Nursing Home Spending Patterns in the 1990s: The Role of Nursing Home Competition and Excess Demand

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Objective. To examine nursing home expenditures on clinical, hotel, and administrative activities during the 1990s and to determine the association between nursing home competition and excess demand on expenditures.

Data Sources/Study Setting. Secondary data sources for 1991, 1996, and 1999 for 500 free-standing nursing homes in New York State.

Study Design. A retrospective statistical analysis of nursing homes' expenditures. The dependent variables were clinical, hotel, and administrative costs in each year. Independent variables included outputs (inpatient and outpatient), wages, ownership, New York City location, and measures of competition and excess demand.

Data Collection/Extraction Method. Variables were constructed from annual financial reports submitted by the nursing homes, the Patient Review Instrument and Medicare enrollment data.

Principal Findings. Clinical and administrative costs have increased over the decade, while hotel expenditures have declined. Increased competition was associated with higher clinical and administrative costs while excess demand was associated with lower clinical and hotel expenditures.

Conclusions. Nursing home expenditures are sensitive to competition and excess demand conditions. Policies that influence competition in nursing home markets are therefore likely to have an impact on expenditures as well.

Key Words. Nursing homes, costs, competition, excess demand

Nursing homes provide a complex array of services to a heterogeneous group of patients. They offer both clinical care and a living environment that serves as the residents' home. Nursing homes allocate their revenue-constrained resources between these various products in ways that depend on the market environment they face.

In this study, we examine costs associated with clinical care, hotel services, and administration in New York State (NYS) nursing homes during the 1990s. We choose this time period because throughout this decade nursing homes experienced several major changes in their environment, which may have had an impact on their resource allocation decisions. In the next section, we describe these changes and discuss how they might have affected costs. We then examine data for 1991, 1996, and 1999 to determine if these changes have occurred and to what degree.

TRENDS IN NURSING HOME DEMAND, SERVICES, AND COSTS

Nursing home activities and, hence, costs can be divided into three major categories: clinical (medical and personal) care, hotel services, and administration. This typology is useful because as we discuss below, each type of cost is subject to different influences and is likely to exhibit different trends. Furthermore, each influences different aspects of nursing home care. Table 1 defines these three cost categories in terms of cost centers as reported by nursing homes in their annual financial reports.

During the 1990s, the environment for nursing homes changed in ways that likely affected all three cost categories: sub-acute care continued to grow and became an important line of business for many nursing facilities, the competitive environment changed with many nursing homes markets no longer exhibiting excess demand, and the introduction of the Minimum Data Set (MDS) reporting system and increased regulations and fraud investigations increased the administrative burden that nursing homes had to meet.

Sub-acute care, consisting of medically intensive short stays for patients recuperating from an acute hospital episode, became an important component of nursing home care during the 1990s. This was in response to incentives created by prospective payment under Medicare and the emergence of managed care organizations looking for more cost-effective alternatives to

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Table 1: Assignment of Nursing Home Cost Centers to Clinical, Hotel, and Administrative Activities

<i>Clinical Activities</i>	<i>Hotel Activities</i>	<i>Administrative Activities</i>
Laboratory expenses	Depreciation, leases, and rentals expenses	Fiscal services expenses
Electrocardiology expenses	Depreciation, major movable equipment	Administrative expenses
Electroencephalogy expenses	Interest on capital debt expenses	Nursing administration expenses
Radiology expenses	Plant operation and maintenance expenses	Utilization review expenses
Inhalation therapy expenses	Grounds expenses	Transportation expenses
Podiatry expenses	Security expenses	Other expenses
Dental expenses	Laundry and linen expenses	Cafeteria expenses (for nonpatients)
Psychiatric expenses	Housekeeping expenses	Housing expenses (for nonpatients)
Physical therapy expenses	Patient food service	
Occupational therapy expenses		
Speech and hearing therapy expenses		
Pharmacy expenses		
Central service supply expenses		
Medical staff expenses		
Ancillary services expenses		
Activities program expenses		
Nonphysician education expenses		
Medical education expenses		
Medical director's office expenses		
Medical records expenses		
Social services expenses		
RHCF expenses		
Special pediatrics expenses		
Traumatic head injury expenses		
AIDS expenses		
Long-term ventilator		
Dependent expenses		
Respite care expenses		
Adult care facility expenses		
ICF mental retardation		
Independent living expenses		

long hospital stays, which often require rehabilitation care. National statistics show that the percent of residents aged 65 and over who have Medicare as a primary source of payment at admission, all of whom are sub-acute care patients, increased from 4.9 percent in 1985 to 25.9 percent in 1995, and 32.8

percent in 1999 (Hing 1987; Dye 1997; Anonymous 2002), with a commensurate increase in Medicare expenditures for nursing home care (from \$2.4 billion in 1990 to \$11.6 billion in 1996). This increase in sub-acute care is expected to have influenced behavior of nursing homes in two ways. First, sub-acute care is much more medically intensive than long-term custodial care. Thus, as nursing homes treat more sub-acute patients, more resources would have to be allocated to clinical activities to meet the needs of these patients. Second, when nursing homes compete in the market for sub-acute patients, they recognize that these patients are primarily interested in the quality of the clinical services they provide (Spector and Mukamel 2001). Therefore, the growth in sub-acute care would create incentives for nursing homes to increase investment in clinical care, incentives that are likely to be stronger the more competitive the market. In a resource constrained environment, it may also lead to reduced investment in hotel services, services which are more important to the long-stay residents than to the sub-acute, short-stay-patients.

During the 1990s, competition in the market for long-term care services also changed. Nursing homes increasingly faced competition from home care and assisted living, which are alternatives to nursing home care for less debilitated and cognitively impaired individuals. At the same time, many states either abolished moratoria on nursing homes construction or relaxed certificate-of-need regulations (Harrington et al. 1997). The decrease in demand and increase in bed supply eliminated the excess demand that nursing home experienced historically in many markets (Scanlon 1980; Nyman 1989a). During the 1990s, average occupancies declined to below 90 percent (Rhoades, Poter, and Krauss 1998), suggesting that excess demand conditions no longer prevailed (Nyman 1993). Even in NYS, where nursing home occupancies remained above 96 percent throughout the 1990s, waiting time in a hospital ward for a nursing home bed declined from 33.4 days in 1991 to 11.3 days in 1999 (authors calculations from the NYS hospital discharge data set—SPARCS). The percent of NYS nursing homes facing excess demand (see definition and further discussion below) declined from 62.6 percent in 1991 to 16.3 percent in 1999. In excess demand markets, in which patients, particularly those covered by Medicaid, have to wait long periods for a bed to open, competition is limited to private pay and Medicare residents. Thus, while in the early 1990s many nursing homes were competing for Medicare and private-pay patients only, by the end of the decade they were competing for Medicaid patients as well. The emergence of competition for Medicaid patients is expected to affect investments in both clinical and hotel services. Long-term care residents, unlike post-acute patients, have preferences not only over the clinical care they

receive but also the hotel services the facility offers, because they spend long periods of time in the facility (often until death) and it becomes their home. Thus, when nursing homes no longer face excess demand, they will have incentives to invest not only in clinical services but also in hotel services.

Administrative costs were also subject to new forces during the 1990s. The Balanced Budget Act (BBA) of 1997 required implementation of the Minimum Data Set (MDS) and electronic transmission of the data by all nursing homes starting in 1998. In NYS, this had begun earlier as some nursing homes participated in the Multistate Nursing Home Case Mix and Quality Demonstration (Zimmerman et al. 1995). The BBA also mandated consolidated billing, which meant that nursing homes would have had to process many more bills than before. In addition, in 1995 the Federal government began an operation to uncover fraudulent billing, targeting nursing homes among others. This required nursing homes to justify their charges, which in turn meant linking clinical and billing data. Those nursing homes that sought managed care contracts for sub-acute care also faced a need to better understand their cost structure and identify costs associated with sub-acute care separately from other costs. All of these placed new administrative demands on nursing homes during the 1990s, which likely led to investment in more sophisticated information systems and increased administrative costs. Furthermore, competition among nursing homes likely increased the need to advertise, resulting in higher administrative expenditures in more competitive areas.

To summarize, we expect that the changes in the environment during the 1990s would have influenced nursing homes expenditures in the following ways:

Clinical Costs

- Clinical care costs would have increased throughout the decade as managed care and Medicare PPS made sub-acute care a lucrative and expanding line of business.
- Clinical costs would be higher in more competitive areas and in areas that do not experience excess demand, as nursing homes compete for both sub-acute and long-term care residents.

Hotel Costs

- Hotel expenditures may have declined during the 1990s if nursing homes shifted resources to clinical activities in order to

accommodate the demand for sub-acute care, which is focused on clinical services.

- Hotel costs would be higher in more competitive areas and in areas without excess demand, markets in which nursing homes are facing competition not only for the sub-acute and private-pay patients but also for Medicaid residents.

Administrative Costs

- Administrative costs would have increased throughout the decade as nursing homes faced new regulatory requirements.
- Administrative costs would be higher in more competitive areas and in markets without excess demand reflecting the increased costs of attracting new residents.

METHODS

Data and Sample

There were 500 free-standing NYS nursing homes that were in operation in 1991, 1996, and 1999. Of these, 35 nursing homes were excluded because of incomplete or inaccurate data. The data set included three observations for each facility, one for each year—1991, 1996, and 1999, except for 19 observations (facility/year combinations) that were deleted because of missing data. The final sample includes 1,376 observations for 465 facilities.

Annual expenditures by cost center (listed in Table 1), inpatient days, outpatient services (adult day care visits, outpatient clinics, and home health care), and wages were obtained from the Residential Health Care Facility (RHCF) reports. These are annual financial reports that are submitted by nursing homes to the State of New York. Information about case mix was obtained from the Patient Review Instrument (PRI). The PRI is a resident-level data set with information about health and functional status. It includes a Resource Utilization Group's (RUGs) II score for each resident (Medicare, Medicaid, private pay, and others) and is used by the State of New York to calculate a case-mix index for each facility (New York State Department of Health 1994). Medicare enrollment data were matched to the PRI data at the individual resident level. The Medicare data were used to obtain the zip code of the resident in the year prior to admission to the nursing home for the calculation of competition (see below).

The quality of the data reported in the RHCF and the PRI is similar to or better than the quality of other administrative data sources that are typically used in this type of analysis. While the data are self-reported and while facilities may have incentives to “doctor” the data in order to maximize their revenues, their ability to do so is minimal because both data sets are used by the State of New York in calculating Medicaid payment rates and the State makes an effort to assure data accuracy. All data elements are defined explicitly and uniformly across all facilities, and the RHCF has to conform to accepted accounting principals and the accuracy of the data has to be certified by a licensed accountant. The PRI is similar to the MDS in that it is a resident-level data set, which includes functional and health assessments performed every 6 months. These data are used by NYS to calculate a case-mix index, RUGs II, which is the precursor to the RUGs III measure based on the MDS.

Expenditures by Type

The RHCF reports annual costs by cost center. These were aggregated into three categories: hotel, clinical, and administrative. Table 1 shows the assignment of cost centers. All expenditures were converted to 1999 dollars by using an index of nursing home costs used by the State of New York in its payment methodology. This index is calculated from cost indices of 23 nursing home inputs, such as different labor categories, office supplies, insurance, taxes, interest expenses, food, housekeeping supplies, utilities, drugs, and medical supplies. This inflation index is based on inputs specific to nursing homes in NYS and is therefore preferred to more general indices such as the consumer price index (CPI) or the medical component of the CPI.

Nursing Home Markets

The market for each nursing home was defined by new patient migration patterns, using the Zwanziger, Mukamel, and Indridason (2002) methodology. The zip code of residence in the year prior to nursing home entry for each newly admitted resident was determined based on Medicare enrollment data.¹ The core market of a nursing home included the zip codes with the most admissions, which together made up at least 70 percent of total admissions. This cutoff was chosen because the last 30 percent of admissions tend to come from a large number of zip codes, each contributing only one or few admissions each (Zwanziger, Mukamel, and Indridason 2002). This market definition is preferred to markets definitions based on county boundaries, which has

been used in previous studies of nursing homes. For most nursing homes the markets we define were stable over time.

Competition and Excess Demand

A competition index was calculated for each nursing home, following Zwanziger, Mukamel, and Indridason (2002). First, the Herfindahl-Hirschman Index (HHI) was calculated for each zip code based on the distribution of admissions originating in that zip code. The HHI is defined as the sum over all facilities of the square of their shares of the admissions from this zip code. The weighted average HHI for each facility was then calculated as the average of its zip code specific HHIs, using as weights the percent of admissions from each of the zip codes. The competition index was defined as $1 - \text{HHI}$. It varies between 0 and 1, with 0 indicating monopoly (only one facility in the market) and 1 indicating perfect competition.

We also created a dichotomous variable indicating excess demand conditions. A market was defined as an excess demand market if the average number of empty beds was five or less. We chose this definition following Nyman (1989b) and based on inspection of the distribution of the average number of empty beds in each market by year. As can be seen in Figure 1, in 1999, when we expect excess demand to be the lowest, the distribution of the average number of empty beds seems to be bimodal, with the first mode at five beds, suggesting that five or less empty beds may be an indication of an excess demand market. Because this choice is not clear cut, we repeated the cost analyses with two other definitions of excess demand—six or fewer empty beds and seven or fewer. The results were similar for the most part and we therefore report the estimates based on five or fewer beds.

Analyses

We estimated three cost equations: clinical, hotel, and administrative costs. Following Grannemman et al. (1986) and Nyman (1988) a hybrid cost function was estimated as follows:

$$\begin{aligned} \log(C_{i,t}) = & \alpha_0 + \alpha_1 T96 + \alpha_2 T99 + \alpha_3 \text{Comp}_{i,t} + \alpha_4 \text{EXD}_{i,t} \\ & + \sum_{s=1}^2 \alpha_{5,j} \log^s(D_{i,t}) + \alpha_6 \log(1 + \text{Outpat}_{i,t}) \\ & + \alpha_7 \log(W_{i,t}) + \alpha_8 X_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where $C_{i,t}$ are annual costs for facility i in year t ; T96 and T99 are indicator variables that allow for an intercept shift relative to 1991; $\text{Comp}_{i,t}$ is the com-

Figure 1. Distribution of the Average Number of Empty Beds in Nursing Homes

petition index for facility i in year t and EXD is a dichotomous variable indicating if the market for facility i experienced excess demand in year t (defined as having five or fewer empty beds). D denotes inpatient days, which for the clinical cost equation were case-mix adjusted based on the average facility RUGs II score reported in the PRI. $Outpat$ is a vector of outpatient outputs including adult day care, outpatient clinic, and home care visits. W is a vector of wages, including wages for aides, licensed practical nurses, registered nurses, technicians, environmental staff, clerical, and management personnel. Finally, X is a vector of two other possible cost shifters: ownership, New York City (NYC) location, and their interaction.

The error term, $\varepsilon_{i,b}$, was assumed to be correlated for observations for the same facility in different years (e.g., $cov(C_{i,t91}, C_{i,t96}) \neq 0$) but to be uncorrelated across facilities (e.g., $cov(C_{i,t91}, C_{j,t91}) = 0$). The correlations within facility over time and the variance of the cost function were modeled as an unstructured covariance matrix that was allowed to vary by ownership.

Interactions between competition, ownership, and NYC location were also explored, as suggested by previous studies (Mukamel and Spector 2000). Only the interaction between NYC and for-profit ownership was significant and are therefore the only interactions included in the models presented here.

One of the difficulties in estimating cost functions is that outputs, days and case mix, may be endogenous with costs. Such endogeneity, if it exists, would lead to bias in the estimated equation. In the case of nursing homes in NYS, however, outputs are likely to be exogenous or only weakly endogenous, because nursing home beds were capped by Certificate of Need regulation, and occupancy rates averaged over 96 percent in each of the three years studied. Thus, total days are exogenously determined, as argued by Gertler and Waldman (1992) and Mukamel and Spector (2000). As excess demand becomes less prevalent toward the end of the decade, endogeneity bias may be of more concern. However, the very high occupancies, even at the end of the decade, mitigate this concern. Case mix may be only weakly endogenous because the payment system links reimbursement to costs for the Medicaid and Medicare patients (Mukamel and Spector 2000).

RESULTS

Figure 1 shows the distribution of empty beds in 1991, 1996, and 1999. In 1991, the majority of markets have a very small number of empty beds, with the mode at 2 and 3. In 1996, the distribution begins to shift to the right with

more markets at 5 and 6 empty beds. By 1999, the distribution changes even more. It becomes bimodal with one mode at 5 empty beds and one at 10 and 11, suggesting that there are two underlying distributions, one characterizing excess demand markets with only a few empty beds and one characterizing markets without excess demand and a larger number of empty beds.

Table 2 presents descriptive statistics for all variables included in the analyses. Expenditures data and percent of facilities facing excess demand are shown by year. Data for all other variables are for 1999 only, because there were no large differences over the three years.

Multivariate Results

Table 3 presents the three estimated models, where the dependent variable is log of expenditures for each category. The associations with all variables (e.g., wages and outputs) were as expected.² Expenditures changed over time. Clinical expenditures were the same in 1991 and 1996 but increased significantly by 1999. Administrative expenditures also increased, exhibiting a much larger increase than clinical expenditures, increases that were significant in both years relative to 1991. Hotel expenditures on the other hand declined relative to 1991, in both years.

Changes in the Associations between Competition, Excess Demand, and Costs

Nursing homes in more competitive areas had significantly higher clinical ($p = 0.0002$) and administrative costs ($p = .0006$). An increase in competition of 0.08 (one standard deviation from the state average at 0.86) was associated with an increase of 2.16 percent in clinical costs and 2.51 percent for administrative costs. Hotel expenditures also increased with competition (at 0.91 percent), although this increase was not significantly different from zero ($p = .14$).

Excess demand was significantly associated with lower clinical ($p = .02$) and hotel costs ($p = .02$) but not lower administrative costs ($p = .26$). Clinical costs in excess demand markets were lower by 1.6 percent and hotel costs were lower by 1.7 percent.

DISCUSSION

This paper examines the allocation of resources in nursing homes in NYS during the 1990s in three categories: clinical services, hotel services, and administration. We hypothesized that the trend toward sub-acute care would

Table 2: Descriptive Statistics

	<i>Mean</i>	<i>Standard Deviation</i>
Clinical expenditures (in 1999 million dollars)		
1991	4.84	4.39
1996	5.35	4.87
1999	5.78	5.24
Hotel expenditures (in 1999 million dollars)		
1991	3.46	2.82
1996	3.47	2.82
1999	3.53	2.97
Administrative expenditures (in 1999 million dollars)		
1991	1.66	1.36
1996	2.48	2.12
1999	2.44	2.22
Ownership* (%)		
For-profit	54.1	
Private nonprofit	39.1	
Public	6.8	
Competition*		
For-profit	0.87	0.09
Private nonprofit	0.86	0.08
Public	0.78	0.07
Percent of nursing homes in excess demand markets (with five or less empty beds)		
1991	62.6	
1996	50.2	
1999	16.3	
New York City*	28.6%	
Inpatient days*	65,320	42,610
Average RUGs score*	1.156	0.119
Adult day care visits*†	12,599	12,703
Outpatient clinic visits*†	7,281	12,018
Home care visits*†	81,096	121,680
Average wages (1999 \$ per hour)*		
Registered nurses	27.03	8.12
Licensed practical nurses	19.45	4.42
Aides	13.81	3.52
Technicians	21.92	6.89
Environmental workers	13.00	3.89
Management	35.24	16.63
Clerks	16.98	5.49

*Values shown are for 1999.

†Averages exclude facilities with zero visits. Seventy-nine facilities had nonzero day care visits, 11 had nonzero outpatient clinic visits, and 37 had nonzero home care visits.

increase clinical expenditures and may potentially result in cutbacks on hotel services. We also hypothesized that regulatory changes and a federal focus on

Table 3: Multivariate Analyses Results

<i>Independent Variables</i>	<i>Model 1: Log Clinical Expenditures</i>		<i>Model 2: Log Hotel Expenditures</i>		<i>Model 3: Log Administrative Expenditures</i>	
	<i>Estimate</i>	<i>Standard Error</i>	<i>Estimate</i>	<i>Standard Error</i>	<i>Estimate</i>	<i>Standard Error</i>
Intercept	11.795	0.085***	11.992	0.089***	10.996	0.151***
Year 1996	0.007	0.006	−0.035	0.006***	0.313	0.012***
Year 1999	0.073	0.008***	−0.026	0.008***	0.289	0.015***
Competition	0.266	0.071***	0.113	0.077	0.313	0.124**
Excess demand	−0.016	0.007**	−0.018	0.008**	−0.016	0.014
Log inpatient days [†]	0.907	0.034***	1.078	0.040***	0.960	0.062***
Log inpatient days squared [†]	0.025	0.010***	−0.015	0.012	−0.013	0.018
Log adult day care visits [‡]	0.014	0.007**	0.052	0.007***	0.062	0.011***
Log outpatient clinic visits [‡]	0.008	0.015	0.029	0.017*	0.015	0.026
Log home care visits [‡]	0.009	0.006*	0.001	0.007	0.034	0.010***
Log RN wage	0.063	0.018***	0.049	0.020**	0.049	0.034
Log LPN wage	0.050	0.034	0.059	0.035*	0.134	0.065**
Log aides wage	0.269	0.037***	0.116	0.038***	−0.022	0.070
Log technician wage	0.042	0.014***	0.029	0.014**	0.053	0.026**
Log environmental wage	0.120	0.026***	0.074	0.027***	−0.014	0.050
Log management wage	0.045	0.015***	0.039	0.015**	0.229	0.028***
Log clerical wage	0.021	0.020	0.015	0.021	0.027	0.037
For-profit	−0.073	0.015***	−0.074	0.017***	0.045	0.027*
Public	0.073	0.026***	−0.105	0.032***	−0.141	0.043***
New York City (NYC)	−0.002	0.024	0.081	0.029***	0.114	0.041***
For-profit* NYC	−0.107	0.027***	−0.116	0.031***	−0.166	0.048***

Statistical significance:

*** $p < .01$,

** $0.01 < p < .05$,

* $0.05 < p < .10$.

[†]For the clinical expenditures model days were weighted by the RUGs case-mix index.

[‡]Because many facilities had zero outpatient services these variables were defined as $\log(1 + \text{number of visits})$.

RN, registered nurses; LPN, licensed practical nurses.

fraud and abuse would increase administrative costs. Furthermore, higher nursing home competition as well as lack of excess demand would be associated with higher expenditures in all categories. In general these hypotheses were confirmed. Clinical and administrative costs grew during the period while hotel costs declined. Higher competition was associated with higher expenditures and excess demand was associated with lower costs.

These findings suggest that policies that influence competition among nursing homes, such as certificate of need regulations or policies encouraging alternatives to nursing homes, will influence nursing home expenditures: increased competition and elimination of excess demand will increase costs. An important question bearing on the value of increased competition is whether these additional expenditures translate into more services and services of higher quality. The answer to this question is outside the scope of this paper. We can offer, however, two observations. In a previous study (Mukamel and Spector 2000, and authors calculations), we found that clinical quality in NYS nursing homes in 1991 (as measured by risk-adjusted mortality and risk-adjusted decline in functional status) was higher in more competitive areas, suggesting that higher clinical expenditures may be associated with better care. On the other hand, the higher administrative costs in more competitive areas may not be “productive” if they are directed toward activities such as advertising. Thus, increased competition may both enhance and detract from the scope and quality of services that nursing homes offer, and the net effect would need to be determined empirically in future research.

The decrease in hotel costs during the period we studied may be a result of difficult choices that nursing homes have had to make. The increase in administrative costs, which may have been forced on them by governmental actions, and in clinical costs, presumably directed at the demand for sub-acute services, coupled with a resource constrained environment in which revenues for the majority of patients are determined by Medicare and Medicaid and not by the market, may have left nursing homes with the need to cut resources in hotel services. Hotel services are of particular importance to the long-stay residents, who live in the facility until their death. The trends we observe raise a concern that this aspect of care, which likely affects the quality of life of long-stay residents, may have deteriorated. Furthermore, it suggests that nursing homes may be trading off the needs of their long-stay versus their short-stay, post-acute residents.

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NOTES

1. We have used the Medicare data to determine the zip code of residence in the year prior to nursing home admission. As the vast majority of nursing home patients are over the age of 65 they are eligible for Medicare and therefore appear in the Medicare enrollment data we used to determine their zip code. Their nursing home stay does not have to be covered by Medicare for them to be included in the Medicare enrollment data.
2. As expected, all three expenditure types increase with inpatient days and outpatient services, although the association with outpatient services is not always statistically significant. Similarly, with few exceptions, all wages were positively and significantly associated with costs. For-profit facilities had lower expenditures, compared with private nonprofit nursing homes, with larger effects in NYC. Public facilities had higher clinical expenditures but spent less on hotel and administrative activities.

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