

# Does Investor Ownership of Nursing Homes Compromise the Quality of Care?

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For the 1.6 million Americans who reside in nursing homes, the quality of care largely determines the quality of life. Most patients in acute-care hospitals will return to their homes and families, regaining command of their sleep schedules, food choices, hygiene, and mobility. They can generally change physicians and hospitals if dissatisfied. Most nursing home patients cannot go home again; many are too impaired to exercise meaningful choices or protest poor treatment. They are forever bound to the rhythms, diets, and treatments decreed by their institution's management.

Poor-quality care has long plagued the nursing home industry.<sup>1-5</sup> Two thirds of the nation's nursing homes are investor owned.<sup>6</sup> Several small studies suggested that for-profit facilities deliver poorer quality care, compared with nonprofit and public facilities.<sup>7-10</sup>

We analyzed quality-of-care data derived from government inspections of virtually all US nursing homes that receive Medicare or Medicaid payments.

## METHODS

We analyzed data on ownership (investor owned, nonprofit, and public), quality, and other characteristics of US nursing homes that are certified for payment from Medicare and Medicaid. Federal regulations mandate about 185 quality standards grouped into 17 categories. State surveyors operating under contract with the Health Care Financing Administration inspect facilities approximately yearly and may issue citations for deficiencies.

The Health Care Financing Administration compiles these surveys in the On-Line Survey Certification and Reporting (OSCAR) system database. We used OSCAR to analyze all surveys conducted during 1998 in all 50 states and the District of Columbia. We excluded facilities with fewer than 16 beds, those reporting implausible nurse staffing figures, and du-

**Objectives.** Two thirds of nursing homes are investor owned. This study examined whether investor ownership affects quality.

**Methods.** We analyzed 1998 data from state inspections of 13 693 nursing facilities. We used a multivariate model and controlled for case mix, facility characteristics, and location.

**Results.** Investor-owned facilities averaged 5.89 deficiencies per home, 46.5% higher than nonprofit facilities and 43.0% higher than public facilities. In multivariate analysis, investor ownership predicted 0.679 additional deficiencies per home; chain ownership predicted an additional 0.633 deficiencies. Nurse staffing was lower at investor-owned nursing homes.

**Conclusions.** Investor-owned nursing homes provide worse care and less nursing care than do not-for-profit or public homes. (*Am J Public Health.* 2001;91:XXX-XXX)

plicate records. Our analysis encompassed 13 693 facilities of the 15 401 in the OSCAR database. To examine the stability of our findings, we repeated all analyses on the 13 941 facilities in the 1997 OSCAR database.

We examined total deficiency rates, as well as deficiencies classified into 3 subgroups, as described elsewhere.<sup>11</sup>

1. "Quality of care" deficiencies were outcome and process measures directly related to resident care, which the federal survey designated as resident assessment, quality of care, nursing services, dietary services, physician services, rehabilitative services, dental services, pharmacy services, and infection control.

2. "Quality of life" deficiencies included those concerned with patient dignity and choice (e.g., patients' rights; use of restraints; admission, transfer, and discharge policies), the physical environment (e.g., facility cleanliness and lighting), and the provision of social services and activities.

3. "Other" deficiencies included all other categories (e.g., administrative procedures, record keeping, and personnel policies).

Surveyors rated each deficiency on an ascending severity scale from A to L. Levels G through L indicate that a patient was actually harmed by the deficiency. To assess whether

differences in deficiency rates were clinically meaningful, we also analyzed the subset of deficiencies in levels G through L.

We also examined nurse staffing ratios as an indicator of quality. Many studies have documented the importance of nursing in both the process and the outcome of nursing home care.<sup>8,12-18</sup> We analyzed total nurse staffing and staffing ratios for each of 3 occupations: (1) registered nurses, (2) licensed vocational and licensed practical nurses, and (3) nursing aides or assistants. We computed staffing hours per patient-day by assuming a 35-hour workweek per full-time employee.

Facilities with sicker patients should provide more extensive and varied care.<sup>19-21</sup> Hence, they have more opportunities to fail and probably run a higher risk of being cited for deficiencies. We analyzed case mix with an index of 3 activities of daily living (ADLs): eating, toileting, and transferring. The ADL index was constructed by adding scores on the 3 ADLs, with 3 representing the lowest need for assistance (a 1 on each ADL) and 9 indicating the greatest dependency.<sup>11,22</sup> The ADL index was our principal control for case mix in multivariate models.

We also tabulated rates of 5 diagnoses or problems available from the OSCAR data: depression, dementia, behavioral symptoms, urinary incontinence, and pressure sores. Interpreting correlations between these diagnoses

and quality indicators was problematic (this issue also might arise, although to a lesser extent, with ADLs). Patients with these problems may need more care. However, substandard care may exacerbate, or even cause, some of these problems. Hence, we report rates of these diagnoses principally for descriptive purposes and included incontinence and pressure sore rates in confirmatory (but not principal) multivariate models and therefore were controlled for in our multivariate analyses.

Several characteristics of nursing homes and reimbursement may confound the relation between investor ownership and quality:

- Homes with more Medicaid residents have lower registered nurse and licensed practical nurse staffing levels.<sup>7,22</sup>
- Hospital-based nursing homes have higher reimbursement<sup>23</sup> and staffing levels than do freestanding nursing facilities.<sup>18</sup>
- Homes categorized as skilled nursing facilities for Medicare only care for sicker patients and have higher staffing<sup>7</sup> and reimbursement<sup>23</sup> levels than do nursing

home facilities for patients covered by Medicaid.<sup>8</sup>

- Facilities affiliated with a multifacility chain may have lower costs,<sup>20,24,25</sup> which may affect care.

We used SAS<sup>26</sup> to compute univariate means of all variables for investor-owned, nonprofit, and public nursing homes. We used 1-way analysis of variance to test differences; differences were significant at  $P < .01$  unless otherwise stated. We used ordinary least squares regression to examine the effect of investor ownership on deficiencies, controlling for ADL index, percentage of residents covered by Medicaid, whether the facility was hospital based, whether it was a skilled nursing facility for Medicare only, whether the facility was part of a chain, and location by state.

## RESULTS

Of the 13 693 nursing homes, 9009 (65.8%) were investor owned, 3789 (27.7%)

were nonprofit, and 895 (6.5%) were public (Table 1).

The ADL index was minimally higher in investor-owned homes—5.76 vs 5.71 in nonprofit facilities and 5.75 in public facilities. Differences in the proportions of residents with depression, dementia, behavioral symptoms, urinary incontinence, and pressure sores were small and inconsistent.

Two thirds of the investor-owned facilities were owned by a chain, compared with 40% of the nonprofit facilities and 8% of the public facilities. Investor-owned homes were larger than nonprofit homes but smaller than public homes. Investor-owned facilities had more Medicaid patients (68% of all residents) than did nonprofit facilities (49%) or public facilities (62%). Only 3% of the investor-owned homes were hospital based, compared with 28% and 39% of the nonprofit and public facilities, respectively. Investor-owned facilities were more often located in the South or West and had lower occupancy rates.

Investor-owned nursing homes had more of all types of deficiencies than did nonprofit or public facilities (Table 2). Total deficiencies at investor-owned facilities averaged 5.89 per home, 46.5% higher than at nonprofit facilities and 43.0% higher than at public facilities.

Nurse staffing was lower at investor-owned nursing homes for each occupational category. Licensed nursing (registered nurse plus licensed vocational and licensed practical nurses) hours per patient-day at investor-owned facilities were 31.7% lower than at nonprofit facilities and 22.8% lower than at public facilities; nursing aide hours were 11.9% and 16.0% lower, respectively.

In the multivariate analysis, investor ownership predicted more deficiencies of each type after control for ADL index, location by state, and the 4 facility and reimbursement characteristics (Table 3). Investor-owned nursing homes averaged 0.679 more deficiencies; chain ownership predicted an additional 0.633 deficiencies. Homes with a higher ADL index had more deficiencies, as did those with a higher proportion of Medicaid patients. Homes certified as skilled nursing facilities for Medicare only had fewer deficiencies.

Analyses excluding the 1054 skilled nursing facilities for Medicare only showed nearly identical results, as did confirmatory models

**TABLE 1—Characteristics of Nursing Homes Analyzed: United States, 1998**

	Investor Owned	Nonprofit	Public
No. of homes	9009	3789	895
Chain owned, %	66	40	8
Region, %			
Midwest	31	40	43
Northeast	16	25	15
South	37	23	27
West	16	12	15
Average beds	108	97	117
Occupancy rate, %	85.6	86.9	88.2
Hospital based, %	3	28	39
Skilled nursing facility—Medicare only, % <sup>a</sup>	4	17	10
Patient characteristics			
ADL index	5.76	5.71	5.75
% With depression	30	29	30
% With dementia	44	40	43
% With behavioral symptoms	31	27	32
% With urinary symptoms	52	50	51
% With pressure sores	7	7	6
% With Medicaid coverage	68	49	62

Note. ADL = activities of daily living.  $P < .01$  for difference between investor-owned and other nursing homes for all variables shown in table.

<sup>a</sup>The percentage of homes certified as skilled nursing facilities for Medicare only. Such facilities generally care for patients with a higher level of need and receive higher reimbursement.

**TABLE 2—Average Number of Deficiencies Found at Investor-Owned, Nonprofit, and Public Nursing Homes: United States, 1998**

Type of Deficiency	Investor Owned	Nonprofit	Public
Quality of care	3.56	2.59	2.63
Quality of life	1.92	1.18	1.25
Other	0.41	0.25	0.24
Total	5.89	4.02	4.12

Note.  $P < .01$  for all differences between investor-owned and other nursing homes.

**TABLE 3—Multivariate Analysis of Predictors of Number of Deficiencies at US Nursing Homes, 1998**

	Deficiencies			
	Quality-of-Care	Quality-of-Life	Other	Total
Intercept	1.217	0.085	-0.219	1.084
% Covered by Medicaid	0.010*	0.011*	0.002*	0.023*
ADL index	0.242*	0.034	0.030*	0.306*
Hospital based	-0.086	-0.138	-0.034	-0.258
Skilled nursing facility—Medicare only <sup>a</sup>	-0.832*	-0.208	-0.057	-1.097*
State <sup>b</sup>	...	...	...	...
Chain owned	0.412*	0.179*	0.042*	0.633*
Investor owned	0.366*	0.246*	0.067*	0.679*

Note. ADL = activities of daily living. Adjusted  $R^2$  for prediction of total deficiencies = 0.223.

<sup>a</sup>The percentage of homes certified as skilled nursing facilities for Medicare only. Such facilities generally care for patients with a higher level of need and receive higher reimbursement.

<sup>b</sup>The model included a 51-level variable for state. We do not report coefficients for each state.

\* $P < .01$ .

that controlled for rates of urinary incontinence and pressure sores.

Approximately one quarter of all deficiencies were severe (levels G–L). Rates of severe deficiencies at investor-owned facilities were 40.5% higher than at nonprofit homes and 35.8% higher than at public homes.

Results from the analysis of the 1997 data were very similar to the results of the 1998 analysis. Investor-owned facilities had total deficiency rates 29.8% higher than those at nonprofit facilities and 25.2% higher than those at public facilities. In multivariate analysis, investor ownership predicted an additional 0.623 deficiencies per home in 1997.

## DISCUSSION

Our results suggested that investor-owned nursing homes deliver lower quality care than

do nonprofit or public facilities. Moreover, investor-owned facilities usually are part of a chain, and chain ownership per se is associated with a further decrement in quality.

Investor-owned facilities appear to provide less nursing care, a finding consistent with previous research.<sup>7,8,13,27</sup> Higher registered nurse staffing levels predict lower death rates, and better licensed practical nurse staffing is associated with better functional outcomes.<sup>18</sup> Facilities with higher nurse staffing levels have fewer deficiencies.<sup>11</sup> Skimping on staffing by for-profit homes may partly explain their lower quality.

A Pennsylvania study found fewer pressure sores and higher staffing levels at nonprofit facilities.<sup>8</sup> A recent non-peer-reviewed report found higher deficiency rates at investor-owned homes but did not control for confounders.<sup>28</sup> An analysis of 1987 data found

approximately 6% higher death and infection rates among private-pay patients in for-profit homes compared with those in nonprofit ones.<sup>9</sup> We (and others<sup>13</sup>) have found lower quality at facilities with more Medicaid patients, presumably because Medicaid payments are generally low, and Medicaid patients have fewer options for care.

The number of deficiencies yields an incomplete, proxy measure of quality; more systematic information on patient outcomes and satisfaction would be useful supplements. Despite clear federal guidelines, surveyors' decisions may be somewhat subjective, and perhaps some are biased against for-profit homes. However, the data we analyzed were the only systematic evaluations of quality available for all certified US nursing homes.

Our multivariate model controlled for case mix with several facility- and reimbursement-related variables associated with case mix, as well as the ADL index. ADLs are primary components of the well-validated resource utilization groups (RUGS III) case-mix index.<sup>21</sup> Unfortunately, other variables needed to compute a full RUGS III are not available from OSCAR or other comprehensive nursing home data sources. Because differences in ADL case mix between ownership types were small, and there were no consistent differences in rates of common conditions such as incontinence and dementia, we doubt that unmeasured case-mix differences explain our findings.

Investor-owned facilities were larger than nonprofit nursing homes (a factor that may be associated with more deficiencies), but public facilities were even larger yet had better staffing and fewer deficiencies. In confirmatory multivariate models that included facility size and certification (data not shown), investor ownership remained a strong predictor of higher deficiency rates.

The most obvious explanation for our findings is that profit seeking diverts funds and focus from clinical care. The nation's largest nursing home chain generated 1997 profits of \$5.28 per patient-day,<sup>29</sup> enough money, at prevailing wages,<sup>30</sup> to erase more than half of the investor-owned homes' nurse staffing deficit relative to nonprofit homes.

Our findings do not mean that the quality of care at most nonprofit or public facilities is

excellent or even adequate.<sup>3–5,31–34</sup> Despite previous attempts to tighten the regulation of nursing homes, enforcement has been lax.<sup>3–5</sup> After the passage of nursing home reform legislation in 1987, industry lobbyists delayed the effective implementation of sanctions until 1995<sup>35</sup>; enforcement may have actually declined in the early 1990s.<sup>36</sup>

Our findings on quality in long-term care mirror data from acute-care settings.<sup>37</sup> Investor-owned hospitals have higher costs,<sup>38–48</sup> despite spending less on clinical personnel than do nonprofit facilities.<sup>47</sup> Death rates and postoperative complication rates also are higher at investor-owned hospitals,<sup>46,49</sup> and nurse staffing levels are lower.<sup>49</sup> Investor-owned health maintenance organizations have worse quality scores and spend less on care and more on administration and profits than do not-for-profit plans; overall costs are identical.<sup>50</sup>

Nursing homes care for many people too frail, too sick, too poor, and too powerless to choose or even protest their care. We believe it unwise to entrust such vulnerable patients to profit-seeking firms. ■

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### Contributors

C. Harrington, S. Woolhandler, and D. U. Himmelstein planned the study, designed analyses, and drafted the paper. C. Harrington, J. Mullan, and H. Carrillo developed the database and performed the data analyses. All authors reviewed and contributed to the final paper.

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