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Journal

Health Affairs, 32(8)

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Publication Date

2013-08-01

DOI

10.1377/hlthaff.2012.1416

Peer reviewed

Published in final edited form as:
Health Aff (Millwood). 2013 August ; 32(8): 1416–1425. doi:10.1377/hlthaff.2012.1416.

Satisfaction With Massachusetts Nursing Home Care Was Generally High during 2005-09, With Some Variability Across Facilities

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Abstract

Since 2005 Massachusetts has publicly reported results from biennial surveys of satisfaction with nursing homes, completed by responsible parties for residents, to promote consumer-centered care. Our analysis of the results from 2005, 2007, and 2009 revealed generally high satisfaction with care, which remained stable over time. On a scale of 1 to 5 (from very dissatisfied to very satisfied), average satisfaction with overall care was 4.22–4.31 and satisfaction that overall residents' needs were met was 4.09–4.16; 89.9–90.1 percent of respondents would recommend the facility. Satisfaction ratings varied considerably across facilities, with higher scores associated with higher nursing staffing levels, fewer deficiency citations, and nonprofit or government ownership. Scores for six domains of care were, in general, closely associated with satisfaction scores. However, family members seemed less satisfied with the physical and social activities available to residents and with the food and meals served than with such attributes as the physical environment. Our findings suggest that including the consumer's perspective would improve the Centers for Medicare and Medicaid Services' current nursing home reporting efforts, but that refinements may be necessary to detect the impact of consumer reporting on the quality of patient-centered care.

The quality of nursing home care is a long-standing concern for home residents and their family members, health professionals, and policy makers.(1-3) Recent literature suggests continuing problems with quality and safety, such as inappropriate medication use,(4) untreated pain,(5) and unauthorized use of physical restraints.(6) Each year approximately 3,500 nursing homes, or roughly 20 percent of such facilities nationwide, are cited by state government inspectors for care deficiencies that might cause serious harm to residents.(3)

During the past two decades various efforts have been made to address the issue of nursing home quality. For example, federal and state regulations on quality have been strengthened

in such areas as mandated minimum staffing levels,(7-9) annual state on-site inspections of care,(10,11) and sanctions for violations of care standards.(10) In 2002 the Centers for Medicare and Medicaid Services (CMS) started to make publicly available quality report cards for all US certified nursing homes, with the goal of fostering market competition and consumer choices—both potential drivers of improved care.(12) The CMS also provides online performance measures for each facility, including the adequacy of its clinical resources (such as nurse staffing levels), citations received for deficiencies, and clinical outcomes (for example, pressure ulcer rates).(13)

Although such clinical and regulatory data are increasingly collected and made available to the public, very little information on nursing homes from the consumers' perspective has been obtained and publicly disseminated. Provision of patient-centered health care is, nevertheless, an essential element of high-quality care.(14) The implementation of resident-centered quality assessments and service plans in nursing homes was the primary goal of the nursing home reform in the Omnibus Budget Reconciliation Act of 1987.(1) Since then a broad consensus has evolved that consumer involvement plays an essential role in continuous quality improvements in nursing homes.(2,15-17)

With the goal of promoting consumer-centered nursing home care, as of 2009 six states(18) had developed and published consumer satisfaction measures that supplement the national reports issued by CMS.(18-20) And since 2005 the Department of Public Health in Massachusetts, one of those six states, has conducted biennial surveys of consumer satisfaction with nursing home care across the state.(21)

We report key insights into the experiences of Massachusetts nursing home residents gained from our analysis of the three waves of consumer survey data published to date (from 2005, 2007, and 2009). We also offer observations on the associations between reported experiences with common indicators of nursing home quality (or their proxies) and facility characteristics.

In framing our analyses, we hypothesized that higher care quality would be associated with the increased well-being of nursing home residents and therefore would positively relate to reported satisfaction. The findings suggest that there was a high level of satisfaction with both overall care and individual domains of care, as well as considerable variation in consumer ratings across facilities and domains of care. We found that higher nurse staffing levels, better compliance with care standards, and nonprofit ownership were all associated with higher satisfaction ratings. Additional work is necessary to determine the expected impact of patient satisfaction reporting on patient-centered care in nursing homes.

Study Data And Methods

The Survey Instrument

The 2005, 2007, and 2009 Massachusetts nursing home consumer satisfaction surveys asked fifty-four questions about the experiences of residents (both long-term residents and short-term residents who had a length-of-stay of at least four weeks), which were extensively pilot tested before the initial survey in 2005.(21) With two exceptions, the methodology remained consistent in the three surveys. First, survey participation was voluntary in 2005 but mandatory in 2007 and 2009 for all nursing homes in the state that were certified by Medicare, Medicaid, or both. Out of a total of approximately 440 eligible nursing homes, 297 voluntarily participated in the 2005 survey; all eligible nursing homes participated in the later surveys (439 homes in 2007 and 430 in 2009). A small number of facilities were not eligible in each survey year because they served short-term residents only. Second, a

question about overall satisfaction ("Would you recommend this nursing home to a friend or family member?") was asked in 2007 and 2009, but not in 2005.

Reported satisfaction scores for the first three survey years were obtained from the public reporting website maintained by the state government.(21) Data from the 2011 survey were not available at the time of our analyses.

Survey questionnaires were mailed to the parties responsible for all long-term residents of nursing homes and for short-term residents with stays of at least four weeks. In the majority of cases, responsible parties are adult children or spouses of residents. In 2005 surveys were mailed to 25,655 responsible parties, 16,488 of whom responded (a response rate of 64 percent); the response rates were 61 percent (20,883 out of 34,830) in 2007 and 60 percent (19,457 out of 34,594) in 2009. In each survey year almost two-thirds of the respondents were female, and the majority were between fifty and sixty-nine years old. More than three-quarters of respondents reported visiting the facility at least once a week, and more than half of the residents for whom respondents were responsible had been in the facility for more than two years. Various approaches such as reminder postcards, repeated mailings, and follow-up calls were used to increase response rates.(21)

The Massachusetts Department of Public Health classified survey questions into six domains of care that rated administrative and direct care staff, physical environment, activities available, personal care, food and meals, and residents' personal rights. The degree of satisfaction with each item asked about was rated on a five-point scale (1 was very dissatisfied, 2 dissatisfied, 3 not satisfied or dissatisfied, 4 satisfied, and 5 very satisfied). The composite score for each domain was calculated as the average of the scores of all questions within the domain, and thus it too ranged between 1 and 5.

The survey also asked three questions about overall level of satisfaction: satisfaction with the nursing home, satisfaction with the nursing home's ability to meet residents' needs, and (in 2007 and 2009 only) whether the respondent would recommend the facility to a friend or family member. Responses to the first two of these global questions were rated on the same five-point scale as the domain questions, while possible responses to the recommendation question were yes and no. More details about the survey design and administration are available on the Massachusetts Department of Public Health's website.(21)

Data On Other Facility Characteristics

We linked the satisfaction survey files to the online survey, certification, and reporting databases of corresponding years. These databases are facility-level files maintained and updated by CMS for its reports on annual inspections and its Nursing Home Compare website; they are widely used for monitoring the quality of care and in policy analyses.(8,9,22) Key variables available included nurse staffing levels by category (registered nurses, licensed practical or vocational nurses, and certified nursing assistants), the number of deficiency citations issued during annual inspections, profit status (for profit, nonprofit, or government owned), number of certified beds, certification type (Medicare only, Medicaid only, or both), chain affiliation (yes or no), proportion of Medicare residents, proportion of Medicaid residents, and overall occupancy rate.

Analysis

We analyzed facility-level satisfaction scores because scores from individual respondents were not available. We first compared overall satisfaction scores and scores for individual domains of care in the three surveys, and we used general linear models to test differences in scores over time. We then performed Pearson correlation analyses among overall satisfaction scores and scores for individual domains for each year separately.

In further bivariate analyses of data from each year, we estimated linear regression models to test the associations between each satisfaction score (overall or for a domain) and all of the nursing home characteristics listed above. We chose to focus on the following four variables as "objective" indicators of quality of care (or their proxies): total licensed nurse (registered nurse and licensed practical or vocational nurse) hours per resident day, certified nursing assistant hours per resident day, number of deficiency citations, and profit status. We tested the associations of these variables with reported residents' experiences.

Nursing home care is highly labor intensive. There is substantial evidence to support the broad consensus that higher staffing levels directly improve the quality of care and residents' outcomes.(7-9) Quality surveys distinguish among types of nurses because of important differences in their training, roles, and responsibilities.

Registered nurses have two to four years of training and are responsible for the assessment, treatment, and management of residents' conditions, in addition to supervising other licensed and unlicensed nursing staff. Licensed practical or vocational nurses have about one year of training; they often serve as unit charge nurses—that is, [please provide]—and primarily focus on giving medications and treatments as well as supervising certified nursing assistants. To be certified, nursing assistants are required by federal law to have a minimum of seventy-five hours of training and to pass a competency test, and some states have additional training requirements. Certified nursing assistants are responsible for providing assistance with activities of daily living (such as dressing, toileting), ambulation, and other direct care. Nursing homes with higher staffing levels should be better able to attend to patients' needs and provide care that is more patient centered.

Deficiency citations represent state inspectors' evaluations of a facility's quality and safety problems, which cover violations of a comprehensive list of federal and state standards related to clinical and personal care. We posited that nursing homes that complied better with multifaceted care standards—that is, homes with a lower number of deficiency citations —would also have higher satisfaction scores.

Many previous studies have shown that for-profit nursing homes tend to provide worse nursing and personal care than nonprofit or government-owned nursing homes do.(9,22,23) Therefore, although profit status is not a direct measure of quality, it is often used as a proxy for it. We further hypothesized that for-profit nursing homes would be less attuned to residents' needs and experiences when compared to nonprofit and government-owned facilities.

For overall and individual domain satisfaction reported in each year, we fit separate multivariate linear models to determine whether the associations between reported experiences and key quality indicators or proxies persisted after we controlled for other facility characteristics. The dependent variable in each model was the satisfaction score, and all models also controlled for county fixed effects by using dummy variables for counties in Massachusetts. We calculated adjusted satisfaction scores as predictions from estimated coefficients of the models, and we present adjusted scores stratified by facility characteristic.

Last, we examined geographical variations in satisfaction according to counties. Although the results are not presented in the article because of space limitations, they suggest considerable geographical variations in consumer ratings. See the online Appendix for [please provide].(24)

Limitations

This study had several limitations. First, our analyses on family member ratings of care were limited to certified nursing homes in Massachusetts. Thus, results should be generalized only with caution to noncertified facilities or facilities in other states. However, the characteristics of all participating nursing homes in Massachusetts in 2009, shown in Exhibit 1, were similar to those of other nursing homes nationwide.(11)

Second, although this study documented associations between consumer satisfaction and nursing home quality indicators or proxies, it could not confirm causal relationships.

Finally, although the Massachusetts surveys achieved relatively high response rates among family members (at least 60 percent for each of the three surveys that we analyzed), we cannot rule out the possibility of nonresponse bias: The scores of facilities with low response rates may be more likely to include extreme values. Thus, we ran sensitivity analyses in which we excluded facilities at extremes of the distribution of reported scores. We confirmed that including facilities with possible low response rates in the main analyses did not bias our findings.(24)

Study Results

Satisfaction With Care

Massachusetts nursing homes earned an average overall consumer satisfaction score of 4.31 in 2005, 4.22 in 2007, and 4.25 in 2009 (the highest possible score was 5.00; Exhibit 1 shows 2009 results). The average scores for meeting residents' needs overall were 4.16 in 2005, 4.09 in 2007, and 4.12 in 2009. On average, 90.1 percent of surveyed respondents indicated they would recommend the nursing home to a friend or family member in 2007, while the proportion of such respondents was 89.9 percent for 2009. None of these overall satisfaction measures showed any significant change during 2005–09 ($p > 0.05$).

Exhibit 2 shows satisfaction scores for the six domains of care in the three survey years. Again, the average scores did not change significantly over time ($p > 0.05$). In 2009 the average satisfaction score was 4.22 for administrative and direct care staff, 4.13 for physical environment, 3.85 for activities available, 4.13 for personal care, 3.99 for food and meals, and 4.14 for residents' personal rights.

Our correlation analyses revealed relatively high correlations among the three overall satisfaction measures, and each of the three overall satisfaction scores was also highly correlated with satisfaction in every domain ($p < 0.05$ for all). In 2009 the Pearson correlation coefficient was 0.95 between overall satisfaction with the nursing home and satisfaction that overall residents' needs were met, and the two overall satisfaction scores were both highly correlated with the overall recommendation rate (Pearson correlation 0.82 and 0.76, respectively). In addition, the correlations between the overall satisfaction and recommendation scores and individual domain satisfaction scores were higher than 0.80 in most cases and higher than 0.60 in all cases. The results for 2005 and 2007 were similar.

Satisfaction With Quality

In the bivariate and multivariate analyses for correlations between family satisfaction and indicators of or proxies for quality, we found very similar results across reporting years. Therefore, we present here only the results for 2009. In addition, scores of overall satisfaction with a nursing home were highly correlated with scores of overall satisfaction that residents' needs were met, and bivariate and multivariate analyses were very similar for the two overall ratings. Accordingly, we report here only the results for overall satisfaction.

Exhibit 3 shows that all quality indicators or proxies were associated positively with better overall consumer satisfaction with a nursing home and with willingness to recommend the facility, although the associations with licensed nurse staffing did not achieve significance. We performed sensitivity analyses using alternative cutoff points to categorize nurse staffing levels and number of deficiency citations; the results of these sensitivity analyses were essentially the same as those shown in Exhibit 3 and thus are not presented here.

The findings supported our hypothesis that the quality indicators or their proxies would be positively associated with better overall consumer evaluations. We also observed associations between higher overall satisfaction and smaller facility size, lower percentage of Medicare patients, higher occupancy rate, and lack of affiliation with a nursing home chain.(24)

The results summarized in Exhibit 4 confirm that three of the four quality indicators or proxies that we chose tended to be associated with better adjusted satisfaction scores for the individual domains of care: Higher levels of certified nursing assistant staffing, lower numbers of deficiencies, and nonprofit and government ownership all significantly predicted greater satisfaction. The fourth indicator or proxy, higher levels of licensed nurse staffing, also seemed to be associated with higher satisfaction, although that association was not significant.

To determine the robustness of associations between reported satisfaction—both overall and in individual domains of care—and quality indicators or proxies, we performed sensitivity analyses in which we excluded facilities with the highest and the lowest satisfaction scores. Because these results did not change greatly, they are not reported here. However, they are provided in the online Appendix.(24)

Discussion

Family members and other responsible parties generally reported very high satisfaction with the care provided to both long-term residents of Massachusetts nursing homes and to short-term residents whose lengths-of-stay were at least four weeks. An average of 90 percent of respondents also indicated that they would recommend the facility to a friend or family member. Nevertheless, the survey results suggest that much room for improvement exists. For example, family members reported less satisfaction with the physical and social activities available to residents and with the food and meals served in the facility, compared to other domains of care such as the facility's physical environment.

It is also noteworthy that nursing facilities varied considerably in both respondents' overall satisfaction and their satisfaction with individual domains of care, with a number of facilities performing relatively poorly. In 2009 the overall satisfaction scores of 25 percent of nursing facilities (about 100 facilities) were below 4.0—that is, respondents reported being less than satisfied with them. Seventy-five percent of facilities received scores below 4.0 for activities available to residents; 50 percent received scores below 4.0 for food and meals provided; and 25 percent received scores below 4.0 for each of the other four domains of care. Given the relatively high correlations among ratings in the six domains, it is not surprising that facilities performing at a low level in one aspect of care tended to perform at low levels in other aspects as well.

It also seems to be the case that from 2005 to 2009, consumer ratings of care remained stable over time both generally and for facilities with relatively low performance. Several reasons may explain these findings. First, consumer ratings on average were very high in the first, voluntary reporting year of 2005. Because of a possible "ceiling effect," discussed below, ratings might not be easily raised in subsequent years. Second, the voluntary

reporting in 2005 might not have generated adequate incentives for improvement, even for the facilities that were initially rated lowest. Finally, facilities might not have had enough time to improve performance between the time when reporting started (2005) or became mandatory (2007) and the last survey year for which data are available (2009).

Prior analyses on the Nursing Home Compare website showed no or mixed changes in performance indicators shortly after the initial publication of these data,(12) but evidence of continued improvement emerged over a longer period of time.(25,26) Thus, continued dissemination of consumer satisfaction data may be expected to increase patient-centered care in the longer term. Meanwhile, the use of these data should be considered for broader purposes, such as setting payment rates or implementing pay-for-performance incentives, to achieve more-general goals of continuous quality improvement.

Satisfaction With Care Versus Quality Indicators And Proxies

The variations in consumer ratings of care were in part explained by facilities' nursing staffing levels, compliance with governmental care standards as reflected in the number of noncompliance citations received, and profit status. Our review of the literature suggests that few studies have previously examined the relationships between subjective consumer perceptions of care and more objective or government-reported quality indicators of nursing homes.(18,27,28) A study by Judith Lucas and coauthors found that higher overall satisfaction, as indicated by reports of 1,500 residents in a sample of seventy-two nursing homes, was associated with higher staffing levels of certified nursing assistants.(27) A more recent analysis of Maryland nursing homes showed that higher overall ratings of care by family members were associated with improved ratings of facilities based on either overall nurse staffing levels or state inspection results.(19) In addition, for-profit facilities tended to receive lower ratings of consumer satisfaction compared with nonprofits.

This study contributes to the limited literature on consumer satisfaction with nursing homes by presenting the results of a detailed analysis of responses to Massachusetts's surveys. We found that both overall satisfaction and satisfaction with each domain of care were associated with several quality indicators and proxies. These relatively robust associations across care domains might be expected, given the relatively high correlations among domain scores. However, we note that the quality indicators and other factors examined explained only a portion of the variation in consumers' reported experiences: R-squared values were between 0.31 and 0.43 across domains. Other, unmeasured factors related to facilities and consumers—such as staff practice styles and consumer care preferences—may also be responsible for the high correlations seen across domains.

Our finding that higher staffing levels of licensed nurses (registered nurses and licensed practical or vocational nurses) and certified nursing assistants were associated with better reported patient experiences is consistent with previously published findings.(19,27) The lack of significance of our observed association between licensed nurse staffing and satisfaction may reflect insufficient power in our multivariate analyses. Alternatively, it might be explained by the fact that the majority of certified nursing assistants are front-line caregivers. Higher staffing levels of certified nursing assistants permit greater facility and staff responsiveness to the needs and concerns of residents and their family members in highly visible ways. Licensed nurses, in contrast, tend to influence the more clinical and less visible aspects of care delivery that may not be as easily appreciated by lay consumers.

The finding that better compliance with governmental care standards was associated with better consumer satisfaction overall and with satisfaction in specific care domains confirmed our hypothesis that assessments of care by state regulators and family members would be

positively correlated—although the regulator's perspective is presumably more objective while the consumer's is more subjective.

The associations we found between for-profit ownership and lower consumer satisfaction with care are consistent with numerous prior reports that for-profit facilities tend to invest less in clinical and personal care,(9,22,23) which—as one would expect—leads to lower ratings of care by consumers. The literature on hospital care has similarly shown that improved consumer satisfaction tends to be associated with key hospital characteristics included in the present analysis, such as higher levels of nurse staffing and nonprofit ownership.(29,30)

Policy Implications

Data on patient satisfaction have been collected and publicly reported for other health care sectors, such as health insurance plans and hospitals.(29-31) When used with other indicators of care, consumer assessments have great potential to empower consumers to make choices, promote quality improvement, and inform pay-for-performance initiatives. Until now, however, efforts to collect and disseminate consumer-oriented data for nursing homes have been very limited.(16,17,20)

The Massachusetts satisfaction surveys provide important nursing home performance data from the consumer's perspective and represent one of six early state efforts to publicly report such data.(18) Because the cognitive impairments and severe mental and physical disabilities experienced by many nursing home residents would prevent them from completing a survey, Massachusetts, along with Maryland(19) and several other states,(18) has not surveyed nursing home residents directly.

Previous research has suggested that although reports of residents and family members may be highly correlated, family members generally report higher satisfaction levels than do residents.(32,33) Thus, although family member surveys are an alternative and easily used source of satisfaction information, they should not, in general, substitute for direct surveys of nursing home residents. In the future states might consider collecting data from both residents and their family members, as well as collecting separate data for short-term and long-term residents because of the differences in their care needs and expected outcomes.

Agencies in two other states, Ohio(34) and Rhode Island,(35) conduct satisfaction surveys of both nursing home residents and their family members. Family and resident surveys in other states tend to ask questions about issues also investigated in the Massachusetts survey, such as overall satisfaction and satisfaction with staff, the facility's physical environment, and residents' personal rights.(18-20)

However, states vary substantially in survey design, including the manner in which questions and possible responses are framed. For example, there are five possible responses (ranging from very dissatisfied to very satisfied) to most questions in the Massachusetts surveys. In contrast, the Maryland and Ohio surveys have four possible responses (never, sometimes, usually, and always) for the majority of questions, which ask how often the nursing home provides satisfactory care in individual domains. The four-point scale does not allow respondents to equivocate, unlike the five-point scale, which includes the response of "not satisfied or dissatisfied." Given these variations in state surveys, levels of reported satisfaction with care may not be readily comparable across states.

The ability of state surveys to discriminate between nursing homes with different levels of resident-centered care may also vary. Our analyses of the first three biennial Massachusetts surveys showed that the average scores of satisfaction overall and with individual domains

of care were approximately 4.0—that is, they indicated some level of satisfaction on average—during each survey round. This finding may indicate a relatively high level of satisfaction with care in general that persisted throughout the period 2005-09. But it raises a potential concern: Is the survey used in Massachusetts able to identify facilities with the poorest patient-centered care, or to detect meaningful levels of improvement over time? Additional work is necessary to confirm whether the survey could be improved to increase its discriminatory power, or whether the ceiling effect we observed is inherent and reflects the way family members perceive the care delivered to residents.

We also note that the scores reported for each domain of care in Massachusetts are averages of answers to a group of questions within the domain. Reporting domain-specific scores keeps the report cards relatively straightforward for lay consumers. However, reporting data at the aggregated level only may mask important but subtle variations in performance and reduce the discriminatory abilities of the report cards.

For example, the survey asks fifteen questions about satisfaction with administrative and direct care staff. The questions cover such issues as the quality of physician and nursing care, staff turnover, the friendliness of staff to residents, and communication between staff and family members. It is possible that consumer ratings of staff in a particular facility are very good overall but relatively poor in one or several of these subcategories. However, the Massachusetts results, as currently reported, do not allow consumers, researchers, or policy makers to explore this possibility.

It is also conceivable that family members may be the best source of information when rating some areas of interest (such as communication between staff and family members) but not others (for example, respectfulness and friendliness of the staff toward residents), even if those family members are meaningfully involved in residents' care routines. Massachusetts might consider publishing ratings for subdomains in the future, such as those in which a facility does poorly or those likely to measure consumer evaluations in the most accurate way, in addition to the aggregated scores.

Since 2000 the Agency for Healthcare Research and Quality and CMS have considered jointly sponsoring the development of a Consumer Assessment of Healthcare Providers and Systems for nursing homes.(16,17) Despite the challenges inherent in directly surveying residents, the agencies' most recent plans are to collect satisfaction data from both residents and family members and, in the resident surveys, to collect data from short-term and long-term residents separately.(17) This is a laudable effort that would allow for national public reporting of both residents' and family members' experiences with nursing homes, as well as separate reporting from the two groups of nursing home consumers that have distinctly different characteristics.

Conclusion

Although in general family members are highly satisfied with the care provided in Massachusetts nursing homes, rating scores vary considerably across domains of care, facilities, and regions of the state. Quality indicators or proxies (such as nurse staffing levels) published by CMS are correlated with but do not fully explain consumer-reported ratings, suggesting that data from consumers' perspectives could enhance CMS's current reporting efforts. Although consumers' ratings of nursing homes did not improve in the first three waves of the Massachusetts survey, the use of better data collection and reporting approaches in the future, together with broader use of consumer satisfaction data, may promote increasingly patient-centered nursing home care in the longer term.

Acknowledgments

The authors acknowledge funding from the National Institute on Aging (Grant No. R01AG032264). The views expressed in this article are those of the authors and do not necessarily represent the views of the National Institute on Aging.

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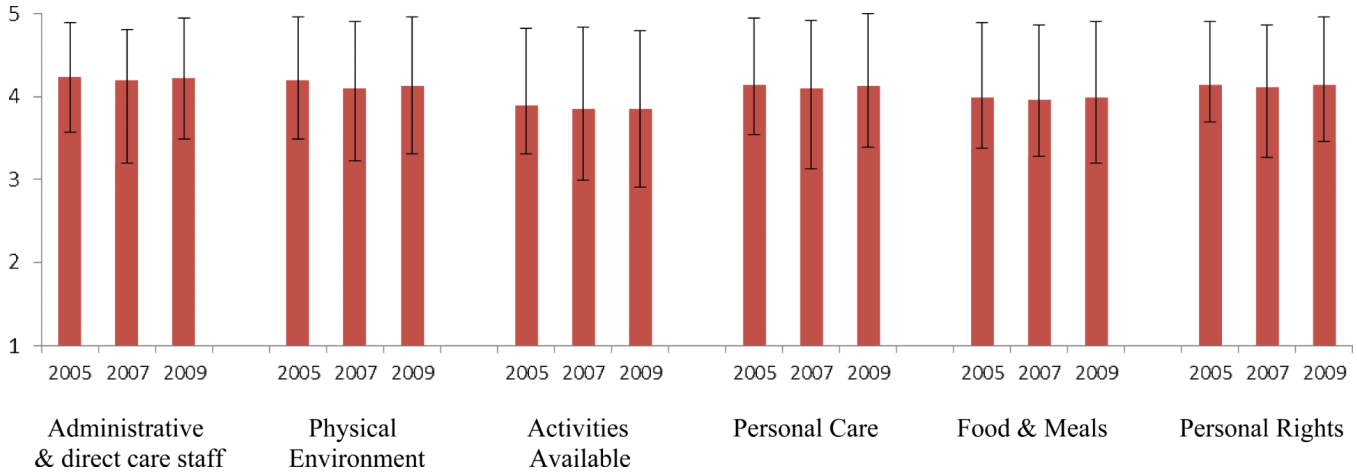

Exhibit 2.

Satisfaction Scores For Individual Domains Of Nursing Home Care In Massachusetts, 2005-09

SOURCE: Authors' analysis of Massachusetts nursing home satisfaction surveys of 2005, 2007, and 2009 (see Note 21 in text).

NOTES: Answers to questions about each domain were coded on a five-point scale, with 1 meaning very dissatisfied and 5 very satisfied.

Error bars reflect maximum and minimum scores of all nursing homes.

Average satisfaction scores for individual domains of nursing home care in Massachusetts, 2005-2009 (note: questions for each domain are coded on a five-point scale with one for very dissatisfied and five for very satisfied; error bars reflect maximum and minimum scores of all nursing homes.)

Exhibit 1

Characteristics Of Massachusetts Nursing Homes Participating In Consumer Satisfaction Survey, 2009

Characteristic	Statistic	SD or %
Satisfaction score		
Overall satisfaction, mean[a]	4.25	(0.30)
Overall resident needs met, mean[b]	4.12	(0.30)
Would recommend to a friend, percent[c]	89.9	__ [d]
Nursing hours per resident day (mean)		
RNs, LPNs, LVNs	1.7	(0.5)
RNs alone	0.8	(0.5)
LPNs and LVNs alone	0.9	(0.3)
Certified NAs	2.4	(0.5)
Number of deficiency citations, mean	5.4	(5.0)
Profit status, number		
For profit	303	70.8%
Nonprofit	119	27.8%
Government owned	6	1.4%
Certification category, number		
Medicare only	13	3.0%
Medicaid only	7	1.6%
Both Medicare and Medicaid	408	95.4%
Affiliated with a chain, number	224	52.3%
Number of certified beds, mean	113.1	(48.8)
Percentage of Medicare residents, mean	14.8	(11.4)
Percentage of Medicaid residents, mean	61.5	(21.1)
Percentage occupancy rate, mean	89.3	(11.7)

SOURCE Authors' analysis of Massachusetts nursing home satisfaction survey (see Note 21 in text) and the Centers for Medicare and Medicaid Services' online survey, certification, and reporting databases of 2009.

NOTES $N = 428$. Nursing homes serving short-term residents only did not participate in the survey; two nursing homes with missing data were also excluded. SD is standard deviation. Scores were coded on a five-point scale, with 1 meaning very dissatisfied and 5 very satisfied. RN is registered nurse. LPN is licensed practical nurse. LVN is licensed vocational nurse. NA is nursing assistant.

[a] Range: 3.24–5.00.

[b] Range: 3.09–5.00

[c] Range: 32.0–100.0.

[d] [Please provide].

Exhibit 3

Adjusted Overall Consumer Satisfaction And Recommendation Scores According To Selected Nursing Home Characteristics, 2009

Characteristic	Adjusted overall satisfaction score[a]	Adjusted rate of recommendation to a friend, %[b]
RN, LPN, and LVN hours per resident day		
<1.5	4.21	88.6
1.5-2.0	4.24	89.9
≥2.0	4.46	93.6
Certified NA hours per resident day		
<2.0	4.09***	84.7***
2.0-2.5	4.27***	90.6***
≥2.5	4.42***	94.1***
Number of deficiency citations		
0	4.41**	93.9**
1-10	4.25**	89.9**
≥10	4.15**	86.9**
Profit status		
For profit	4.19***	88.3***
Nonprofit	4.39***	93.2***
Government owned	4.58***	96.0***

SOURCE Authors' analysis of Massachusetts nursing home satisfaction survey (see Note 21 in text) and the Centers for Medicare and Medicaid Services' online survey, certification, and reporting databases of 2009.

NOTES Predictions of adjusted scores and adjusted rates were based on a linear regression model that adjusted for the nursing home characteristics listed in Exhibit 1 and for county fixed effects. Significance refers to within-group differences. See Appendix Exhibit A1 for additional characteristics and unadjusted results (see Note 24 in text). RN is registered nurse. LPN is licensed practical nurse. LVN is licensed vocational nurse. NA is nursing assistant.

[a]Average score for respondents' overall satisfaction with care. Scores were coded on a five-point scale, with 1 meaning very dissatisfied and 5 very satisfied.

[b]Percentage of respondents who answered yes to the question, "Would you recommend this nursing home to a friend or family member?"

** $p < 0.05$

*** $p < 0.01$

Exhibit 4

Adjusted Consumer Satisfaction Scores For Domains Of Care According To Selected Nursing Home Characteristics, 2009

	Domains of care					
Characteristic	**Administrative and direct care staff**	**Physical environment**	**Activities available**	**Personal care**	**Food and meals**	**Residents' personal rights**
RN, LPN, and LVN hours per resident day						
<1.5	4.20	4.06	3.80	4.09	3.95	4.10
1.5-2.0	4.19	4.15	3.84	4.12	3.96	4.12
≥2.0	4.33	4.34	4.01	4.32	4.20	4.27
Certified NA hours per resident day						
<2.0	4.09***	3.96***	3.70***	4.00***	3.83***	4.00***
2.0-2.5	4.23***	4.15***	3.86***	4.14***	4.00***	4.15***
≥2.5	4.32***	4.28***	3.99***	4.28***	4.14***	4.26***
Number of deficiency citations						
0	4.33	4.30***	3.97**	4.29**	4.09	4.25
1-10	4.21	4.13***	3.85**	4.13**	3.99	4.13
≥10	4.14	4.04***	3.74**	4.04**	3.90	4.06
Profit status						
For profit	4.17***	4.07***	3.78***	4.07***	3.93	4.08***
Nonprofit	4.31***	4.30***	3.99***	4.26***	4.11	4.25***
Government owned	4.41***	4.20***	4.06***	4.43***	4.16	4.29***

SOURCE Authors' analysis of Massachusetts nursing home satisfaction survey (see Note 21 in text) and the Centers for Medicare and Medicaid Services' online survey, certification, and reporting databases of 2009.

NOTES Predictions of adjusted scores are based on linear regression models that adjusted for the nursing home characteristics listed in Exhibit 1 and for county fixed effects. Scores were coded on a five-point scale, with 1 meaning very dissatisfied and 5 very satisfied. Significance refers to within-group differences. See Appendix Exhibit A2 for additional characteristics and unadjusted results (see Note 24 in text). RN is registered nurse. LPN is licensed practical nurse. LVN is licensed vocational nurse. NA is nursing assistant.

** $p < 0.05$

*** $p < 0.01$