COMPARING SERVICE AND QUALITY AMONG CHAIN AND INDEPENDENT U.S. NURSING HOMES DURING THE 1990s

Jane Banaszak-Holl[1], Whitney B. Berta[2], Joel A.C. Baum[3], Will Mitchell[4]

[1]University of Michigan School of Public Health, 109 S. Observatory Drive, Ann Arbor, MI 48109-2029, (734) 936-1668, janebh@umich.edu

[2]University of Toronto, Department of Health Administration, McMurrich Building, 2nd Floor, 12 Queen's Park Crescent West, Toronto, Ontario M5S 1A8, (416) 978-4236, whit.berta@utoronto.ca

[3]Rotman School of Management, University of Toronto, 105 St. George Street, Toronto, Ontario M5S 3E6, (416) 978-4914, baum@rotman.utoronto.ca

[4]Fuqua School of Business, Duke University, Box 90120, Durham, NC 27708-0120, (919) 660-7994, Will.Mitchell@duke.edu

Acknowledgements: Correspondence should be addressed to Jane Banaszak-Holl at the University of Michigan address above. This research was supported by funds from the Blue Cross Blue Shield of Michigan Foundation although the ideas reported herein are solely the responsibility of the authors.

August 3, 2002 (version: descrip6.doc)

COMPARING SERVICE AND QUALITY AMONG CHAIN AND INDEPENDENT U.S. NURSING HOMES DURING THE 1990s

Abstract

Purpose: This article evaluates the impact of chain ownership of nursing homes by examining whether facilities demonstrate variation in services, staffing and health outcomes across three structural dimensions—chain ownership, chain and facility size and proprietary status.
Design and Methods: We link files of facility inspection reports from 1991 through 1997, excluding government facilities. Chain ownership was identified from reported names of corporate owners. We examine differences in means for measures of case mix, service availability, and health outcomes by ownership and size categories.
Results: Most nursing home chains own fewer than ten facilities. Chain-owned facilities, in general, provide lower staffing but a higher proportion of beds for rehabilitative care and Alzheimers' patients. There are negligible differences in case mix across chain and non-chain facilities. Overall, quality is poorer among for-profit facilities but does not vary with chain ownership.
Implications: Results indicate that chain and for-profit ownership have distinct and often different effects on services, staffing and health outcomes. Chain ownership may mediate the negative effects of the profit motive by providing administrative structures for facilitating quality care. Further multivariate research is needed to distinguish the effects of chain and for-profit ownership.

Key Words: Differences in care, nursing home ownership, corporate control

COMPARING SERVICE AND QUALITY AMONG CHAIN AND INDEPENDENT U.S. NURSING HOMES DURING THE 1990s

INTRODUCTION

The growing chain ownership of nursing home facilities in the United States has generated substantial concerns that chains reduce quality of care and availability of services, in order to maintain corporate profits. In the U.S., nursing home chains have flourished since the 1970s, subsequent to the passage of Medicare and Medicaid and the extension of public payment for nursing home residency (Light 1986). Consolidation of nursing homes has been ongoing. Over the period of our study, 1991 to 1997, the proportion of nursing homes in the U.S. belonging to multi-unit chain organizations increased from 39% to 45%. The role of profit motives in acquisition and divestiture transactions over the last decade has motivated some of the concern for quality of care and service availability. Increased concentration in the market for long-term care may have allowed nursing home owners to become more lax in their service provision and quality.

Many observers point to a few prominent for-profit U.S. nursing home chains that have received negative press following allegations of fraud and poor resident care as evidence of the poor care that is to be expected in the hands of profit-oriented firms (McGinley 1999). These concerns, however, have been the subject of limited empirical analyses and these studies have provided mixed evidence for the impact of ownership on health care services and quality (Harrington et al. 2001; Banaszak-Holl et al. 1996; Cohen and Dubay 1990; Lee et al. 1983) and on the efficiencies that nursing home chain organizations realize (McKay 1991; Holmes 1996).

Research findings often do not consider structural differences existing across chain organizations and simple comparisons of for-profits with nonprofits or of chains with freestanding facilities also can confound the effects of these different types of ownership. For nursing homes in particular, research typically has assessed ownership effects using a simple chain versus non-chain facility dichotomy (Baum

1999). This dichotomy neglects the structural variation that exists both across the industry and within the chain form.

Nursing home chains may vary in membership, proprietary status, and organizational size. These differences in facility and chain structural characteristics reflect differences in the *missions* of organizations – which influence the ways in which organizations secure capital and pursue growth – and differences in the *structural capacity* and motivation for these organizations to handle consumer problems, including quality of care. In this paper, we examine the extensiveness of structural differences across nursing homes in the United States, and the effects of each source of structural variation on a set of clinical and health outcomes.

The corporate chain is a relatively recent phenomenon but it is already becoming predominant across service industries. Corporate chains are similar to multi-product or multi-plant manufacturing companies (Baum and Ingram 1998; Greve and Baum 2001), but are unique in encompassing many geographically distinct units that are alike in what they produce and in their organizational structure. Chains can generate economies of scale through control of markets (Luke, Ozcan and Olden 1995) and through corporate offices that apply uniform standards (Davis 1993). In order for chain organizations to realize advantages inherent in their size and multi-market structure, corporate offices must exert close control over what local units do and develop systems that discourage variation. The level of corporate control will also affect the selectivity of the acquisition process and the systematic dissemination and use of information and knowledge across member facilities (Banaszak-Holl, Berta, Bowman, Baum and Mitchell 2002). In other industries, researchers have found that structural characteristics of chains impact knowledge transfer across units and the capabilities of units (Baum and Ingram 1998; Baum, Li and Usher 2000; Greve 1999).

In health care, and for nursing homes more specifically, the growth of corporate chains has been fueled largely through acquisitions and hence, corporate changes in local facilities' strategy and practices requires chains to change existing practices, many of which are highly routinized. Acquisitions reflect an imperfect way of achieving corporate goals, because they frequently do not lead to the expected benefits

(Spang, Bazzoli and Arnould 2001). Indeed, if a chain implements standardized technology in a facility that has been operating at peak performance, the changes may reduce the quality within the facility (Banaszak-Holl et al. 2002). Nonetheless, nursing home acquisitions have been common, because stringent Certificate of Need (CON) and moratoria on construction (Harrington et al. 1997) prohibit chains from taking a McDonald's approach to building new units (e.g., franchises) in competitively advantageous locations.

Variations across three distinct structural dimensions – chain ownership, chain and facility size, and proprietary ownership status – are particularly relevant when comparing how chains and independent facilities influence changes to services and quality at the local facility level. We expect these three key dimensions to impact the operations of nursing homes at the chain and facility levels. We examine how these effects manifest in terms of differences across structural characteristics (occupancy rates, staffing intensity and service mix), the type of residents receiving care, and the quality of care that nursing homes provide.

Chain Membership. It is unclear how to weigh the costs and benefits of chain ownership for the accessibility of services and quality of care provided within nursing homes. Processes of shared learning as well as economies of scale across geographically dispersed units may impose constraints on the use and quality of services within member facilities. Chains may also seek to increase their local market power in order to constrain the demands for quality (Ho 2000). Because chain organizations operate multiple facilities, the corporate owners may not be directly involved with individual patient care (Light 1986), and the lack of community context may make profit motives even stronger among corporate chain owners (Harrington et al. 2001). In addition, benefits of standardization may not be realized if economies of scale are not achieved (McKay 1991) or if market power reduces incentives for local facilities to operate effectively.

While research has sought to determine how cost savings can be achieved in long-term care, concerns that cost savings lead to reductions in the quality of care and access to services, particularly for Medicaid recipients, have not always been supported. No evidence has indicated that cost containment

has been achieved via means other than nursing home efficiency, such as through staffing reductions, reduced availability of services, and the admission of less costly patients (Davis 1993). Cohen and Dubay (1990) found few differences in services and staffing across chain and non-chain facilities. Other research has shown that chain-owned nursing homes do not enjoy significant cost savings when compared to independently owned homes (Lee, Birnbaum and Bishop 1983).

Chain and Facility Size. Size includes both chain size (number of homes operated by a chain) and facility size (number of beds within a home). Larger chains may engage professional management who are facile at implementing structural change and understand how to effect control over local facilities. On the other hand, very large chains may face difficulties in managing a diverse set of facilities, particularly if they are geographically dispersed. The standardization strategy chains commonly pursue mitigates this possibility.

The size of the local facility will also impact the capabilities and activities of management staff. Small facilities may lack the capacity to support economies of scale; for example, they may not be able to hire a full-time therapist to provide occupational or speech therapy. In addition, small facilities will be run largely by a single administrator or a small management staff, and these individuals may spend most of their time handling immediate operational or clinical problems with little opportunity (or even expertise) to engage in strategic planning or the expansion of services.

Proprietary Status. Chains are common among nonprofit and for-profit health providers and include both very small and very large corporate structures. Even religious owners of nursing facilities have merged to form larger corporate offices and achieve economies of scale. At the same time, some for-profit chains are very small, including only two or three nursing homes, and are owned by local entrepreneurs who are not accountable to public shareholders. These small chains may not have the benefits of a large corporate staff or economies of scale.

The role of chain ownership must be distinguished from that of for-profit status in determining service and quality differences across corporate structures. Profit orientation is widely held to influence the quality of nursing home care by shaping incentive systems within facilities. The absence of equity

owners in nonprofit facilities promotes the use of revenues to improve performance and affords nonprofits the ability to apply their revenues to providing less profitable services and subsidizing charity care. In contrast, for-profit operators are seen as driven by a greater focus on efficiency and cost-cutting, and are frequently charged with downgrading quality and under-investing in facilities, staff, and innovation (Aaronson et al. 1994; Baum 1999; Lemke and Moos 1989; Rosko et al. 1995; Weisbrod and Schlesinger 1986). Other research fails to sustain the comparison, though, demonstrating that the focus of for-profits on efficiency does not lower resident welfare, although it might (Cohen and Dubay 1990) or might not (Gray 1991) manifest as lower operating costs compared to homes with other types of ownership.

In the health care field, for-profit chains have been the target of particular criticism because corporate chains are generally suspected of responding to growth incentives through mergers and acquisitions rather than through performance improvements within facilities (Gray 1997). Researchers have argued that for-profit facilities lower quality service because profit maximization drives them to minimize service for payment (Weisbrod and Schlesinger 1986). For-profit incentives are perceived to be strongest within corporate chains, because shareholders of large public firms demand quick and strong responses to changes in profit.

While large nonprofit chains may also ignore local community interests, nonprofit chains have incurred less stringent criticism. They are perceived as pursuing more humane or altruistic missions. Realistically though, even nonprofits must maintain a positive financial balance and managers in nonprofits, because they are also agents of community owners, may act as competitively as their for-profit counterparts. Moreover, the presence of nonprofits in the market will drive for-profit nursing homes to be more responsive to the community (Hirth 1997).

Overall, both theory and research indicate that chain ownership, size and proprietary status will affect the missions of organizations and their internal capabilities and capacities. Here, we use descriptive data to examine the variation across chain ownership, for-profit status, and chain and facility size in the types and quality of service provided in nursing home facilities. These data provide a rich

picture of how chains and independent nursing home facilities have shaped the nursing home industry in the United States.

METHODS

We use a longitudinal data set linking annual files of the federal OSCAR data. The OSCAR files include information from state-based inspections of all Medicare/Medicaid certified facilities operating in the continental U.S. from 1991 through 1997, but we have excluded government-owned facilities from our analyses. OSCAR includes information on nursing home structure (e.g., size, staffing, services offered), resident case mix (e.g., proportion of residents requiring assistance with Activities of Daily Living and who are incontinent), system membership (e.g., multiunit affiliation and name), and counts of health and non-health related deficiencies reported during state inspections. Inspections are mandated on an annual basis, although the time between inspections can be two years or more (the mean inspection period in our data is 374 days).

Key here is the operationalization of chain membership. About half the nursing homes in these data report belonging to a multi-institutional corporation; this is the variable that has traditionally been used to identify chain membership. The OSCAR data also include the names of the multi-institutional corporations to which nursing homes reported belonging. We identified nursing home chains and nursing homes' membership in these chains based on the reported corporate names. We coded chain membership through line-by-line inspection of the records (more than 100,000 records), assessing inconsistencies by comparing name spelling and inter-temporal relationships to specific homes. Finally, we compared corporate ownership for large chains using 1990-1998 volumes of the *Medical and Healthcare Marketplace Guide* (Dorland's Biomedical Publications).

On average, we find that about 6% of nursing homes reported belonging to a multiunit company but were the *only* facilities reporting ownership by that corporation. Such cases were labeled "single-home holding companies," and were often either stand-alone corporate offices or health provider systems that included facilities other than nursing homes (such as are found in continuing care retirement communities, hospitals, or health systems). Past research relying on the OSCAR chain ownership

variable may have failed to identify these single-home "chains." This measurement problem may have confounded findings in past studies. We define chains as corporations that own at least two facilities in a given calendar year.

Table 1 reports the number of nursing home facilities and chains from January 1991 through September 1997. In total, there are about 104,000 records in the data set, covering over 19,000 unique nursing homes. We identified 2,255 unique nursing home chains. Most of the multi-home chains are quite small, with roughly 87% operating 10 or fewer homes. Thus, extensive chaining of nursing homes exists, but it is still primarily a small-scale phenomenon.

[Table 1 about here]

Table 1 also shows that a small number of nursing homes dropped out of the data set during the study period with about 130 homes per year disappearing from the sample during the years 1991 through 1994 (when about 1% of the facilities disappeared) and somewhat more disappearing in the years 1995 and 1996. Some of these disappearances likely reflect facilities that closed; however, many of the latter cases of disappearance are facilities with longer intervals between inspections (i.e., they will appear in inspection reports subsequent to the study period).

Our analyses provide descriptive information on structural characteristics (occupancy rates, staffing intensity and service mix), payer mix, case mix, and quality of care across categories of facilities. For comparison, we define categories of ownership (for-profit vs. nonprofit), chain membership (chain member vs. independent), and size of the facility (3-50 beds, 51-100 beds, 101-200 beds and more than 200 beds), and size of the chain (2-10 homes, 11-50 homes, 51-100 homes or more than 100 homes). Prior research suggests that organizations differing in size compete in different ways, for different resources, and using different operating and strategic capabilities (Hannan and Freeman 1977; McKelvey 1982). Hence, we include both facility and chain size as a basis for making our descriptive comparisons. The four-way comparison of independent for-profit facilities, independent nonprofits, chain-owned for-profits and chain-owned non-profits distinguishes between the impacts of chain-membership and proprietary status on clinical and health outcomes.

Occupancy rates are defined as the number of residents per bed. Clinical staffing intensity is defined as the number of clinical staff per bed and includes RNs, LPNs, nursing aides and therapy staff. Service mix is defined as the availability of services relative to the number of total beds in the facility. We include three types of specialty care beds, those for residents with Alzheimer's disease, those for residents with rehabilitative needs, and those available for miscellaneous medical services. In addition, we measure the availability of two types of specialty services – injection and therapy services (therapy may include speech, occupational or physical therapy). Payer mix is defined by the percent of residents who are covered through Medicaid, Medicare, or private payment, where the private payment category includes other types of insurance (such as VA, CHAMPUS, and private insurance). Case mix factors include the percent of residents who are incontinent, receiving anti-psychotic drugs, and bedfast.

Finally, we consider variations in quality, where quality is measured by the number of health deficiencies cited on state inspections, by the percent of residents with pressure ulcers (i.e., PUs), and by the percent of residents who are restrained. We scale each facility's number of deficiencies by the mean for all facilities in the state, because previous research has found substantial state variation in the number of citations (Harrington and Carillo 1999). Previous research has used the health deficiency and pressure ulcer measures to indicate nursing home quality (e.g., Harrington et al. 2001; Marlin et al.1999; Mukamel 1997). The percentage of residents with PUs indicates a health care quality problem directly linked to a resident's quality of life in a facility and in part because PUs are often preventable and subsequently considered a good indicator of quality (Aaronson et al. 1994). Although for both restraint and pressure ulcer prevalence (to a lesser extent), these problems are also linked to the case mix of residents within the facility.

In order to facilitate comparisons across facilities with different case mixes, we also created scales that adjust both the restraint and PU rates by the distribution of residents with key clinical characteristics. Restraint Mix (RM) is defined as the percent of restrained residents divided by the percent of residents receiving anti-psychotic drugs. Pressure Ulcer Mix (PUM) is defined as the percent of residents with pressure ulcers divided by the percent of bedfast residents. The RM and PUM scales thus

include deflators for the proportion of residents who are most likely to require restraints or to have bedsores owing to their inability to leave their bed. Greater values of the RM and PUM measures indicate greater case-weighted prevalence of poor quality of care.

If profit orientation is the key factor determining quality, independent and chain-owned nonprofits should be no different in their structure, processes, or outcomes. Furthermore, independent and chain-owned for-profit facilities will act similarly although chain-owned for-profit facilities may have differing structure, processes, and outcomes since the strength of the profit motive will be stronger in these facilities. On the other hand, if chains are more capable of sharing best practices, achieving economies of scale, and implementing administrative changes, outcomes and processes at chain facilities will be better than in independently-owned facilities – regardless of profit status – even though these chain-owned facilities will not necessarily report greater structural resources.

In interpreting results, we examine the relative magnitude of differences. We also calculated t-tests for differences across chain status, profit status, size, and within chains for profit status and size, and within proprietary status by size.[1] Owing to the large sample size, even small differences are highly significant, however.

RESULTS

We first compared nursing homes along structural characteristics of occupancy levels, staffing, and service mix. We found that chain-owned facilities differ from both independent for-profit facilities and independent nonprofits. We confirm that independent nonprofits have the highest levels of occupancy and staffing, but we also find intriguing differences between chains and independent facilities. Table 2 reports these results.

[Table 2 about here]

Occupancy Rates. Four results concerning occupancy rates are notable. First, occupancy rates tend to be high across all facilities, ranging from 78% to 89%, indicating at least some excess capacity in the industry. Second, occupancy rates differ only slightly among independent homes, where the average occupancy rate ranges from 86% to 87% across all size categories, and in chain-owned homes, where the

average ranges from 85% to 86%. Third, the smallest homes (those with 3-50 beds) tend to have lower occupancy (78%-80%) than larger facilities; this holds across ownership categories, with the exception of for-profit independents where the occupancy rate within the smallest homes is 87%. At the same time, though, large homes (201+ beds) operated by non-profit chains also have lower occupancy (79%) than the industry average.

The strongest conclusion we can draw from the occupancy rate results is that occupancy tend to be high, with only small variations across ownership and size categories. The lowest occupancy rates tend to occur in the smallest homes.

Staffing Intensity. Four results stand out in the comparison of staffing intensity. First, staffing intensity within facilities tends to decline with size of home, across all ownership categories. Second, for a given size facility, nonprofits tend to have higher staffing ratios to residents than for-profits, within both the chain and independent categories. Third, within both for-profit and nonprofit categories, chain-owned homes report lower staffing intensity than independents. Fourth, when comparing chains of various sizes, we find that nonprofit chains with the most homes have the lowest staffing levels. Overall, the findings show lower staffing intensity among for-profits, chains, larger facilities, and larger chains.

Availability of Specialty Care. We next examine differences in the availability of specialty care beds and services. Three conclusions can be made about the availability of rehabilitative beds. First, there is a moderate tendency for smaller homes to provide more rehabilitation beds. Second, chains also provide more rehabilitation beds, especially for-profit chains (except for for-profit chains with only a few facilities). By contrast, for-profit independents provide the lowest proportion of rehabilitation beds. Two patterns emerge for Alzheimer's beds. First, smaller facilities have fewer beds devoted to Alzheimer's care. Second, compared to independent homes, chain-owned homes tend to have more beds for residents with Alzheimer's disease, particularly nonprofit chains. We observe two differences in the provision of miscellaneous medical services. First, smaller homes provide slightly more miscellaneous services beds. Second, non-profit nursing homes generally provide more miscellaneous service beds than for-profit homes, with the independent nonprofit homes providing the highest proportion of miscellaneous medical

services overall. Two differences arise for injection and therapy services across classes of facilities. First, small facilities tend to provide a higher rate of injection and therapy services. Second, nonprofits also tend to provide higher rates of these specialty services.

In summarizing the variation in availability of specialty services, facility size plays an important role, with larger facilities providing more Alzheimer's care and miscellaneous medical services, but fewer beds for rehabilitation patients, less injection services, and less therapy services. In addition, for-profit facilities often provide lower levels of specialty services and beds (therapy services, injection services, miscellaneous medical services), while chains provide higher levels of rehabilitation and Alzheimer's care beds. Thus, difference patterns emerge for profit and chain status. That is, nonprofit facilities are the biggest providers of some services (injection and therapy) while chain-owned homes are the biggest providers of other services (Alzheimer's and rehabilitative beds).

Second, this variability notwithstanding, for-profit chains with larger numbers of homes commonly have relatively high levels of services across all five categories. Overall, then, although service availability varies substantially by type of service and type of facility, for-profit chains are most likely to provide the most diverse combination of services. This result may stem from a combination of economies of scale across facilities and the availability of professional management to coordinate the services.

Payer Mix. Distinguishing payer source for residents is important because, during the study period, nursing homes tended to receive larger payments from private pay and Medicare residents then from Medicaid (Medicare margins greatly exceeded those of Medicaid prior to implementation of a prospective payment system for skilled nursing facility care, which was enacted in 1999). Private payment is most common in the nonprofit homes, with few differences by size or chain status, suggesting that residents with the resources to pay for their own care tend to prefer nonprofit homes. Medicare coverage is highest in the smallest facilities, across all categories of ownership, and within nonprofit facilities, particularly chain-owned nonprofits. In contrast, residents covered by Medicaid are more prevalent in larger facilities and for-profit facilities. Table 3 reports the results comparing payer mix, as well as case mix, and quality of care, which we turn to subsequently.

[Insert Table 3 about here]

Two patterns stand out for payer mix. First, there is a marked segmentation in the industry such that large for-profits, including both chain-owned and independent facilities, are most likely to serve residents with the lowest level of payment. Thus, the highest proportions of private pay residents are served by nonprofit nursing facilities and is consistent with residents with private resources demonstrating preferences for nonprofit facilities. Second, the percent of residents covered by Medicaid tends to fall slightly with for-profit chain size. This pattern may indicate a strategy by large national level chains to minimize their low-profit Medicaid population, possibly because their managerial and marketing sophistication makes them better able than smaller chains to target and attract more profitable residents.

Case Mix. Case mix of residents is critical for the care nursing homes provide because it directly impacts the time that staff members spend caring for residents. The prevalence of incontinence does not appear to vary with proprietary status or with chain ownership, although rates of incontinence are frequently lower in the smallest facilities (those with under 50 beds) where the staffing ratios are higher. Rates of anti-psychotic drug use do not appear to vary with proprietary status, but are slightly higher among for-profit chains when compared to all other types of facilities. The percent of bedfast residents also is slightly higher among chain-owned for-profits. In most cases, the percentage of bedfast residents is highest in the smallest facilities (those with under 50 beds). Perhaps the most striking pattern here is that for-profit chains are as likely or even somewhat more likely to provide care to the most difficult-to-serve population.

Quality of Care Indicators. We next compared facilities along the quality indicators of restraint use, pressure ulcer prevalence, and deficiency citations. The differences by size category are much more extreme than the differences by proprietary status or chain ownership.

Two comparisons are notable for restraint use. First, there are only small differences across ownership and chain categories. The highest restraint use is reported among independent for-profits where 20% of residents were restrained (the RM scale, which adjusts restraints by case mix, also is slightly higher for for-profit independents). By contrast, the lowest restraint use is found among chain-owned

nonprofits, which on average report that 18% of residents were restrained. Second, restraint use increases substantially with facility size, regardless of type of ownership, with the biggest difference arising within the smallest facilities. The smallest independents (those facilities with less than 50 beds) report 14% of residents having restraints as compared to 21% restrained in the largest independents (those with more than 200 beds). Likewise, among chain-owned nonprofits, 12% of residents in the smallest facilities are restrained as compared to 23% in the largest facilities. Similar results can be observed in the RM scale, which adjusts restraints by the percentage of residents receiving anti-psychotic drugs, showing that the RM measure increases modestly with facility size. Thus, although the percentage of residents bedfast tends to decline with facility size, our results suggest that a more difficult case mix is not driving these findings. Instead, it is possible that the larger facilities, which we showed tend to have fewer staff per resident, use restraints as a substitution for personal care.

We find two striking differences in PU prevalence. First, chain-owned for-profits have the highest rates of PUs (on average 7.7% of residents in chain-owned for-profits have PUs). By contrast, though, the lowest prevalence of pressure ulcers is among independent for-profits (which on average report 6.8% of residents have PUs). Second, facility size affects pressure ulcer incidence: PUs are more prevalent within the smallest facilities (with less than 50 beds) with the sole exception of independent for-profits, where ulcers are uniformly moderate.

Notably, though, the PU rate differences change when we use the PUM measure, which adjusts for bedfast case mix. We now find that independent for-profits shift from the lowest PU prevalence (6.8%) to the highest PUM measure (1.36), because they have the lowest proportion of bedfast residents. In parallel, we find that the smallest facilities tend to have the lowest PUM ratings (1.04 to 1.17), because they have the highest level of bedfast residents. Some of the variation in pressure ulcer incidence appears to arise from case mix differences. At the same time, though, additional differences arise from for-profit status and facility size, with for-profit and larger homes tending to have higher PU prevalence.

Three striking differences arise when comparing the state-weighted health deficiency frequency. First, deficiencies are greatest for independent for-profits, followed by chain-owned for-profits. Among

all facilities, independent for-profits were on average cited for 1.14 times the state average as compared to 1.02 for chain-owned for-profits, 0.87 for independent nonprofits, and 0.84 for chain owned nonprofits. Second, facility size influences the frequency of health deficiency citations. Homes with fewer beds (especially under 50 beds) tend to receive fewer deficiency citations. Among independent nonprofits, the smallest facilities, those with less than 50 beds, receive on average 0.67 health deficiencies as compared to 1.16 health deficiencies for the largest facilities, those with more than 200 beds. Third, citations for health deficiencies decrease as the number of facilities in the chain increases. Thus, there are contravening effects of two types of size, as greater facility size leading to more deficiencies, while greater chain size leads to fewer deficiencies.

Four summary conclusions arise concerning quality of care. First, larger facilities tend to have lower quality across all three care dimensions, including restraints, case-mix adjusted pressure ulcers, and health deficiencies. Second, for-profit homes often have lower quality on the three dimensions, especially when comparing rates of deficiencies. Third, often chain status in and of it self has little discriminating influencel; however, the combination of independent and for-profit ownership also commonly associates with lower quality on the three dimensions. This final pattern may arise from a combination of strong financial pressure of for-profit status and limited professional management in independent homes.

DISCUSSION AND CONCLUSIONS

While chains are increasingly dominant in the nursing home industry, little information is currently available on the types of chains operating in this industry or on the strategy and structure of this organizational form. We provide descriptive information that is useful for economic and policy considerations. Indeed, we provide detailed tables of results in part because such data have never before been published and reveal important characteristics of the evolution of nursing home chains.

One key finding is that while the largest nursing home chains are most visible in news stories on the industry, most nursing home chains are relatively small (with under 10 facilities). Further research is needed to explore the local control of these chains as much policy debate has focused on the loss of community control with the entry of nursing home chains. Our results elaborate the ways in which chain

facilities differ on structural characteristics and health outcomes. Several differences are notable when comparing chains and for-profit homes to independent and nonprofit facilities.

First, chain-owned facilities provide lower staffing than independents, which parallels differences between for-profit and nonprofit facilities. Lower staffing undoubtedly arises, in part, from the profit motive. In addition, though, the fact that nonprofit chains also have somewhat lower staffing levels suggests that central coordination by chain headquarters may help facilities operate more efficiently than independent homes.

Second, service provision differs across proprietary and chain status. Chain-owned facilities offer more beds for rehabilitative care and for Alzheimer's patients, but lower levels of specialty services such as therapy and injection services. One explanation is that the provision of some types of specialty services is less compatible with standardization – the hallmark of chain strategy. Provision of specialty services requires specialized units, technology, and staff, especially for medically intensive care such as injection services, that are distinct from the inputs required for general purpose care. In contrast, the provision of Alzheimer's care services may be easier to implement in standard processes across facilities. In addition, though, specialty services also tend to be less common at for-profit facilities, whether chain or independent. This variation might arise in part because specialty services are more costly to provide.

Third, for-profit homes have the highest proportion of Medicaid patients, despite the fact that this is the lowest margin segment of the market, while nonprofits have the highest share of higher-margin private-pay residents. Previous research has certainly demonstrated resident preferences for nonprofit facilities (Hirth 1999), and our research confirms that for-profit enterprises are not skimming the cream of the high margin market. Chains, meanwhile, sit in the mid-range of the payment source distribution, again allaying concerns that chains are disproportionately attracting particular classes of residents. One important question that arises here is how the recent reductions in Medicare payment levels, which occurred following the study period, have affected the growth and characteristics of chain ownership.

Fourth, there is relatively little difference in terms of case mix difficulty across the ownership and chain categories, in terms of incontinence, use of anti-psychotic drugs, and bedfast residents. Again, this

may allay some concerns that chains and for-profit facilities target easier-to-serve populations, leaving more difficult cases for the non-profit and independent sectors of the industry.

Fifth, quality appears poorest among for-profit homes. For-profit homes exhibit higher health deficiencies and case-weighted pressure ulcer (PUM) prevalence. Chain facilities, however, have lower restraint usage and are mid-range in both the distribution of health deficiencies and the case-weighted pressure ulcer mix (PUM). These findings are significant because, in the U.S., for-profit chains have tended to grow by acquiring poor quality, independent for-profit homes and subsequent to acquisition, often improve quality within these facilities (Banaszak-Holl et al. 2002). The evidence here that for-profit chain facilities have higher quality than for-profit independent facilities and comparable quality (though higher deficiencies) to nonprofit chains reinforces these earlier findings in suggesting that quality care may not be incompatible with chain management.

Sixth, it is useful to consider the characteristics and performance of for-profit chains, which bear much of the brunt of public concern. For-profit chains have the lowest staffing levels, although only slightly below for-profit independents, and these for-profit chains offer relatively low levels of specialty services such as injections and therapy, surpassing only for-profit independents. At the same time, though, they offer relatively high levels of specialty beds for rehabilitation and Alzheimer's care. Intriguingly, the largest for-profit-chains that own more than 100 homes tend to be superior to smaller chains on the quality measures. Overall, then, for-profit chains tend to provide a mid-range of services and quality, neither highly superior to other classes of facilities nor markedly worse. One area of concern among for-profit chains is that large facilities (200+ beds) often have poor quality. At the same time, though, large for-profit independents also tend to have poorer quality than smaller for-profit independent facilities. Thus, facility size and for-profit status appear to drive the quality problems more than the chain status.

Finally, it is useful to consider what classes of homes tend to provide the widest variety and best quality of care. Here, facility size clearly is the most critical element. Independent of the structural dimensions of chain membership and proprietary status, the results show that nursing facilities that are

small in size (3 to 50 beds) tend to be good places for their residents. These facilities have the highest staffing ratios, the highest proportion of specialty services, the lowest restraint usage, low case-adjusted pressure ulcer (PUM) rates, and the lowest health deficiency frequencies. The superiority of smaller facilities tends to hold whether the home is a chain or independent, for-profit or not-profit. Thus, the strongest single indicator is the ability of staff to provide personal care to the residents, which smaller facilities are better able to offer. Of course, this care will commonly come at a higher price.

Endnotes

1. Ttests are not reported in our tables but are available from the authors. Given the multiple comparisons that were done, their conclusion would significantly increase the complexity of the tables reported here. All differences that are noted in the text were found to be significant.

REFERENCES

Aaronson, W.E., J.S. Zinn and M.D. Rosko. (1994). Do for-profit and not-for-profit nursing homes behave differently? *The Gerontologist* 34:775-86.

Banaszak-Holl, J., W.B. Berta, D. Bowman, J.A.C. Baum and W.Mitchell. (2002). The Rise of Human Service Chains: Antecedents to Acquisitions and their Effects on the Quality of Care in U.S. Nursing Homes. *Managerial and Decision Economics.* In press.

Banaszak-Holl, J., J.S. Zinn, and V. Mor. (1996). The impact of market and organizational characteristics on nursing care and facilities service innovation: A resource dependency perspective. *Health Services Research* 31: 97-109.

Baum, J.A.C. (1999). The rise of chain nursing homes in Ontario, 1971-1996. *Social Forces* 78: 543-584.

Baum, J.A.C. and P. Ingram. (1998). Survival-enhancing learning in the Manhattan hotel industry, 1898-1990. *Management Science* 44: 996-1016.

Baum, J.A.C., S.X. Li and J.M. Usher. (2000). Making the Next Move: How Experiential and Vicarious Learning Shape the Locations of Chains' Acquisitions. *Administrative Science Quarterly*, 45: 766-801.

Clement, J.P., D.G. Smith, J.R.C. Wheeler. (1994). What do we want and what do we get from not-for-profit hospitals? *Hospital and Health Services Administration* 39(2): 159-178.

Cohen, J.W., and L.C. Dubay. (1990). The effects of Medicaid reimbursement method and ownership on nursing home costs, case mix and staffing. *Inquiry* 27: 183-200.

Davis, M.A. (1991). On nursing home quality: A review and analysis. *Medical Care Research* 48(2):129-166.

Davis, M.A. (1993). Nursing home ownership revisited: Market, cost and quality relationships. *Medical Care* 31(11):1062-1068.

Dorland's Biomedical Publications. (1990-1998). *The Medical & Healthcare Marketplace Guide*. Dorland's Biomedical Publications, Philadelphia, PA.

Gray, B.H. (1991). *The Profit Motive and Patient Care*. Cambridge: Harvard University Press.

Gray, B.H. (1997). Conversion of HMOs and hospitals: What's at stake? *Health Affairs* 16(2): 29-47.

Greve, H.R. (1999). Branch systems and nonlocal learning in organizational populations. In Anne S. Miner and Philip C. Anderson (eds.) *Population-level Learning and Industry Change: Advances in Strategic Management* 16: 57-80. Stamford CT: JAI Press.

Greve, H.R. and J.A.C. Baum. (2001). Introduction: A multiunit, multimarket world. *Multiunit Organization and Multimarket Strategy: Advances in Strategic Management* 18: 1-28. Oxford UK: Elsevier/JAI Press.

Hannan, M.T. and J. Freeman. (1977). The population ecology of organizations. *American Journal of Sociology* 82: 929-964.

Harrington, C. and H. Carillo. (1999). The regulation and enforcement of federal nursing home standards, 1991-1997. *Medical Care Research and Review* 56(4): 471-494.

Harrington, C., J.H. Swan, J.A. Nyman and H. Carrillo. (1997). The effect of Certificate of Need and Moratoria policy on change in nursing home beds in the United States. *Medical Care* 35(6):574-588.

Harrington, C., S. Woolhandler, J. Mullan, H. Carrillo, and D.U.Himmelstein. (2001). Does investor ownership of nursing homes compromise the quality of care? *American Journal of Public Health* 91(9):1452-1455.

Hirth, R.A. (1999). Consumer information and competition between nonprofit and for-profit nursing homes. *Journal of Health Economics* 18:219-240.

Hirth, R.A. (1997). Competition between for-profit and nonprofit health care providers: Can it help achieve social goals? *Medical Care Research and Review* 54(4): 414-438.

Holmes, J.S. (1996). The effects of ownership and ownership change on nursing home industry costs. *Health Services Research* 31: 327-346.

Lee, A.J., H. Birnbaum, and C. Bishop. (1983). How nursing homes behave: A multi-equation model of nursing home behavior. *Social Science and Medicine* 17(23): 1897-1906.

Lemke, S. and R.H. Moos. (1989). Ownership and quality of care in residential facilities for the elderly. *The Gerontologist* 29:209-215.

Light, D.W. (1986). Corporate medicine for profit. *Scientific American* 255: 38-45.

Luke, R.D., Y.A. Ozcan, and P.C. Olden. (1995). Local markets and systems: Hospital consolidations in metropolitan areas. *Health Services Research* 30: 555-567.

Marlin, D., M. Sun and J.W. Huonker. (1999). Strategic groups and performance in the nursing home industry: A reexamination. *Medical Care Research and Review* 56(2): 156-176.

McGinley, L. (1999). Medicaid fix: House limits evictions from nursing homes. *Wall Street Journal*, March 11: B1.

McKay, N. (1991). The effects of chain ownership on nursing home costs. *Health Services Research* 26: 109-118.

McKelvey, B. (1982). *Organizational Systematics*. Berkeley: University of California Press.

Mukamel, D.B. (1997). Risk-adjusted outcome measures and quality of care in nursing homes. *Medical Care* 28(10): 952-962.

Rosko, M.D., J.A. Chilingerian, J.S. Zinn and W.E. Aaronson. (1995). The effects of ownership, operating environment, and strategic choices on nursing home efficiency. *Medical Care* 33: 1001-1021.

Spang, H.R., G.J. Bazzoli, and R.J. Arnould. (2001). Hospital mergers and savings for consumers: Exploring new evidence. *Health Affairs* 20(4): 150-158.

Weisbrod, B.A. and M. Schlesinger. (1986). Public, private, nonprofit ownership and the response to asymmetric information: The case of nursing homes. In S. Rose-Ackerman (ed.) *The Economics of Nonprofit Institutions: Studies in Structure and Policy*: 133-51. New York: Oxford University Press.

Table 1. Descriptive statistics (Data period: January, 1991 - September, 1997)

	Total	1991	1992	1993	1994	1995	1996	1997 (9 mon)	1991-1996 mean
Total nursing home records, by year	103,949	13,467	15,682	15,927	15,605	14,831	17,755	10,682	15,545
Unique nursing homes, last year home appeared in data	19,558	95	133	125	169	352	8,034	10,650	
Independent nursing homes with no corporate parent	52,501	7,289	8,059	8,057	7,752	7,115	8,954	5,275	7,871
Independent homes operated by single-home holding companies	7,059	865	1,216	1,025	1,076	1,033	1,207	637	1,070
Chain-owned nursing homes (own 2+ homes)	44,389	5,313	6,407	6,845	6,777	6,683	7,594	4,770	6,603
Total nursing home records	103,949	13,467	15,682	15,927	15,605	14,831	17,755	10,682	
Independent nursing homes with no corporate parent		54%	51%	51%	50%	48%	50%	49%	51%
Independent homes operated by single-home holding companies		6%	8%	6%	7%	7%	7%	6%	7%
Chain-owned nursing homes (own 2+ homes)		39%	41%	43%	43%	45%	43%	45%	42%
Total homes		100%	100%	100%	100%	100%	100%	100%	
Number of unique chains (own 2+ homes)	2,255	725	863	872	880	858	928	624	854
Operate 2-10 homes		89%	86%	87%	87%	87%	86%	89%	87%
Operate 11-50 homes		10%	13%	11%	10%	11%	11%	8%	11%
Operate 51 + homes		1.7%	1.4%	1.5%	2.2%	2.2%	2.3%	2.6%	2%
Total		100%	100%	100%	100%	100%	100%	100%	

Table 2. Descriptive comparisons on structural characteristics by chain, for-profit status and nursing home size, 1991-1997*

			Structural Characteristics		Specialty Services					
			Occupancy	Clinical staff/	% rehab	% Alz.	% misc.	% resid.	% resid.	% all spec.
		Cases	Rate	resident *	beds	beds	special beds	rec. injection	rec. therapy	services
Independent	***Home size***									
Not-for-profit	3-50 beds	7,313	0.80	1.50	1.2%	0.4%	2.6%	16%	40%	60%
Not-for-profit	51-100 beds	8,944	0.88	1.00	0.5%	1.6%	1.1%	10%	18%	31%
Not-for-profit	101-200 beds	7,695	0.89	0.93	0.8%	4.1%	0.9%	10%	16%	32%
Not-for-profit	201+ beds	2,665	0.88	0.91	0.8%	4.5%	1.0%	10%	18%	35%
	weighted mean	26,617	**0.86**	**1.11**	**0.8%**	**2.3%**	**1.4%**	**12%**	**23%**	**40%**
For-profit	3-50 beds	5,849	0.87	1.00	0.7%	0.8%	1.0%	10%	15%	28%
For-profit	51-100 beds	14,865	0.87	0.87	0.5%	1.4%	0.7%	10%	13%	26%
For-profit	101-200 beds	14,120	0.87	0.81	0.6%	2.4%	0.8%	10%	14%	28%
For-profit	201+ beds	2,362	0.87	0.76	1.5%	3.5%	0.9%	11%	18%	34%
	weighted mean	37,196	**0.87**	**0.86**	**0.6%**	**1.8%**	**0.8%**	**10%**	**14%**	**27%**
Chain	***Home size***									
Not-for-profit	3-50 beds	1,363	0.78	1.42	2.0%	0.6%	1.3%	17%	47%	68%
Not-for-profit	51-100 beds	2,430	0.89	0.91	0.4%	2.2%	0.6%	10%	17%	30%
Not-for-profit	101-200 beds	2,212	0.87	0.87	0.6%	5.5%	1.3%	10%	15%	33%
Not-for-profit	201+ beds	348	0.79	0.88	2.2%	6.2%	1.1%	11%	15%	35%
	weighted mean	6,353	**0.86**	**1.00**	**0.9%**	**3.2%**	**1.0%**	**12%**	**23%**	**39%**
For-profit	3-50 beds	3,347	0.79	1.25	2.1%	0.8%	1.4%	14%	32%	50%
For-profit	51-100 beds	12,621	0.87	0.82	0.8%	2.2%	0.5%	11%	15%	29%
For-profit	101-200 beds	15,649	0.86	0.79	1.2%	3.3%	0.9%	11%	16%	32%
For-profit	201+ beds	1,524	0.84	0.79	1.5%	5.5%	1.7%	11%	17%	36%
	weighted mean	33,141	**0.85**	**0.85**	**1.1%**	**2.8%**	**0.8%**	**11%**	**17%**	**33%**
Chain	***Chain size***									
Not-for-profit	2-10 homes	4,230	0.84	1.08	1.2%	3.4%	1.3%	12%	24%	41%
Not-for-profit	11-50 homes	1,067	0.84	0.98	0.6%	2.7%	0.5%	12%	24%	40%
Not-for-profit	51-100 homes	0								
Not-for-profit	101+ homes	1,056	0.93	0.75	0.2%	3.0%	0.5%	10%	17%	31%
	weighted mean	6,353	**0.86**	**1.00**	**0.9%**	**3.2%**	**1.0%**	**12%**	**23%**	**39%**
For-profit	2-10 homes	10,723	0.86	0.85	0.8%	2.6%	0.8%	11%	15%	31%
For-profit	11-50 homes	9,438	0.85	0.89	1.3%	2.1%	0.9%	11%	18%	34%
For-profit	51-100 homes	2,841	0.85	0.83	1.1%	3.1%	0.7%	11%	17%	33%
For-profit	101+ homes	10,139	0.85	0.83	1.3%	3.4%	0.9%	11%	18%	35%
	weighted mean	33,141	**0.85**	**0.85**	**1.1%**	**2.8%**	**0.8%**	**11%**	**17%**	**33%**
Mean										
Independent			0.87	0.96	0.7%	2.0%	1.1%	11%	18%	33%
Chain			0.85	0.88	1.1%	2.8%	0.9%	11%	18%	34%
Not-for-profit			0.86	1.09	0.8%	2.5%	1.4%	12%	23%	40%
For-profit			0.86	0.85	0.9%	2.2%	0.8%	11%	15%	30%

* Clinical staff = RNs, LPNs, and aides

Table 3. Descriptive comparisons of resident population hy chain, for-profit status and nursing home size, 1991-1997*

			Payer Mix			Case Mix			Quality Indicators				
			Perc. Resid.	Perc. Resid.	Perc. Resid.	Perc. Resid.	Perc. Resid. Rec.	Perc. Resid.	Perc. Resid.		Perc. Resid.		No. of
		Cases	w/ Medicaid	w/ Medicare	w/ private pay	incontinent	anti-psychotics	bedfast	restrained	RM *	w/ PU	PUM *	Hlth Defic.
Independent	***Home size***												
Not-for-profit	3-50 beds	7,313	37%	38%	25%	39%	32%	8.9%	14%	0.43	10.1%	1.13	0.67
Not-for-profit	51-100 beds	8,944	56%	6%	38%	50%	36%	4.7%	19%	0.55	5.8%	1.23	0.84
Not-for-profit	101-200 beds	7,695	63%	6%	31%	53%	36%	4.5%	21%	0.59	6.2%	1.37	0.98
Not-for-profit	201+ beds	2,665	70%	6%	24%	54%	35%	4.8%	21%	0.60	7.0%	1.45	1.16
	weighted mean	26,617	**54%**	**15%**	**31%**	**48%**	**35%**	**5.8%**	**19%**	**0.53**	**7.2%**	**1.27**	**0.87**
For-profit	3-50 beds	6,849	68%	9%	23%	49%	40%	5.5%	17%	0.44	6.5%	1.17	1.02
For-profit	51-100 beds	14,865	69%	5%	26%	49%	36%	5.0%	21%	0.57	6.6%	1.32	1.08
For-profit	101-200 beds	14,120	71%	6%	23%	49%	35%	5.1%	21%	0.60	7.0%	1.39	1.22
For-profit	201+ beds	2,362	76%	6%	18%	48%	34%	4.0%	19%	0.66	7.8%	1.93	1.36
	weighted mean	37,196	**70%**	**6%**	**24%**	**49%**	**36%**	**5.0%**	**20%**	**0.56**	**6.8%**	**1.36**	**1.14**
Chain	***Home size***												
Not-for-profit	3-50 beds	1,363	26%	46%	27%	35%	33%	10.3%	12%	0.35	10.7%	1.04	0.57
Not-for-profit	51-100 beds	2,430	54%	7%	38%	50%	36%	4.4%	18%	0.50	5.4%	1.23	0.80
Not-for-profit	101-200 beds	2,212	61%	7%	32%	53%	38%	4.9%	21%	0.55	6.3%	1.29	1.02
Not-for-profit	201+ beds	348	61%	8%	31%	53%	36%	5.3%	23%	0.63	7.5%	1.41	1.10
	weighted mean	6,353	**51%**	**16%**	**33%**	**48%**	**36%**	**5.9%**	**18%**	**0.49**	**7.0%**	**1.22**	**0.84**
For-profit	3-50 beds	3,347	47%	33%	20%	41%	38%	9.2%	14%	0.38	10.1%	1.10	0.71
For-profit	51-100 beds	12,621	68%	8%	23%	49%	36%	5.5%	19%	0.50	7.1%	1.29	0.93
For-profit	101-200 beds	15,649	70%	9%	21%	50%	38%	5.8%	20%	0.52	7.7%	1.31	1.13
For-profit	201+ beds	1,524	72%	9%	19%	49%	37%	5.6%	20%	0.54	8.2%	1.47	1.39
	weighted mean	33,141	**67%**	**11%**	**22%**	**48%**	**38%**	**6.0%**	**19%**	**0.50**	**7.7%**	**1.29**	**1.02**
Chain	***Chain size***												
Not-for-profit	2-10 homes	4,230	50%	18%	32%	48%	36%	6.5%	19%	0.52	7.5%	1.16	0.86
Not-for-profit	11-50 homes	1,067	49%	19%	33%	45%	36%	6.1%	14%	0.40	7.5%	1.23	0.86
Not-for-profit	51-100 homes	0											
Not-for-profit	101+ homes	1,056	58%	4%	38%	49%	36%	3.0%	18%	0.51	4.1%	1.35	0.78
	weighted mean	6,353	**51%**	**16%**	**33%**	**48%**	**36%**	**5.9%**	**18%**	**0.50**	**7.0%**	**1.20**	**0.84**
For-profit	2-10 homes	10,723	71%	7%	22%	49%	38%	5.7%	20%	0.53	7.3%	1.29	1.11
For-profit	11-50 homes	9,438	66%	12%	22%	48%	36%	6.2%	19%	0.51	8.1%	1.31	1.05
For-profit	51-100 homes	2,841	66%	12%	23%	50%	37%	6.9%	20%	0.52	8.0%	1.15	1.07
For-profit	101+ homes	10,139	64%	14%	22%	48%	38%	6.0%	17%	0.45	7.8%	1.29	0.90
	weighted mean	33,141	**67%**	**11%**	**22%**	**48%**	**38%**	**6.0%**	**19%**	**0.50**	**7.7%**	**1.28**	**1.02**
Mean													
Independent			63%	10%	27%	49%	36%	5.4%	20%	0.55	7.0%	1.32	1.03
Chain			64%	12%	24%	48%	37%	6.0%	19%	0.50	7.6%	1.26	0.99
Not-for-profit			54%	15%	31%	48%	35%	5.8%	19%	0.53	7.2%	1.35	0.86
For-profit			69%	8%	23%	49%	37%	5.5%	19%	0.53	7.2%	1.32	1.08

* RM = "Restraint Mix", i.e., Percent residents restrained / Percent receiving anti-psychotics

* PUM = "Pressure Ulcer Mix", i.e., Perc. Residents w/PU / Percent res. bedfast