# What Does Hospice Cost?

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**Abstract:** This paper presents the preliminary results of the economic analyses of the National Hospice Study (NHS), mandated by the United States Congress to investigate the implications of including hospice services in Medicare. Data were collected over an 18-month period from approximately 4,000 patients receiving hospice and conventional terminal care in 25 hospices and 12 conventional care sites. Subsequent analysis may lead to changes in the specific results, and some of the differences may be due to confounding variables that cannot be adjusted for.

According to these data, hospital based (HB) hospice costs per day are 44 per cent higher than home care (HC) hospice costs per day ($95 versus $66, respectively). In addition, per patient hospice costs are 24 per cent more for patients enrolled in HB than in HC hospices ($5,890 versus $4,758, respectively). The proportional difference between HB and HC in cost per patient is smaller than the cost per day difference due to the shorter average HB length of stay, 62.3 days compared to 72.5 days for HC.

Regarding the cost savings of hospice compared to conventional care, HC hospice costs are lower than conventional care costs regardless of length of stay. However, HB costs seem lower than conventional care costs only for patients with lengths of stay less than two months. Hospice and conventional care patients appear to differ with respect to predisposition toward intensive health care utilization. When this difference is explored more thoroughly in subsequent analyses, the estimated cost differential between hospice and conventional care may change. (*Am J Public Health* 1984; 74:689–697.)

*Introduction*

A common belief is that hospice care costs less than conventional treatment of terminal illness. The Medicare hospice benefit, created by the US Congress under the Tax Equity and Reform Act of 1982 (TEFRA), was motivated in part by this belief. Hospice has also become popular with some third-party insurance payers and employers as a cost-containment device. These beliefs have been nurtured by a literature on hospice care.[1–10]* While previous research has been relatively unsophisticated and limited by small samples, it has helped to support the view that hospice costs less than conventional care.

The National Hospice Study (NHS) was designed explicitly to answer questions about the cost of hospice and its potential for reducing costs. The NHS involves the evaluation of a national demonstration sponsored by the Health Care Financing Administration (HCFA). The NHS also evaluated the impact of hospice on the type of care provided and on the quality of life of patients and families.

This paper discusses preliminary NHS findings about the cost of hospice. The results are important because these data were used extensively by HCFA in preparation of its TEFRA hospice regulations and reimbursement rates.[11] The final TEFRA Medicare regulations state that "the data from HCFA's hospice demonstration used in conjunction with other Medicare program data provide an adequate basis for the development of a prospective payment system." The results should be useful to organizations trying to evaluate how they will fare under the new Medicare hospice benefit. They also should be useful to discussions of the appropriateness of current Medicare policies, as well as the appropriateness for replication by other third-party payers. The final report on the NHS, to be completed later in 1984, will expand the analysis to non-Medicare patients and to non-demonstration hospices as well as to components of cost not considered here, specifically the costs of physicians, drugs, supplies, and equipment, and out-of-pocket costs. These other costs account for less than 10 per cent of the costs reported here and, roughly, are distributed similarly for patients in different care settings.

The paper addresses two issues in the context of the NHS. The central focus of the paper is to address the question: What is the cost of hospice? In order to interpret the NHS findings properly, it is important to recognize that the conditions under which the demonstration was conducted differ from those incorporated under TEFRA. For example, TEFRA requires that certified hospices provide certain core services and imposes certain limits on aggregate costs and utilization.** No such requirements existed under the NHS. In addition, the NHS imposed a requirement, unlike TEFRA, that all patients have a primary care person.

The paper also addresses, but less thoroughly, a second question: Does hospice care provided to Medicare beneficiaries cost less than conventional methods of caring for terminally ill cancer patients? The preliminary results are sufficient to conclude that whether hospice reduces costs is dependent on the type of hospice a patient uses, and the length of the hospice stay as well as the timing of the hospice stay vis-a-vis the onset of the terminal phase of the illness. However, the specific point estimates may change, as the final analyses will include additional cost information. A third cost issue not considered here involves the time of family and friends. The amount of informal support provided to hospice patients is considered in Morris and Sherwood,[12] who conclude that the amount of informal support provided

*See also Leibowitz A, Kaplan S, Wales J, Kane R: Does hospice save money in direct or indirect ways? Santa Monica, CA: Rand Corp., 1983 (unpublished study).

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**Editor's Note:** See also related editorial p 652 this issue.



**TEFRA provides for up to 210 days of Medicare-reimbursed certified hospice care at prospectively set rates. There is an average aggregate annual cap, set by each hospice's projected Medicare caseload multiplied by $6,500 per beneficiary (a figure that varies regionally and is subject to annual revision for inflation). Medicare will reimburse for inpatient care up to 20 per cent of the total days of elected hospice care among all of a hospice's patients.

to hospice patients far exceeds that provided to patients in other types of home care programs.

*Methods*

Initial exploratory analyses emphasized the importance of distinguishing between hospices with beds (either as part of a hospital or freestanding organizations with their own inpatient beds) and hospices without direct control over inpatient beds. The terminology used here to refer to these two types of hospice is, respectively: hospital based (HB) or home care based (HC) hospice. HC hospices provide inpatient care by hospitalizing their patients in unaffiliated hospitals.

The NHS analysis includes 11 HB and 14 HC demonstration hospices located throughout the United States.*** The final NHS analysis also will include data on 14 nondemonstration hospices. In addition, the NHS incuded 12 conventional care (CC) sites located in different areas representing, in the opinion of knowledgeable area physicians, "good" (nonhospice) oncological care.

The NHS hospices were in operation prior to their participation in the NHS beginning in 1980. Since that time, perhaps 1,000 hospices have begun operation.[13] Thus, the results may not be representative of current hospices. Nonetheless, the results underscore the important behavioral differences that exist across hospice settings.

Several patient samples were identified and data obtained over an 18-month period in 1981–1983. Estimates based on two samples are reported here: The *Hospice Cost Sample* is used to estimate the cost of hospice to Medicare; it includes all demonstration Medicare hospice patients admitted in the first year of the demonstration. The *Terminal Cancer Cost Sample* is limited to patients with diagnoses of terminal cancer; it is used to estimate the cost savings of hospice to Medicare for cancer and excludes patients with noncancer terminal diagnoses. Greer, *et al*, discussed selection of NHS sites and samples.[14]

**Sites and Samples**

The Hospice Cost Sample is the universe of demonstration Medicare patients with complete cost data who were admitted to 25 demonstration hospices during the first year of the two-year demonstration (between October 1, 1980 and December 31, 1981) and who had a known termination status from hospice by February 1, 1983. Because it may be months after an episode that Medicare bills are filed and data accrue in the Medicare data system, the analyses reported here include only patients who met this cutoff date. The cutoffs were selected after analyses of sample sizes, billing lags, data completeness, and hospice lengths of stay. The final report will cover patients admitted during the second year of the demonstration.

Data describing the characteristics of the 2,746 HC and 1,143 HB hospice patients in the Hospice Cost Sample at the time of their admission into hospice are presented in Table 1. Ninety per cent of the sample were 65 years of age or older, as would be expected in a sample of Medicare beneficiaries. There were approximately the same percentages of males and females. Over 90 per cent of the sample had cancer. The majority of patients were married at the time of admission, and only a few lived alone.

The Terminal Cancer Cost Sample is used to analyze the cost saving due to hospice. The Terminal Cancer Sample is more narrowly defined than the Hospice Cost Sample to match more closely the samples of hospice and comparison conventional care (CC) patients. The sample includes all NHS demonstration Medicare hospice patients with a diagnosis of cancer who were admitted to the 25 hospices after October 1, 1980, and who died prior to June 30, 1982. In size, the hospice component of the Terminal Cancer Cost Sample is about 25 per cent smaller than the Hospice Cost Sample. In addition, the Terminal Cancer Sample includes about 400 Medicare patients with cancer diagnoses who were identified at the participating CC sites by their physician as terminally ill and who had a primary care person. Otherwise, the characteristics of patients in the Hospice Cost and Terminal Cost samples generally are similar.

**Cost Calculations**

All cost data are reported in 1982 US dollars. Patient data for demonstration hospice services come from special Medicare bill files. Data regarding regular Medicare services provided to hospice and conventional care patients by nonhospice providers come from the Medicare Bill History File. Together, these sources record the utilization and charges for Medicare reimbursable services provided to sample patients by hospitals, skilled nursing facilities (SNFs), and home health agencies. The most important Medicare reimbursable services not included are those of fee-for-service physicians and outpatient clinics. Costs of salaried hospice staff physicians are included in the demonstration data. Cost estimates do not include out-of-pocket expenses or payments by other third parties. As noted earlier, the effect of these exclusions did not affect the groups differentially. Data on the patients' characteristics were collected on NHS Intake Forms.

Since the NHS data come from an atypical sample of hospices and hospitals, a cost methodology was developed to adjust cost estimates to 1982 national Medicare reimbursement rates.† The cost methodology weights measures of patient utilization by national Medicare costs per unit of service. Where utilization levels are unavailable, the methodology adjusts charges. The cost measures, computed separately for each patient for home and inpatient services, as described in the Appendix.

Total inpatient costs are the sum of routine and ancillary costs. Conventional hospital routine costs as well as inpatient care provided to HC and HB hospice patients by nonhospice providers are computed with a constant weight of $156 per day, the 1982 national average Medicare community hospital routine per diem. The per diem weight for inpatient care provided by HB hospices is $180, the national Medicare per diem raised by the average 15.7 per cent differential between the demonstration HB hospices' routine per diem and the per diem of their affiliated hospitals.

Ancillary charges are converted to costs in two steps. The first step adjusts for the price differential between a patient's provider and the national average. The patient's adjusted ancillary charge is then converted to Medicare reimbursable costs using the national average Medicare cost to charge ratio (i.e., 0.656).

Home services costs for hospice care are computed by multiplying each patient's hours of home care by the appropriate hospice's average Medicare reimbursable cost per

***An additional HB hospice which provided no home care did not comply with the terms of the demonstration, and is excluded from all analyses.

†These cost estimates should not be confused with the rates set by HCFA to reimburse for services provided under TEFRA.

**TABLE 1—Preliminary National Hospice Survey Medicare Demonstration Hospice Cost Sample at Time of Admission, by Hospice Type**

| Variable | Home Care (N = 2746) | Hospital Based (N = 1143) |
|---|---|---|
| Age | | |
| 21–84 | 10.7 | 8.2 |
| 65–74 | 54.9 | 58.3 |
| 75+ | 34.4 | 33.6 |
| Sex | | |
| Male | 51.4 | 52.5 |
| Female | 48.6 | 47.5 |
| Marital Status* | | |
| Currently Married | 62.9 | 54.7 |
| Not Currently Married | 37.1 | 45.3 |
| Family Income | | |
| $0–9,999 | 60.4 | 58.3 |
| 10–49,999 | 38.4 | 41.0 |
| 50,000+ | 1.2 | 0.7 |
| Patient Living Arrangement* | | |
| Alone | 8.9 | 16.5 |
| Not Alone | 91.1 | 83.2 |
| PCP Relationship | | |
| Spouse | 56.0 | 49.8 |
| Child | 28.1 | 34.3 |
| Other | 15.9 | 15.9 |
| Race | | |
| White | 94.3 | 94.8 |
| Other | 5.7 | 5.2 |
| Diagnosis | | |
| Colon | 13.8 | 14.4 |
| Lung | 21.9 | 19.9 |
| Breast | 9.5 | 9.6 |
| Prostrate | 7.0 | 9.4 |
| Other Cancer | 40.4 | 39.7 |
| Non Cancer | 7.4 | 7.0 |
| Functional Status** Mean Score | 8.4 | 9.4 |
| Prior Utilization | | |
| Number HCFA Bills in 2 Months Before Hospice Enrollment** | 1.3 | 1.5 |
| Number of HCFA Inpatient Days in 2 Months Before Hospice Enrollment | 16.4 | 22.0 |

SOURCE: NHS Intake Record Data

*Notes a significant Chi Square of F test ($p < 0.01$) that indicates that the distributional pattern for the variable by type of hospice (HB/HC) was different from what would be expected by chance.

**Modifed Katz Activity of Daily Living Scale rates a patient's functional status on a scale from 1 to 14; higher scores indicate less ability to function.

hour of home care. Costs of conventional home care, SNF, and other institutional care are set equal to charges, an assumption based on corroborating NHS analysis. Further detail on the cost methodology is in Birnbaum, *et al.*[15]

The findings presented below on the cost of hospice are not adjusted for differences in patient mix because the statistical adjustments (noted below) make little difference. Random assignment of patients was not possible. Instead, regression analysis, described in Birnbaum,[15] was used to adjust the costs of HB and HC hospices for differences between settings in such patient mix characteristics as age, sex, diagnosis, functional status, and living arrangement, as well as length of stay. Length of stay dominates the adjustment process. In contrast, the findings presented on the impact of hospice on terminal cancer costs are adjusted statistically because patient mix differences between hospice and conventional care patients alter the conclusions. Certain other potential confounding factors could not be adjusted for (such as the effect of discharge status—dead or alive, locality, or medical need) and allow some uncertainty about the results.

## *Results*

### Descriptive Statistics on Hospice Cost

What is the cost of hospice care? The NHS results suggest that the average HB hospice day costs Medicare 44 per cent more than the average HC day; $95 versus $66.†† Since HC patients stay longer in hospice than do HB patients (their mean stays are 72.5 and 62.3 days, respectively), the percentage difference in cost per patient is less. The total cost per patient for the services provided during hospice

††Adjusting for length of stay and patient mix (i.e., age, sex, diagnoses, utilization prior to hospice) reduces HB/HC cost per day differences from $95 (unadjusted) to $92 (adjusted) for HB, and from $66 (unadjusted) to $67 (adjusted) for HC. A model on a reduced sample that incorporates data on a patient's functional status and living arrangement yields adjusted estimates of $88 and $65 per day. Adjustment yields similar (percentage) effects on the respective cost per patient and utilization measures.

**TABLE 2—Total Hospice Cost per Patient, Cost per Hospice Day, and Number of Patients by Site,[a] Unadjusted for Patient Mix, (listed in order of decreasing cost per patient)**

| Hospice Sites | Total Hospice Cost per Patient | Average Cost per Hospice Day | Average Hospice Days per Patient | Number of patients[c] N=3383 |
|---|---|---|---|---|
| Home Care Hospices | | | | |
| Site 1 | $7716 | $90 | 85.9 days | 85 patients |
| Site 2 | 6313 | 79 | 80.4 | 386 |
| Site 3 | 6310 | 78 | 81.0 | 400 |
| Site 4 | 5116 | 55 | 93.9 | 217 |
| Site 5 | 4918 | 54 | 91.1 | 174 |
| Site 6 | 4575 | 71 | 64.1 | 60 |
| Site 7 | 4443 | 55 | 81.3 | 85 |
| Site 8 | 4398 | 45 | 97.6 | 90 |
| Site 9 | 4261 | 60 | 71.6 | 300 |
| Site 10 | 3947 | 109 | 36.1 | 229 |
| Site 11 | 3767 | 65 | 57.8 | 267 |
| Site 12 | 3712 | 60 | 62.0 | 62 |
| Site 13 | 3094 | 82 | 37.8 | 148 |
| Site 14 | 2301 | 31 | 74.4 | 243 |
| Hospital Based Hospices[b] | | | | |
| Site 1 | $8595 | $153 | 56.3 days | 62 patients |
| Site 2 | 7501 | 69 | 109.3 | 43 |
| Site 3 | 7466 | 83 | 90.0 | 47 |
| Site 4 | 6884 | 100 | 69.2 | 89 |
| Site 5 | 6635 | 88 | 75.8 | 108 |
| Site 6 | 6410 | 88 | 72.6 | 77 |
| Site 7 | 5994 | 99 | 60.4 | 76 |
| Site 8 | 5378 | 112 | 48.2 | 50 |
| Site 9 | 5191 | 43 | 121.8 | 30 |
| Site 10 | 5021 | 112 | 44.9 | 477 |
| Site 11 | 4804 | 68 | 70.4 | 78 |

SOURCE: Year 1 Medicare Demonstration Hospice Cost Sample Data Base.

[a]Calculated in 1982 dollars for services provided to patients from date of hospice enrollment to hospice discharge using National Hospice Survey cost methodology.

[b]Patients admitted to one demonstration hospice were not included because that hospice did not comply with the terms of the demonstration in that it provided no home care.

[c]Excludes six patients from one of Home Care hospices who enrolled after that hospice began an inpatient unit in the second year of the demonstration.

enrollment is $5,890 per HB patient, 24 per cent more than the $4,758 cost per HC patient.

There is considerable variation in costs among hospice patients. Much of the cost difference between hospice types comes at the extremes of the patients' cost distribution. The HC distribution is skewed more than the HB toward less costly patients. While 17.9 per cent of HC patients have total costs of $500 or less, this is true for only 9.4 per cent of the HB patients. In contrast, 22.8 per cent of the HC patients and 29.3 per cent of the HB patients incur total costs exceeding $6,500.

Tables 2 and 3 show that considerable variation in costs

**TABLE 3—Distribution of Patients by Length of Stay in Hospice, Unadjusted for Patient Mix**

| | Home Care Hospices (N=2746 patients in 14 hospices) | | Hospital Based Hospices (N=1143 patients in 11 hospices) | |
|---|---|---|---|---|
| Length of Hospice Stay | Per Cent of Patients | Cumulative Percentage | Per Cent of Patients | Cumulative Percentage |
| 1–5 days | 8.3% | 8.3% | 10.1% | 10.1% |
| 6–10 | 9.2 | 17.5 | 10.5 | 20.6 |
| 11–20 | 14.8 | 32.3 | 16.6 | 37.2 |
| 21–30 | 11.3 | 43.6 | 9.7 | 46.9 |
| 31–60 | 20.5 | 64.1 | 21.0 | 67.9 |
| 61–90 | 10.6 | 74.7 | 11.2 | 79.1 |
| 91–180 | 15.0 | 89.8 | 13.7 | 92.8 |
| 181–210 | 2.4 | 92.2 | 1.1 | 94.0 |
| 211–240 | 1.6 | 93.8 | 1.2 | 95.2 |
| 241–300 | 2.6 | 96.4 | 1.6 | 96.8 |
| 301+ | 3.6 | 100.0 | 3.2 | 100.0 |
| Total Hospice Days | 199,206 days | | 71,235 days | |
| Mean Length of Stay | 72.5 days | | 62.3 days | |
| Median Length of Stay | 37.1 days | | 33.3 days | |

SOURCE: Year 1 Medicare Demonstration Hospice Cost Sample Data Base.

**TABLE 4—Average Utilization of Hospice Services, Unadjusted for Patient Mix**

| Units per Hospice Patient | Home Care Hospices (N=2746 patients in 14 hospices) | Hospital Based Hospices (N=1143 patients in 11 hospices) |
|---|---|---|
| Inpatient Days (Hospice and Hospital) | | |
| Mean | 5.2 days | 18.2 days[a] |
| Median | 0.4 | 9.0[a] |
| Home Services Hours | | |
| Mean (excluding Continuous Care) | 108.4 hours | 59.3 hours |
| Median | 38.6 | 9.4 |
| Continuous/Home Respite Care Hours | | |
| Mean | 11.9 hours | 0.5 hours |
| Median | 0.1 | 0.005 |

SOURCE: Year 1 Medicare Demonstration Hospice Cost Sample Data Base.
[a]Includes both hospital and Hospital Based hospice inpatient care received by Hospital Based patients.

exists at the facility level. Table 2 shows that most HB hospices' costs are above the higher cost HC hospices and most HC hospices' costs are below the least expensive HB facilities. Five of the 11 HB hospices had per-patient costs greater than the $6,500 TEFRA cap. Also, some of the hospices with high average costs per patient and relatively long average lengths of stay have relatively low average costs per hospice day, and vice versa. Sites with discrepancies in cost per day and cost per patient rankings are sites with lengths of stay considerably different from the average. These results suggest that intra-group differences in patient mix and/or management are large and emphasize the need for further research on large samples of hospices.

Table 3 provides information about the distribution of length of stay in hospice. The average length of stay is longer in HC than HB hospice. The sample distribution of length of stay for both types of hospice is extremely skewed, such that the median length of stay (37.1 days and 33.3 days for HC and HB, respectively) is approximately half the mean length of stay. While most hospice patients receive around one month of hospice care, some patients remain in hospice for long periods. The percentage of persons with a length of stay greater than 210 days (specified as the TEFRA maximum benefit period for hospice) is 7.8 per cent for HC and 6.0 per cent for HB patients.

**Determinants of Hospice Costs**

What determines the cost of hospice? Hospice costs reflect the volume of services utilized and the cost per unit of service. Utilization data in Table 4 show that HB patients receive 3.5 times the number of inpatient days that HC patients do. Consequently, the percentage of the HB hospice stay in an inpatient setting is more than four times that of HC patients (29.2 per cent versus 7.2 per cent). Inpatient care is virtually synonymous with hospital care; less than 5 per cent of hospice inpatient care involved SNF nursing home care.

While HC patients receive 1.8 times more home service hours than HB patients, such care is considerably less expensive than inpatient care. Although there are differences in the unit costs of service by type of hospice (Table 5), these differences are relatively small compared to the utilization differences. Thus, difference in inpatient utilization between HC and HB patients leads to differences in hospice costs.

Average utilization rates reflect the percentage of patients using each type of service (i.e., user rates) and the frequency of use of specific services. While most HB patients (83.6 per cent) receive inpatient care, less than half of the HC patients (42.8 per cent) receive inpatient care. In contrast, virtually all HC patients (99.7 per cent) receive home services, while two-thirds of the HB patients (67.4 per cent) receive home services. In addition to regular home

**TABLE 5—Unit Costs of Hospice Patients' Services,[a] Unadjusted for Patient Mix**

| Unit Costs of Service | Home Care Hospices (N=2746 patients in 14 hospices) | Hospital Based Hospices (N=1143 patients in 11 hospices) |
|---|---|---|
| Inpatient (Hospital and Hospice) | | |
| Total Costs/Total Days of Inpatient Care | $278 | $218[b] |
| Median Cost for Inpatient Days[c] | 259 | 195[b] |
| Homes Services (excluding Continuous Care) | | |
| Total Costs/Total Days at Home | 46 | 43 |
| Median Cost for Home Days[c] | 37 | 27 |
| Continuous/Home Respite Care[d] | | |
| Total Costs/Total Hours of Care | 18 | 45 |

SOURCE: Year 1 Medicare Demonstration Hospice Cost Sample Data Base.
[a]Calculated in 1982 US dollars for services provided to patients from date of hospice enrollment to hospice discharge using National Hospice Survey (NHS) cost methodology (see Appendix).
[b]Includes both hospital and Hospital Based (HB) inpatient care received by HB patients.
[c]Calculated by weighting data for the NHS sample of patients by number of inpatient days and number of home days, respectively, to synthesize a sample of inpatient days and a sample of home days (as opposed to a sample of patients).
[d]Median data not presented because variability in cost per hour was censored by the technique used to estimate cost of services. The estimation formula treats cost per hour as constant within each site.

services care, hospice patients under the demonstration also received continuous care at home during periods of medical crisis and home respite care for relief of the family. Continuous care and home respite care are provided principally to HC patients: 11.0 per cent of the HC patients receive continuous care and home respite care, but only 1.0 per cent of the HB patients receive such care.

Even among users of inpatient care, there are major differences in utilization between the two types of hospice. The frequency of use of inpatient days among HB users (21.8 days per user) is almost twice the HC level (12.1 days), but similar to the level for all HB patients because most HB patients use inpatient care. However, due to a relatively low use rate, the average number of inpatient days per HC user is over twice the average number of inpatient days for all HC patients (12.1 days versus 5.2 days).

There is virtually no difference between HC home service hours per user and hours per patient (108.8 hours versus 108.4 hours, respectively) because virtually all HC patients receive home services. The HB home services per user is greater than HB home services per patient (88.0 hours versus 59.3 hours) because many HB patients use no home services. The largest difference in use rates and frequency of use for both HB and HC patients occurs for continuous care and home respite care. HC hours per user are 10 times that of the per patient measure (108.8 hours versus 11.9 hours). The HB hours per user of continuous and home respite care are almost 100 times that of the per patient measure (45.5 hours versus 0.5 hours).

The elements of hospice cost per patient are shown in Figure 1. Higher HB costs per day and per patient reflect greater use of inpatient services among HB patients. Inpatient care accounts for most (64.7 per cent) of HB patient total costs while home service (excluding continuous care and home respite care) account for most (64.2 per cent) of HC patient total costs. Among HC patients, inpatient care accounts for almost one-third of total hospice cost, while among HB patients, home services (excluding continuous care) account for almost one-third of total hospice costs. Differences between HC and HB patients in the costs of these components lead to differences in total per patient cost. While HC patients receive more home care than HB patients, HB per patient total costs are higher than HC total costs because HB patients receive more inpatient care. Home services (excluding continuous care and home respite care) cost over one-and-one-half times more for HC patients than for HB patients—$3,054 versus $1,871 per patient, respectively. However, HB inpatient cost per patient is over two-and-one-half times HC costs—$3,972 versus $1,439 per patient, respectively.

The costs of continuous care and home respite care are a minor component of cost, at 4.5 per cent of HC per patient total cost and an even smaller component of HB per patient total cost, 0.37 per cent.

An additional source of variation in hospice costs derives from variation in ancillarly utilization. The HC patients receive inpatient care arranged by the hospice but in nonhospice settings typically in community hospitals. However, the HB patients receive inpatient care typically in the HB hospice's own inpatient unit. The HB hospices are better able to control the amount of ancillary services provided to their patients. The cost of ancillary services per inpatient day for HC patients is higher than for HB patients. The HB distribution is skewed by a preponderance of many inpatient days with low ancillary costs. While 6.2 per cent of the HC

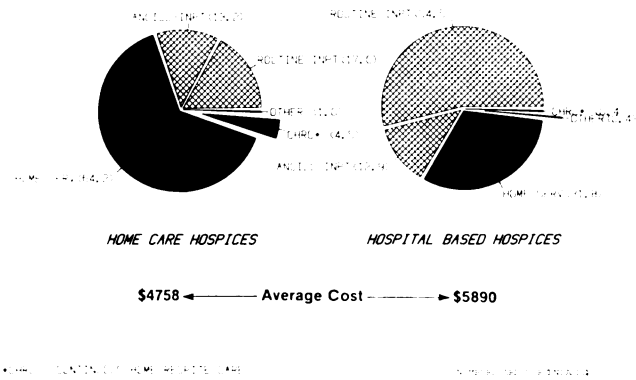


**FIGURE 1—Composition of Hospice Cost per Patient (1982 US Dollars)**

**SOURCE: Year 1 Medicare Demonstration Terminal Cancer Cost Sample Data Base.**

patients with inpatient stays have ancillary costs of less than $40 per inpatient day, 65.8 per cent of the HP patients have ancillary costs of less than $40 per inpatient day.

The cost of hospice also varies by type of patient, as shown in Table 6. Most notable is the fact that patients who were discharged alive from hospice stayed longer and cost more than patients who died in hospice. Around 10 per cent of the hospice samples of supposedly terminal patients were discharged alive, a result surprising to all reviewers of these findings as well as to the authors. Data are not available to determine whether these patients were discontented, in remission, or simply moving to a different geographic location. Noncancer patients stayed longer and cost more than cancer patients in the NHS hospices. Patients who lived alone without family support also stayed longer and cost more. These and other patient mix characteristics contributed to differences between the unadjusted and adjusted cost estimates noted previously.

**Cost Savings Impact of Hospice**

Two reasons for hospice savings are typically advanced. First, since the hospice model developed in the United States emphasizes care in a home setting, hospice should substitute home care for relatively expensive inpatient care. Second, for those hospice patients that receive inpatient care, hospice treatment should be less aggressive than conventional care. Therefore, hospice should involve less intensive use of expensive ancillary services. However, hospice could lead to cost increases if home services supplement inpatient care rather than substitute for it.

Cost savings were estimated, over seven time intervals counting backwards from date of death, by comparing actual hospice costs to what costs would have been (predicted costs) for hospice patients in conventional care. Conventional care cost predictions were made by combining information on each hospice patient's characteristics (age, sex, cancer type) with age, sex, and cancer type parameters estimated in a regression run on data from NHS conventional care patients. Savings are defined as actual hospice costs minus predicted conventional care costs.

As noted previously, the data presented here differ from those used to analyze the cost of hospice, in that they involve only cancer patients discharged dead from hospice or patients who died with a diagnosis of cancer. Also, the relative costs of hospice vis-a-vis conventional care are

**TABLE 6—Average Cost in Hospice by Type of Patient[ab]**

A. Average Cost and Length of Stay by Discharge Status

| | Home Care Hospices | | Hospital Based Hospices | |
|---|---|---|---|---|
| | Alive Discharges (N=291) | Dead Discharges (N=2455) | Alive Discharges (N=99) | Dead Discharges (N=1044) |
| Total Cost per patient | | | | |
| Mean | $5467 | $4674 | $10,369 | $5466 |
| Median | 2732 | 2180 | 6412 | 3214 |
| Days of Hospice Stay | | | | |
| Mean | 106.3 days | 68.5 days | 113.3 days | 57.5 days |
| Median | 72.7 | 35.2 | 71.4 | 31.2 |

B. Average Cost and Length of Stay by Diagnosis

| | Home Care Hospices | | Hospital Based Hospices | |
|---|---|---|---|---|
| | Noncancer (N=185) | Cancer (N=2308) | Noncancer (N=75) | Cancer (N=998) |
| Total Cost Per Patient | | | | |
| Mean | $7367 | $4690 | $7392 | $5895 |
| Median | 3846 | 2205 | 3705 | 3385 |
| Days of Hospice Stay | | | | |
| Mean | 109.7 days | 71.8 days | 73.4 days | 62.1 days |
| Median | 71.8 | 37.3 | 37.8 | 33.4 |

C. Average Cost and Length of Stay by Living Arrangement

| | Home Care Hospices | | Hospital Based Hospices | |
|---|---|---|---|---|
| | Lived Alone (N=152) | Not Alone (N=1559) | Lived Alone (N=90) | Not Alone (N=446) |
| Total Cost Per Patient | | | | |
| Mean | $5768 | $4349 | $7705 | $5925 |
| Median | 3715 | 1955 | 5072 | 3577 |
| Days of Hospice Stay | | | | |
| Mean | 98.9 days | 68.7 days | 78.3 days | 68.1 days |
| Median | 58.5 | 36.0 | 40.5 | 38.8 |

SOURCE: Year 1 Medicare Demonstration Hospice Cost Sample Merged Data Base.

[a]Calculated in 1982 US dollars for services provided to patients from date of hospice enrollment to hospice discharge using National Hospice Survey cost methodology (see Appendix).

[b]Sample sizes shown differ among the three tables, because patients with missing data on living arrangements and diagnosis have not been included in Tables B and C.

adjusted for important patient mix variables such as length of cancer illness and prehospice utilization.†††

**Impact Results**

What is the impact of hospice on the costs of terminal cancer care? The answer is, "It depends." Whether hospice saves money depends crucially on the type of hospice and the timing in which patients enter hospice. There is no simple, unambiguous answer as to the cost savings of hospice care. While HC hospice always seems to lead to savings, HB hospice can lead to cost increases for patients with long hospice stays (greater than two months).

Figure 2 compares the cost of patients in each type of hospice to what their costs would have been in conventional care. Estimates are computed separately for cohorts of patients with different lengths of hospice stay.

For hospice stays of less than two months, both HC and HB hospices produce significant savings. HC savings exceed HB savings. For both types of hospice, savings decline as length of hospice stay increases. Costs in HB hospices for longer than two-month stays become significantly greater than conventional care costs. The HC hospice costs remain lower than conventional care costs regardless of length of stay. The fact that, regardless of setting, hospice saves less on average for long stays than for stays of less than two months reflects both a tendency toward lower savings in all time intervals for long-stay patients and a tendency for hospice to cost more than conventional care immediately after intake for patients with stays of greater than two months.

The difference in cost savings due to the time trajectory is due to patterns of utilization. The amount of inpatient care received by conventional care patients increased rapidly in the last weeks before death. In contrast, while the amount of home care provided to hospice patients increased in the weeks before death, HC home care utilization seems almost relatively stable compared to the very large increases in inpatient care provided to CC and, to a lesser extent, to HB patients.

†††Since the NHS Final Report will include a reestimation of cost savings using a data base with more extensive information on prior utilization, results reported here could change.

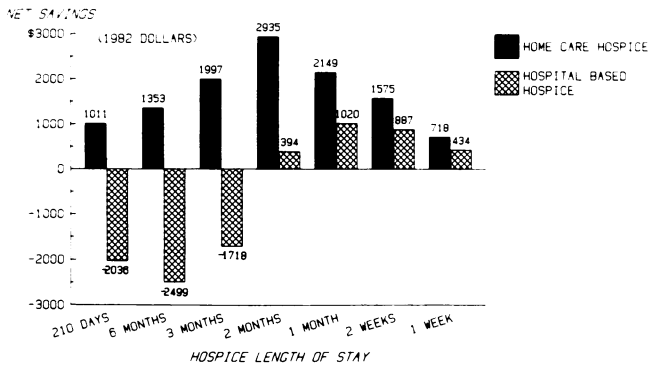


**FIGURE 2—Cumulative Medicare Savings/Costs of Hospice Relative to Comparable Conventional Care Patients by Hospice Length of Stay and Type (1982 US Dollars)**

**SOURCE: Year 1 Medicare Demonstration Hospice Cost Sample Data Base.**

Such differential utilization patterns are to be expected given the differences in the site of death. While over 60 per cent of HC patients die at home, this is true for only 20 per cent of HB patients.[16] Further information on the hospice-conventional care cost impact analyses are in Kidder, *et al.*[17]

Hospice and conventional care patients appear to differ with respect to predisposition toward intensive health care utilization. For example, conventional care patients are more likely to live alone than HB hospice patients, and both conventional care and HB patients are more likely to live alone than HC hospice patients (24 per cent, 16 per cent, and 9 per cent for CC, HB and HC, respectively). When this difference is explained more thoroughly in subsequent analysis, the estimated cost differential between hospice and conventional care may change.

*Discussion*

The economies often associated with hospice persist for HC hospices, regardless of time spent in hospice. However, as one looks at Medicare costs for longer than the last weeks before death, HB hospice cost savings progressively diminish and essentially disappear at around two months before death. While these results are useful in predicting hospice experience under TEFRA, Medicare hospice costs in the future will probably be greater than those found in the NHS. This is because NHS conventional care comparisons do not include noncancer patients or patients discharged alive from hospice; care for both groups was more costly than for cancer patients who died in hospice. The TEFRA Medicare hospice program includes these patients, and they may be expected to enroll in TEFRA hospice. Another reason for expecting higher hospice costs in the future is that the TEFRA legislation imposes no obstacles to the entry of patients without primary care persons (PCP) into hospice, whereas the demonstration did so. Since NHS hospice patients who live alone cost more than those who do not, it can be inferred that hospice patients without a PCP also cost more than patients with a PCP. Costs per patient under TEFRA therefore may be higher than those experienced in the NHS if patients without a PCP enter hospice in large numbers.

A crucial factor affecting future hospice costs will be the quality of hospice management. Hospice costs are sensitive to several factors that are at least partially under the control of a hospice. For example, while it is impossible to predict a patient's date of death, it is possible to discourage entry of patients who seem to have longer expected lengths of stay based on measures of functional status and physician's prognoses. Similarly, hospices can choose to admit only patients who have informal support available or who have cancer diagnoses.

The amount of inpatient care provided to hospice patients will be a crucial factor in determining the cost of hospice. HB hospices should have more control over patient costs since they control the beds and services provided to their inpatients. However, HB hospices will need to control institutionalization to avoid exceeding the caps. The HC hospices will be vulnerable to paying for expensive hospitalizations for their patients. It would be prudent for HC hospices to develop enforceable arrangements with local hospitals to control inpatient costs, particularly the use of ancillary services. For example, it may be possible to arrange "discounts" to HC hospices for respite care use of "guaranteed" hospital beds that the hospice always has available and pays for or for "weekend" use of hospital beds that are otherwise empty.

Another choice open to hospices is to provide hospice-style service but not seek certification as a hospice for purposes of third-party reimbursement. A hospice, after certification as a home health agency, can obtain reimbursement for home health services provided to its patients through regular third-party reimbursement procedures. While not considered in this paper, the nondemonstration hospices in the NHS received considerable amounts of third-party reimbursement by billing as home health agencies. Costs of noncertified hospices should be lower since they will be able to avoid expenses for services required to gain hospice certification. Also, the services offered by such nonhospice programs may be different.

Ultimately, the cost of hospice and whether it leads to savings will be determined by how hospice becomes integrated into the health care industry. To the extent that hospitals and hospices work together as an integrated system, at least informally, well-managed hospice care should be financially viable. In an era of increasing hospital rate regulation, hospitals will need to develop arrangements for discharging terminal patients who need not be hospitalized.

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### *ACKNOWLEDGMENTS*

The National Hospice Study is funded by the Health Care Financing Administration (Grant #99-P-97793/1-0) and by grants from The Robert Wood Johnson Foundation and The John A. Hartford Foundation. The views expressed here are those of the authors and not of the US Department of Health and Human Services, the Health Care Financing Administration, or the National Hospice Study. The authors are grateful to David S. Greer, MD, and Dr. Vincent Mor (both of Brown University and, respectively, the Principal Investigator and Project Director of the National Hospice Study), and to Craig Coelen, Nancy Goodrich, and Chris Saia (of Abt Associates, Inc). This report is based on a paper presented at the Annual Meeting of the Gerontological Society of America, San Francisco, November 1983.

## APPENDIX
## National Hospice Survey Cost Methodology

$$\text{Hospital (and Hc Hospice) Inpatient Cost} = \left[\text{National Average Medicare Per Diem Cost} + \text{Patient's Adjusted Ancillary Cost Per Day}\right] \times \text{Patient's Inpatient Days}$$

$$\text{HB Hospice Inpatient Cost} = \left[\left[\text{National Average Medicare Per Diem Cost} \times \frac{\text{Patient's HB Hospice's Avg Routine Per Diem}}{\text{HB's Hospital Avg Routine Per Diem}}\right] + \text{Patient's Adjusted Ancillary Cost Per Day}\right] \times \text{Patient's Inpatient Days}$$

$$\text{Ancillary Cost} = \left[\frac{\text{Average Ancillary Charge (US)}}{\text{Avg Ancillary Charge (Patient's Provider)}}\right]^{*} \times \text{Patient's Ancillary Charges Per Day} \times \frac{\text{Average Cost (US)}}{\text{Average Charges (US)}}$$

$$\text{Other}^{**}\text{ Inpatient Cost (mostly SNF)} = \text{Reimbursements} = \text{Charges}$$

$$\text{Hospice Home Services Cost} = \text{Patient's Hours of Home Services} \times \text{Provider's Average Cost per Hour of Home Service}$$

$$\text{Nonhospice Home Services Cost} = \text{Charges}^{***}$$

*This term was calculated for hospital costs and set equal to 1.0 for inpatient hospice costs.
**Other miscellaneous inpatient costs included care in Skilled Nursing Facilities, as well as Christian Science hospitals, chronic care hospitals, psychiatric hospitals, and tuberculosis hospitals.
***Analysis of NHS Medicare (nonhospice) home service data showed that nearly all charges were fully reimbursed. For this sample of patients the median value of the ratio of home services reimbursements to charges was 1.0, with an arithmetic mean of 0.98.
NOTE: HC = Home Care; HB = Hospital Based; SNF = Skilled Nursing Facility.