulation, can fulfill their federal and state regulatory responsibilities within those resources. One approach would be for Congress to establish the amount of funds for regulation of nursing facilities as a fixed percentage of the estimated federal trust funds spent on nursing facilities each year. This would remove the political considerations around federal funding and build in greater stability in regulatory funding.

The data we have presented on state survey agency performance, although incomplete and imperfect in

many ways, demonstrate that there are alarmingly wide variations across states, which we believe primarily reflect differences in state agency behavior and commitment to regulation rather than underlying differences in the quality of care.

The regression analyses showed a direct relationship between state agency funding for licensing and certification, and the average number of deficiencies and the percentage of facilities that receive deficiencies rated as severe (at the G level or above, where intermediate sanctions are imposed). This association suggests that agencies with sufficient resources are better able to identify quality problems and are more willing to take actions against such facilities, as would be expected.

Surprisingly, other performance indicators were not directly associated with state agency resources in our regression analyses, but this may reflect the limited power of those analyses given the size of our data set or the nonlinearity of any relationships which exist. However, it is clear that there are many other influences on performance, apart from the level of licensing and certification resources. For example, state survey agencies may fall behind with their annual nursing facility surveys because of survey staff shortages or other workload priorities (such as complaint surveys or enforcement activities). Similarly, differences in complaint investigation performance may reflect differences in state procedures, definitions, and tracking systems (USGAO, 1999c).

It is evident that, in many states, some resistance to expanding nursing facility regulation exists at a state level within the administration and/or legislature. This resistance is reflected in state-hiring moratoriums, funding caps, agency staff limits, and poor remuneration packages for agency staff—all of which may be significant obstacles to improving the performance of state licensing and certification agencies. The USGAO (2000) noted that states reported that a large proportion of the new appropriations for fiscal year 1999 survey initiatives were not fully used in part because of their late distribution, which slowed down the hiring of new staff.

Because the relationship between agency resources and performance is not robust, simply increasing the federal funding available to these state agencies may not solve their performance problems. It is clear that other measures to bring about improvements and efficiencies in agency performance may be needed. CMS has increased its surveyor training initiatives (USGAO, 2000), but many state agencies report the need for additional training. CMS has agreed with the USGAO (1999b, 2000) and the U.S. Senate Special Committee on Aging that there is a need for more federal oversight of state agencies. To this end, CMS developed new nursing home survey protocols in July 1999; identified facilities in each state that need more frequent inspections and monitoring; implemented an abuse intervention campaign; and implemented enhanced regional office oversight, including more comparative surveys of state agency surveys and monitoring (USGAO, 2000).

At present, CMS's arrangements for overseeing the performance of state survey agencies are rather limited, and it has little ability to deal with poor performance or encourage good performance (USGAO, 1999c, 1999d, 2000). We would argue that CMS should do more to develop and promulgate models of good practice among state survey agencies, to improve the CMS central and regional office monitoring of state agency performance on a continuing basis, and to address problems of poor state agency performance. For example, CMS could set standards for survey team size and composition, and the number of days per survey for a range of facility sizes; CMS could build in travel factors as a means of standardizing the survey activities and the funding levels for state agencies. Moreover, CMS could standardize survey protocols that may ensure more efficiency and uniformity. The training of state surveyors is also an important area for CMS. Ultimately, CMS should be able and willing, if need be, to contract with another organization or agency to undertake Medicaid and Medicare certification or to perform the function itself where the state survey agency's performance is unacceptable.

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## Feature Article



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## What Is Nursing Home Quality and How Is It Measured?

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**Purpose:** In this commentary, we examine nursing home quality and indicators that have been used to measure nursing home quality. **Design and Methods:**

A brief review of the history of nursing home quality is presented that provides some context and insight into currently used quality indicators. Donabedian's structure, process, and outcome (SPO) model is used to frame the discussion. Current quality indicators and quality initiatives are discussed, including those included in the Facility Quality Indicator Profile Report, Nursing Home Compare, deficiency citations included as part of Medicare/Medicaid certification, and the Advancing Excellence Campaign. **Results:** Current quality indicators are presented as a mix of structural, process, and outcome measures, each of which has noted advantages and disadvantages. We speculate on steps that need to be taken in the future to address and potentially improve the quality of care provided by nursing homes, including report cards, pay for performance, market-based incentives, and policy developments in the certification process. Areas for future research are identified throughout the review. **Implications:** We conclude that improvements in nursing home quality have likely occurred, but improvements are still needed.

**Key Words:** Quality of care, Nursing homes, Long-term Care

In the past, nursing home care and long-term care were synonymous. If elders needed long-term care, it would invariably be provided in a nursing home. In recent years, the long-term care sector has changed considerably and is arguably evolving into a “system” in which care can be provided in settings that are more appropriate for consumers’ needs. This includes care by home health providers, adult day care, residential care, and assisted living (to name just four). However, nursing homes are still an essential component of the current long-term care system. In the United States, approximately 1.6 million elderly and disabled persons receive care in 1 of the 17,000 nursing homes ([National Nursing Home Survey, 2004](#)). Enduring issues surrounding nursing homes have been quality related. The often-poor quality of nursing homes has been a consistent issue of concern for consumers, government, and researchers.

In this commentary, we first provide a brief review of the history of nursing home quality. This centers on how nursing home quality has been

measured and provides some context and insight into currently used quality indicators in the nursing home industry. In doing so, we note that the concepts of what is measured, who does the measuring, and why measures are used are intertwined. We secondly provide our opinion on the relative merits of indicators of quality. Notable current quality indicators are presented. We then speculate on steps that need to be taken in the future to address and potentially improve the quality of care provided by nursing homes. These steps include policy changes and future research that is needed.

Numerous definitions of quality exist. A current well-cited example comes from the [Institute of Medicine \(IOM\) \(1996\)](#): “The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (p. 5). Operationalizing “quality” from definitions such as these proffered by the IOM can be problematic as the definitions are extremely general and subjective and as such resulting measures tend to be unable to fully realize the quality concept ([Castle, Zinn, Brannon, & Mor, 1996](#)).

Because of this inability to adequately realize “quality” in nursing homes, quality indicators are prevalent rather than quality measures. This helps denote a less precise association between the “indicator” and actual quality (i.e., they are surrogate measures). This has also fostered the creation of many quality indicators. For example, in choosing the quality indicators to be reported in Nursing Home Compare ([www.medicare.gov/NHCompare](http://www.medicare.gov/NHCompare); discussed subsequently), 181 indicators were considered. With many quality indicators available, some organization is useful. In this regard, in conceptualizing and organizing quality indicators, the approach of [Donabedian \(1985\)](#) is valuable.

Donabedian proposed that quality could be measured in terms of structures (S), processes (P), and outcomes (O). Structural measures are the organizational characteristics associated with the provision of care. Process measures are characteristics of things done to and for the resident. Outcome measures are the desired states one would (or would not) like to achieve for the resident. Donabedian’s SPO approach is somewhat pervasive in the quality literature. For example, in MEDLINE (2005–2010), 57% ( $N = 3,950$ ) of nursing home studies either directly or indirectly applied this approach of conceptualizing quality indicators. This approach of conceptualizing quality indicators as SPO measures is also used in this commentary.

The SPO approach also has theoretical underpinnings in that good structure should facilitate good process and good process should facilitate good outcomes. However, we note that the theoretical SPO underpinnings were not developed specifically for nursing homes and some have questioned its suitability for this setting ([Glass, 1991](#)). Moreover, SPO linkages are not always validated in the nursing home literature ([Gustafson, Sainfort, Van Konigsveld, & Zimmerman, 1990](#)). Some scholars have also further substantially developed components of this approach by including factors such as culture (S) and work groups (P) ([Scott Poole & Van De Ven, 2004](#)), whereas others in long-term care have modified the SPO theory, for example by combining it with contingency theory ([Zinn & Mor, 1998](#)).

## A Brief History of Nursing Home Quality

A significant influence on nursing home quality has come from federal and state oversight bodies. This is the result of nursing home facility licensure and certification requirements and payments nursing homes receive from federal and state programs. Thus, a history of nursing home quality is intertwined with developments in these federal and state entities. We highlight key federal and state activities that have influenced quality indicators.

State health departments use a licensure process to establish standards for nursing home care. In 1961, the Public Health Service (as part of the U.S. Department of Health, Education, and Welfare) began studying nursing home state licensures after problems were being reported by the Commission on Chronic Illness and by a number of states ([IOM, 1986](#)). The Public Health Service issued the Nursing Home Standards Guide that expressed the need for standardized definitions of nursing homes and other critical terminology (i.e., administrator, advisory council, and resident). This guide also recommended “basic minimum standards applicable to all nursing homes” ([Department of Health, Education, and Welfare, 1961](#), p. 5). The recommendations consisted of 77 health and safety standards—55 of these were structural quality indicators.

The nursing home industry continued to develop. By the late 1960s, by today’s standards, what we would call the modern nursing home industry existed. This industry development and growth were primarily in response to the newly created Medicare and Medicaid programs. Certification was a requirement

for nursing homes to receive reimbursement for Medicare and/or Medicaid residents. This certification process occurs approximately yearly and consists of an on-site inspection by a team of surveyors. These surveyors monitor quality of care and assess whether the facility meets standards for certification (see review by Castle, Men, and Engberg, 2007, of the current certification process).

Despite the entry into the nursing home market of many new facilities, demand outstripped supply. Many nursing homes operated at 100% occupancy, and nursing homes generally did not incur much in the way of competitive pressure from each other. Quality issues remained, and health and safety standards continued to be developed and implemented. By 1974, 90 health and safety standards existed (for what were termed Skilled Nursing Facilities), with 59 of these as structural quality indicators.

In 1977, a new federal organization, the Health Care Financing Administration (HCFA) was created specifically for the coordination of Medicare and Medicaid. As part of this coordination, HCFA assumed jurisdiction over the nursing home certification process and development of standards for certification. HCFA continued to amend the standards and the certification process during the 1980s. One major change included using deficiency citations (Spector & Drugovich, 1989). That is, a deficiency citation represents an area in which a facility does not meet a Nursing Home Standard for certification.

As part of the improvements to the standards for certification, process quality indicators were introduced. For example, process quality indicators included the prevalence of daily physical restraints, occasional bladder/bowel incontinence without a toileting plan, and indwelling catheters. By 1987, certification consisted of 136 health and safety standards, with 98 of these structural quality indicators and 38 as process quality indicators (IOM, 1986).

Despite the amendments to the standards and the certification process that occurred during the 1980s, these generally did not keep pace with the increasingly complicated medical needs of residents. The nursing home industry's solution was to lobby to weaken the certification process. This move by the nursing home industry was contrary to media reports that had identified fraud, abuse, neglect, and poor care in nursing homes. Thus, HCFA commissioned the IOM to examine and report on nursing home regulations (IOM, 1986). The expert committee assembled by the IOM to

examine nursing home regulations concluded that care was "shockingly deficient" (IOM, 1986, p. 2). This was further verified by a General Accounting Office report (GAO, 1987). Both the IOM and the GAO reports advocated for stronger government oversight to protect nursing home residents.

The IOM and GAO recommendations were incorporated into Subtitle C of the Omnibus Budget Reconciliation Act of 1987 (OBRA-87). The specific nursing home reform provisions are sometimes referred to as the Nursing Home Reform Act (Emerzian & Stampp, 1993). The changes were regarded as significant and wide ranging. Forty-seven recommendations were included. A timetable was established for implementation, and not all the changes to standards and enforcement were in effect until 1995. OBRA-87 was largely responsible for the quality environment in which nursing homes operate today. This includes a more stringent survey process, revised care standards, sanctions and remedies, training of nurse aides, and use of the Resident Assessment Instrument (of which the Minimum Data Set (MDS) is a major component).

The IOM report recommended that nursing home regulations should be refocused and to move from assessment of structure and process to an assessment of outcomes. This was facilitated by the MDS. The MDS is a summary assessment of each resident. The original MDS developed in 1990 and implemented in 1991 was redesigned as the MDS 2.0 in 1995 (Rahman & Applebaum, 2009). This includes measures of residents' functional status and health conditions. With this information from the MDS, outcome indicators were developed (e.g., falls, behavioral symptoms affecting others, symptoms of depression, bladder/bowel incontinence, and urinary tract infections). In 1999, the Nursing Home Standards for health and safety used during the certification process consisted of 153 standards; 81 of these were structural quality indicators, 48 of these were process quality indicators, and 24 of these were outcome quality indicators.

The progression over time in use of quality indicators as part of the Nursing Home Standards is shown in Table 1. For parsimony, this time line is simplified as information from only 5 years are presented. The use of these various SPO quality indicators has evolved gradually, and few watershed events have prompted substantial change (with the exception of OBRA-87).

The drivers of use of these SPO quality indicators are also simplified. The drivers not only include federal/state oversight as described (i.e., as part of

Table 1. Progression Over Time in Nursing Home Standards and Deficiency Citations

SPO indicator type	Year				
	1963 <sup>a</sup>	1974 <sup>b</sup>	1987 <sup>b</sup>	1999 <sup>c</sup>	2009 <sup>c</sup>
Structure	5 of 55	5 of 59	5 of 98	5 of 81	5 of 104
Patient Care Advisory Physician	Disclosure of ownership	The resident has the right to receive information in a language he/she can understand.	Employment of qualified dietitian (F361)	Nurse aide registry verification (F496)	In-service education (F497)
Patient Care Attending Physician	Staff development	The resident has the right to manage his/her finances and are not required to deposit their personal funds with the facility.	Sufficient support personnel (F362)		
Charge Nurse on staff	Patient rights	The resident has the right to choose a personal attending physician.	Use of charge nurse and Registered Nurse (F354)	Responsibilities of Medical Director (F501)	
Registered professional nurse or licensed practical nurse on staff and on duty at all times	Director of nursing services	The activities program must be directed by a qualified professional.	Emergency physician services 24 hr a day (F389)	Paid feeding assistants (F373)	
Sufficient number nursing personnel on duty at all times (only recommendations based on what current state mandates are)	24-hr nursing care	The facility must help residents who have difficulties with vision and hear make appointments and arrange transportation.	Dental services in nursing facilities (F412)	Infection control program (F441)	
Process	5 of 22	5 of 31	5 of 38	5 of 48	5 of 62
Medical examinations upon admission and once every 2 months	Medical reviews	The facility must conduct initial and periodic “comprehensive, accurate, standardized, reproducible assessment of each resident’s functional capacity.”	Treatment to prevent/heal pressure sores (F314)	Influenza and pneumococcal immunization (F334)	
Only use physical restraints when necessary	Not medically necessary admissions or continued stays	Each resident must be examined at minimum every 3 months by the facility and revise the resident’s assessment based on the findings.	Assessment after significant change (F274)	Minimum Data Set transmission requirement (F287)	
Written nursing care plans	Staff hygiene	A comprehensive care plan must be developed within 7 days after completion of the comprehensive assessment.	Develop comprehensive care plans (F279)	Quarterly review of assessments (F276)	
Serious illness, accident, or death reporting process	Notification of patient status change	A physician may delegate tasks to a physician assistant, nurse practitioner, or clinical nurse specialist who is acting within the scope of practice as defined by State law.	Discharge summary (F287)	Drug regimen reviewed monthly (F428)	

(Table continues on next page)

Table 1. (continued)

SPO indicator type	Year				
	1963 <sup>a</sup>	1974 <sup>b</sup>	1987 <sup>b</sup>	1999 <sup>c</sup>	2009 <sup>c</sup>
Process	5 of 22	5 of 31	5 of 38	5 of 48	5 of 62
	Automatic "Stop Orders"	Patient care plan	In accordance with State and Federal laws, the facility must store all drugs and biologicals in locked compartments under proper temperature controls, and permit only authorized personnel to have access to the keys.	Notice before room/roommate change (F247)	Promptly notify Physician of Radiology/other findings (F511)
Outcome		3 of 3	5 of 24	5 of 24	
		A resident who is incontinent of bladder receives appropriate treatment and services to prevent urinary tract infections and to restore as much normal bladder function as possible.	Resident free from significant medication errors (F333)	Free from unnecessary drugs (F329)	
		Residents who have not used antipsychotic drugs are not given these drugs unless antipsychotic drug therapy is necessary to treat a specific condition as diagnosed and documented in the clinical record.	No development of mental problems (F320)	No feeding tube unless unavoidable (F321)	
		The facility must ensure that a resident maintains acceptable parameters of nutritional status, such as body weight and protein levels, unless the resident's clinical condition demonstrates that this is not possible.	Maintain nutrition status/therapeutic diet (F325)	No reduction in range of motion unless unavoidable (F317)	
			Activities of daily living do not decline unless unavoidable (F310)	Medication error rates of 5% or more (F332)	
			Maintain hearing and vision (F313)	Facility free of accident hazards (F323)	

Note: Some quality indicators can be categorized either as process or outcome quality indicators (Zimmerman, 2003).

<sup>a</sup>These standards were recommendations that predate federal nursing home standards. States were responsible for implementing and enforcing all nursing home standards at this time.

<sup>b</sup>Standards are presented.

<sup>c</sup>Deficiency citations are presented (deficiency citations are notice given to a nursing home to identify an area that is not meeting the minimum requirements [standards] set forth by law). The notation following the deficiency citation (i.e., F number) represents the coding on the survey form.

the certification process) but also include advances in measurement science and data availability (e.g., the MDS). They also include prompts from external bodies, such as the Joint Commission. The Joint Commission accredits relatively few nursing homes but as part of the Oryx system in the late 1990s emphasized outcomes of providers (Morrissey, 1997). This invariably had a spillover influence on nursing homes.

### **Advantages and Disadvantages of SPO Indicators of Quality**

The use of varying SPO quality indicators over time connotes improvement. This may not be the case; we have little evidence that quality indicators have improved in their association with actual quality. Moreover, some research has determined that current quality indicators do not meet accepted standards for measures (Nakrem, Vinsnes, Harkless, & Paulsen, 2009). It is also tempting to state that an improved association with quality may be especially true for outcome indicators. A prevailing view is that we should use more outcome indicators to improve quality (Spector & Mukamel, 1998). This is an issue we now discuss as SPO indicators have both advantages and disadvantages.

#### *Structural Quality Indicators*

Structural quality indicators are advantageous in several respects. Most significantly, structural quality indicators are easy to measure. Data used are often routinely available and relatively inexpensive.

Structural quality indicators also have disadvantages. Nursing homes can meet structural quality measure standards but not necessarily provide quality care. Echoing this, Donabedian (1988) noted that structural quality indicators can be blunt instruments. Although structural quality indicators are considered important for assuring quality, they are best viewed as "necessary but not sufficient." This is typified by the nursing home staffing level literature.

Staffing levels are included in many current quality initiatives. It would seem almost intuitive that providing higher levels of caregivers would improve quality of care. However, the literature in this area is somewhat ambiguous—with many empirical studies finding no such relationship (Castle, 2008). As a way of explaining this apparent anomaly, staffing levels are viewed as likely extremely important, but how staff are used (i.e., processes) may be just as inherently linked to quality (Castle).

#### *Process Quality Indicators*

Process quality indicators have advantages. They are often easy to interpret. For example, either a resident received a pneumonia vaccination or they did not. Many are also easy to enumerate and do not require adjustment (described subsequently). Process quality indicators may also help pinpoint how to improve quality of care. The Nursing Home Compare measure—prevalence of occasional bladder/bowel incontinence without a toileting plan—would indicate that a toileting plan should be used for residents with bladder/bowel incontinence. For consumers, this asset may be less important as a quality indicator, but for providers, this is of use.

Process indicators may also have inefficiencies as quality indicators. In many cases, process indicators assess what is being done and not necessarily the appropriateness of what is being done. Medications (a process indicator) can be given to the wrong resident (Handler et al., 2008). Other medication errors include incorrect dose, incorrect time, incorrect prescription, or even given when not needed (to name just four; Handler et al., 2008).

Process measures are often criticized as representing measures of documentation rather than actual care. Such criticisms of paper compliance are often a drawback levied on physical restraint use care, for example. To prevent the damaging side effects of immobility due to restraint, federal regulations mandate that restrained residents should be released, exercised, and repositioned every 2 hrs. However, Schnelle, Simmons, and Ory (1992) determined that actual care and the documentation of this mandate were often inaccurate.

As measures assessing what is being done, process quality indicators are limited in that some components of care are difficult to measure. Technical expertise is important in many components of care. For example, use of physical restraints does not include a dimension for how well this procedure was implemented. A nursing home resident can be placed in physical restraints in such a way that bruising or restricted circulation can occur.

#### *Outcome Quality Indicators*

Outcome indicators are considered more stringent quality indicators than structural or process indicators because deviations from appropriate care should influence residents' health outcome (Donabedian, 1988). Moreover, outcome indicators

in many cases are important to know—they have intrinsic interest. Mortality rates, for example.

Nevertheless, outcomes can be problematic measures. To be a valid indicator, the change in residents' health status (i.e., outcome) must be attributable to prior care (i.e., under the control of the provider). Spector and Mukamel (1998) describe this attribution difficulty as the difficulty in isolating the facility effect. This attribution is in many cases unclear. In addition, many outcomes are influenced by genetic, environmental, or other factors unrelated to care. That is, care is only one of several determinants of health status (Mant, 2001).

To help mitigate these confounding issues (genetic, environmental, or factors unrelated to the care process), outcome measures are often statistically manipulated to account for differences in risk for adverse outcome among residents (and/or facilities). The process and science of "risk adjustment" has many issues, most of which were previously discussed by Spector and Mukamel (1998). One important issue is a real risk of either over or under adjustment of the value of the outcome indicator—which will bias the reported outcome rate.

One particularly challenging issue for risk adjustment is the often interrelated nature of the constructs used. For example, a factor associated with the development of pressure ulcers is malnutrition. So if facilities receive a high number of residents with malnutrition, some adjustment would seem necessary. However, if the nursing home influenced the malnutrition in the first place, then as a characteristic used for risk adjustment, this is clearly inappropriate.

This malnutrition example also raises the issue that the baseline distribution of many outcomes (or resident characteristics) is also not random among nursing homes. For example, some nursing homes specialize in treating some outcomes (e.g., pressure ulcers) or gain a reputation for providing high quality care in a specific area, thereby receiving more residents with that condition. For these nursing homes, unadjusted outcome scores will not accurately reflect the quality of care.

The period of observation for some outcome indicators may also be untenable (Brook, McGlynn, & Shekelle, 2000). For the resolution of clinical conditions, such as depression, knowing that there was no clinical reoccurrence may be a more appropriate quality indicator than a simple prevalence rate. However, the period of follow-up observation needed is unclear, the data collection needed

becomes more complex, and the resident may not reside in the facility long enough for the indicator to be of use.

## Current Quality Indicators

The "quality" of nursing homes is generally assessed using several quality indicators, usually including a mixture of several SPO indicators. Current important sets of quality indicators are the deficiency citations used as part of Medicare/Medicaid certification, the Facility Quality Indicator Profile Report, those used by Nursing Home Compare, and the Advancing Excellence Campaign. These current sets of quality indicators are important because they are national in scale and include a comprehensive scope of quality indicators. They influence which quality indicators providers address, consumers pay most attention to, and regulators examine. The quality indicators used in these initiatives are shown in Table 2 and are categorized into SPO indicators.

### Deficiency Citations

Deficiency citations are influential quality indicators because they represent an assessment of quality coming from the main nursing home oversight body. They are presented in many report cards (including Nursing Home Compare) in government reports (such as those from the GAO) and in the lay press.

### Facility Quality Indicator Profiles

The Center for Health Systems Research and Analysis developed indicators that could be used to evaluate nursing home care (Zimmerman, 2003)—these are often called the Nursing Home Quality Indicators (or QIs). These were developed from the clinical research literature and care planning guidelines. There were a total of 24 indicators that covered 12 areas of care that were found to be the most relevant through information from the MDS (Meiller, 2001). These Quality Indicators are influential because through the National Automated Quality Indicator System, regulators can gauge quality issues as a preliminary step to the certification process (Zimmerman). Specifically, the Facility Quality Indicator Profile Report identifies areas for further emphasis during the survey process. These reports are not available to the public but are available to each provider.

**Table 2.** Quality Indicators Used in Prominent Quality Initiatives

Quality initiative	Structure	Process	Outcome
Nursing Home Compare		Residents who were physically restrained Long-stay residents given the influenza vaccine Long-stay residents who were assessed and given the pneumococcal vaccine Short-stay residents who were assessed and given the pneumococcal vaccine  Short-stay residents given the influenza vaccine	Residents who have increased depression or anxiety Residents with a urinary tract infection Residents who have an increased weight loss. Residents who have a decreased ability to move about in and around their room Residents who have increased their need for help with daily activities Residents who spend most of their time in bed or in a chair Low-risk residents who lose control of their bowels and/or bladder Residents who spend most of their time in bed or in a chair Residents who have moderate to severe pain High-risk residents who have pressure sores Low-risk residents who have pressure sores Short-stay residents with delirium Short-stay residents who had moderate to severe pain Short-stay residents with pressure sores
Quality Indicators		Prevalence of occasional or frequent bladder or bowel incontinence without a toileting plan Prevalence of indwelling catheters Prevalence of tube feeding  Prevalence of antipsychotic use in the absence of psychotic and related conditions Prevalence of antianxiety/hypnotic drug use Prevalence of hypnotic use more than two times in the last week Prevalence of daily physical restraints Prevalence of little or no activity	Incidence of new fractures  Prevalence of falls Prevalence of behavioral symptoms affecting others Prevalence of symptoms of depression  Prevalence of depression without antidepressant therapy Use of nine or more different medications Incidence of cognitive impairment Prevalence of bladder or bowel incontinence Prevalence of fecal impaction Prevalence of urinary tract infections Prevalence of weight loss Prevalence of dehydration Prevalence of bedfast residents Incidence of decline in late loss ADLs Incidence of decline in ROM Prevalence of little or no activity Prevalence of Stage 1–4 pressure ulcers

(Table continues on next page)

Table 2. (continued)

Quality initiative	Structure	Process	Outcome
Deficiency citations (used in 2009)	5 of 104	5 of 62	5 of 24
	Facility must develop and implement written policies and procedures that prohibit mistreatment, neglect, and abuse of residents and misappropriation of resident property (F226)	Proper treatment to prevent or treat pressure sores (F314)	ADLs do not decline unless unavoidable (F310)
	Facility may not employ persons who have been found guilty of abuse (F225)	Resident is not catheterized, unless unavoidable (F315)	No reduction of ROM, unless unavoidable (F317)
	Facility must have written policies and procedures that prohibit abuse and neglect (F224)	Appropriate treatment for incontinent resident (F316)	Residents are free of any significant medication errors (F333)
	Facility should have policies that accommodate residents' needs and preferences (F246)	Proper care and services for resident with nasogastric tube (F322)	Each resident's drug regimen must be free from unnecessary drugs (F329)
	Facilities director must be fully qualified (F249)	Facility must provide sufficient fluid intake to maintain proper hydration and health (F327)	Residents who use antipsychotic drugs receive gradual dose reductions (F331)
Advancing Excellence Campaign		Reduce the use of physical restraints Improve treatment of pressure ulcers  Improve pain management for long-term residents Improve pain management for short-term residents Set clinical quality targets yearly Assigning the same nurse aides to the same residents	Reduce pressure ulcers Incorporate resident and family care experiences into improvement plans Measure staff turnover and satisfaction

Note: The notation following the deficiency citation (i.e., F number) represents the coding on the survey form.  
ADLs = activities of daily living; ROM = range of motion.

### Nursing Home Compare

Nursing Home Compare was developed by the Centers for Medicare and Medicaid Services (CMS; in 2001, HCFA changed its name to CMS). Via the Internet, Nursing Home Compare provides information on all Medicare/Medicaid-certified nursing homes in the United States. This information includes what are called Quality Measures (GAO, 2002), which are intended to represent indicators of quality of care. The number of Quality Measures has varied over time and currently consists of 19. The Quality Measures were the result of extensive testing that included both provider and consumer concerns of what indicators were most useful (Abt Associates, 2004). Nursing Home

Compare is influential because it presents publicly available standardized quality information on most nursing homes in the United States.

### Advancing Excellence Campaign

The Advancing Excellence Campaign was instituted in 2006. It is a voluntary coalition of providers (such as the American Health Care Association [AHCA]) with the goal of promoting excellence in nursing home care (Advancing Excellence in Americas Nursing Homes, 2009). This includes measuring quality indicators (see Table 2). Nursing homes voluntarily work on improving three of the eight quality goals. The Advancing Excellence Campaign

is included as an influential quality initiative as it includes several leaders in quality from government agencies, foundations, and providers.

We do note that many other public and private entities influence quality indicators used for nursing homes. These include Quality Improvement Organizations (QIOs; Kissam et al., 2003) and the Agency for Healthcare Research and Quality. Many states also have initiatives in place that address one or two specific indicators (e.g., Indiana Pressure Ulcer Quality Improvement Initiative; [www.in.gov/isdh/24611.htm](http://www.in.gov/isdh/24611.htm)). Other states are using pay for performance (P4P), also known as Value-Based Purchasing, initiatives as part of Medicaid reimbursement for nursing homes. Given the link to reimbursement, the quality indicators used are clearly important for nursing homes in these states (Briesacher, Field, Baril, & Gurwitz, 2009) and are discussed subsequently.

### **Issues With Current Quality Indicators**

The previous sections highlight ambiguities in quality indicators used in nursing homes. SPO quality indicators each have various advantages and disadvantages. No clear delineation or consensus on which sets of SPO indicators should be used exists. A large and confusing number of sets of quality indicators are prevalent. Individual quality indicators and sets of quality indicators, in general, are also encumbered by several other issues. These are further discussed.

#### **Parsimony**

No single quality indicator represents the overall quality of a nursing home (i.e., a global measure). Possibly, the closest global measure is the Five Star Quality Rating System recently introduced by CMS as an addition to the Nursing Home Compare Web site. The Five Star Quality Ratings give consumers a “snapshot” or simplified look at how a nursing home compares on quality. This rating system provides a graphical representation (i.e., stars) of overall high and low performance in three areas: Health Inspections, Staffing, and Quality Measures (CMS, 2010).

The availability and use of multiple quality indicators have limitations. One disadvantage of using multiple quality indicators is that findings can be inconsistent. Empirically, quality indicators have orthogonal relationships (Mor, 2005). That is, multiple dimensions of quality are thought to exist. This likely occurs because nursing homes provide care across multiple dimensions (medical and

social, to name two); and they are not consistent in the quality of care for each dimension.

Thus, the number of “needed” quality indicators is a vexing issue. A narrow focus on a single (or a few) quality indicator may be misleading and may lead to erroneous, incomplete, or simply incorrect conclusions. However, a focus on more quality indicators introduces the risk of confusion and may be no less misleading or incomplete.

#### **Measurement Issues**

For relatively rare outcomes, quality indicators have limited ability (power) to detect real differences in quality. The standard errors for rare events are large, giving rise to several issues. First, the true quality level lies within the standard error so that reliability of a single measure is questionable. Second, this is compounded when comparing more than one facility. With large bands of standard errors, it can be problematic to differentiate whether one facility has a truly better/worse quality level than that of the other.

A further issue is the assumed linearity of quality indicators. That is, does a 10% rate represent twice the quality problem of a 5% rate? Also, linearity assumes full use of the scale such that 0% and 100% are possibilities. This is improbable for many quality indicators. For example, pressure ulcer rates less than 2% are considered improbable (Lyder, 2003). So the implied scales are not necessarily clinically achievable. Experience shows that the functional form of quality indicators is often unexpected and nonlinear (Castle & Engberg, 2005).

As part of process and outcome quality indicator assessment, ascertainment bias can occur (a type of detection bias). Assessing the elements included in a process or outcome quality indicator may vary by provider. As Mor, Angelelli, Gifford, Morris, & Moore (2003) have described, higher quality nursing homes may be more able to make these assessments than lower quality nursing homes. Higher quality nursing homes may be actively “looking” for problems. Alternatively, lower quality nursing homes may have high staff turnover or high agency staff use, for example, and may inadequately complete documentation (Sangl et al., 2005). As such, higher quality nursing homes may have systematically higher quality indicator rates, and lower quality nursing homes may have systematically lower indicator rates.

The issue ascertainment bias (detection bias) has been of particular concern with quality indicators formulated from the MDS data (Sangl et al.,

2005). That is, the reliability and validity of the data have been subject to some criticism (Rahman & Applebaum, 2009). Issues such as interrater variability are often raised as problems influencing the usefulness of these data.

Detection bias is a measurement issue inherent to deficiency citations. Considerable variation in the use of deficiency citations across different locations exists. Many states do not emphasize the same deficiency citations, and some are more or less aggressive in the use of deficiency citations in general. The high degree of variation can limit the usefulness of deficiency citations not only for CMS but also for consumers and providers.

### Nursing Home Characteristics

U.S. nursing homes consist of a diverse group of providers. Some of the diversity in structural characteristics of nursing homes can work against the use of many quality indicators. One obvious example is that the small average number of beds limits statistical power. Less frequently noted is the unit-based nature of many nursing homes. This structural arrangement can lead to distinct practices and outcomes in different units. Powell Lawton maintained that we could learn substantially more about nursing home quality by using a unit-based perspective. Mor and colleagues (2003) also indicate that intra-provider variation may be helpful. Simply put, the averages reported on facility quality may hide substantial and important variation in quality. However, examining intra-provider variation limits statistical power but can also add to the quality indicator overload (by reporting quality indicators on each unit). Nevertheless, a reasonable question would seem to be should a facility with widely disparate quality levels, yet somewhat reasonable average levels, be required to report this variation?

Nursing home residents are also quite varied. Some residents spend very little time in the facility (e.g., for rehabilitation), which limits their exposure time to facility influences. Moreover, health status can be transitional, and untangling these transitional health changes from adverse changes precipitated by facility care can be problematic. These residents may also require care that is distinct from other residents. In such cases, specific outcomes are sometimes used (e.g., in Nursing Home Compare). This specificity restricts the generalizability of these quality indicators.

In addition to short-stay residents, many other subpopulations of residents exist in nursing homes

with distinct needs and characteristics—many of which can influence quality. This includes not only resident needs based on demographics age, gender, and race but also resident needs based on characteristics, such as religion. Thus, in many respects, there is no such thing as a “typical” nursing home or a “typical” nursing home resident. As such, this challenges much of the quality rubric (including assessment, reporting, and development of indicators).

### Consumer-Determined Quality

Quality indicators are also often criticized as having a medical focus, and as such, some dimensions of quality that consumers' value do not get reflected. Use of resident and family satisfaction scores represent one means of including a consumer “voice” as quality indicators (Sangl et al., 2007). States such as Ohio include satisfaction indicators in their report cards (Ejaz, Straker, Fox, & Swami, 2003). However, this approach is uncommon primarily due to the expense involved in collecting satisfaction information (Sangl et al., 2007).

Resident and family complaints are investigated, first as part of the Long-Term Care Ombudsman Program if the complaint was filed through the Ombudsman (Allen, Klein, & Gruman, 2003) and second as part of the state certification agency if the complaint was filed to this agency (Stevenson, 2006a). As consumer-generated quality concerns, complaints were shown by Stevenson (2006a) to be more timely than other quality indicators, and they had the potential to supplement quality reporting efforts.

Consumers of nursing home services examine nursing home quality information from report cards. Many report cards (e.g., Angie's List) are not associated with government entities. Some of these report cards use many of the same quality indicators as government-sponsored sites, such as deficiency citations (Castle & Lowe, 2005), whereas others offer consumer opinions/reviews of nursing homes. This shows that a market for consumer-based information exists and that it may have some value. Stevenson (2006b) presents a review of public reporting of nursing home quality.

### Policy Initiatives and Quality

OBRA-87 undoubtedly changed nursing home care in many ways. Some empirical research has attributed OBRA-87 as successfully influencing quality (Shea, Russo, & Smyer, 2000), whereas

some studies have identified a relatively small influence on quality (Kumar, Norton, & Encinosa, 2006). However, OBRA-87 was a watershed event in ways other than its influence on quality. OBRA-87 represented the use of quality as a “tool” that policy makers could use to influence the nursing home market. Until OBRA-87, policies had focused on quality assessment (e.g., through the certification process). However, OBRA-87 promoted a more proactive approach that stipulated specific actions needed for quality improvement (although certification still remains a process primarily consisting of assessment).

As a follow-up to the 1986 IOM report that helped stimulate OBRA-87, a further report continued to highlight poor quality nursing home care (IOM, 2001). Policy interventions have continued to address the nursing home quality issue, and many of these continue to use quality indicators as proactive tools to affect the nursing home market.

The first two policy interventions we discuss are report cards and P4P. These generally come under the rubric of what are called market-based incentives (Werner & Konetzka, 2010). These initiatives use provider competition (i.e., the market) as an aggregate mechanism to facilitate quality improvement. The next policy intervention is patient safety, which is a movement with its genesis in the acute care sector. Policy developments in the certification process are next discussed. Finally, the potential implications of the recent 2010 health care reforms as part of the Patient Protection and Affordable Care Act (P.L. 111–148) are discussed.

### *Report Cards*

Somewhat recently, a consumer empowerment movement has developed in health care. This movement has influenced health care policy, and one linchpin to this was the development of report cards. Report cards have the potential to influence quality of care. The mechanism behind this change rests on consumers’ examining report cards and migrating toward higher quality facilities and nursing homes in turn competing to improve their quality in order to attract potential residents.

The AARP has published a compendium that lists report cards available in each state (Kelly & Gearon, 2008). The most widely discussed nursing home report card is Nursing Home Compare (Mukamel, Weimer, Spector, Ladd, & Zinn, 2008). Since 2002, when Nursing Home Compare was first widely released, improvements in the Quality

Measures have occurred. For example, Mukamel and colleagues (2008) found two Quality Measures (from five examined) to show significant improvement over time. However, the MDS is used to construct the Quality Measures. It may be that nursing homes have become better at completing the MDS documentation.

### *Pay for Performance*

P4P initiatives are policy options that seem to be gaining some traction for influencing the quality of the nursing home industry. From 2002 to 2007, six states (Iowa, Minnesota, and Kansas, Georgia, Ohio, and Oklahoma) have used nursing home P4P (Arling, Job, & Cooke, 2009). An additional program has been initiated by CMS, the Nursing Home Value-Based Purchasing Demonstration Program (Levenson, 2006). Quality indicators are key components of all P4P initiatives.

Some results indicate that P4P has improved levels of some nursing home quality indicators (Arling et al., 2009), although others have noted that there are not enough data to show that P4P incentives are enough to change providers’ behaviors and there is limited evidence that P4P improves overall quality of care (Briesacher, Field, Baril, & Gurwitz, 2008).

These P4P initiatives are shaping the emphasis on quality indicators. For the most part, existing quality indicators are used. For example, residents with pressure ulcers, catheters, physically restrained, and whose mobility decreased. Thus, new quality indicators are not included in P4P, but because of their use in P4P schemes, these quality indicators have assumed greater importance. Still, these quality indicators are subject to many of the issues discussed earlier. They are especially problematic with respect to the number of needed measures as the risk of using too few quality indicators is that they can unnecessarily narrow the view of whether quality has truly improved.

### *Patient Safety*

The *To Err is Human* (Kohn, Corrigan, & Donaldson, 1999) report galvanized the public and legislators partly by suggesting that as many as 98,000 deaths attributable to avoidable mistakes occurred in U.S. hospitals. As a result, patient safety has become an important topic for many health care providers. Moreover, prominent national organizations have developed various initiatives to

assess and improve patient safety in the nursing home setting (e.g., AHCA, 2009; [www.ahcancal.org](http://www.ahcancal.org)).

These initiatives are also shaping current quality indicators. In the 9th Scope of Work for QIOs, Patient Safety Culture is to be assessed in nursing homes. Certification has likewise recently started to address patient safety issues. This includes emphasis on deficiency citations for patient safety issues (e.g., medication administration). CMS also recently extensively updated the pharmacy- and medication-deficiency citations addressing medication errors (Krechting, 2006).

### Certification

CMS has continued to refine the nursing home certification process. For example, the timing of survey visits was criticized as being highly predictable. Thus, more variation in this timing was introduced (GAO, 1999). Sanctions (e.g., fines) were criticized as ineffectual. The sanctions were further developed for facilities that received deficiency citations (penalties of up to \$10,000 a day, denial of payment for new admissions, state monitoring, temporary management, and termination from the Medicare or Medicaid programs; GAO, 1999).

A recent change in certification is the Special Focus Facility (SFF) initiative. Nursing homes that are determined to have a greater number of quality problems, more serious problems than average, and a demonstrated pattern of quality problems are included in this initiative (CMS, 2008). For nursing homes, inclusion in the SFF program entails having two survey inspections per year (rather than the standard one survey) and the potential to be terminated from the Medicare and/or Medicaid programs.

### Health Care Reform

As part of the Patient Protection and Affordable Care Act, there are requirements that would necessitate nursing homes to disclose information on ownership, accountability requirements, finances (i.e., expenditures) and place information on standardized quality indicators on a Web site (much like Nursing Home Compare) (Kaiser, 2010; <http://healthreform.kff.org/>). Depending on how these requirements are implemented, further quality indicators for nursing homes may become widely available (e.g., benefits paid to staff, staff wages, staff turnover).

## Provider Initiatives and Quality

With respect to the development and use of quality indicators, policy interventions are significant. However, clearly, it is provider initiatives that ultimately influence nursing home quality. These initiatives include the use of Quality Assessment (QA), Total Quality Management (TQM), Continuous Quality Improvement (CQI), and Perfecting Patient Care (PPC; Spear, 2004). It is worth clarifying also that the development and measurement of quality indicators are not necessarily related to solutions to quality. It is effective use by providers that is most related to quality solutions. Nevertheless, with respect to quality indicators, one provider development, culture change, has significantly affected the development and measurement of quality indicators.

Since the early 1990s, some nursing homes have adopted resident-directed philosophies (or resident-directed care; also known as culture change). Organizations, such as Action Pact, Inc. and Eden Alternative, have fostered the growth of resident-directed care. This places the resident at the center of the decision-making process. It allows the traditional top down model of decision making to become inverted to allow staff (e.g., nurse aides) to work with the residents to make decisions (i.e., when to eat). This recognizes the importance of residents' Quality of Life (QoL; Castle, Ferguson, & Hughes, 2009). Quality indicators used thus are QoL related, which include measures such as energy levels, sleep, self-esteem, and sense of mastery.

Culture change is primarily a provider development. However, characterizing the public-private intertwining of nursing home quality, CMS is influential in this area also. CMS directed QIOs to facilitate improvements in nursing home culture (Werner & Konetzka, 2010). The implementation of the new MDS 3.0 is expected for October 2010 (Rahman & Applebaum, 2009). With this reformulation, the MDS 3.0 is reported to include items assessing resident QoL ([www.cms.hhs.gov](http://www.cms.hhs.gov)), which is a departure from the primarily clinical focus of most of the quality indicators coming from these data (Rahman & Applebaum).

The benefits of culture change have proven difficult to gauge. After a 1-year study comparing the first year of implementation of the Eden Alternative and a control nursing home run by the same organization, very few quantitative differences existed (Coleman, Looney, O'Brien, Zeigler, & Pastorino, 2002).

## **Furthering Advances in Quality**

We have identified substantial progress in the area of “quality” of nursing homes. Numerous quality indicators have been developed. Numerous policy initiatives have been implemented. Numerous provider initiatives also exist. For this narrative, the “elephant in the room” remains what can be done to further improve quality? We propose that further advances in quality may occur: first, by some long-term care integration policies; second, enhanced current initiatives; and, third, enhanced certification activities. These are discussed, along with additional research that may be needed to make these advances a reality.

First, one somewhat troubling fact appears to be that many nursing homes still have poor quality levels. Yet, many of the initiatives discussed earlier indicate that improvements in quality have occurred. In this regard, we cite [Cherry \(1991\)](#) who identified improved quality and poor quality as not necessarily contradictory. Cherry pointed out that in the nursing home setting, we are often describing less poor care versus poor care, not necessarily good versus poor care.

Alternatively, the poor quality levels that seem to exist in many nursing homes may be a function of the quality process itself. As we identify earlier, it may be that quality indicators are simply not accurate metrics for measuring actual quality. Given the number of quality indicators, this is likely not the case for all indicators. It may be that given the number of quality indicators available, the worst receive attention, whereas the best do not. For example, physical restraint use has declined, but a more recent emphasis on pain management has developed. Parenthetically, we note that this does seem to be an issue with quality measurement in general. We seek and report the worst and not necessarily the best (with some exceptions such as deficiency free nursing home status).

In addition, to be fair to nursing homes, resident case mix has increased. Thus, nursing homes are challenged to care for sicker residents with substantially more health problems. So quality may have indeed improved, but this may not have kept pace with the challenges presented by the resident population.

### *Long-Term Care Integration*

One non-nursing home policy would be to address integration and continuity with other areas

of the long-term care system ([Konetzka & Werner, 2010](#)). That is, to step back from nursing homes to address the “system” of long-term care providers. Many residents come to nursing homes with unmet needs (and frustrations) that could (or should) have been addressed in other settings. As the often-final stop in several transitions across various long-term care settings, nursing home quality would surely benefit if residents were cared for appropriately in these prior settings.

A further policy option does not focus directly on nursing homes but has a spillover influence. That is, the emphasis on Home and Community-Based Services (HCBS) as an alternative to nursing home care ([Reinhard, 2010](#)). Policy makers have expanded the coverage of HCBS (primarily under Medicaid waivers) to redirect potential nursing home residents to community settings ([Wiener, Tilly, & Alecxih, 2002](#)). In addition, in the recently enacted health care reform legislation (i.e., Patient Protection and Affordable Care Act), barriers to providing HCBS would be eliminated (section 2402), including increased coverage of services, removal of limits on the number of participating individuals, and incentive payment programs for states to develop HCBS ([Richards, 2010](#)). This may force more market-based competition among nursing homes.

### *Enhanced Current Initiatives*

One intervention would be for policy makers and providers to continue along their current paths—but doing what they know in an enhanced fashion. That is, for providers, culture change, QA, TQM, CQI, and PPC could all be continued. To continue with these initiatives, a change in emphasis is needed. Policy often focuses on aligning the needed incentives, whereas these provider initiatives need an alignment of favorable conditions. An extreme example would be Medicaid payment reform. An argument could be made that providers already have the tools for providing quality care (i.e., QA, TQM, CQI, and PPC) but that resources are needed to stimulate improvement. Empirical research has shown that levels of Medicaid payment rates (as an essential resource for nursing homes) are consistently associated with nursing home quality ([Grabowski, 2004](#)). However, this is presented as an extreme example as such reform is unlikely in the current fiscal environment.

More subtle changes in emphasis may be needed and more feasible. An example would be better

top management capability. Policy could promote these more favorable conditions (e.g., subsidies for nursing home top management education). However, the role of CMEs, state licensing standards, and the role of training all need to be investigated more thoroughly. Improving staffing levels and staffing competencies could also produce an alignment of favorable conditions, although policy to date has tended to emphasize stipulating staffing conditions (especially staffing levels). These often-unfunded mandates have the incumbent risk of providers' skimping in other areas—thereby nullifying any potential quality gains.

One area of research from a feasibility standpoint would be the notion that providers are indeed able to effectively use existing tools for providing quality care (Wagner, van der Wal, Groenewegen, & de Bakker, 2001). Many of these are built off the notion of using systems level quality improvement (Werner & Konetzka, 2010). This orientation may be difficult to implement in an industry that is technology deficient and reliant upon a paraprofessional workforce. However, the QIOs appear to have had some success in doing so (Kissam et al., 2003). One recent notable quality indicator development initiative has included the resources available in the average nursing home in choosing candidate quality indicators (Saliba et al., 2005).

For policy makers, report cards, patient safety initiatives, P4P, and the certification process could all be continued. Each has its benefits and limitations. Subtle changes could also be made, such as providing aggregate information on chains; this could promote more corporate involvement in quality. P4P could be integrated with specific quality improvement activities such that payments are for specific measures (such as improved staffing). However, from a quality perspective, this creates a vast number of quality indicators that need to be tracked by providers and creates tensions between providers and regulators. It also creates the risk of accentuating measurement and not improvement. One recent suggestion to overcome this quality indicator overload is to focus on quality improvement and not necessarily specific indicators (Werner & Konetzka, 2010). That is, nursing homes could choose areas for improvement and be credited for these initiatives. This has the advantage of overcoming the retrospective nature of quality monitoring (Scott, Vojir, Jones, & Moore, 2005). However, a disadvantage would be that public reporting initiatives would still likely drive the

areas chosen for improvement. This would make these quality indicators more salient.

### Certification Process

The use of deficiency citations is thought to foster minimal compliance by providers. That is, these can create thresholds such that deficiency citations foster a quality floor rather than quality improvement. Still, the certification process (beyond deficiency citations) represents a viable and ongoing infrastructure for further quality improvement and development of quality indicators. It may be possible to make further use of this process and further use of deficiency citations. They are ultimately used as quality indicators with specifications as benchmarks, rankings, and specific targets. Further development of metrics for deficiency citations would appear integral to their effective use as quality indicators.

The certification process is generally regarded as fostering a compliance culture. It may be possible for nursing homes to form relationships with State Survey Agencies, who conduct survey and certification activities. This may move the compliance orientation to a more proactive orientation (Kissam et al., 2003).

Deficiency citations could be used for further quality indicator development. As described, producing a global quality indicator comes with many issues. However, using deficiency citations may be amenable to producing an aggregate quality score. For each deficiency citation, 1 of the 12 categories is used to define scope and severity of the problem(s) identified. Some research exists in this area wherein a numeric system for collapsing the scope and severity information and reducing measurement noise in survey results was developed (Antonova, 2008). This could be expanded as an aid to parsimoniously reporting deficiency citations.

### Conclusions

Quality concerns in nursing homes still exist. Many of these concerns have received considerable attention in the public press. For example, the Lexus-Nexus (a database of press reports) lists more than 500 accounts of poor quality in nursing homes in 2009. Empirical research studies still identify poor quality and government reports continue to find fault with care in nursing homes. Nevertheless, these current accounts should be tempered by current nuances that have occurred in our understanding of quality of care in nursing homes.

The scope of nursing home quality indicators is phenomenal. The scale of what is routinely measured is also extremely broad. But somewhat ironically, 45 years after the passage of Medicare and Medicaid and more than 20 years after the passage of OBRA-87, it remains somewhat difficult to answer the following question: what is the quality of nursing homes in 2010? What we can say with some certainty is that improvements have likely occurred, and what we can say with even more certainty is that improvements are still needed.

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# Reliability of the Nursing Home Survey Process: A Simultaneous Survey Approach

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**Purpose:** We designed this study to examine the reliability of the nursing home survey process in the state of Kansas using regular and simultaneous survey teams. In particular, the study examined how two survey teams exposed to the same information at the same time differed in their interpretations.

**Design and Methods:** The protocol for simultaneous surveys consists of having one in-region and one out-of-region team survey a facility together.

**Results:** The regular and simultaneous survey teams generally agreed about the number of deficiencies. The intraclass correlation coefficient was 0.87 for total deficiencies and 0.76 for deficiencies with scores of G or higher. But in a substantial number of instances the teams did not agree about the scope and severity of the deficiency or about what regulation the nursing home had breached.

**Implications:** The survey process is reliable when assessing aggregate results, but it is only moderately reliable when examining individual citations. Stakeholders (i.e., consumers, policy makers, nursing home administrators) should be aware of the limitations of the survey process. It needs to be modified to reduce variability.

**Key Words:** Federal citations, F tags,  
Quality of care, Deficiencies

In order to participate in Medicare and Medicaid, nursing facilities must meet conditions of participation set by the Centers for Medicare and Medicaid Services (CMS; for a review, see Mullan & Harrington, 2001). In order to ensure compliance with 189 federal regulations, state survey agencies must inspect each nursing facility every 9 to 15

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months (CMS, 2005). These regulations fall into several categories: resident rights, quality of life, quality of care, resident assessment, services, dietary, pharmacy, rehabilitation, dental and physician, physical environment, and administration. Surveyors cite deficiencies when a facility does not substantially comply with a regulation. Although the regulations and survey process are federally mandated, state agencies carry out the survey process.

Dissatisfaction with the survey process is widespread. Resident advocacy groups stress that state survey teams often miss important problems with care and fail to respond to complaints quickly. A Government Accountability Office (GAO; 2004) study identified several reasons for these shortcomings: insufficient and inexperienced survey staff, confusion about the regulations, inadequate state oversight of the survey process, and the predictable timing of surveys. Surveyors question the integrity of the inspection, political pressures to water down inspection findings, and the effectiveness of the enforcement process (Grassley, 2004). Industry representatives argue that the current survey and enforcement system "is an entirely subjective, process-oriented snapshot inspection system that focuses on punishment—not quality improvement" (Ousley, 2001 p. 1).

An ongoing concern for all of these stakeholders is that the number of deficiencies varies substantially between states (GAO, 2003). For example, in 2001 the proportion of deficiency-free nursing homes ranged from 33.5% in Virginia to 0% in Nevada, and the mean number of deficiencies ranged from a high of 14.2 per facility in Nevada to a low of 1.9 per facility in New Jersey (Office of the Inspector General, 2003).

Variation also exists within states. For example, the state of Kansas is composed of 6 survey regions. In 2001 facilities in the Northeast Region averaged 11.64 deficiencies, nearly three times as many as facilities in the West Region (3.69 deficiencies). Furthermore, deficiencies in the Northeast Region tended to be assigned higher scope and severity. Administrators and directors of nursing tended to think this heterogeneity reflected differences in the survey process; surveyors thought it reflected differences in facility characteristics. Although they did

**Table 1. Scope and Severity Matrix**

Severity of the Deficiency	Scope of the Deficiency, Rating (State Share)		
	Isolated	Pattern	Widespread
Immediate jeopardy to resident health or safety	J (0.2%)	K (0.0%)	L (0.0%)
Actual harm that is not immediate jeopardy	G (5.8%)	H (0.0%)	I (0.0%)
No actual harm with potential for more than minimal harm that is not immediate jeopardy	D (45.0%)	E (34.0%)	F (9.7%)
No actual harm with potential for minimal harm	A (0.0%)	B (0.9%)	C (4.3%)

**Notes:** The State Share is the percentage of deficiency citations with this scope and severity cited in surveys of free-standing Kansas nursing homes in 2003. F, H, I, J, K and L deficiencies may constitute substandard quality of care. Fines may be levied or restrictions on participation in Medicare and Medicaid may be imposed.

not resolve this question, our earlier analyses found statistically significant regional differences ( $p < .001$ ) even after controlling for size, case mix, nursing hours per resident day, and ownership (Forbes-Thompson et al., 2003). The reliability of the survey process appears to be worthy of careful study.

The purpose of this study was to evaluate in some depth how and why Kansas survey teams varied in their assessments. More specifically, our aim was to compare the findings of two survey teams exposed to the same information at the same point in time. We addressed this aim using a mixture of quantitative and qualitative methods.

An overview of the survey process provides a context for our study. Surveys entail standard procedures plus flexibility once a team enters a nursing facility. The process begins with presurvey preparation that includes a review of the facility's quality indicators (Arling, Kane, Lewis, & Mueller, 2005), history of complaints, and previous survey results. The team then proceeds to an entrance conference with the administrator and an initial tour. After this the team selects a group of residents, based on pre-survey information and the initial tour, for a more in-depth review. Using protocols established by CMS, the survey team gathers information in a number of ways, including medical record reviews, observations of direct resident care, resident interviews, family interviews, and observations of events such as activities and meals. Each phase of the survey process has detailed written guidelines, and as information is gathered, the team reviews it and sharpens the focus of the survey on potential problem areas.

This structure allows teams to react to and explore problems identified during data collection. It also allows for prioritization of problems while on

site. However, this flexibility may also increase the variability of the survey process, because surveys of apparently similar facilities may focus on quite different aspects of care. How detailed a survey becomes also may depend on the observational skills of the surveyors, the clinical and management skills of the surveyors, or the number of problems found.

On the last day of the survey, surveyors meet to interpret their findings and to identify the number, scope, and severity of deficiencies that they found. The survey team then meets with the administrative staff and shares its preliminary findings. In Kansas, a quality improvement coordinator reviews these findings before the team submits the final survey report to the Department on Aging.

We should note that the final survey report may not be "final." Nursing homes can appeal any deficiencies or penalties through an informal dispute resolution process. Reductions in the number, scope, and severity of citations are common (GAO, 2003a).

Some deficiencies identify more serious problems than others, and some deficiencies allow for the imposition of more serious penalties. Table 1 outlines the scope and severity of deficiencies that surveyors may cite. Ratings A through C indicate substantial compliance with recommendations, so only Category 1 remedies are permitted (Office of the Inspector General, 2005). These remedies include development of a plan to correct the problem, enhanced monitoring by the survey agency, or mandatory training. Teams often do not cite such deficiencies. There were 0 A citations in Kansas in 2003, 21 B citations, and 96 C citations.

Citations that are rated D, E, or G permit imposition of Category Two remedies. These remedies include fines, denials of payment for new admissions, or denials of payment for all residents. These are the most common types of citations. More than 1,700 D and E deficiencies were cited in Kansas in 2003. G deficiencies are far less frequent; only 129 were issued in 2003.

Deficiencies that are rated F, H, I, J, K, or L can result in Category Three remedies. These include fines, termination from Medicare and Medicaid, and temporary management by an individual chosen by the state agency. F deficiencies are fairly common; more than 200 were cited in 2003. In contrast, H–L deficiencies are uncommon. A total of 5 J deficiencies were cited in 2003.

In most instances, the Department on Aging imposes Category Two or Three penalties only when a nursing home has failed to make corrections by the time of its resurvey. As a result, Category Two or Three penalties are not common. During the second and third quarters of 2003, the Kansas Department on Aging imposed fines on 11 nursing homes and admission bans on 18 (Kansas Department on Aging, 2004). The Department did not terminate any nursing homes from Medicaid or install temporary management in any nursing homes.

**Table 2. Simultaneous Survey Protocol**

Protocol
<ol style="list-style-type: none"><li>1. The RST guided all aspects of the survey process and followed normal policies and procedures.</li><li>2. RST assignments (e.g., who would conduct the closed record review) were shared with the SST so that the respective team members would be informed of their responsibilities.</li><li>3. All team meetings to discuss findings were held in separate locations and tape recorded for evaluation by the research team.</li><li>4. Preliminary off-site preparation was conducted in separate locations. The SST received the same presurvey documents to review as the RST.</li><li>5. The RST and SST were matched teams and respective SST members followed respective RST members one on one.</li><li>6. Team members were not allowed to discuss assessments or interpretations with members of the other team.</li><li>7. If the RST did not raise a concern, the SST was not allowed to pursue that issue. The SST was to document the issue in field notes.</li><li>8. Members of the SST followed respective RST members continuously (e.g., into residents' rooms to observe care and into meetings to interview staff).</li><li>9. All survey-related information (e.g., policies and procedures) were requested by and directed to the RST. Copies were made for the SST.</li><li>10. Teams and facilities were informed that the findings of the SST were not related to the facility's certification and state licensure.</li></ol>

*Notes:* RST = regular survey team; SST = simultaneous survey team.

The Department also recommended additional federal penalties to CMS.

## Methods

### *Setting and Sample*

Kansas has six geographical survey regions. Each region has at least two trained survey teams, a quality improvement coordinator, and a regional manager.

During the summer of 2003, we randomly selected two nursing homes from each region from a list of facilities scheduled for resurvey. We excluded from consideration nursing homes with fewer than 50 beds in order to reduce the burden on small facilities of having two survey teams in their home. Twelve homes comprised the sample for what we labeled "simultaneous surveys."

The simultaneous survey teams consisted of one in-region team (the regular survey team or RST) and one randomly selected out-of-region team (the simultaneous survey team or SST). The regional manager overseeing the annual survey selected the RST. The manager from another randomly selected region selected the SST. In order to ensure that survey differences were not due to their composition, we matched teams in size and expertise. For example, if the RST included their quality improvement coordinator, the SST also sent their quality improvement coordinator.

This design reflected two considerations. First, as we noted above, there were indications that the survey process varied by region. In order to examine this, the SST needed to come from a different survey region than the RST. Second, in order to ensure that the regular survey would be seen as valid by all interested parties, the RST needed to be assigned by the usual practice in that region. Otherwise a simultaneous survey might place a nursing home at a competitive advantage or

disadvantage. Clearly, other designs might be preferable in other circumstances.

### *Procedures*

Table 2 outlines the simultaneous survey protocol. The RST entered facilities following the normal protocol as prescribed by CMS. A member of the research team immediately informed the administrator that the SST would be following them as part of a quality improvement evaluation. A member of the research team also informed the administrator that the SST would not be interviewing staff, looking at or requesting additional records, or evaluating residents on their own. The SST would be shadowing the RST and reviewing its information. The RST directed the survey in accordance with policies and procedures. Members of the SST followed their RST counterparts to observe the same environmental dynamics; however, we did not allow the two team members to discuss interpretations or assessments with each other.

Survey teams usually meet several times during a survey to review what information they have collected to that point. These meetings then guide the remainder of the survey. For example, teams can use these meetings to decide which resident problems should be emphasized or which additional staff interviews are needed. The RST and SST conducted their meetings at the same time in different locations and tape recorded them. We had instructed SST members to document the problem areas and interviews they would follow up on if they were conducting a regular survey; we used the information obtained from both teams in order to evaluate consistency and provide insights into decision-making processes that influenced survey results. A member of the research team was onsite to ensure that the RST and SST

**Table 3. Deficiencies Cited by the RST and the SST**

Facility	Total Deficiencies		G+ Deficiencies <sup>a</sup>		Same F Tag, Different Scope or Severity	Distinctly Different F Tags
	RST	SST	RST	SST		
1	22	23	2	2	5	14
2	3	3	0	0	1	0
3	30	31	3	5	6	14
4	9	19	0	1	4	11
5	16	24	0	1	9	11
6	17	17	2	1	7	6
7	19	15	0	1	4	5
8	18	23	1	2	6	15
9	8	9	1	1	1	7
10	13	16	0	0	6	7
11	0	1	0	0	0	1
12	6	3	0	0	0	5
Total	161	187	9	14	49	96
Intraclass correlation coefficient		0.87		0.76		
95% confidence interval		0.64–0.96		0.38–0.92		

Notes: RST = regular survey team; SST = simultaneous survey team.

<sup>a</sup>G+ deficiencies include G, H, I, J, K, and L, but none higher than H were cited.

members followed the protocol and did not share information with one another.

### Protocol Rationale

We took several issues into consideration when designing this protocol. One was to avoid compromising the quality of resident care. Survey teams tend to disrupt normal routines, and we were concerned that repeated inspections would lead to repeated disruptions. In addition, our primary goal was to evaluate the performance of two teams exposed to the same information. Because nursing homes must address violations that teams observe during the course of an inspection, having back-to-back surveys would not have guaranteed that a follow-up survey team would have been exposed to the same problems. Conducting simultaneous surveys minimized disruption and ensured that both teams analyzed the same information.

### Data Analysis

Our aim was to describe how and why the conclusions of the RST and SST differed. We used a triangulated design using both quantitative and qualitative methods (Fielding & Fielding, 1986; Jick, 1979). Our analysis of how the conclusions differed was largely quantitative. We designed the qualitative analyses to add depth to the analyses and to help answer why the reports of the teams differed.

Our approach examined the data at two very different levels of aggregation. First, treating each nursing home facility as a random effect, we calcu-

lated the intraclass correlation coefficient (ICC). The ICC equals the between-facility variance divided by the sum of the within-facility variance (from RST and SST) plus the between-facilities variance. Perfect agreement between the two survey teams would result in an ICC of 1.0, and complete randomness would result in an ICC of 0.0. Recognizing that differences in the scope and severity of deficiencies matter as well as the number of deficiencies, we cross-tabulated the deficiencies by the levels of harm cited by the RST and SST and calculated a Kappa statistic. Kappa measures how much the agreement between the teams exceeds the amount expected by chance. Complete agreement would give a Kappa of 1.0, and agreement that is no better than chance would give a Kappa of 0.0.

In order to assess why the conclusions differed, we performed a content analysis (Weber, 1990). Two registered nurse researchers, one with formal training in the survey process, independently reviewed the content of all of the written documentation for each team (researcher field notes, team notes, and meeting transcripts). They then met to resolve any differences in their reviews. In order to ensure confidentiality, we substituted numbers for resident names in these materials, and we restricted access to the materials to the research team.

In order to explore what prompted differences between the teams, the content analysis examined the data that the RST and SST used to reach their conclusions. At issue was whether the teams described different problems or characterized the same problems in different ways. For the same infraction, for example, one team could cite F-tag F221 “no unnecessary physical restraints” and another team could cite F-tag F223 “free from abuse.” If both registered nurse researchers agreed that the RST and SST had cited the facility for separate shortcomings, they categorized the F tag as “distinctly different.”

### Results

#### ICCs

Table 3 shows that the RST and SST cited similar numbers of deficiencies. The ICC for total deficiencies cited by the two teams was 0.87 with a 95% confidence interval of 0.64 to 0.96. Given that values greater than 0.70 indicate good reliability, this is quite high (Kramer & Feinstein, 1981). The RST and SST also cited similar numbers of G+ deficiencies. The ICC was 0.76 with a 95% confidence interval of 0.38 to 0.92. The SST cited more deficiencies than the RST for 8 of the 12 nursing homes, but a paired *t* test failed to reject the hypothesis that the means were the same.

Counts do not fully describe the decisions of the RST and SST. Table 3 also shows that in 49 instances the RST and SST agreed about which regulation was being breached but differed on the

scope and severity. In another 96 instances, the two teams cited distinctly different deficiencies, meaning that they identified different failures to comply with the regulations. The number of distinctly different deficiencies rose with the number of citations. The correlation with RST citations was 0.76 and the correlation with SST citations was 0.89. Both correlations were significantly different from 0 at the 0.01 level.

### Kappa Statistics

Table 4 cross-tabulates the findings of the RST and SST, focusing on the levels of harm identified. With 12 facilities and 189 regulations, 2,268 violations were possible. Overall, the level of agreement was moderate, as we estimated a Kappa of 0.57 (Landis & Koch, 1977). Kappa estimates the degree of consensus while controlling for the amount of chance agreement to be expected based on the marginal distributions (Steinle, 2004). Because the RST and SST found no deficiencies most of the time, we needed this control in order to avoid overstating reliability.

In most instances neither team found a violation. The RST found no violations 92.9% of the time, and the SST found no violations 91.8% of the time. The SST agreed with the RST 96.5% of the time.

The teams seldom cited deficiencies entailing no actual harm with potential for minimal harm. The RST gave 11 A, B, or C citations, and the SST gave 9. The similar totals masked considerable disagreement. The SST found no deficiency for 55% of the A-C deficiencies cited by the RST and found a D-F deficiency for 18%. The RST found no deficiency for 11% of the A-C deficiencies cited by the SST and found a D-F deficiency for 56%.

Deficiencies with D-F scope and severity levels, which entail a finding of no actual harm with the potential for more than minimal harm, were the most common citations. Most disagreements also involved these deficiencies. Of the 141 cited by the RST, the SST cited no deficiency for 29%, an A-C deficiency for 4%, a D-F for 63%, and a G-I for 4%. Of the 164 D-F deficiencies cited by the SST, the RST cited no deficiency for 42%, an A-C deficiency for 1%, a D-F deficiency for 54%, and a G-I for 2%. In short, both teams cited no deficiency in a substantial number of the cases in which the other team issued a D-F deficiency.

Deficiencies involving actual harm were uncommon. Even so, the teams differed in their conclusions. The SST cited a D-F deficiency for 4 of the 9 G-I deficiencies cited by the RST and found no breach of the remaining regulation. The RST cited a D-F deficiency for 6 of the 14 G-I deficiencies cited by the SST and found no breach in four instances.

Neither team cited J, K, or L deficiencies, which involve immediate jeopardy for residents.

**Table 4. Cross-Tabulations of Deficiencies by Level of Harm**

Deficiency	No Deficiency	A-C	D-F	G-I	J-L	RST Totals
No deficiency	2,033	1	69	4	0	2,107
A-C	6	3	2	0	0	11
D-F	41	5	89	6	0	141
G-I	1	0	4	4	0	9
J-L	0	0	0	0	0	0
SST totals	2,081	9	164	14	0	2,268

Notes: RST = regular survey team; SST = simultaneous survey team.

A-C deficiencies find no actual harm with potential for minimal harm. D-F deficiencies find no actual harm with potential for more than minimal harm. G-I deficiencies find actual harm for residents. J-L deficiencies find immediate jeopardy for residents.

Kappa = 0.57.

### Content Analysis

As noted above, ICC and Kappa calculations do not fully take into account the differences between the RST and SST. A closer examination of Facility 6 illustrates this. The RST and SST cited the same number of deficiencies, yet there were important differences in their findings. In seven instances the teams disagreed on the scope and severity of the deficiencies, and in six instances the teams cited distinctly different deficiencies. Most of the scope and severity differences were minor, but not all. The RST and SST both identified quality of care deficiencies in the management of pain. The RST assigned an E deficiency, and the SST assigned a G, implying actual harm to residents. The RST and SST both identified deficiencies in the treatment of residents with pressure ulcers. The RST assigned a G deficiency, and the SST assigned a D. In addition, the RST cited three deficiencies that the SST did not: not having an adequate activities program, improperly ordering medications, and not having a backup power supply system. The SST cited four deficiencies that the RST did not: failing to reassess a resident whose condition had changed, not taking adequate care to prevent urinary tract infections, having an overly high medication error rate, and failing to investigate a bruise of unknown origin.

Some disagreements reflected different interpretations of the facts, even though the RST shaped the information that both teams had. For example, in Facility 4 the RST issued a D quality of care citation because the facility failed to follow its own protocol in caring for a resident with a pressure ulcer. The SST identified additional problems with the care provided to this resident and saw similar problems in the care of another resident. The SST issued a G quality of care citation. In another instance, both the RST and SST cited Facility 3 for failures to provide an appropriate accounting of resident funds. The initial citations were both Es, but the SST ultimately assigned an H. The difference appeared to spring

from the conclusion of the SST that at least three items that had been purchased with residents' funds could not be found anywhere in the facility, an issue that the RST did not address. The SST issued an additional H citation for staff treatment of residents and revised its citation for improper accounting of resident funds citation to an H.

Overall, SSTs cited 26 more deficiencies than RSTs, with 18 of these coming from Facilities 4 and 5. For Facility 4, the SST final report identified 10 more deficiencies than the RST final report. The SST issued seven D citations for problems that the RST did not identify or discuss. The SST also issued two citations for problems that the RST combined into one deficiency. After consultation with the regional office, the RST chose not to cite two problems that both teams had identified. In one instance the RST discussed a problem that the SST cited, but decided not to cite the facility. (The RST also cited one deficiency that the SST did not.) For Facility, 5 the SST identified eight more deficiencies than the RST. Five of these deficiencies were due to inconsistencies between the care plan and the care provided that the SST examined and the RST did not. The missing care included activities for one resident, assistance with eating for another resident, protective booties for a resident at risk for pressure ulcers, a contracture boot for another resident, and range of motion therapy for yet another resident.

Our observers noted a striking difference in how the teams tracked medication administration. In Facility 4 the RST focused on one of the medications given to a resident, but the SST made notes on all of the resident's medications. The two teams found similar numbers of errors, but the SST calculated a much lower error rate because the denominator was much larger. The RST gave an E deficiency to Facility 4 for medication administration; the SST did not.

In their discussions, SST members critiqued the RST fairly regularly. For example, the SST notes for Facility 6 included comments that, "I would have followed up more on [the] broken thermostat," and "I would have knocked and checked" to see if a resident scheduled for an interview was in her room with the door closed. The SST notes for Facility 11 noted that there were unasked questions about a "resident being left alone on toilet and orthostatic hypotension" and "fall investigation." Additionally, some teams identified deficiencies by "running through the regulations." Other teams identified deficiencies by running through the leader's concerns.

Yet attributing these differences to the teams obscures the important roles of other staff.

Teams discuss concerns with their regional managers and quality improvement coordinators several times during a survey. Furthermore, teams discuss their findings with these administrative staff following their decision-making meeting. Again, this process has both strengths and weaknesses. On the one hand,

the experience of regional managers and quality improvement coordinators allows them to assist more junior surveyors by providing guidance and putting information into perspective. On the other hand, most regional managers and quality improvement coordinators are not on site and so provide guidance without seeing the evidence firsthand. Analyses of meeting and field notes indicated that the number of changes between the initial and final reports ranged from 0 to 14 per team.

Several comments indicated that regional managers had a significant influence on the survey process. For example, some regional managers did not encourage surveyors to write deficiencies for paperwork violations unless there were concomitant care problems. In addition, some surveyors noted that their regional managers instructed them that hand washing had to be a huge issue before they should cite it. One team commented that their regional manager would never let them go into an extended survey for a particular F tag. Some teams made a point of staying for the first meal after entering the facility, and others did not. Some teams were very methodical in their decision-making style, going in order through the regulations, whereas others discussed concerns according to their priority or in top-of-mind order. In short, different teams used different processes.

An important finding was that teams differed in assessments of scope and severity for the same resident care issue. Our content analysis identified several instances in which there were no clear right or wrong assessments of scope and severity. When teams disagreed on the scope and severity, we could trace these differences to differences in interpretations of the regulations and of the interventions provided by the facility.

An example dealing with pressure ulcer prevention and healing illustrates the difficulty with scope and severity determinations. The *Facility Guide to OBRA Regulations, and Interpretive Guidelines and the LTC Survey Process* offers the following guidance:

A determination that development of a pressure sore was unavoidable may be made only if routine preventive and daily care was provided. Routine preventive care means turning and proper positioning, application of pressure reduction or relief devices, providing good skin care, (i.e., keeping the skin clean, instituting measures to reduce excessive moisture), providing clean and dry bed linens, and maintaining adequate nutrition and hydration as possible. (p. 22)

Their notes indicated that surveyors seldom had difficulty in determining whether the facility identified the resident as being at risk. But surveyors looking at the same evidence disagreed on whether the facility interventions were aggressive enough or

whether the facility tried enough different interventions. Surveyors scrutinized the data collected and took their decisions very seriously but had differing perceptions of when a facility had done enough.

## Discussion

Even though the teams examined the same data, they often differed in the number, scope, and severity of deficiencies cited. The teams also routinely assigned different F tags when they cited facilities. In short, the teams generated substantially different surveys from the same facts. Yet abstracting from the details of the surveys, the teams painted very similar pictures of facilities' overall compliance with federal regulations.

These data support two very different interpretations. One stresses the variability of the survey process; the other stresses its global consistency. The variability interpretation notes that the two survey teams often reached different conclusions about whether a deficiency existed, what regulation had been breached, the scope of the deficiency, or the severity of the deficiency. These differences, furthermore, might well have consequences. The penalties imposed by the survey agency, the career prospects of facility managers, and the responses of consumers are likely to be different for a nursing home that gets 7 D deficiencies than for a nursing home that gets 12 D deficiencies and 1 G.

The variability of the survey process reduces its value to nursing home managers, who should be the primary users of its detailed findings. The same process can draw no deficiencies from one survey team and multiple deficiencies from another. As a result, nursing home administrators and directors of nursing cannot be confident that a good survey means that a process works well. Nor can administrators and directors of nursing be confident that genuine improvements in care will result in a better survey if the next team relies on different interpretations of the regulations and what constitutes having done enough. Speaking for a number of her peers, one director of nursing described the survey process as "demoralizing." Improvement efforts are inhibited by a survey process that falls short of systematic, replicable data gathering and analysis (Schnelle, Osterweil, & Simmons, 2005).

The variability of the survey also reduces its value to regulators and policy makers. The inspection is supposed to provide assurance that a nursing home is in substantial compliance with federal and state regulations, either at the time of the inspection or after completion of a plan to correct problems. An unreliable survey process may mean that nursing homes that do not actually meet federal or state standards will be eligible for Medicare and Medicaid payments. The many disagreements of these two teams about whether a regulation had been breached, which regulation had been breached, and

how serious the breach was cannot make federal or state officials comfortable.

The variability perspective would also note that we had designed the structure of this study in order to exclude some forms of variation. Had they not been constrained to look at the data assembled by the RST, the members of the SST might well have gathered different facts and identified different problems. Indeed, comments to this effect by members of the SST were routine. It is likely that this study understates the variability of the survey process.

Yet these data also highlight the overall consistency of the survey results. The total numbers of deficiencies and the number of G+ deficiencies cited by the RST and SST were quite similar. If consumers rely on the total number of deficiencies or the number of high-level deficiencies as measures of quality, our results suggest that consumers should view surveys as highly reliable. We do not know how consumers use nursing home survey results, but their structure suggests that consumers should use them as part of a broader assessment process. Surveys may not reflect current conditions in a nursing home and should be used with care, just like any other measure.

Viewed at a macro level, this study suggests that, given the same data, the two teams reached very similar conclusions. Viewed at a micro level, this study suggests just the opposite. Although state survey agencies and consumers may feel comfortable focusing on macro results, managers must make decisions at the micro level, and their concerns about reliability weaken the credibility of the survey process. In order to reduce the variability of survey results, changes in the survey process and in the training of surveyors warrant consideration. The CMS trial of the Quality Indicator Survey appears to be a promising initiative (CMS, 2004). This five-state experiment enhances training, sampling, and decision support software to make surveys more structured.

This article suggests that surveyors need more specific criteria, in the form of decision-making algorithms, to reduce the influence of individual perceptions. These findings concur with other evaluations of survey consistency (GAO, 2003b; Office of the Inspector General, 2003, 2004). CMS has begun a process of developing and evaluating clearer guidelines for surveyors. Our findings support that effort.

These results also suggest that continued efforts to standardize training and decision rules are important. Especially at the state level, common understandings of what constitutes a breach of the regulations should reduce the angst of the industry and increase the confidence of regulators and the public. In assigning the number, scope, and severity of deficiencies, consistency is of primary importance.

One should not overlook the limitations of this study. It applies to one state with a specific administrative structure. Moreover, the sample used in this study was not large. And, although they were

randomly selected and generated data comparable to statewide averages, we cannot guarantee that the facilities or survey teams were representative of Kansas. The results should not be generalized to other states. Furthermore, this study eliminated differences in the information collected. As a result, the differences reported here were entirely due to differences in interpretation. As we noted above, these results seem likely to underestimate the variability of survey results in the wild.

It is important to remember that the survey process is designed to measure compliance with federal regulations. It is tempting to infer that a survey with few deficiencies identifies a good facility and a survey with many deficiencies identifies a bad one. Indeed, numerous research studies and consumer guides do exactly that (e.g., Castle, 2000; Castle & Mor, 1998; Harrington, O'Meara, Kitchener, Simon, & Schnelle, 2003). Yet, as one surveyor noted, "The number of deficiencies is not a good quality indicator for whether I would put my mom somewhere or not. You know it relates back to what was the scope and severity of those deficiencies and what were those deficiencies really about" Our results suggest that the survey process is only moderately reliable in describing the scope and severity of nursing home deficiencies. Given that compliance with federal regulations may well have changed since the survey was completed, consumers should use the survey results with care.

Many states and CMS rely on public reporting of survey results as a spur to better nursing home care. Indeed, this appears to represent an important de facto shift from a policy of pure deterrence to a policy of deterrence plus transparency (Chou, 2002). Consumers evidently seek this information. Yahoo! reports that "Nursing Home Compare" is the nation's second most popular nursing home care site and is one of the most frequently visited sections of the Medicare Web site (Office of the Inspector General, 2004; Yahoo! Health Directory, 2005). As a result, the reliability of nursing home surveys becomes an even more visible public policy issue. Survey results will have the greatest impact on nursing home quality if consumers and the industry believe that deficiencies are valid, reliable measures of quality. This belief will be undercut by variations in the number, scope, and severity of deficiencies when the facts are held constant. The appropriate policy response is to acknowledge these variations and address them by clarifying definitions and interpretations, by improving training, and by providing feedback to surveyors. Simultaneous surveys like the ones reported here should become standard features of survey agencies. Using simultaneous surveys as a calibration tool is clearly feasible.

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