

Impact of Medicare payment policy on home health resources utilization

by Audrey Irvine, Elayne Kornblatt Phillips, Patricia Cloonan, James C. Torner, Mary E. Fisher, and Gary A. Chase

In this study, the association between Medicare regulations and the provision of public home health care is examined. Medicare clients were compared with non-Medicare groups of those 65 years of age or over and those under 65. Results suggested that both age- and

payer-related factors contribute to utilization of services. Older patients showed greater need for chronic illness care relative to younger patients; however, Medicare patients used fewer resources and had poorer outcomes relative to older non-Medicare patients.

Introduction

Since 1965, Medicare has wrestled with the challenge of providing the elderly with a regular source of mainstream medical care. The focal point of this massive social intervention has been the hospital, resulting in a relationship between Medicare policy and hospitals that has benefited both and worked effectively until recently (Balinsky and Starkman, 1987; Evans, 1983). However, in the last 10 years, changes in the health care environment have made the traditional fiscal relationship between hospital and Medicare increasingly unmanageable. These changes have included the increasing number of elderly in the general population, longer hospital stays, the shift away from acute to chronic illness needs, rapidly increasing medical costs, increased life expectancy, and an increasingly complex array of expensive and sophisticated medical technologies (Evans, 1983; Vladeck, 1984).

Together these factors have brought about a crisis in the allocation of medical resource dollars that was addressed in part through the implementation of prospective payment by diagnosis-related groups (DRGs) (Goldberg, 1984; Vladeck, 1984). This payment strategy has curbed costs and improved hospital efficiency as anticipated (Vladeck, 1984) by curtailing hospital length of stay. However, once patients began returning to the community, a mechanism was needed for providing care in cases where it was still required. The Omnibus Reconciliation Act of 1980 eased restrictions on payment for home care (Health Care Financing Administration, 1985). The greater availability of financing and the increased patient demand resulted in a dramatic increase in the number of Medicare certified home care agencies (Reif, 1984; Wood and Estes, 1984). In Virginia alone, the number of agencies increased by two-thirds since 1982.

By the mid-1980s, rising costs in home health were becoming an issue much as they had previously in the hospital setting. Cost-containment efforts by the Health Care Financing Administration (Reif, 1984) focused on stricter interpretation of Medicare guidelines. This policy increased the denial rate for Medicare payment (Taylor, 1986) and shortened lengths of stay in home care. Further cost containment is currently being

suggested through the implementation of a prospective payment system in public home health, yet little research has examined resource utilization for the elderly in home health.

As part of a study on the impact of hospital prospective payment on public home health services (Phillips et al., 1989), changes were compared in home health resource utilization for the years 1983-85 for Medicare and non-Medicare samples. During the data analysis, we identified a group of patients 65 years of age or over who were not receiving Medicare. One-third of this group had Medicaid; two-thirds of the sample received free care. Recent research on the number of uninsured Americans (Short, Moheit, and Beauregard, 1988) suggested that about 1 percent of those 65 years of age or over are without Medicare coverage. By identifying this group, we could examine two related issues. The first concerns the relationship of Medicare policy to public home health care provision to the elderly. Comparisons of the Medicare and the 65 years or over non-Medicare samples permitted us to investigate differential needs for services on entering home health care and the degree to which Medicare policy is associated with delivery of care and patient outcomes.

Second, we were able to describe public home health care resource utilization patients by age group. To do this, the two groups of 65 years or over public home health patients were compared with the younger non-Medicare group on requests for care, services provided, length of stay in home health, referral source, prognosis, and patient outcome.

Methods

Sample

Home health patient referral logs for all city and county health departments in Virginia were obtained for a 2-year period from 1983-85. These logs contain a chronological record of all referrals for home health services, including record number and start-of-care date. Only cases opened to care were included in the sample.

As the referral logs arrived from the agencies, sampling began by randomly selecting 1 of the first 10 cases. After this case was identified, every fifth case was selected from the logs. The selection process did not begin afresh with each log but continued from the previous log until all logs had been sampled from. This process yielded a 20-percent sample of all cases. Because logs contained patients as they were referred, it was

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Reprint requests: Audrey Irvine, Ph.D., Department of Behavioral Medicine, Drawer F, Blue Ridge Hospital, University of Virginia Health Sciences Center, Charlottesville, Virginia 22903.

possible to select the same patient on multiple episodes of care, although this occurred in less than 1 percent of the sample. An episode was defined from the start of care to the date of discharge. This process yielded a sample of 2,200 episodes.

Examination of the age distribution for the Medicare and non-Medicare samples revealed the expected age differences (Table 1). The degree of overlap in the two distributions, however, was unexpected. One-fifth of the non-Medicare sample was 65 years or over. This represented approximately 10 percent of the patients 65 years or over being seen in public home health or about 10 times the proportion of older individuals without Medicare coverage in the general population. Additionally, only 37.5 percent of this sample of older non-Medicare patients had private insurance compared with 74.5 percent found in previous research (Short, Moheit, and Beauregard, 1988). Sixty-three percent of this sample was defined as indigent. In subsequent analyses, this older non-Medicare group was compared with the Medicare and under 65 non-Medicare samples on the main dependent variables.

Data collection and transformation

Retrospective record reviews were conducted at the Home Health Services office of Virginia's State Health Department. This office maintains files on all patients who have received home health care through the local

health departments, with the exception of two counties, which were collected on site. Each record contains referral forms (HHS Forms 2043 and 2043A) and transaction record forms for billing. Of the entire sample selected, 1,981 episodes were located. The most common reasons for records not being located were that old records with no recent activity are sometimes destroyed, and that records are sometimes misfiled in Virginia's library system. There is no way to systematically track such records.

Referral forms for each identified episode were reviewed for information on physician-requested frequency of visits (per week) and the number and type of physician-requested nursing services. Records were also reviewed for actual services delivered, including number of billed nursing visits and duration of nursing visits (in hours). The variable length of episode (in days) was calculated by subtracting the start-of-care date from the discharge date. Principal source of payment was also obtained. In episodes of care that were ongoing at the time of data collection, the last billed visit was recorded as the discharge date, and the episode was artificially truncated.

Data were also collected on a number of individual variables: referral source, patient age, length of hospital stay (for post-hospital referrals), patient outcome (according to Medicare outcome categories delineated on the HHS Form 2043 such as hospitalization, nursing home placement, death, goals met, etc.), and prognosis at referral.

Table 1

Descriptive information for Medicare, 65 or over non-Medicare, and under 65 non-Medicare groups

Descriptive category	Medicare	65 or over non-Medicare	Under 65 non-Medicare
Years of age	75.0	78.5	46.4
Length of hospital stay in days	21.25	23.48	13.1
Referral source		Percent distribution	
Hospital	66.2	54.1	70.7
Physician	16.7	18.9	12.9
Nursing home	2.0	2.0	0.2
Self	0.2	4.0	2.8
Other	11.6	20.9	12.9
Prognosis			
Guarded	20.0	22.7	13.1
Poor	17.1	10.2	11.7
Fair	32.2	40.6	27.5
Good	30.4	25.8	46.5
Excellent	0.2	0.0	1.0
Other	0.0	10.8	0.2
Sex			
Male	36.98	38.4	38.2
Female	63.02	61.7	61.8
Medicaid			
Yes	14.6	35.9	31.7
No	85.5	64.1	68.3
Private insurance			
Yes	44.27	37.48	36.28
No	55.73	62.52	63.72
Indigent			
Yes	55.7	62.5	63.6
No	44.3	37.5	36.4

SOURCE: (Phillips, 1988).

Registered nurses were hired and trained to extract the data from records. Interrater reliability was measured by correlating the responses from each nurse on each of the dependent variables for three cases at two different time periods. Correlations among nurses by dependent variable ranged from .80 to 1.00 at the beginning of coding and from .76 to 1.00 during the data collection. For three of the resource variables—billed nursing visits, duration of visits, and length of episode—the range of values was quite skewed. A log transformation was used to normalize the distributions.

Results

Unless otherwise noted, the following analyses used chi square tests of association for categorical data and general linear model (GLM) for analysis of continuous data. Use of GLM allowed comparisons across the disparate sample sizes involved in this study.

The three-group comparison of age yielded a significant ($X^2 = 75.2, p < .0001$) difference. The young (under 65) non-Medicare sample ($n = 442$) had a mean age of 46.4 ($\sigma = 8.54$), whereas the 65 or over non-Medicare sample ($n = 135$) had a mean age of 78.5 ($\sigma = 16.85$), making them on the average $3\frac{1}{2}$ years older than the Medicare sample ($\bar{X} = 75.2, \sigma = 11.15, n = 1,387$). The difference in age between the older groups was also significantly different ($F = 5.29, df = 1, p = .02$).

These three groups were found to be significantly different in their referral source ($X^2 = 26.87, df = 7, p = .003$), length of hospital stay ($F = 4.26, df = 2, p = .01$), and prognosis ($X^2 = 66.3, df = 14, p = .000$). Hospital was the primary referral source for all three groups, followed by physician referrals for the Medicare and under 65 non-Medicare groups. The second most frequent referral source for the 65-or-over non-Medicare group was other sources such as neighbors, family, and

social service agencies. Length of hospital stay was shortest for the young non-Medicare group and longest for the 65 or over non-Medicare sample. Not surprisingly, prognosis on referral was significantly better for the young non-Medicare sample. The two older groups differed significantly from one another on prognosis ($X^2 = 15.8, p = .02$); however, no consistent pattern was evident beyond a slightly worse prognosis for the older non-Medicare group. The three groups did not differ on gender.

Amount of services requested

Examination of the total number of nursing services requested yielded a significant three-group comparison (Table 2). The means suggest that the 65 or over non-Medicare sample was requesting one-third less nursing services on the average compared with either the under 65 non-Medicare or Medicare sample. For the frequency of nursing services requested, the two older groups looked more similar, requiring significantly less-frequent visits per week than the under 65 non-Medicare sample. This younger non-Medicare sample was requesting approximately one and one-third more visits per week than the older groups.

Services delivered

Significant differences were also found for services delivered. For both the number of visits received and nursing time consumed, the younger non-Medicare sample consumed more care. In each case, resources consumed by the 65 or over non-Medicare sample fell between the resources consumed by the Medicare and under 65 non-Medicare samples. The mean differences in both cases were significantly different. The length of stay was also significantly different for the three groups. Surprisingly, it was the Medicare and under 65

Table 2
Mean comparisons of dependent variables for three payment group samples

Data category	Payment group	\bar{X}	<i>N</i>	SD	<i>F</i>	<i>p</i>
Total nursing services	Medicare	2.41	1,398	1.31	5.58	0.004
	Non-Medicare > 65	2.03	135	1.14	—	—
	Non-Medicare < 65	2.39	446	1.21	—	—
Frequency of nursing visits	Medicare	1.99	1,379	2.31	84.9	0.0001
	Non-Medicare > 65	1.92	135	2.11	—	—
	Non-Medicare < 65	3.32	441	3.16	—	—
Log of nursing visits	Medicare	1.27 ¹ (18.6)	1,393	0.24	8.07	0.0003
	Non-Medicare > 65	1.30 ¹ (19.9)	135	0.30	—	—
	Non-Medicare < 65	1.33 ¹ (21.4)	446	0.26	—	—
Log of nursing time	Medicare	0.98 ² (9.5)	1,322	0.35	6.95	0.001
	Non-Medicare > 65	1.00 ² (10)	122	0.41	—	—
	Non-Medicare < 65	1.06 ² (11.5)	433	0.36	—	—
Log length of stay	Medicare	1.77 ³ (58.9)	1,398	0.53	9.44	0.0001
	Non-Medicare > 65	1.97 ³ (93.3)	135	0.58	—	—
	Non-Medicare < 65	1.75 ³ (56.2)	443	0.50	—	—

¹Unadjusted mean visits.

²Time in hours.

³Length of stay in days.

NOTES: \bar{X} is the mean. *N* is the sample size. SD is standard deviation. *F* is the *F*-statistic. *p* is the probability level. > 65 means 65 years of age or over. < 65 means under 65 years of age.

SOURCE: (Phillips, 1988).

non-Medicare groups that were most similar. The 65 or over non-Medicare sample remained about 34.4 days longer in home health, a substantial increase in length of stay.

Specific nursing services requested

A three-group comparison of specific nursing service requests shows significant age-related trends for several of the services. The nursing services for which there were significant differences in requests are depicted on Figure 1. Significant differences in requests were found for Foley irrigation, Foley installation, venipuncture, vitamin B12 injections, teaching terminal illness care, wound care, diabetes education, and chest physiotherapy. The chi square in each case was significant ($p < .003$). The Medicare and 65 or over non-Medicare samples requested more Foley irrigation, venipuncture, and vitamin B12 injections, and less wound care and diabetes education.

Outcomes were compared across the three groups and again for the two older groups. In both cases, the differences in outcome were significant. The chi square comparisons reveal that the Medicare sample had the poorest outcomes; that is, fewer goals were met, and more hospitalizations and more deaths occurred (Table 3).

Significant differences in the use of home health aides were also found among the three groups. Mean comparisons of aide visits show that the older (65 or over) non-Medicare sample received a mean of 15.86 ($\sigma = 44.4$) aide visits versus 6.1 ($\sigma = 24.7$) for the Medicare sample and 2.4 ($\sigma = 16.5$) for the under 65 non-Medicare sample ($F = 15.22$, $df = 2$, $p < .000$).

These results are probably not explained by differences in ability to pay for services, because the 65 or over non-Medicare sample was, on the whole, poorer than the Medicare sample. As seen in Table 1, Medicare patients were more likely to have private insurance than either the 65 or over non-Medicare sample or the under 65 non-Medicare sample. About one-third of the two non-Medicare samples were receiving Medicaid compared with 14.6 percent of the Medicare sample ($X^2 = 80.74$, $df = 2$, $p = .000$). The 65 or over non-Medicare and the under 65 non-Medicare groups had the highest percentage of indigent. These differences were significantly different for the three groups ($X^2 = 10$, $df = 2$, $p = .000$).

We examined the relationship among dying (no, yes), prognosis, and being in either of the two older payment groups (Medicare and 65 or over non-Medicare). We found that prognosis was significantly poorer for those who died ($X^2 = 23.5$, $df = 1$, $p = .000$). Patients who died were also more likely to have requested terminal illness care ($X^2 = 101.49$, $p < .001$), to be older ($X^2 = 13.31$, $p < .01$), and to have received more home health aide visits ($F = 9.5$, $p < .01$). Of those who died, no difference was found between the two older groups on prognosis ($X^2 = .003$, $df = 1$, $p = .95$). Medicare and non-Medicare comparisons of death as an outcome approached significance ($X^2 = 3.3$, $df = 1$, $p = .07$), possibly due to decreased sample size.

GLM was used to test whether length of stay in home health was significantly different for the two older groups. We found that the older non-Medicare group stayed in home health slightly longer than the Medicare group ($\bar{X} = 1.93$ log days, $\bar{X} = 1.67$ log days). This

Figure 1
Three-group comparison of nursing services

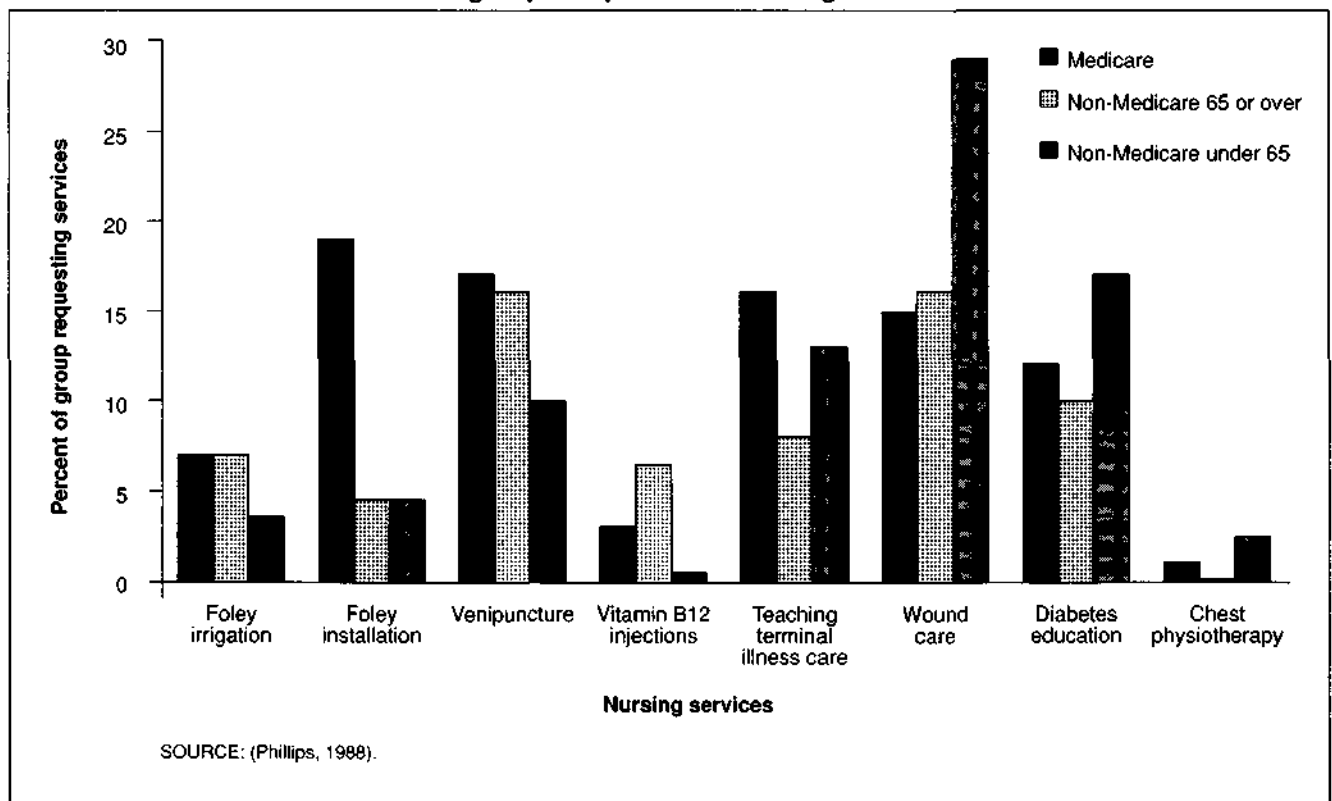


Table 3
Patient outcomes for the three payment groups

Payment category	Goals met	Rehospitalized	Placed in nursing home	Died	Received other care	Other outcomes	<i>N</i>
				Number			
Medicare	574 (41.7)	245 (17.8)	76 (5.5)	238 (17.3)	55 (3.9)	188 (13.7)	1,376
Non-Medicare 65 years of age or over	73 (50.3)	18 (12.4)	6 (4.1)	16 (11.0)	5 (3.4)	27 (18.6)	148
Non-Medicare under 65	246 (57.9)	42 (9.9)	7 (1.6)	36 (8.5)	16 (3.8)	78 (18.3)	433

NOTES: $\chi^2 = 87.2$, $p = 0.000$. Numbers in parentheses are percents. *N* is the sample size.
SOURCE: (Phillips, 1988).

difference only approached significance ($F = 3.26$, $df = 1$, $p = .07$). No differences were found between groups for diagnosis.

Finally, logistical regression was used to test predictors of death outcome. Included in these runs were the two older groups, age, and length of stay in home health. A significant model was generated using age ($\chi^2 = 14.08$, $df = 1$, $p = .002$, $B = -.60$) and payment source ($\chi^2 = 14.08$, $df = 1$, $p = .054$, $B = -.25$). In both cases, patients were less likely to die if they were older and non-Medicare. A second logistical regression procedure deleted length of stay and included number of home health aide visits delivered, requests for terminal illness care, and whether referred from hospital. Results suggest that death was associated with having requests for terminal illness care ($\chi^2 = 83.84$, $p = .001$, $B = .15$), being older ($\chi^2 = 13.67$, $p = .002$, $B = .67$), and having more home health aide visits ($\chi^2 = 6.43$, $p = .01$, $B = .002$).

To further examine the relationship of outcomes to payment status (i.e., Medicare versus non-Medicare), additional tests of association were performed. These categorical analyses tested the relationships between having goals met versus having some other outcome including rehospitalization, death, or referral to nursing home or other sources of community care. Outcomes of goals met were associated with having a better prognosis ($\chi^2 = 110.86$, $p = .000$). As mentioned earlier, the Medicare and 65 or over non-Medicare groups differed only slightly on prognosis at entry to home health ($\chi^2 = 15.8$, $p = .02$). With a 6.7-percent difference between the two groups on whether goals were met, neither was significantly more likely to have an outcome of goals met ($\chi^2 = 2.89$, $p = .089$).

Logistical regression was used to predict goals met using length of stay in home health, payment source, age, number of home health aide visits, and sex. Having goals met was significantly associated with being an older non-Medicare patient ($\chi^2 = 6.48$, $p = .01$), being older in general ($\chi^2 = 24.5$, $p = .0001$), and having more home health aide visits ($\chi^2 = 23.3$, $p = .001$). Sex and length of stay in home health were not associated with outcome in this analysis.

Discussion

The three-group comparisons suggest that the younger non-Medicare sample is receiving more care; that is, more visits and more hours of nursing in the same length

of time as the Medicare group. The data support that younger patients require more acute illness care and are more likely to receive positive outcomes than either of the two older groups.

Comparison of the three groups revealed some interesting similarities and differences. Relative to the younger non-Medicare group, the two older groups were found to be similar in prognosis, referral source, frequency of service requested, specific nursing services requested, diagnosis, and length of hospital stay, suggesting an age cohort predominately in need of chronic illness care. Indeed, the 65 or over non-Medicare group exaggerated this pattern by requesting fewer services and consuming fewer visits over a much longer stay in home health.

However, when the two older groups were compared, some differences became evident. Relative to the 65 or over non-Medicare group, the Medicare sample was referred more frequently from the hospital, was younger, was funded more often by private insurance, had fewer indigent, requested more nursing services, stayed in home health fewer days, and had worse outcomes.

Two possible hypotheses could explain the differences in resource consumption for this 65 or over non-Medicare group. The first, of course, is age. The 65 or over non-Medicare sample is older than the other groups and may be exhibiting characteristics of the old-old, needing more long-term illness care than their somewhat younger Medicare cohort. The chronic nature of their illness may contribute to better outcomes despite a slightly poorer prognosis and greater age.

A second explanation may be related to the funding guidelines of the respective funding agencies. Medicare regulations select for patients who are acutely or terminally ill, denying payment for long-term chronic maintenance care. Non-Medicare sources (such as private insurance and Medicaid) will more often continue to fund care beyond the limits dictated by Medicare policy guidelines. This pattern of payment is reflected in the longer lengths of stay and the greater number of home health aide visits for the 65 or over non-Medicare sample.

Our data suggest that the more lenient funding available through non-Medicare sources seems to facilitate achievement of positive outcomes, particularly goals met. Having an outcome of goals met was related to being non-Medicare, being older, and having more home health aide visits. This supports the idea that there is an older, less acute subgroup of patients who are not covered by Medicare. However, an outcome of death was also related to being older and having more home health

aide visits. Death outcomes initially appeared to be related to payment source (i.e. having Medicare); however, in subsequent analyses, requests for terminal illness care replaced payment source as a predictor. This suggests that there is a subset of older terminally ill Medicare patients for whom death may be an appropriate outcome.

These data strongly suggest that age and payment source co-vary such that, while both groups are elderly, the younger elderly are more likely to be Medicare and the older elderly are more likely to be non-Medicare. Despite this and despite the fact that age is a strong predictor of death, the relatively younger Medicare patients are more likely to have death as an outcome. This may reflect a selection bias whereby Medicare funds care for patients who are more acutely or terminally ill. A caveat must be inserted here regarding the 65 or over non-Medicare sample. We have relatively little data on this sample and so cannot comment on the generalizability of this group to the larger 65 or over non-Medicare population.

Our data also have important implications for the development of a prospective payment system in public home health. More specifically, they suggest that payment systems that are not sensitive to age differences, such as the use of group means by diagnosis, may not work effectively. There are three reasons for this. First, the diversity of care needs, particularly when comparing the 65 or over and under 65 age groups, are so great as to penalize the elderly who are less resilient and need longer lengths of care to achieve positive outcomes. Second, the less positive outcomes for the Medicare sample suggest that the assumption made under DRGs that less care will have no detrimental effect on patient outcomes may not be valid for the aged. And, finally, the incentives under prospective payment that push patients out of hospitals quicker and sicker will also be operating in home care, threatening to push these individuals into an environment where there are no service providers to provide needed care.

A note should be made regarding the percent of elderly patients without Medicare being seen through the public health department. The traditional mission of the public health department has been the provision of health care to the indigent. Under the fiscal conservatism of the last decade, however, public home health has been told to compete in the marketplace and pay its own way. Previously, the health department was able to do this by balancing the cost of caring for the indigent with paying patients. The recent expansion of private home health care, however, has cut deeply into the availability of paying patients, tipping the fiscal balance and putting many public home health services out of business. Data

presented in this article suggest that the public health departments are seeing these patients in approximately 10 times the number that the national average of elderly without Medicare would indicate. Approximately two-thirds of these patients do not have any source of payment.

If public home health is mandated to compete in the marketplace for its survival, then the playing field must be leveled. A possible alternative is to require all home health agencies to accept a percent of the indigent, as is done in many hospitals. On the other hand, State health departments could return to the historical mission of providing indigent care. This would allow the private industry to continue referring the indigent case load, ensuring care for the poor elderly despite fluctuations in the market. Such a decision will, however, require a commitment on the part of our communities to allocate the needed resources for this care.

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