The Effects of Hospice Coverage on Medicare Expenditures

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This article reports on the findings of a study of the effects of the hospice program on Medicare Part A expenditures during the first three years of the program. The analysis compared treatment costs between hospice beneficiaries and nonbenefit patients with diagnosis of malignant cancer during their last seven months of life. It was estimated that during the first three years of the hospice program, Medicare saved $1.26 for every dollar spent on Part A expenditures. While the methodology included use of data from Medicare claims to adjust for confounding factors, including self-selection bias, our estimated savings might still have been overstated due to persistent selection effects. The extent of savings also varied according to the hospice's organization. Freestanding hospices, in contrast to those affiliated with either a hospital, nursing home, or home health agency, achieved the greatest savings by utilizing home care more extensively. However, we note that payment rates are increasing and the limits on the benefit period are being lifted, making it possible that the savings related to the hospice program found in this study will not continue. Of greater importance may be the long-term access and quality effects engendered by the benefit's preference for home care.

THE MEDICARE HOSPICE BENEFIT

In the 1982 Tax Equity and Fiscal Responsibility Act (TEFRA), Congress added a hospice benefit to the Medicare program. The hospice model of care, which stresses pain relief for terminally ill patients and

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counseling for their families, spread rapidly in the United States during the early 1980s. The federal government began seriously to consider the implications of a Medicare hospice benefit in 1980, with the implementation of demonstrations in 26 hospice programs. Well before findings from the evaluation of this demonstration were available (in the "National Hospice Study"), Congress mandated hospice coverage for all eligible Medicare beneficiaries. This article reports findings on the effects of the hospice benefit on Medicare expenditures.[1]

The hospice benefit incorporates many traditional Medicare features. Reimbursable services can be provided only through Medicare-certified programs; Medicare-certified hospices must meet standards similar to those used to certify other Medicare providers.

However, the benefit is also unique in several respects. Medicare pays one of four fixed, prospective per diem rates for every day of hospice benefit coverage. Each rate is defined by a service level and setting: a "routine home care" rate that covers days when the patient is at home but not receiving continuous skilled nursing services; a "continuous home care" rate for crisis days when the patient needs constant skilled nursing attention; a "general inpatient care" rate for medically necessary days in a hospital; an "inpatient respite care" rate for institutional days provided for the relief of the patient's primary informal caregiver. Copayments may be collected for inpatient respite care and prescription drugs provided by the hospice program; few hospices have bothered with copayments since the cost of collection outweighs the gain in revenue in most cases.

Utilization controls are imposed on providers as conditions both of certification and reimbursement. These include an annual aggregate Medicare reimbursement limit for each participating hospice, based on the average costs of treating terminally ill patients in nonhospice settings, and a limit on total provider inpatient days (general plus respite) to 20 percent of each provider's total reimbursable days.

During the years covered by this study, providers were reimbursed by Medicare for a maximum of 210 days for each enrolled hospice benefit recipient. Congress subsequently removed this limit in 1989 (through the Medicare Catastrophic Coverage Act), reimposed it after one year (when the Act was repealed), and removed it again in the Omnibus Budget Reconciliation Act of 1990.

Two years after implementation, total reimbursements under the benefit did not exceed 1 percent of estimated total Parts A and B reimbursements for the care of all terminally ill Medicare cancer patients. More recently, however, the annual growth of hospice benefit expenditures has accelerated, a trend which should continue with the lifting of restrictions on benefit payments and recent increases in payment rates.

From the beginning, the hospice benefit has provoked interest and controversy out of proportion to its share of Medicare expenditures. The hospice approach continues to challenge maintained beliefs about medical practice in the care of dying patients. In addition, responding to a widely held conviction that hospice care should be less costly than traditional methods, Congress constrained the benefit with caps and limits. These limits, and payment rates roundly criticized by the industry as inadequate, were alleged to have discouraged participation during the first three years of the benefit.

SELECTION BIAS AND SAMPLING METHODS

Early research, including findings from the evaluation of Medicare's hospice demonstration (the National Hospice Study), generally showed hospice patients incurring lower costs than terminally ill patients in traditional settings (Mor, Greer, and Kastenbaum 1988; Mor and Masterson-Allen 1987; Mor and Kidder 1985). Hospice patients were more likely to be treated at home in the last month of life than patients in traditional care (Birnbaum and Kidder 1984; Brooks and Smyth-Staruch 1984; Greer, Mor, Morris, et al. 1986; Mor, Greer, and Kastenbaum 1988). Evidence also showed that average expenditure varied by hospice type, independent of patient mix.

Generalizing from this evidence has been difficult, because researchers have chosen divergent typologies of hospice providers to fit various conceptual models or to conform to data limitations. The National Hospice Study simplified the array of options to two categories and found significant differences in expenditure between hospital-based hospices (those that provide inpatient services directly) and home care–based hospices (those that make arrangements with other providers for inpatient care) (Mor, Greer, and Kastenbaum 1988). Expenditures in home care–based hospices were lower, due mainly to greater reliance on home care in the final month of life. Congress, convinced by the evidence from research and prompted by industry lobby groups, included inpatient day limits in the benefit and mandated "core services" to support the medical and social needs of benefit recipients in an effort to encourage home care and cost containment.

Selection Bias

Critics maintain that researchers have consistently underestimated the potential for self-selection bias in hospice cost savings estimates. The "hospice selection" argument is relatively straightforward. Terminally ill individuals are assumed to select hospice care to avoid aggressive medical interventions and for support in their intention to die at home. It is further necessary to assume that these same individuals would choose to reject aggressive therapy and remain at home even if hospice were *not* available. Hospices are thus able to enroll those among the terminally ill least likely to use expensive medical services. As a consequence, the "savings" attributed to the hospice intervention are overstated because observed expenditure differences between hospice and "comparison" patients are due partly to the special preferences and behaviors of the hospice enrollee. Not surprisingly, therefore, criticism has tended to focus on criteria used in past studies to define sampling frames for comparison patients (Brooks 1983; Mor and Masterson-Allen 1987; Kane, Wales, Bernstein, et al. 1984; Zimmer, Groth-Junker, and McCusker 1984).

For researchers who must work within the limits of quasi-experimental research designs, the standard approach to selection bias is first to sample in a way that minimizes differences between treatment and comparison groups regarding the most serious potential sources of bias and then to use multivariate statistical techniques to control further for selection effects. Some with the courage (and the data) to model selection statistically employ a two-step procedure, first estimating a regression that predicts the choice and then adding to the right-hand side of a linear regression predictions from the selection model. Others incorporate variables assumed to be related to selection behavior directly into the linear regression equation.

For the Medicare hospice benefit evaluation, the complexity of the selection process and limitations on data severely restricted the available options. Two choices are made in electing the Medicare hospice benefit:

- Hospice care is selected over traditional care, a decision that requires both acceptance of a general philosophy and technique of care, and choice of a specific hospice provider.
- The Medicare hospice benefit is selected over other methods of financing hospice care. Choice of a financing method might coincide with or precede choice of hospice care.

Presumably, the choice of hospice care is driven principally by the preferences of patients and their families constrained by provider availability, hospice admissions criteria, and attitudes of family physicians. Research into hospice choice is thin and inconclusive, limited by reliance on proxy measures of attitudes and behaviors. For example, findings from a recent population-based study of cancer reported by Moinpour and Polissar (1989) suggest that patients who elect hospice have had cancer for a longer time than those who elect traditional care, have different types of cancer, have relatively strong informal supports, and come from relatively comfortable economic circumstances. However, without some understanding of how attitudes and philosophies of terminally ill individuals interact with objective health events, efforts to model hospice choice will always relegate critical influences (attitudes toward dying at home, for example) to an unmeasured residual.

Adding a financing decision to hospice choice magnifies the potential for selection effects and adds behavioral complexity to modeling efforts. There are reasons to believe that the direction of bias in both choice processes may be the same, tending toward overstating the potential cost savings of hospice.

The incentives implicit in alternative financing mechanisms shape the advice providers give patients and their families about enrolling in the benefit. Hospice providers have an incentive, under the benefit's prospective per diem payment system, to recommend enrollment to individuals with relatively limited needs for expensive (inpatient) care. In addition, the seven-month restriction on benefit payments that applied during the first years of the program created an incentive for providers to encourage enrollment late in the disease process, to avoid making extended commitments for unreimbursed care. Taken together, these incentives imply selection into the benefit of patients with home supports and other resources sufficient to minimize use of inpatient services during the final weeks when the terminally ill are at highest risk for institutionalization.

Data limitations restricted efforts to model selection effects associated with patient and provider behavior. The evaluation had access only to Medicare claims and eligibility data. Detailed information on ways in which certified hospice providers address financing issues with their patients was unavailable, and the literature offered no guidance on proxy indicators of provider behavior. Therefore, efforts to control for selection bias were confined to implementing a broad, inclusive sampling design for choosing comparison group members and to using specific variables, such as health services utilization before the last months of life, as adjustors in multivariate expenditure regressions.

Sampling Design

Comparison patients were sampled from a frame that included all Medicare beneficiaries with at least one malignant cancer-related hospital claim in the last two years of life, who died during the three years covered by the evaluation, and who had never been enrolled in the hospice benefit.[2] Noncancer hospice benefit and comparison patients were excluded from the expenditure analyses. Over 90 percent of all hospice patients in certified and noncertified programs have a primary diagnosis of cancer, a ratio that has remained relatively constant for many years.

This sample was used in estimates of the net costs to Medicare of the hospice benefit, with one further adjustment. Each year, a number of beneficiaries disenrolled and then reenrolled in the program, with average gaps of about two months (the first gap occurring between the first two 90-day benefit periods, and the second, lasting from 2.0 to 2.5 months, between the second and last benefit periods). Some also left and died outside the program, within an average of 100 days from disenrollment. Although the reasons behind disenrollment have not been documented, misdiagnosis is the most plausible explanation. These individuals made up roughly 7 percent of all beneficiaries in 1986, up slightly from 6 percent in 1985. In age, gender, race, types of conditions, and enrollment patterns by type of hospice, these patients were no different from beneficiaries continuously enrolled until death. It is difficult to categorize these "cross-over" beneficiaries or to compare them with one or the other "pure" groups: beneficiaries who enrolled and died within the benefit program, and those who never enrolled. For this reason, cross-overs were excluded from expenditure analyses. Because there were so few cross-overs during the years studied, this exclusion did not significantly change estimates of average Part A expenditure for hospice beneficiaries. However, cross-overs incurred from $1,000 to $3,000 more in total expenditures in the last year of life than did the average hospice beneficiary.

Salient characteristics of cancer patients in the two samples are presented in Table 1. Hospice beneficiaries tended to be somewhat younger, were more likely to be white, and were less likely than comparison group members to have an initial hospital claim with a diagnosis of malignant cancer within the last month of life. Although true clinical length of illness measures were unavailable, the evidence from Medicare claims suggests that hospice beneficiaries were also more likely to know of their condition for several months before death.

Table 1: Characteristics of Hospice Beneficiaries and Comparison Sample Cancer Patients (1985, 1986)

	1985		*1986*	
Characteristic	*Hospice* (N = *5,991*)	*Comparison* (N = *7,467*)	*Hospice* (N = *12,366*)	*Comparison* (N = *7,174*)
Age				
<75	54%	47%	52%	47%
≥75	46	53	48	53
Gender				
Male	53%	54%	54%	53%
Female	47	46	46	47
Race				
White	91%	87%	90%	88%
Other	9	13	10	12
*Diagnosis**				
Colon cancer	29%	21%	28%	20%
Lung cancer	26	21	26	22
Breast cancer	6	4	6	4
Prostate cancer	11	9	11	10
Urinary cancer	3	4	4	4
Leukemia	1	4	1	4
Other cancer	24	38	24	36
Length of stay	32.1 days	–	35.9 days	–
Length of illness (percent <30 days)	13.6%	20.7%	13.9%	20.6%

Source: Abt Associates Inc./Health Care Financing Administration (AAI/HCFA) Hospice Benefit Enrollment File.

*Percentages represent proportions of all cancer diagnoses. Noncancer percentages in the benefit were 6 and 7 percent (FY 1985, FY 1986). Note that sample sizes may differ among tables. This table includes all sample members, with or without complete reimbursement and utilization data.

METHODS AND DATA

This evaluation tests two null hypotheses: first, that no difference in total average Medicare Part A expenditures exists between terminally ill beneficiaries enrolled in the hospice benefit and otherwise comparable individuals who were not enrolled,[3] and second, that expenditures on hospice beneficiaries do not vary by type of hospice. The literature suggests alternative hypotheses: that the benefit would generate savings for Medicare and that hospice type does make a difference, with lower expenditures in hospices that emphasize home care.

Comparisons of (Table 2) expenditures unadjusted for patient mix

Table 2: Total 1986 Average Monthly Medicare Part A Reimbursement for Hospice Beneficiaries and Comparison Sample

	Hospice* (N = 9,738)			Comparison (N = 3,624)
Time Period	*Hospice Benefit (1)*	*Part A (2)*	*Total Part A (3)*	*Total Part A (4)*
Last month	$1497	$1572	$3069	$4071
Month 2	426	1584	2010	1757
Month 3	139	1341	1480	1194
Month 4	48	1054	1102	883
Month 5	31	838	869	815
Month 6	16	696	712	661
Months 8–12	34	2233	2267	2253
Last year of life	2202	9953	12155	12179

Source: AAI/HCFA Hospice Benefit Monthly File.

*Hospice sample includes all who enrolled and incurred some benefit expenditures, including those with gaps and those who disenrolled before death.

and program characteristics show that the average hospice beneficiary who died of cancer in 1986 incurred only $24 less in total Medicare spending than the average comparison patient over the last year of life. Data for the last month of life show hospice beneficiaries' expenditures to be $1,000 lower than those of nonbenefit patients. In months 2–4, however, the pattern was reversed, with hospice beneficiaries incurring higher expenditures. However, a valid test of the net expenditure hypothesis requires adjustment to isolate the benefit "effect."

An ideal model for estimating the net costs or savings to Medicare of a hospice benefit would compare hospice benefit enrollees both to terminally ill patients in hospice (but not enrolled in the benefit) and to patients not enrolled in hospice over comparable periods before death, adjusting for selection bias and other confounding factors. There are various possible analytic constructs of "time before death," including the following:

- Compare expenditures over the period from initial diagnosis of malignant cancer until death, matching benefit and comparison group members on length of illness.

  This model defines clinically meaningful episodes, with well-articulated start and end dates, and incorporates directly a variable (length of the terminal illness) that many have viewed as an important covariate in the hospice enrollment decision. However, it was not considered to be a practical choice for this evaluation, because clinically valid dates of the initial diagnosis were not available.

- Compare expenditures over fixed, standardized periods before death for both hospice and comparison patients.

  This model, used for similar purposes in the National Hospice Study, was selected for the hospice benefit evaluation. It is a reasonable choice that concedes the difficulty of defining a starting point for comparing expenditures of hospice and nonhospice patients. Entry into the hospice, or enrollment in the benefit in this case, marks the obvious beginning of an "episode." No similar starting point can be defined for comparison patients. Therefore, defining time by months before death permits standardized comparisons of expenditures within a time frame.

Estimates of net costs of the benefit in this evaluation were based on differences in Medicare Part A–reimbursed expenditures of hospice benefit enrollees (including both benefit and regular Part A expenditures) and expenditures of comparison group members living in counties with certified hospices over the last seven months of life (the maximum benefit period during the study), adjusted statistically for patient and program characteristics. To define net expenditures relative to the timing of enrollment, separate estimates were generated for the last (seventh) month, the second-to-last month (sixth), and earlier months through the first month before death. Comparison group members were contrasted to hospice enrollees categorized by length of enrollment. Separate monthly expenditure estimates were computed for each enrollment cohort.

For example, the final month's expenditures of those hospice beneficiaries enrolled for one month or less were compared to expenditures of those comparison group members who had been diagnosed with cancer at least one month or more before death. Seven separate estimates were generated for the final month. In each, data were pooled from cancer-diagnosed comparison group members and hospice beneficiaries in one of the seven length-of-enrollment cohorts. Data used in estimates for the second month before death excluded comparison group members whose first cancer claim appeared within the last two months of life. Estimates for the second month were similarly generated separately for the seven benefit enrollment cohorts. Altogether, 28 separate ordinary least squares (OLS) regression estimates were computed, for each length-of-enrollment and month-before-death combination. The adjustment regressions were specified in the following general form:

$$\begin{aligned} Y^{i}_{11} = {} & B_{\mathrm{i}} + B_2(H)^{i}_{11} + B_3(T)^{i}_{11} + B_4(H*T)^{i}_{11} + \\ & B_5(X)^{i}_{11} + B_6(C)^{i}_{11} + B_7(E)^{i}_{11} + e^{i}_{11} \end{aligned}$$

where

> Y is monthly Medicare Part A expenditures.
>
> H $(=0,1)$ is a categorical indicator of enrollment in the Medicare hospice benefit.
>
> X denotes variables included to adjust for confounding influences and selection bias using beneficiary data, including:
>
> > Demographic (age, gender) variables;
> >
> > Medical diagnosis variables (colon, lung, breast, prostate, urinary, leukemia and "other" cancers);
> >
> > Indicators of prior utilization (one or more Medicare inpatient or home health claims in two periods, 8–12 and 13–18 months before death, as categorical variables), and the total reimbursements paid in these periods for beneficiaries with prior utilization; and
>
> Measures of access to certified hospice programs,^{4} include:
>
> > C $(=0,1)$, which measures whether or not a beneficiary lives in a county with at least one certified hospice;
> >
> > E, which measures the intensity of exposure to the Medicare hospice benefit, defined as the sum of the total days in operation of all certified hospices in the county, measured from the initial date of certification.
> >
> > T $(0 = 1985,\ 1 = 1986)$ is a categorical time indicator.^{5}
> >
> > Bs are regression coefficients, and e is a random error term; i indexes the observation.
>
> Subscripts denote the month and length-of-enrollment cohort—in this instance, the last month of life (month 1), in which hospice patients with benefit enrollments of one month or less (cohort 1) are pooled with comparison group members with initial cancer claims before one month.

The benefit "effect," defined as the difference in average patient mix-adjusted expenditures between benefit and comparison groups with equal access to certified hospice care in the last month of life is B_2

in 1985 and $B_2 + B_4$ in 1986. Table 3 presents the regression through which the effect for the cohort enrolled one month or less was estimated. The regression model shown here had low explanatory power, with an adjusted R-square statistic of .0242. None of the 28 estimated regressions explained more than 5 percent of total variation in monthly expenditure. Given the paucity of independent variables, this result, though disappointing, was not unexpected. Similar results from similar data were obtained in the National Hospice Study.

Hospice benefit enrollment was clearly associated with a net cost saving for this cohort. The hospice coefficient was negative, as hypothesized, and highly significant. In 1985, expenditures on terminally ill patients with and without one month or less of the hospice benefit differed by roughly $942 (within an estimated range from $849 to $1,034) in the last month of life. Estimated savings remained at this level in 1986 (the coefficient of hospice interacted with time was statistically insignificant).

Age was positively correlated with expenditure, at a decreasing rate. The included cancer groups, excepting leukemia, were generally less costly on average than the excluded group ("other" cancers).

Estimates of access effects suggest that average costs of caring for both benefit and comparison group members were higher in counties with certified hospices than in other areas. This finding is supported by evidence on Medicare reimbursements for terminally ill cancer care *before* the hospice benefit was implemented in 1983. Total average Medicare charges per case in 1983 were $7,913 in counties that subsequently gained certified hospices; $7,397 in counties with noncertified hospices; and $5,904 in counties with no hospice programs (Medicare Hospice Benefit Program Evaluation 1986). Counties with certified hospices tended to be more urbanized, with more sophisticated and complex health care systems than the average.

Patients who used inpatient services before their last seven months of life incurred lower expenditures in the last month, as the highly significant, negative coefficient estimates in Table 3 suggest. Prior utilization measures were included to help adjust for factors assumed to be related to the enrollment decision.

In addition to estimates of average benefit effects, regressions were estimated to demonstrate the influence of hospice *type* on expenditure differentials. For this study, hospice types were defined by affiliation with a Medicare-certified provider. Some certified hospices are affiliated with home health agencies, hospitals or, less frequently, skilled nursing facilities (SNFs). Freestanding hospices have no separate affiliation. This typology was chosen to conform to Medicare

Table 3: Total Expenditures Regression Last Month of Life*

Explanatory Variable	*Coefficient*	*Standard Error*	t-*Statistic*
Intercept	2388.90	1194.41	2.00
Hospice Beneficiary (Yes = 1)	-941.69	92.33	-10.20
Died in 1986 (Yes = 1)	75.53	77.40	0.98
Hospice/Died in 1986	-162.65	109.20	-1.49
Gender (Female = 1)	48.79	55.38	0.88
Age at death	64.12	32.16	1.99
Age-squared	-0.56	0.22	-2.58
Colon cancer	-93.32	72.60	-1.29
Lung cancer	-237.64	73.93	-3.21
Breast cancer	-495.08	136.35	-3.63
Prostate cancer	-407.26	97.00	-4.20
Urinary cancer	-96.10	135.48	-0.71
Leukemia	639.71	168.34	3.80
Total certified hospice days in county	0.08	0.04	2.07
Live in certified county (Yes = 1)	437.27	79.24	5.52
Part A inpatient services 8–12 months before death (Yes = 1)	-410.28	77.88	-5.27
Part A inpatient reimbursement 8–12 months before death	0.03	0.01	2.97
Part A inpatient services 13–18 months before death (Yes = 1)	-343.05	82.52	-4.16
Part A inpatient reimbursement 13–18 months before death	0.04	0.01	3.67
Part A home health services 8–12 months before death (Yes = 1)	-274.01	123.52	-2.22
Part A home health reimbursement 8–12 months before death	0.20	0.09	2.18
Part A home health services 13–18 months before death (Yes = 1)	203.38	143.18	1.42
Part A home health reimbursement 13–18 months before death	0.11	0.10	1.11

N = 16,218
F-value = 19.25
R^2 = 0.026
$\bar{R}^2$ = 0.024

*Estimated on pooled data: hospice beneficiaries with lengths of enrollment of 30 days or less, and all comparison group members.

practice. It does not map readily into typologies used in earlier research. In particular, provider affiliation is not conclusive evidence of how inpatient services are arranged, even though it was the criterion used in the National Hospice Study model. However, it is reasonable to hypothesize that freestanding and home health agency–affiliated hospices, with no direct institutional commitments to fill beds, would be less likely to care for their patients in institutional settings than hospices affiliated with hospitals or nursing homes.

FINDINGS

ADJUSTED ESTIMATES OF NET EXPENDITURE EFFECTS

After adjusting for demographic, medical, and program-related influences, hospice beneficiary expenditures in the last month of life were significantly lower than expenditures of the comparison group for six out of seven length-of-enrollment cohorts. In Table 4, regression coefficient estimates are converted into ratios of comparison group to hospice benefit expenditures adjusted to a common set of beneficiary characteristics. The ratios can be interpreted as dollars saved (in reduced expenditures on a nonbenefit patient) for every dollar spent (on a hospice beneficiary), and they range, in the last month, from $0.93 (an apparent net cost, based on statistically insignificant coefficient estimates) to $3.77 (for the few hospice beneficiaries with enrollments between six and seven months).

Earlier months show no clear evidence of a hospice benefit expenditure advantage. For example, hospice enrollment of a Medicare beneficiary three months before death produced a savings ratio of $1.48 in the last month of life but added expenditure in months 2 ($0.91) and 3 ($0.73). Lengths of enrollment over three months were not "cost effective" for Medicare, as the last line in Table 4 shows, except, possibly, for the longest enrollment cohort.

Overall, however, these findings suggest that the benefit did save Medicare expenditures. A weighted sum of savings ratios across all length-of-enrollment and month cells yields an average expenditure ratio of $1.26. Even though the benefit adds Medicare expenditures over long enrollment periods, this bottom-line calculation of savings for Medicare reflects the fact that most participants were enrolled in the benefit for one month or less, the period of maximum saving. The average length of benefit enrollment barely exceeded 30 days (32 days

Table 4: Adjusted[†] Medicare Reimbursement Saved per Dollar of Hospice Expenditure by Length of Enrollment and Month

	Length of Enrollment[‡]						
	<1 Month	*30–59 Days*	*60–89 Days*	*90–119 Days*	*120–149 Days*	*150–179 Days*	*180–209 Days*
Last month of life	1.32*	1.49*	1.48*	1.42*	1.50*	0.93	3.77*
Month 2		0.82*	0.91	0.88	0.88	0.67	1.35
Month 3			0.73*	0.72	0.71	0.61	0.86
Month 4				0.84	0.71	0.46	0.73
Month 5					0.83	0.65	0.61
Month 6						0.92	0.56
Month 7							0.75
Total for all months after hospice entry	1.32*	1.14*	1.04	0.99	0.96	0.72*	1.06*

Source: AAI/HCFA Hospice Benefit Monthly File.

[*] Ratio is significantly different from 1 at 10 percent level of significance or better.

[†] Adjustment for demographic factors and medical condition, through multivariate regression.

[‡] Comparison patients' enrollment cohort is determined by the date of the first cancer diagnosis. For example, patient's diagnosed 80 days before death would be included in estimates reported in the first three columns, since they could have been enrolled for any of those periods. Hospice patients are included only in the column in which their actual enrollment falls. The savings ratio is the ratio of comparison to hospice mean reimbursement.

Table 5: Adjusted* Medicare Reimbursement Saved per Dollar of Hospice Expenditure in the Last Month of Life in Certified Hospice Counties by Length of Enrollment and Hospice Type (1986)

	Hospice Type		
Length of Enrollment	*Freestanding*	*Home Health Agency-Based*	*Hospital/Skilled Nursing Facility-Based*
<30 days	1.45	1.04	0.94
30-59 days	1.59	1.19	1.09
60-89 days	1.63	1.13	1.15
90-119 days	2.71	0.78	0.82
120-149 days	3.24	1.03	0.79
150-179 days	0.38	4.55	2.07
180-209 days	0.76	2.92	2.92

Source: AAI/HCFA Hospice Benefit Monthly File.

*Adjustment for demographic factors and medical condition, through multivariate regression.

in 1985 and 35 days in 1986), with a median stay of around 20 days in both years.

EXPENDITURES BY HOSPICE TYPE

Medicare expenditures for beneficiaries in freestanding hospices were generally lower than in hospices affiliated with "traditional" providers. As shown in Table 5, average adjusted expenditure ratios in the last month of life during 1986 ranged from $1.45 in freestanding hospices to $0.94 in programs affiliated with hospitals and skilled nursing facilities. The benefit barely broke even in home health agency-based hospices, with a ratio of $1.04.

As in the National Hospice Study, provider type, inpatient utilization, and the net expenditure advantage of hospice care were closely associated. Hospital-based and SNF-based hospice beneficiaries used more inpatient services than beneficiaries in freestanding and home health agency-based programs. As Table 6 shows, 24 percent of hospice beneficiaries used general inpatient services after enrollment in 1986. In freestanding programs, only 19 percent used any inpatient care. Fifty-eight percent of the beneficiaries in SNF-based programs used inpatient services. Levels of inpatient utilization varied by provider type as well. In freestanding hospices, 10 percent of all hospice days were billed as general inpatient or inpatient respite care. SNF-based hospices averaged 28 percent. Finally, a minority of all hospice

Table 6: Medicare Hospice Benefit Inpatient Utilization by Hospice Type (1986)

	All (N = *10,510)*	*Freestanding* (N = *6,137)*	*Hospital-Based* (N = *1,681)*	*Skilled Nursing Facility-Based* (N = *190)*	*Home Health Agency-Based* (N = *2,502)*
Percent using inpatient services	24	19	37	58	25
Percent using only inpatient services	7	6	10	17	7
Percent inpatient to total benefit days					
All patients	12	10	18	28	13
Patients with inpatient utilization	49	52	44	48	48

Source: AAI/HCFA Hospice Benefit Utilization File.

beneficiaries (7 percent on average) used *only* inpatient services while enrolled. Again, the percentage was lowest in freestanding hospices, averaging 6 percent, and highest in SNF-based hospices, averaging 17 percent.

DISCUSSION

THE EXPENDITURE EFFECT AND THE ROLE OF SELECTION BIAS

In transition from a movement to an industry, hospice has continued to emphasize home care in the very last weeks of life, a practice closely associated with the "savings" researchers have attributed to the hospice intervention. The benefit seems to have reinforced this pattern. In the hospice benefit evaluation, adjusted expenditure estimates showed a hospice benefit "effect," in terms of lower Part A expenditures in the last seven months of life for Medicare hospice beneficiaries relative to a nonbenefit comparison group. The effect was pronounced for beneficiaries in freestanding hospices.

Efforts were made, within the constraints imposed by the research design and the available data, to control for self-selection bias through careful sampling techniques and statistical adjustment. These efforts were bound to be partially successful at best, given the available data.

Despite the plausibility of the selection argument, it is prudent to remain skeptical about the direction of selection effects relative to predisposing variables, such as "length of illness," "preference for home care," or "strength of informal supports." Evidence from the evaluation suggests that benefit enrollees were terminally ill and heavy users of health services longer than the average nonbenefit patient. Benefit enrollees apparently had more time to experience the frustration of curative therapies and to weigh the alternatives than did individuals who died soon after diagnosis.

However, careful research shows no evidence that those who elect hospice or the Medicare hospice benefit are predisposed toward home care, whatever their utilization patterns become once enrolled. More important, there is no evidence that, whatever the preferences of hospice benefit enrollees for dying at home, these preferences can be realized inexpensively and without the hospice intervention. The standard selection argument assumes that hospice can truly succeed only with certain highly motivated and well-supported patients. However, at least some of these patients may be able to achieve their goals only with the help of hospice care. Data from the hospice benefit evaluation show that hospice programs were remarkably successful in maintaining their patients at home until death. Most hospice beneficiaries (88 percent) died at home, whereas most comparison patients (63 percent) died in a hospital.[6] Moinpour and Polissar (1989) note that hospice was a statistically significant and positive influence on the probability of dying at home, and that the strength of the hospice effect increased the shorter the time from diagnosis (of terminal cancer) to death.

Without hospice or the benefit, many potential hospice users and their families, already burdened by a long and draining illness, might surrender and accept institutionalization in the last weeks, forgoing their intentions for death at home. Further research is needed to define the effectiveness of the hospice intervention and benefit coverage for patients with varied attitudes toward care, prior medical histories, and informal support networks.

The Role of Hospice Type

Some types of hospice appear to have been more successful than others in caring for patients at home. This success generates lower expenditures, under both cost-based reimbursement systems of the kind implemented in the National Hospice Study and prospective payment through the Medicare hospice benefit. Freestanding and home health agency-based certified hospices emphasized a home-oriented care regime, as did home care-based hospices in the National Hospice Study. Affiliation was the distinguishing feature in both instances. Home orientation was associated with no affiliation or affiliation with traditional providers *without* beds. However, the extent to which expenditure differentials relate to practice patterns as opposed to patient mix is still unclear.

Part of the confusion rests on lack of consistency in the typologies used in different studies. More research into hospice provider decision making and organizational behavior could help clarify the reasons why affiliation or the nature of arrangements to provide inpatient care affect average expenditure levels.

The role of patient mix in explaining variations in expenditures among hospice types is also poorly understood. Patient-mix differences clearly exist. The National Hospice Study showed that the percentage of hospice patients who lived alone was higher among those admitted to hospices with inpatient capacity: 15.4 percent compared to 5.4 percent in hospices without beds (Mor, Greer, and Kastenbaum 1988, 115). However, effects on expenditures of those variables that capture care resource needs appear to vary over a hospice episode. The National

Hospice Study also found that the needs of terminally ill patients for relief of physical pain and other symptoms tended to converge near death, regardless of the underlying medical condition. Further research is needed, both to define consistent and meaningful hospice typologies and to separate provider practice patterns from patient-mix influences on expenditures.

Future Net Expenditure Effects of the Benefit

In spite of the evidence presented in this article, the hospice benefit is unlikely to be an important tool for containing the costs of terminally ill Medicare beneficiaries. Since the benefit was implemented, Congress has raised payment rates twice, most recently (in the Omnibus Budget Reconciliation Act of 1989) in across-the-board increases of 20 percent in all rates. In addition, Congress has reinstated the unlimited benefit period created in the Medicare Catastrophic Coverage Act. The benefit clearly adds Medicare expenditure the longer a beneficiary remains enrolled.

Forces at work within the hospice establishment should also generate inflationary pressure. Although no more than a third of all U.S. hospices were certified during the evaluation period, rate increases and other regulatory changes have stimulated growth: certified hospices now constitute nearly half of all active U.S. hospice programs (Davis 1991). Further growth seems likely. The General Accounting Office (1989, 43), reporting on a survey of certified and noncertified hospices, noted that inadequacy of the general inpatient and routine home care reimbursement rates ranked first of 27 items of concern among respondents in 1987. Newly certified hospices, attracted by more generous rates, will come increasingly from areas formerly unserved or served only by noncertified programs. The hospice benefit evaluation showed that the expenditure-reducing effects of the benefit would be attenuated in these areas, which tend to have lower average costs of medical care, than in areas already served by certified hospices.

Preliminary evidence suggests that lengths of enrollment have risen steadily, and that they should rise at a more rapid rate after full implementation of the unlimited benefit period. The analyses reported in this article show that longer average enrollment periods work against cost savings through the benefit.

Issues for Further Study

The success of the Medicare hospice benefit may eventually be judged on grounds other than cost. Even if the benefit does increase Medicare expenditure, the program will not, under any reasonable assumptions about the pool of eligible (and interested) beneficiaries, expand to become a significant drain on federal funds in the near future. Although the hospice benefit enlarges the selection of care options open to Medicare beneficiaries, most terminally ill beneficiaries continue to select traditional modalities over hospice care.

Access to hospice and to the hospice benefit is a concern that merits attention. Terminally ill hospice applicants may face barriers related to medical condition and socioeconomic status. Cancer remains the dominant condition in hospice programs. Benefit enrollment must be preceded by a physician's determination that the applicant has at most six months to live. Many physicians seem willing to render this prognosis for certain cancers, but not for other life-threatening conditions. In addition, hospice professionals increasingly see hospice care as terminal *cancer* care, as a casual review of the trade journals shows.

Nonwhite beneficiaries are underrepresented in certified hospices relative to their numbers among terminally ill Medicare beneficiaries. Access to hospice and to the hospice benefit may be constrained more by inequalities in the use of primary- and secondary-level medical services than by specific barriers associated with hospice eligibility criteria or location. Farley and Flannery (1989) note a relationship between the socioeconomic status (SES), stage of disease at diagnosis, and utilization of early detection (mammography utilization among women diagnosed with breast cancer). They argue that racial differences in late-stage breast cancer diagnosis disappear after controlling for SES. The relatively high rate of late-stage diagnosis among African-American women is related to a lower average SES in this group. These authors conclude that knowledge (of the availability of mammography) and attitudes (regarding the need for and effectiveness of mammography) are important correlates of utilization. However, whether attitudes are shaped by real or perceived barriers to health care access or by other influences remains unclear.

Quality of service also merits study, in the context of a benefit that implements powerful incentives to provide care to patients in the home. Although home care was the model most favored by U.S. hospices before the benefit was established, opinion on appropriate practice has never been unanimous. Hospice programs in Europe developed around institutions where dying patients stayed to receive palliative care. The first major hospice program in the United States implemented an inpatient model of care. Certain patients, particularly those without adequate informal supports, may require an inpatient setting to benefit from hospice care. If these patients are denied access, or become enrolled but are treated inappropriately at home, Congress may come under pressure to modify current incentives in the benefit so that hospice care can become a true option for all terminally ill Medicare beneficiaries.

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NOTES

1. The evaluation of the Medicare hospice benefit, conducted by Abt Associates Inc. under contract to the Health Care Financing Administration (HCFA), also reported patterns of growth in the hospice industry, and used a forecasting model to project future levels of Medicare expenditure for terminally ill beneficiaries under various assumptions. Related HCFA contracts included a study of the processes of hospice care in Medicare-certified and noncertified hospices, conducted by the Joint Commission for Accreditation of Health Care Organizations, and a study of costs, utilization, patient characteristics, and administrator attitudes toward the Medicare benefit in a sample of noncertified hospices, conducted by Jack Martin and Company.
2. Some "comparison" beneficiaries in this study may have been enrolled in noncertified hospice programs when they died. Medicare claims do not identify such individuals as hospice patients, because hospices are identified as such on a claim only if they have been certified to provide services under the Medicare benefit. Therefore, the contrasts in this article are between benefit and "nonbenefit" cases, rather than between hospice and "traditional" care.
3. Those who elect the hospice benefit are required to give up their regular Part A coverage for care related to the terminal condition. However, many enrollees incur some regular Part A-reimbursed expenditures after enrollment, presumably for "unrelated" care. Enrollees do not have to surrender their Part B coverage. They may receive benefit-reimbursed (Part A) physician services from a physician on staff of the hospice provider. Alternatively, they may continue to receive Part B-reimbursable services from

their own physicians. Although the evaluation compared total Part B expenditures for beneficiaries and comparison group members who died in 1985, the data were not available in sufficient detail for integration into the adjusted expenditure analyses. Further, the benefit was designed to substitute for regular Part A coverage of expensive inpatient services.

4. No reliable measures of area exposure to certified or noncertified hospice services are available, because information needed to date program startup is missing in all current provider lists. Even if the date of certification were known, some ambiguity would exist about what constitutes exposure to the benefit. Many hospices gained certification but did not enroll any beneficiaries or submit hospice benefit claims for several months.
5. Data for federal fiscal year 1984 were collected and analyzed in the first annual report of the evaluation. However, they were excluded from the analyses presented in this article, to minimize the effects of data idiosyncracies in the early implementation period.
6. In the absence of information from death certificates or other reliable sources, place of death was inferred from claims data. For comparison group members, if the final date on the individual's last inpatient claim was within two days of the date of death, place of death was assumed to be the hospital. For hospice beneficiaries, if all or all but one of the days covered by the final claim under the benefit was reimbursed at general inpatient or inpatient respite rates, the beneficiary was assumed to have died as an inpatient.

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