Do Behaviors Between Non-Profits and For-Profits Differ? Patient Selection, Staffing and Quality in the Hospice Industry

Sabina Ohri
Department of Economics
University of California, Irvine

September 21, 2006

Abstract

This research compares the behavior of non-profit organizations and private for-profit firms under strong incentives from a government program. Specifically, I study the hospice sector, where there are financial incentives created by the Medicare benefit. Medicare reimburses hospices on a fixed per diem basis, regardless of patient diagnosis. Because under this system patients with lower expected costs are more profitable, hospices have an incentive to selectively enroll patients with longer lengths of stay, signaled by admission with certain diagnoses. While it is illegal for hospices to reject potential patients explicitly, they can influence their patient mix through referral networks. A fixed per diem rate also creates an incentive shirk on quality and to substitute lower skilled for higher skilled labor, which clearly has potential implications for the quality of care. After controlling for a number of relevant factors, the results suggest that for-profit hospices differentially take advantage of these incentives. For-profits have significantly different referral networks than non-profits. They receive more patients from long-term care facilities and fewer patients through physician referrals. This mechanism of patient selection is supported by the fact that for-profits also have a higher share of patients with longer lengths of stay and a higher share of cancer patients. While non-profit and for-profit hospices report similar numbers of staff visits per patient and overall nursing visits, for-profit firms make significantly less use of skilled nursing providers and social service workers. There is also some evidence of lower levels of quality in for-profit hospices.

JEL No. I11

1 Background

The hospice industry provides a useful testing ground to compare the behavior of non-profit and for-profit organizations. Since the implementation of the Medicare hospice benefit in 1983, there has been a steady increase in the demand for hospice services. Program spending on the hospice benefit was approximately $5.9 billion in 2003, a fivefold increase from 1992 (Medicare Payment Advisory Commission 2004). The number of Medicare patients using hospice services also quadrupled during the same time period to about 1 million patients (NHPCO 2004), which roughly translates to 20% of Medicare enrollees selecting the hospice benefit.

Higher utilization of hospice services has been accompanied by two trends. First, there has been a noticeable change in patient case mix as hospices attract more non-cancer patients that tend to have a more uncertain trajectory of time to death.[1] Second, in response to this increase in demand for hospice services, there has been tremendous growth in the number of organizations providing hospice services. There was an 82% increase in the number of hospices in the US from 1992 to 1999. There were approximately 3600 facilities in the US in 2004, up from 1935 facilities in 1992 (NHPCO 2004, GAO 2004). In the last decade, the majority of the growth in supply can be explained by the entry of for-profit firms (GAO 2004). The proportion of for-profit agencies increased from 13% in 1992 to 27% in 1999. While non-profits still dominate the industry today, for-profit hospices now make up over one third of the industry (Medicare Payment Advisory Commission 2004).

There are large theoretical and empirical literatures on differences between non-profit and for-profit organizations in the health care system, yet surprisingly little is known about the effect of ownership status among hospices. The objective function of for-profits is clearly to

[1] The percentage of non-cancer hospice enrollees increased from 24% to 49% from 1992 to 2000 (GAO 2004).

maximize profits. On the other hand, the objective function of non-profits organizations is less clear. Non-profits are subject to the nondistribution constraint, which prohibits distributing profits to their owners and to others that exert control over the organization (Hansmann 1980). In addition to this constraint, theoretical research indicates that non-profits may prioritize objectives that are not necessarily profit maximizing. Theoretical models show that non-profits are more likely to adopt objectives that include serving public goals and seek to also maximize other factors than profit, such as output and quality (Newhouse 1970; Feldstein 1971; Weisbrod 1988; Frank and Salkever 1991; Glaeser and Schleifer 2001).

In the hospital and nursing home literatures, empirical work has documented a number of significant differences across ownership forms: the number and type of services provided (Horwitz 2005), charity care (Sloan 1998), staff input mix (Weisbrod 1998), cream skimming in the form of patient selection or firm location decisions (Norton and Staiger 1994), and quality (Sloan et al 2001). The fact that many previous studies have found differences in the provision of services by ownership status for hospitals and nursing homes suggests there may be important differences for hospices, too.

Like these healthcare industries, hospices also provide a useful case study to compare organizations with different ownership forms because of the strong financial incentives created by the Medicare hospice benefit. Medicare reimburses hospices on a fixed per diem basis, regardless of patient diagnosis. Because under this system patients with lower expected costs are more profitable, hospices have an incentive to selectively enroll patients with longer lengths of stay, signaled by diagnosis type at admission. There has been evidence of this practice recently at Odyssey Healthcare, one of the largest national for-profit hospice chains in the US. In July 2006, Odyssey settled a $13 million claim with the US federal government for allegedly continuing hospice care for patients that no longer needed treatment, thereby increasing Medicare reimbursements by extending their patients' length of stay.

While it is illegal for hospices to select or reject patients explicitly, hospices can influence their patient mix by marketing their services to referral sources that admit patients with diagnoses associated with longer lengths of hospice stay. Since curative care is not reimbursed under the Medicare benefit, it is reasonable to assume that (1) length of stay will not be affected by hospice treatment since the care provided is only palliative and (2) a patient's referral source may be used as a predictive measure of length of stay. Concerns over strategic behavior by hospices and their referral networks became evident in the late 1990s when the Office of Inspector General (OIG) of the Department of Health and Human Services discovered that a number of hospices were providing kickbacks for nursing home referrals and issued a fraud alert. Both the allegations against Odyssey and the warning issued by the OIG suggest that hospices are responding to the financial incentives of the Medicare hospice benefit and testing to see if for-profits are taking differential advantage of these incentives is an open empirical question.

Hospices are also a good setting to study differences in quality outcomes across ownership status. If for-profit hospices behave in ways that are systematically different from non-profit hospices, as has been observed in hospital and nursing home markets, the fixed per diem rate creates an incentive for for-profits to shirk on quality and to substitute lower skilled for higher skilled labor. Since hospice patients are often mentally handicapped and/or physically disabled, they are likely to face impairments in evaluating the quality of their care. We may expect to find differences across ownership form in quality since patient monitoring of services is difficult. It is important to shed light on these potential differences since other studies have documented poor quality and general dissatisfaction with end of life care (IOM 1997).

In this paper, I examine the effect of ownership status among hospices on a number of outcomes related to patient selection, staffing and quality. I use annual, facility-level data on all California Medicare licensed hospices in 2002 through 2004, merged with counts of

citations for quality deficiencies, based on annual audits by the state of California. Using information on referral sources, length of stay, and patient type, this study tests for differences in the selection of patients across non-profit organizations and for-profit firms. I also examine differences between non-profit and for-profit agencies in terms of overall staffing levels, the skill mix of the staff employed, and quality citations.

I present three sets of results. I estimate linear regression models on three referral sources: hospital, long term care and physician. I find that for profit facilities are associated with significantly more patient referrals from long term care facilities, significantly fewer referrals from physicians, and no difference in patient referrals from hospitals. I support these results with evidence of ownership differences in patient type across two dimensions: length of stay and disease type. I find that for-profits are significantly more likely to have patients with longer lengths of stay and are more likely to enroll non-cancer patients. Non-cancer patients have been previously shown to be less expensive to treat and have longer lengths of stay. Taken together, this implies that for-profit hospices are responding to the financial incentives of the Medicare per diem benefit by selecting patients via referral networks.

I also estimate linear regression models on skilled nursing visits, social service worker visits and physician visits. The regression results indicate that for profit hospices have a significantly smaller proportion of skilled nurse visits and social services worker visits and no significant differences in physician visits. Lastly, I estimate negative binomial regressions on quality citations and find some weak evidence of lower quality in for profit hospices.

2 Hospice and the Medicare Benefit

Hospices provide palliative treatment for the terminally ill and bereavement counseling for families. Under the Medicare hospice benefit, patients that choose hospice care forgo coverage

for curative treatment under Medicare Part A for their terminal illness. A physician must also certify that each patient has a life expectancy of less than six months when a patient enters a Medicare-certified hospice. Recertification is then required every 90 day period. After two 90 day periods, recertification is required every 60 days.

Medicare, the primary payer for hospice services,[2] reimburses hospices on a per diem basis, regardless of patient diagnosis. There is no discrimination in reimbursement rates across diagnosis type since treatment is meant only to be palliative, not curative. [3] There are four hospice rate categories, each reflecting variation in service intensity and location of service: routine home care, continuous home care, inpatient respite care, and general inpatient care. Routine home care accounts for 96 percent of patient days (GAO 2004, NHPCO 2004), and Medicare reimbursed $118 per day in 2004 (Medicare Payment Advisory Commission 2004). The reimbursement rate is updated annually based on the hospital market basket index.

The cost function facing hospices has been shown to be U-shaped. Hospice care is more expensive at the time of patient admission due to making initial arrangements and developing a plan for care. It is also costly during the few days before patient death due to more intensive usage of hospice services. Costs for the intermediate days are lower (Huskamp et al. 2001, Carey et al. 1989).

Given the fact that costs are lowest during the intermediate days and facilities generate revenue based on the per diem reimbursement, hospices have an incentive to selectively enroll patients with longer lengths of stay, in order to maximize profits. Length of stay can be signaled by admission with certain diagnoses. While it is illegal for hospices to reject potential patients explicitly, they can influence their patient mix through their referral networks.

[2]Using a national survey in 1998, Carlson et al. (2004) find that Medicare is the primary payer for 77 percent for hospice services.

[3]Historically, hospice care was not disease-specific. However, it has evolved considerably with changes in the technology of palliative care since the implementation of the per diem rate.

3 Previous Studies

As mentioned earlier, the objective of for-profits is to maximize profits, while the objective of non-profits is less clear. In the hospice literature, objective functions of non-profit versus for-profit organizations have been empirically tested in three papers. The first, Weisbrod and Lindrooth (2004) use a Medicare data set on all newly admitted hospice patients in 1993 to test if for-profit hospices are more likely to attract patients with longer lengths of stay by recruiting patients with earlier admissions into hospices. They also test a model developed by James (1983) and Weisbrod (2004), where non-profits compete with for-profits for profitable patients, but use profits to support unprofitable patients. They find evidence that is consistent with these hypotheses. The second paper, Hamilton (1994) uses data from the National Hospice Organization's annual National Hospice Census in 1987. She finds evidence that non-profit hospices are patient maximizers, not profit maximizers, in support of a model proposed by Weisbrod and Schlesinger (1986). The third paper, Carlson et al. (2004) use patient-level data from the 1998 National Home and Hospice Care Survey and find that patients at for-profit facilities received significantly fewer services compared to patients at non-profit hospices.

However, none of these studies examine staff inputs or quality outcomes. In the nursing home literature, there have been an ample studies on quality differences across ownership types (Weisbrod and Schlesinger 1986; Gertler 1989; Zinn et al. 1993; Davis 1993; Zinn 1994; Nyman 1988; Cohen and Dubay 1990) that offer mixed evidence of the effect of ownership status on quality. Notably, Chou (2002) finds that in the presence of asymmetric information, there are quality differences between for-profit and non-profit firms, such that for-profit nursing homes have lower quality when it is difficult for consumers to measure.[4]

[4]More recent work on nursing homes and hospitals has focused on the effect of the ownership status of competitors within a market on quality. (For research on nursing homes, see Hirth (1999), Grabowski and Hirth (2003). For research on hospitals, see Silverman and Skinner (2000), Duggan (2000), Cutler and Horwitz

4 Empirical Methods

4.1 Data Sources and Sample Construction

This paper compares non-profit and for-profit hospices on a number of outcomes related to referral sources, the type of care provided and the quality of that care. The analysis is based on a facility-level data set constructed by combining data from the California Office of Statewide Health Planning and Development (OSHPD) on all Medicare-certified hospices in California from 2002 through 2004 with data on hospice quality from the Automated Certification and Licensing Administrative Information and Management Systems (ACLAIMS) of the California Department of Health Services. The OSHPD data provides detailed measures on key facility characteristics, such as patient referral sources, diagnosis categories at admission, length of stay, staffing ratios, patient demographics, financial and other organizational information.

The ACLAIMS data consist of counts of citations of quality deficiencies for 2002 to 2004, based on audits by the California Department of Health Licensing and Certification Program. The Centers for Medicare and Medicaid Services (CMS) contracts with the Department of Health to evaluate compliance with the federal hospice regulations by periodically conducting unannounced surveys of hospice agencies. When a facility is first licensed by Medicare, an unannounced inspection is conducted by state licensing officials. Additional inspections occur if a complaint is filed or as a follow-up to a previous deficiency. These direct quality measures pertain to several aspects of care. They include quality of care, client assessment, client's rights, pharmacy, and adminstration violations.[5] Appendix A summarizes each of these deficiencies. It has been suggested that quality of care and client's right may be the most serious types of violations (O'Meara et al. 2005).

(2000).

[5]There are no deficiencies reported for environmental and nutrition in any of the years studied, so these data are not used in this analysis.

The sample for this analysis includes all freestanding California Medicare licensed hospices that were in operation between 2002 and 2004. There are 335 observations in total; 96 facilities for 2002, 109 facilities for 2003, and 130 facilities for 2004.

4.2 Descriptive Statistics

Table 1 presents summary statistics of the OSHPD data used in this paper. For-profit hospices in California make up nearly half of the market share. Nationally, only one third of hospices are for-profit. Patients with a length of stay up to 30 days make up the bulk of hospice admissions (62%). Patients staying between 31 and 60 days, patients staying between 61 and 90 days and patients staying between 91 and 180 days make up 14%, 8% and 10% of the share, respectively. Patients staying longer than six months, or 180 days, constitute 6% of hospice patients on average. Though the proportion of non-cancer patients has been increasing in past years (MedPac 2004), cancer patients still make up the large majority of patient type. In the California OSHPD data, 56% of patients enter hospices with cancer, compared to 46% of patients nationally (NHPCO 2004).

In this table and in the rest of the paper, staff visits are calculated as follows. The percent of skilled nursing visits correspond to number of registered nurse visits as a proportion of total nursing visits. Total nursing visits include visits by registered nurses, licensed vocational nurses and home health aides. The percent of social service worker visits and the percent of physician visits are both as a proportion of total staff visits. According to the reported means, hospices services are nursing intensive, making up 88 percent of all visits. Of those nursing visits, half of staff visits are skilled nursing visits. Physicians play a minor role in staff visits, making up only 2 percent of all staff visits. This reflects their role in the certifying process of hospice patients under to the Medicare benefit. The data also indicate that on average

most patients are referred to hospices by a physician, while about a quarter are referred from hospitals.

The control variables are summarized at the bottom of Table 1. Facilities have about 17,000 patient days each year. This serves as a control for the size of the facility. On average, 16% of agencies have inpatient facilities, about half (53%) are part of a chain, and 27% are provide services in a rural area. An age variable is created by subtracting the year a facility was licensed from the year of the observation. The mean for the age variable is 4.42 years.

Table 2 summarizes mean differences in patient length of stay, diagnosis type, referral sources and staff visits by ownership type. The general pattern on the non-profit and for-profit means for length of stay is that for-profits have a higher share of patients that stay in hospices for shorter periods of time, while for-profits have more patients at the other extreme. For-profit facilities tend to have patients with lengths of stay greater than 180 days. However, these differences are not statistically significant across ownership form. Non-profits are significantly more likely to have a larger share of cancer patients than for-profit facilities. Cancer patients in hospices have more predictable end-of-life trajectories and tend to have shorter lengths of stay in hospices.

The average proportion of patients referred from a long term care facility is 7%, though this figure is about 18% in for-profit hospices. Moreover, physician referrals play a much larger role in transferring patients to non-profit organizations; they make up 46% of referrals. These means indicate that for-profit hospices are receiving a larger share of patients from different referral sources than non-profits.

The bottom part of Table 2 displays the summary of staff visits by the ownership status of the hospices. For profits have significantly fewer visits by skilled nurses and social service workers than non-profit hospices. While these averages do not control for other factors affecting staff mix, these simple differences point to differences in length of stay, patient case-mix

referral source and the use of high skilled and low skilled labor in for-profit and non-profit hospices.

Table 3 shows the percent of non-profit and for-profit hospices with different types of quality deficiencies. [6] The means suggest that for-profits are more likely to have one or more deficiencies for all categories, except pharmacy. To provide a more general measure of quality, I also aggregate all types of violations into a count for any type of quality deficiency. The last column is this sum of all types of quality deficiencies. Here, we see that non-profit hospices have fewer deficiencies at each level. Though, these results do not control for other factors, they imply there may be quality differences across ownership type.

4.3 Model

4.3.1 Patient Selection

I test for patient selection via referral networks across ownership form in a multiple regression framework. I use three types of dependent variables to estimate differences in patient referral sources between for-profits and non-profits and provide further evidence that the type of patients admitted into for-profit hospices differs from the type of patients admitting into non-profit hospices. I begin by estimating ordinary least squares (OLS) regressions for each of the five length of stay categories. The basic specification is:

$$LOS_{ft} = \beta_0 + \beta_1 Profit_{ft} + \beta_2 X_{ft} + \beta_3 d_t + u_{ft}, \tag{1}$$

where LOS_{ft} is the percent of patients in each length of stay category for facility f in year t. X is a vector of facility/year characteristics that includes a dummy for a chain hospice, a dummy for a facility in a rural area, number of patients at the facility in a given year. I also

[6] The number observations in Table 3 and subsequent tables using the quality data is 291 because data is not available for all hospices surveyed in the OSHPD data.

include an age variable that is defined by the observation year minus a facility's license date. d_t is a set of year dummies between 2002 and 2004.

Next, I estimate OLS regressions for the share of cancer patients. The basic specification is:

$$Cancer_{ft} = \beta_0 + \beta_1 Profit_{ft} + \beta_2 X_{ft} + \beta_3 d_t + u_{ft}, \tag{2}$$

where $Cancer_{ft}$ is the percent of cancer patients in facility f in year t.

Finally, I estimate OLS regressions for the percent of patients from the three largest referral sources. The basic specification is:

$$Referral_{ft} = \beta_0 + \beta_1 Profit_{ft} + \beta_2 X_{ft} + \beta_3 d_t + u_{ft}, \tag{3}$$

where $Referral_{ft}$ is the percent of patients referred from either a hospital, long term care facility or physician in facility f in year t.

For each of these three models, the preferred specification also includes county fixed effects to account for unobserved county characteristics.

4.3.2 Staffing

I use OLS regressions to study differences in staffing across ownership form. The basic specification is:

$$Staff_{ft} = \beta_0 + \beta_1 Profit_{ft} + \beta_2 X_{ft} + \beta_3 Cancer_{ft} + \beta_4 d_t + u_{ft}, \tag{4}$$

where $Staff_{ft}$ is the percent of skilled nursing visits, social services visits, or physician visits in facility f in year t. I include a control for the percent of cancer patients in facility f in year t to control for differences related to patient case-mix specific staffing needs. I also estimate a preferred specification that includes county fixed effects.

4.3.3 Quality

In order to study the impact of ownership status on the count of quality deficiencies in the ACLAIMS data, I estimate negative binomial regressions since the distribution of the dependent variable is non-negative, highly skewed towards zero and the variance of the distribution increases with the mean. Since the quality deficiencies data are over dispersed, Poisson regression cannot be used to model count data because it could cause a downwards bias in the standard errors. Therefore, maximum likelihood estimation of the negative binomial model is used.

The basic specification for the quality deficiencies regression is:

$$E(Quality_{ft}) = exp(\beta_0 + \beta_1 Profit_{ft} + \beta_2 X_{ft} + \beta_3 Cancer_{ft} + \beta_4 d_t + u_{ft}), \tag{5}$$

where $Quality_{ft}$ is a count of deficiencies for a particular type of quality facility f in year t. There are five type of quality deficiencies: quality of care, client assessment, client's rights, pharmacy, and administration violations. I also create a total deficiency variable that equals the sum of all types of deficiencies. As in the staffing regressions, I include a control for the proportion of cancer patients in a facility each year.[7]

5 Results

Tables 4 through 6 display ordinary least squares results. The coefficient on the for-profit dummy is the main result of interest and should be interpreted as the percentage point difference associated with for-profit facilities, relative to non-profit facilities, within county. Table 7 presents the negative binomial regressions with incidence rate ratios, since the coefficients from these regressions are not directly meaningful. I report robust standard errors, clustered

[7] I do not include county fixed effects in the quality regressions because there is not enough variation in the quality data within county.

at the facility level since there are multiple observations on each facility.

5.1 Patient Selection Results

Tables 4 and 5 present the results for the regressions on patient selection. The results for the length of stay regressions are in Table 4. After controlling for other factors, for-profit facilities are less likely to have patients that have shorter lengths of stay and are associated with having patients with extremely long lengths of stay. Specifically, there is no significant difference for the 0 to 30 day, 61 to 90 day, or 90 to 180 day categories between for-profits and non-profits. For-profit facilities are negatively associated with patients in the 31 to 60 length of stay category. The result is significant at the 0.05 level. For-profits are also significantly more likely to have patients that stay for more than 180 days (p-value¡0.01). This result is consistent with the Weisbrod and Lindrooth's (2004) finding using patient-level data that hospices are significantly more likely to admit patients with longer lengths of stay. While the average number of patients in this category is small (6%), the average number of patient days that result is comparatively larger when comparing to the other length of stay categories.

Table 5 presents the results for the cancer patient and referral network regressions. The coefficient on for-profit facilities for the share of cancer patients regressions are positive and significant at the 0.01 level. Nationally, cancer patients in hospice have a median length of stay of 32 days and, on average, have shorter lengths of stay than non-cancer patients (US Department of Health and Human Services 2000).

Table 5 also shows results from the referral source regressions. For-profit and non-profit agencies have very different referral networks, with for-profits receiving significantly more patients from long-term care facilities. In the model that accounts for county fixed effects, there is a 12.6 percentage point effect of being for-profit on the share of long term care referrals.

The result is significant at the 0.05 level. Generally, patients from long term care facilities tend to need non-acute care and have higher expected lengths of stay at hospices. On the other hand, for-profit facilities are negatively associated with referrals from physicians, on the order of 11.4 percentage points in the model that include county fixed effects. There are no significant differences found for hospital referrals. When taken together, these three sets of results imply that for-profit facilities are engaging in patient selection via referral networks.

5.2 Staffing Results

Table 6 presents results from the staffing regressions. I include a control for the share of cancer patients in the facility to account for the fact that there could be different demands on the staffing mix, depending on the case-mix of the patients in the facility. While there are no significant differences across ownership type associated with total staff visits per patient day or in the percentage of nursing visits (not reported), I find sizeable differences in the types of labor employed. For-profit firms make much less use of skilled nursing providers (registered nurses relative to licensed vocational nurses and home health aides) and less use of social services workers. According to the results with county fixed effects, skilled nursing visits are 6.9 percentage points lower in for-profit facilities and social services workers 1.9 percentage points in for-profit facilities. The coefficient is significant at the 0.05 level for skilled nursing visits and significant at the 0.10 level for social services worker visits. The data suggests lower skilled nurse visits are substituting for more skilled nurse visits. There are no significant differences across ownership type in physician visits.

5.3 Quality Results

Table 7 shows the results for the quality regressions for the five types of quality deficiencies and for the aggregate measure. I report incidence rate ratios (IRR) below the for-profit coefficients, since the coefficients from the negative binomial regressions do not have a direct interpretation. (1-IRR) is the percent of an incident for each quality deficiency type. For example, the incidence of a quality of care citation is 94 percent higher in for-profit facilities. After controlling for other factors, we see that for profits have more quality citations in all categories. The result is significant for clients rights and administration and marginally significant for the for quality of care deficiencies and the aggregate quality deficiencies measure. After controlling for facility and patient characteristics, these results off some evidence of lower quality in for-profit facilities.

There is a potentially important selection problem with the quality data. Since the data indicates more for-profit than non-profit entry in the California hospice market and state licensing officials are more likely to inspect a new facility, then for-profit facilities may be more likely to be inspected and to receive a citation. Though I control for age in my regressions, this would create an upwards bias on the quality regression results if age was not an adequate control. As a check, I stratify the sample by age and considered differences in quality citations across for-profits and non-profits. I also tried limiting the sample to new entrants in a given year. While there are too few observations to perform a regression with these subsamples, tabulations (unreported) indicate the for-profits hospices have more quality deficiencies than non-profits hospices.

6 Discussion

This research compares the response of for-profit and non-profit hospices to the financial incentives created by the Medicare benefit. While hospices cannot reject potential patients, I find evidence that is consistent with the fact that they influence their patient mix through their referral networks. The results show that for-profit hospices differentially select patients through referral networks and the characteristics of those patients, in terms of length of stay and disease type, are consistent with the hypothesis that hospices cream skim low cost patients. I find that for-profits are significantly likely to have more patients with longer lengths of stay, more cancer patients and more patients referred from long term care facilities, instead of physicians. The results also indicate that after controlling for patient mix, for-profits substitute away from high skilled nursing with home health aides and licensed vocational nurses. This research is the first to study quality outcomes in hospices and offers some evidence of lower levels of quality in for-profit facilities, though this result is not conclusive.

This paper focused on hospices in California that serve about 10% of the US market. A limitation of this study is that California may not generalize nationally. While there is a slightly higher for-profit presence in California, as compared to nationally, the differences found in this study are in accordance with differences found at the national level using different types of data. The primary benefit of using this data is that it provides much more detailed information at the facility level than other national data sources. The drawback of this data is that it only offers aggregated facility-level measures instead of patient-level data, such that correlations between different types of patient characteristics cannot be studied.

The findings in this study suggest significant differences between for-profit and non-profit hospices along a number of important dimensions. The hospice market will continue to grow as the baby boomers demographic enter the relevant age cohort for hospice services. As

demand for hospice services increase, it is likely that there will be a continued emergence of for-profit presence in the market. This research offers some important evidence of differences across ownership status. If the current Medicare reimbursement rate encourages for-profit hospices to enroll low cost patients from specific referral sources, then the adoption of case-mix adjustments to the Medicare reimbursement rate could help eliminate these differences across ownership status.

References

[1] Arrow, Kenneth J. (1963) "Uncertainty and the Welfare Economics of Medical Care," *American Economic Review*, 53: 941-973.

[2] Carlson, Melissa, William Gallo, Elizabeth Bradley (2004) "Ownership Status and Patterns of Care in Hospice: Results From the National Home and Hospice Care Survey," *Medical Care*, 42(5): 432-438.

[3] Chou, Shin-Yi (2002) "Asymmetric information, ownership and quality of care: an empirical analysis of nursing homes," *Journal of Health Economics*, 21(2): 293-311.

[4] Cohen, J.W. and Dubay, L.C. (1990), "The effects of Medicaid reimbursement method and ownership on nursing home costs, case mix and staffing," *Inquiry*, 27: 183200.

[5] Cutler, David M. and Horwitz, Jill R. (2000) "Converting Hospitals from Not-for-Profit to for-Profit Status: Why and What Effects?," *The Changing Hospital Industry: Comparing Not-for-Profit and for-Profit Institutions. Chicago: University of Chicago Press* 45-79.

[6] Davis, M.A. (1993) "Nursing home ownership revisited: market, cost and quality relationships," *Medical Care* 31: 10621068.

[7] Duggan, Mark (2002) "Hospital Market Structure and the Behavior of Not-for-Profit Hospitals," *RAND Journal of Economics*, Autumn, 433-446.

[8] Duggan, Mark (2000) "Hospital Ownership and Public Medical Spending," *Quarterly Journal of Economics*, November, 1343-1374.

[9] Feldstein, Martin (1971) "Hospital Cost Inflation: A study of nonprofit price dynamics," textslAmerican Economics Review, 61(5): 853-872.

[10] Frank, Richard and David Salkever (1994) "Nonprofit Organization in the Health Sector," *The Journal of Economic Perspectives*, 8(4): 129-44.

[11] Frank, Richard and David and Salkever (1991) "The supply of charity services by nonprofit hospitals: Motives and market structure," *Rand Journal of Economics*, 22(3): 430-445.

[12] Gertler, P.J. (1989) "Subsidies, quality, and the regulation of nursing homes," *Journal of Public Economics* 38: 3352.

[13] Glaeser, Edward L. and Andrei Shleifer (2001) "Not-for-Profit Entrepreneurs," textslJournal Of Public Economics, 81(1): 99-115.

[14] Grabowski, D. C., and R. A. Hirth (2003) "Competitive spillovers across nonprofit and for-profit nursing homes," *Journal of Health Economics* 22(1): 1-22.

[15] Hamilton, Vivian (1994) "The Impact of Ownership Form and Regulatory Measures on Firm Behavior: A Study of Hospices, textslNonprofit Management and Leadership, 4(4): 415- 430.

[16] Hansmann, Henry (1980) "The Role of Nonprofit Enterprise," *Yale Law Journal*, 89: 835-901.

[17] Hirth, Richard (1999) "Consumer Information and COmpetition between Non-Profit and For-Profit Nursing Homes," *Journal of Health Economics*, 18: 219-240.

[18] Horwitz, Jill (2005) "Does Corporate Ownership Matter? Service Provision in the Hospital Industry," NBER Working Paper No. 11376.

[19] Huskamp HA, Buntin MB, Wang V, Newhouse JP (2001) "Providing care at the end of life: do Medicare rules impede good care?" *Health Affairs*, 20(3): 204-211.

[20] Institute of Medicine (1997) *Approaching Death: Improving Care at the End of Life* Washington: National Acadmey Press.

[21] James (1983), "How nonprofits grow: a model," *Journal of Policy Analysis and Management*, Spring, 350-368.

[22] Lindrooth, R.C. and B. Weisbrod (2005) "Do Nonprofit and For-profit Hospices Really Differ? An Analysis of the Hospice Industry," Unpublished Manuscript.

[23] Lorenz K, Ettner SL, Rosenfeld K, Carlisle D, Leake B Asch S. (2002) "Cash and Compassion: Profit Status and the Delivery of Hospice Services," *Journal of Palliative Medicine*, 5:507505.

[24] Medicare Payment Advisory Commission (2004) *Report to the Congress: New Approaches in Medicare* Washington: MedPAC.

[25] Newhouse, Joseph P. (1970) "Toward a Theory of Nonprofit Instiutions: An Economic Model of a Hospital," *The American Economic Review*, 60(1): 64-74.

[26] Nyman, J.A. (1988) "Improving the quality of nursing home outcomesare adequacy or incentive oriented policies more effective?," *Medical Care*, 26: 11581171.

[27] O'Meara, Janis, Carrie Graham, Nicole Laborde, Eric Collier, and Charlene HArrington (2005) "Guide to understanding hospice data on CALNHS.org," Department of Social and Behavioral Sciences, University of California, San Francisco.

[28] Silverman, Elaine and Jonathan Skinner (2000) "Are for-Profit Hospitals Really Different? Medicare Upcoding and Market Structure," Cambridge: National Bureau of Economic Research.

[29] Weisbrod, Burton and Mark Schlesinger (1986) "Public, private, nonprofit ownership, and the response to asymmetric information: The case of nursing homes," *The Economics of Nonprofit Institutions*, New York: Oxford University Press.

[30] Weisbrod, Burton A (1988) *The Nonprofit Economy*, Cambridge: Harvard University Press.

[31] Weisbrod, Burton A (2004) "Organization Behavior in Mixed Industries: Do Private Firms, Government Agencies, and Nonprofits Differ in Hospitals, and Why?" Working Paper, Northwestern University, Department of Economics.

[32] Zinn, J.S., Aaronson, W.E. and Rosko, M.D. (1993) "Variations in the outcomes of care provided in Pennsylvania nursing homes: facility and environmental correlates," *Medical Care* 31: 475487.

[33] Zinn, J.S. (1994) "Market competition and the quality of nursing home care," *Journal of Health Politics, Policy and Law*, 19: 555582.

Table 1. Summary Statistics

	Mean	(Std. Dev.)
For-Profit	0.48	(0.50)
Patients by Length of Stay		
% Patients 0-30 Days	0.62	(0.12)
% Patients 31-60 Days	0.14	(0.05)
% Patients 61-90 Days	0.08	(0.04)
% Patients 91-180 Days	0.10	(0.09)
% Patients 180+ Days	0.06	(0.04)
Patients by Diagnosis Type:		
% Cancer Patients	0.56	(0.18)
Staff Visits:		
% Nursing Visits	0.88	(0.07)
% Skilled Nursing Visits	0.50	(0.18)
% Social Service Worker Visits	0.11	(0.06)
% Physician Visits	0.02	(0.04)
Referral Sources:		
% Hospital	0.24	(0.16)
% Long Term Care Facility	0.12	(0.14)
% Physician	0.38	(0.25)
Control Variables:		
Total Patient Days/1000	17.32	(17.58)
Inpatient Facility	0.16	(0.37)
Chain	0.53	(0.50)
Rural	0.27	(0.45)
Age= Year-License Date	4.42	(2.52)
Year=2003	0.33	(0.47)
Year=2004	0.16	(0.37)
Number of Observations	335	

Source: OSHPD

Table 2. Mean Differences by Ownership Type

	Non-Profit	For-Profit
Patients by Length of Stay:		
% Patients 0-30 Days	0.63	0.63
	(0.09)	(0.14)
% Patients 31-60 Days	0.15	0.13
	(0.04)	(0.05)
% Patients 61-90 Days	0.08	0.08
	(0.03)	(0.05)
% Patients 91-180 Days	0.10	0.09
	(0.08)	(0.08)
% Patients 180+ Days	0.05	0.07
	(0.03)	(0.06)
Patients by Diagnosis Type		
% Cancer	0.64	0.48
	(0.13)	(0.18)
Patients by Referral Source:		
% Hospital	0.24	0.24
	(0.17)	(0.15)
% Long Term Care Facility	0.07	0.18
	(0.08)	(0.17)
% Physician	0.46	0.31
	(0.26)	(0.22)
Staff Visits:		
% Skilled Nursing Visits	0.58	0.17
	(0.14)	(0.02)
% Social Service Worker Visits	0.13	0.08
	(0.05)	(0.06)
% Physician Visits	0.01	0.03
	(0.02)	(0.05)
Number of Observations	175	160

Source: OSHPD

Table 3. Percent of Hospices by Quality Deficiencies and Ownership Type

	Quality of Care		Client Assessment		Client's Rights		Pharmacy		Administration		Total Deficiencies	
	NP	FP	NP	FP	NP	FP	NP	FP	NP	FP	NP	FP
# Deficiencies												
0	81.6	75.7	87.1	81.3	98.0	95.8	94.6	96.5	91.8	86.8	77.6	69.4
1	10.2	9.0	6.1	3.5	1.4	3.5	3.4	2.1	3.4	2.1	5.4	7.6
2 to 10	6.1	12.5	6.1	14.6	0.7	0.7	2.0	0.7	3.4	8.3	15.0	22.9
11 to 20	2.0	2.1	0.7	0.7	0.0	0.0	0.0	1.4	0.7	2.1	0.0	3.5
21 to 30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.4
30 or more	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	1.4	2.8

Source: ACLAIMS

Number of Observations: 291 (NP=147, FP=144)

Table 4. OLS Regression Results on Length of Stay

	0-30 Days		31-60 days		61-90 Days		90 to 180 Days		180+ Days	
	[1]	[2]	[1]	[2]	[1]	[2]	[1]	[2]	[1]	[2]
For Profit	0.003	0.0016	-0.0145**	-0.0166**	-0.0081	-0.0006	-0.0027	-0.007	0.0222***	0.0225***
	[0.0162]	[0.0215]	[0.0059]	[0.0071]	[0.0049]	[0.0060]	[0.0079]	[0.0126]	[0.0065]	[0.0081]
Inpatient Facility	-0.0334	-0.0496*	0.0092	0.0136	0.0065	0.016	0.0221	0.0272	-0.0044	-0.0072
	[0.0277]	[0.0283]	[0.0097]	[0.0119]	[0.0101]	[0.0121]	[0.0200]	[0.0249]	[0.0078]	[0.0092]
Chain	0.0158	-0.0022	0.0038	0.0134*	-0.0085*	-0.0065	-0.0119	-0.0118	0.0007	0.0071
	[0.0161]	[0.0193]	[0.0061]	[0.0073]	[0.0048]	[0.0062]	[0.0094]	[0.0141]	[0.0055]	[0.0074]
Rural	0.0017	-0.0501	-0.0121*	0.0026	-0.0065	-0.0012	0.018	0.0388*	-0.0011	0.0098
	[0.0207]	[0.0325]	[0.0066]	[0.0104]	[0.0063]	[0.0090]	[0.0128]	[0.0200]	[0.0057]	[0.0073]
Age	-0.0008	-0.0037	-0.0002	0.0012	-0.0018	-0.0017	0	0.0004	0.0028**	0.0037**
	[0.0038]	[0.0043]	[0.0013]	[0.0016]	[0.0013]	[0.0016]	[0.0023]	[0.0028]	[0.0012]	[0.0014]
Year=2003	-0.01	-0.014	0.0011	0.0023	0.0101*	0.0112*	-0.0047	-0.0018	0.0036	0.0023
	[0.0140]	[0.0131]	[0.0060]	[0.0061]	[0.0056]	[0.0058]	[0.0109]	[0.0095]	[0.0044]	[0.0046]
Year==2004	-0.0147	-0.0083	-0.0003	-0.0016	0.0067	0.0061	-0.0004	-0.0028	0.0088*	0.0066
	[0.0137]	[0.0151]	[0.0058]	[0.0063]	[0.0047]	[0.0052]	[0.0129]	[0.0145]	[0.0047]	[0.0048]
Total Patient Days/1000	-0.0001	0.0002	-0.0005***	-0.0006***	-0.0002*	-0.0003	-0.0001	-0.0002	0.0008***	0.0009***
	[0.0004]	[0.0005]	[0.0002]	[0.0002]	[0.0001]	[0.0002]	[0.0002]	[0.0004]	[0.0002]	[0.0002]
Constant	0.6373***	0.6708***	0.1566***	0.1444***	0.0925***	0.0847***	0.0955***	0.0919***	0.0181**	0.0081
	[0.0217]	[0.0267]	[0.0093]	[0.0103]	[0.0084]	[0.0108]	[0.0130]	[0.0196]	[0.0071]	[0.0089]
County FE?	N	Y	N	Y	N	Y	N	Y	N	Y
Number of Observations	335	335	335	335	335	335	335	335	335	335

Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. OLS Regression Results on Cancer Patients and on Referral Sources

	Cancer Patients		Hospital Referrals		Long Term Care Referrals		Physician Referrals	
	[1]	[2]	[1]	[2]	[1]	[2]	[1]	[2]
For Profit	-0.1477***	-0.1334***	0.0083	0.0429	0.1309***	0.1259***	-0.1577***	-0.1136**
	[0.0232]	[0.0315]	[0.0277]	[0.0309]	[0.0216]	[0.0259]	[0.0384]	[0.0484]
Inpatient Facility	0.0021	0.0102	0.0544	0.026	-0.0076	0.0019	-0.0205	0.0354
	[0.0301]	[0.0358]	[0.0353]	[0.0387]	[0.0202]	[0.0211]	[0.0436]	[0.0472]
Chain	0.0336	0.0199	0.0066	-0.0471*	0.0102	0.0179	-0.0509	-0.0363
	[0.0220]	[0.0269]	[0.0249]	[0.0278]	[0.0181]	[0.0223]	[0.0394]	[0.0453]
Rural	-0.0365	-0.0715*	0.0138	-0.0107	0.0169	0.0078	-0.0491	-0.0721
	[0.0246]	[0.0374]	[0.0272]	[0.0404]	[0.0202]	[0.0304]	[0.0433]	[0.0492]
Age	0.0085	0.0069	0.0017	0.0001	0.0041	0.0022	0.0013	0.0013
	[0.0056]	[0.0064]	[0.0052]	[0.0058]	[0.0049]	[0.0049]	[0.0078]	[0.0089]
Year=2003	-0.0452**	-0.0451**	-0.0188	-0.023	-0.0198	-0.0136	0.0370*	0.0386*
	[0.0193]	[0.0190]	[0.0165]	[0.0163]	[0.0148]	[0.0151]	[0.0201]	[0.0210]
Year==2004	-0.0570***	-0.0578***	-0.0122	-0.0103	-0.0326**	-0.0309**	0.0558**	0.0543**
	[0.0176]	[0.0185]	[0.0173]	[0.0186]	[0.0144]	[0.0152]	[0.0235]	[0.0269]
Total Patient Days/1000	-0.0014**	-0.0003	0.0015**	0.0029***	0.0013***	0.0007	-0.0019**	-0.0020*
	[0.0006]	[0.0007]	[0.0007]	[0.0009]	[0.0004]	[0.0006]	[0.0009]	[0.0011]
Constant	0.6479***	0.6446***	0.2008***	0.2068***	0.0297	0.0437	0.4971***	0.4668***
	[0.0343]	[0.0395]	[0.0350]	[0.0358]	[0.0248]	[0.0288]	[0.0490]	[0.0541]
County FE?	N	Y	N	Y	N	Y	N	Y
Number of Observations	335	335	335	335	335	335	335	335

Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. OLS Regression Results on Staff Visits

	Skilled Nursing Visits		Social Services Visits		Physician Visits	
	[1]	[2]	[1]	[2]	[1]	[2]
For Profit	-0.1439***	-0.0690**	-0.0426***	-0.0193*	0.0118**	0.0022
	[0.0291]	[0.0283]	[0.0105]	[0.0115]	[0.0047]	[0.0058]
Inpatient Facility	-0.0203	0.0216	0.0077	0.0225*	0.0141*	0.0137
	[0.0257]	[0.0289]	[0.0094]	[0.0118]	[0.0078]	[0.0104]
Chain	-0.0419*	-0.0442*	-0.0068	0.0019	-0.0077	-0.0096
	[0.0224]	[0.0246]	[0.0081]	[0.0092]	[0.0053]	[0.0063]
Rural	-0.0134	-0.012	-0.01	-0.0123	-0.0067	-0.0049
	[0.0245]	[0.0304]	[0.0095]	[0.0123]	[0.0070]	[0.0111]
Age	0.0053	0.0031	0.0049**	0.0051***	-0.0016**	-0.0012
	[0.0050]	[0.0042]	[0.0019]	[0.0017]	[0.0008]	[0.0009]
Year=2003	0.0195	0.0232	0.0064	0.0111**	-0.0047	-0.0053
	[0.0153]	[0.0156]	[0.0051]	[0.0051]	[0.0066]	[0.0072]
Year==2004	-0.0022	-0.0003	-0.003	-0.0002	-0.0031	-0.0044
	[0.0161]	[0.0169]	[0.0056]	[0.0060]	[0.0065]	[0.0075]
Total Patient Days/1000	-0.0014**	-0.0009	-0.0006***	-0.0009***	0.0002	0.0002
	[0.0006]	[0.0007]	[0.0002]	[0.0003]	[0.0002]	[0.0002]
% Cancer Patients	0.1911**	0.2358***	-0.0264	0.015	-0.0192	-0.0192
	[0.0775]	[0.0657]	[0.0285]	[0.0281]	[0.0168]	[0.0209]
Constant	0.4830***	0.4150***	0.1353***	0.0972***	0.0322**	0.0359**
	[0.0697]	[0.0562]	[0.0235]	[0.0242]	[0.0148]	[0.0158]
County FE?	N	Y	N	Y	N	Y
Number of Observations	335	335	335	335	335	335

Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 7. Negative Binomial Regressions on Counts of Quality Deficiencies

	Quality of Care	Client Assessment	Clients' Rights	Pharmacy	Administration	Any Quality Def
For Profit	0.6638*	0.3116	1.3553**	0.3745	1.2524**	0.7925*
	[0.3967]	[0.4345]	[0.5877]	[0.7734]	[0.5973]	[0.4123]
	1.9422*	**1.3656**	**3.8779****	**1.4543**	**3.4988****	**2.2090***
Total Patient Days/1000	0.0181**	0.0108	-0.038	-0.0466**	-0.0043	0.0103
	[0.0082]	[0.0079]	[0.0295]	[0.0200]	[0.0141]	[0.0084]
Inpatient Facility	0.3147	0.6272	-0.3876	0.4031	0.583	0.4573
	[0.5437]	[0.4850]	[1.0608]	[0.6396]	[0.6050]	[0.5334]
Chain	-0.2527	0.1853	0.7573	1.6304***	-0.0153	-0.0051
	[0.4065]	[0.4110]	[0.8755]	[0.6205]	[0.5106]	[0.4047]
Rural	-0.1631	-0.1821	-16.5669***	-2.6529***	-0.4165	-0.3357
	[0.4054]	[0.4448]	[0.5130]	[0.7831]	[0.5895]	[0.4388]
Age	-0.1314	-0.1686**	0.2024	0.056	-0.1269	-0.1384
	[0.0814]	[0.0839]	[0.1265]	[0.1373]	[0.1191]	[0.0863]
Year=2003	-0.9967**	-0.1011	-0.0843	-2.1487**	-0.4715	-0.6602
	[0.4315]	[0.4608]	[0.6906]	[0.9935]	[0.6534]	[0.4663]
Year==2004	-0.3607	0.1561	0.7609	-0.9249	0.7448	0.0911
	[0.5137]	[0.4865]	[0.8981]	[0.7969]	[0.6050]	[0.5172]
% Cancer Patients	-1.3044	-0.5837	1.8916	6.3297**	0.2856	-0.0348
	[1.6579]	[1.7388]	[3.1072]	[2.5211]	[2.4387]	[1.7423]
Constant	0.0538	-0.4532	-6.0924***	-6.0993***	-1.5277	0.2928
	[0.8319]	[0.8253]	[1.8432]	[1.6903]	[1.1858]	[0.8575]
Number of Observations	291	291	291	291	291	291

Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%
Incidence rate ratios are in bold.

Appendix A. Definitions of ALIRTS Quality Deficiency Categories

Quality of Care	Violations occur when the program has failed to care for medical, nursing, or therapy needs appropriately and on a timely basis. These violations also include whether there is a sufficient number of nurses to care for each client.
Client's Rights	Violations occur when a program failed to recognize, respect, and uphold the rights of clients.
Client Assessment	Violations occur when a program has failed to maintain the client environment in a manner that protects the health and safety of its clients personnel and the public.
Pharmacy	Violations occur when a program has failed to comply with pharmacy procedures for properly dispensing and storing medications. These standards are designed to make sure clients get the right medication at the right time.
Administration	Violations occur when a program has failed to provide adequate administration and management. By law, a program must be run in a way that enables it to use its resources to attain and maintain the highest level of physical, mental , and psychosocial well-being for each client.

Source: O'Meara et al. 2005