Length of Stay in Home Care Before and After the 1997 Balanced Budget Act

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Context Prior to 1997, home health agencies (HHAs) were reimbursed on a fee-for-service basis and had incentives to provide more services. The 1997 Balanced Budget Act (BBA) reduced payments for home care services to help control Medicare spending.

Objective To examine the length of stay in home care before and after the 1997 BBA.

Design and Setting Cross-sectional study of home care patients in the 1996 and 1998 National Home and Hospice Care Surveys, which surveyed 1053 HHAs in 1996 and 1088 HHAs in 1998.

Patients Nationally representative random sample of home care patients with Medicare coverage in 1996 (4127 patients) and 1998 (4051 patients).

Main Outcome Measure Length of stay in home care (based on the number of days a patient was enrolled in home care services).

Results From 1996 to 1998, unadjusted median length of stay decreased by 16 days for all home care patients (60-44 days, $P=.002$). The decrease affected for-profit HHAs more than not-for-profit HHAs (111-55 days [51% decrease, $P=.002$] vs 46-36 days [22% decrease, $P=.042$]). In a Cox proportional hazards model of time to discharge from home care, post-BBA year (1998) was associated with a shorter length of stay in home care (adjusted hazard ratio [aHR] for home care discharge, 1.39 [95% confidence interval {CI}, 1.19-1.61]), and for-profit status was associated with a longer length of stay in home care (aHR, 0.82 [95% CI, 0.71-0.94]) after adjusting for patient demographics, diagnoses, and functional status.

Conclusion After the 1997 BBA, length of stay in home care decreased among Medicare patients, particularly among those receiving care from for-profit HHAs.

JAMA. 2003;289:2841-2848 www.jama.com

PRIOR TO THE 1997 BALANCED Budget Act (BBA),[1] home care was the fastest-growing segment of the health care industry.[2] During that time, home health agencies (HHAs) were reimbursed primarily on a fee-for-service basis. Longer stays meant higher revenues, and HHAs had incentives to provide more services.

The growth in the industry, combined with the fee-for-service payment system, led to concerns about fraud and abuse.[3] In 1995, project Operation Restore Trust[4] was implemented to identify fraud and abuse in home health care. To stop fraud and abuse, the Health Care Financing Administration (HCFA) began stricter enforcement of the Medicare home health eligibility criteria, which require home care patients to be homebound, under a physician's care, and to require medically necessary part-time or intermittent skilled nursing or therapy services.[5]

With the 1997 BBA, Congress required HCFA to develop a home health prospective payment system[1] to control Medicare spending. In addition, the BBA clarified the definition of part-time or intermittent nursing care, required that the definition of "homebound" be studied, and excluded venipuncture as a sole eligibility criterion for skilled nursing services in home health care.[1]

A home health interim payment system[6] was phased in starting on October 1, 1997, to curtail spending while the home health prospective payment system (effective as of October 1, 2000) could be developed. The interim payment system paid the least of an agency's actual costs, a reduced aggregate per-visit cost limit (decreased from 112% of average per-visit costs to 105% of median per-visit costs), or a new agency-specific per-beneficiary annual cost limit based on the average home health payment for beneficiaries receiving care in 1994.[1,6]

The Congressional Budget Office projected that the savings from the new home care reimbursement would be $16.2 billion over 5 years (1998-2002).[7] However, under the new payment system, the actual declines in home care spending were far larger than anticipated.[8,9] The decreases in home care funding placed many HHAs at greater financial risk and many agencies closed. From October 1997 to October 1998, nearly 10% of HHAs closed nationwide,[10] and concerns about access to home care developed, particularly for the sickest beneficiaries with the most costly medical care.[11-13]

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In this context, we studied the effect of the 1997 BBA on length of stay in home care.

METHODS

Study Population and Survey

We examined a nationally representative sample of home care patients using the 1996 and 1998 National Home and Hospice Care Surveys (NHHCS)[14,15] and restricted our primary analyses to home care patients with Medicare insurance because the 1997 BBA targeted this population. Patients receiving hospice care and those with primary insurance other than Medicare were excluded, and data from the 1996 and 1998 NHHCS were combined for analysis.

The NHHCS is a nationwide survey of home and hospice care agencies conducted by the National Center for Health Statistics.[16] The 1996 and 1998 NHHCS are the fourth and fifth surveys that have been conducted. The survey is part of the Long-Term Care Component of the National Health Care Survey.[17]

Sampling

The sample design for the 1996 and 1998 NHHCS was a stratified 2-stage procedure. First, a representative sample of the nation's home health and hospice care agencies was selected after being stratified according to agency and regional variables. Of 16 700 HHAs, 1200 were selected in 1996, and 1350 of 16 500 HHAs were selected in 1998. To be eligible, agencies had to provide home health or hospice care services to patients at the time of the survey. Most selected HHAs were eligible, including 1091 (91%) in 1996 and 1158 (86%) in 1998, and the majority of eligible HHAs agreed to participate, including 1053 (97%) in 1996 and 1088 (94%) in 1998.[14,15]

Once the HHAs were selected, up to 6 current patients (median, 6) and 6 discharged patients (median, 6) were randomly selected from each HHA. Current patients were defined as those who were enrolled with the HHA as of midnight on the day immediately before the date of the survey. Discharged patients were discharged from care by the HHA during a designated month between October 1995 and September 1996 (1996 survey) and between October 1997 and September 1998 (1998 survey). The designated month was randomly selected for each HHA.[14,15]

The sampled patients were assigned weights based on the probability of selecting the agency and the patient within each agency, with adjustments for both nonresponse and oversampling or undersampling of agencies. These weights were designed to produce unbiased national estimates of the US home care population.[14,15]

Both current and discharged patients were included in the NHHCS to provide data representative of the entire national home care population. There were differences between current patients and discharged patients. Current patients were more likely to be 65 years and older (88.1% vs 81.2%) and more likely to have 1 or more comorbidities (59.1% vs 54.8%) and activities of daily living (ADL) (53.0% vs 43.7%) and instrumental ADL (IADL) dependencies (43.5% vs 29.8%) than discharged patients.

Data Collection

Surveys were conducted between August and December 1996 (1996 survey), and between August and December 1998 (1998 survey). Data were collected by conducting telephone surveys of HHA staff members who were most familiar with the care provided to the patients. The respondents referred to medical or other records as necessary. No patients were directly interviewed for these surveys.[14,15]

This study was exempt from institutional review board approval because a publicly available database, which does not contain any personal identifying information, was used.

Explanatory Variables

Variables that were available for analysis included the following: (1) patient demographics such as age, sex, race, and marital status; (2) living arrangements and caregiver information; (3) diagnoses at admission (such as congestive heart failure or diabetes); (4) functional status including 6 basic ADLs (bathing, dressing, eating, transferring, walking, and toileting) and 6 IADLs (doing housework, managing money, shopping, using the telephone, preparing meals, and taking medications); (5) vision and hearing difficulties; (6) referral source for home care; (7) payment sources for home care; and (8) agency characteristics including region, metropolitan statistical area, and profit status.

We identified 4 diagnoses that may be associated with chronic home health care needs: congestive heart failure, chronic obstructive pulmonary disease, diabetes, and cancer. We also computed a modified Charlson comorbidity index using the method of Deyo et al[18] for classifying *International Classification of Diseases, Ninth Revision, Clinical Modification* (*ICD-9-CM*) diagnosis codes.

We used 1998 survey year as a proxy for the effect of the 1997 BBA. We grouped HHA ownership as for-profit (proprietary) and not-for-profit (nonprofit/government).

Outcome Variable

Our outcome variable of interest was length of stay in home care. We used Kaplan-Meier methods[19] to estimate length of stay based on the number of days a patient was enrolled in home care services (ie, date of admission to home care until date of discharge for discharged patients, or until date of survey for current patients).

Statistical Analyses

All analyses were performed using SAS-callable SUDAAN (version 7.5.2)[20] to account for the complex sampling design, which included within-agency clustering and weights to reflect national estimates. Data from the 1996 and 1998 NHHCS were combined and analyses adjusted for survey year.

Bivariable analyses were performed examining the association between survey year, profit status, and other patient and agency characteristics. All results were weighted to represent the national home care population. The χ^2

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test was used to test for significant associations. We examined bivariable relationships between patient and agency characteristics and length of stay in home care using unadjusted Cox proportional hazards models.

Unadjusted Kaplan-Meier[19] survival curves were developed to estimate time to discharge from home care, and differences between Kaplan-Meier survival curves were examined using unadjusted Cox models. A multivariable Cox model was developed to identify factors independently associated with time to discharge from home care. We treated patients with incomplete information about the end point of interest (length of stay in home care) as censored observations so that all available data on those subjects would be used, even though the dates of ultimate discharge were not yet known. Specifically, we treated current patients who were still in home care at the time of the surveys (n=4294) and discharged patients who had either moved or changed agencies (n=256) as censored observations. These unadjusted and adjusted survival analyses allowed us to make estimates of length of stay in home care using information available about time from admission to discharge (for discharged patients) and time from admission to the survey date (for current patients).

Backward elimination was performed to build our multivariable model. Survey year, age, and sex were included in all models. Other variables were included in the modeling process if the bivariable associations had *P* values <.25. We used the 4 diagnoses in our model rather than the Charlson score because we felt the diagnoses were more clinically meaningful and provided much of the same information as the Charlson score. Variables with a *P* value of <.05 were retained in the model. Confounding was assessed by adding variables back to the model one at a time. Factors that produced more than a 10% change in the estimated β coefficients of variables in the model were considered confounders and retained in the final model. An interaction term between survey year and profit status was created, and its significance in the multivariable model was assessed.

Adjusted hazard ratios (aHRs) are reported with 95% confidence intervals (CIs), which represent the relative instantaneous rate of being discharged from an HHA.

To evaluate secular trends in home care, several additional analyses were

Table 1. Characteristics of Home Care Patients With Medicare Before and After the 1997 Balanced Budget Act*

Characteristics	Patients, % 1996 (Before) (n = 4127)†	Patients, % 1998 (After) (n = 4051)‡
Age, y		
<65	24.4	10.8
65-74	25.8	26.8
75-84	31.4	41.4
≥85	18.4	21.0
Sex, female	64.4	64.8
Race		
White	66.8	63.9
Black	9.4	12.2
Hispanic	3.2	4.2
Other§	1.6	0.7
Unknown	19.0	19.0
Marital status		
Married	34.3	36.9
Unmarried	52.1	49.1
Unknown	13.6	14.0
Residence‖		
Private/rented residence	92.8	94.7
Retirement/ assisted living/ residential care home	7.3	5.3
Living situation‖		
Lives alone	31.1	33.0
Lives with others	68.9	67.0
Caregiver status		
Has a primary caregiver	75.0	77.9
No caregiver	25.0	22.1
Comorbid conditions		
Congestive heart failure	13.3	16.1
Chronic obstructive pulmonary disease	11.4	13.1
Diabetes	16.9	17.8
Cancer	9.8	8.7
Charlson comorbidity index score‖		
0	44.0	44.4
1	31.1	33.0
2	17.4	16.4
3	4.0	4.2
≥4	3.5	2.0

(continued)

Table 1. Characteristics of Home Care Patients With Medicare Before and After the 1997 Balanced Budget Act* (cont)

Characteristics	Patients, % 1996 (Before) (n = 4127)†	Patients, % 1998 (After) (n = 4051)‡
No. of ADL dependencies‖		
0	58.0	53.4
1	5.1	6.6
≥2	36.9	40.0
No. of IADL dependencies‖		
0	69.2	68.9
1	17.5	19.5
≥2	13.4	11.6
Difficulty seeing	22.2	21.4
Difficulty hearing	18.8	18.0
Referral source for home care‖		
Self/family	3.2	2.7
Nursing home	2.5	3.3
Hospital	39.1	41.3
Physician	43.2	42.7
Agency	6.9	5.5
Other¶	5.2	4.5
Region		
Northeast	26.0	31.3
Midwest	23.8	24.9
South	31.9	31.2
West	18.3	12.6
Metropolitan statistical area		
Urban	82.7	83.2
Rural	17.3	16.8
Home health agency ownership		
For-profit	32.4	38.1
Not-for-profit	67.6	61.9

Abbreviations: ADL, activities of daily living; IADL, instrumental ADL.

*Percentages are all weighted to reflect national estimates. All comparisons between 1996 and 1998 were signficant at *P*<.001. Due to large sample size, some small differences are statistically significant but may not be clinically relevant.

†In 1996, 4127 home care patients represented an estimated 5.8 million home care patients nationwide.

‡In 1998, 4051 home care patients represented an estimated 6.3 million home care patients nationwide.

§Other includes American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, other.

‖Data were unknown or missing for residence (n = 22), living situation (n = 228), Charlson comorbidity index score (n = 7), number of ADL dependencies (n = 132), number of IADL dependencies (n = 168), and referral source for home care (n = 225).

¶Other includes friend/neighbor, religious organization, health maintenance organization, social service agency, health department, other.

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performed. We evaluated trends in length of stay between 1996 and 1998 in non-Medicare patients and also examined changes in length of stay among non-Medicare patients in HHAs with high Medicare volumes (defined as serving ≥20% Medicare patients) and low Medicare volumes (defined as serving <20% Medicare patients).

In addition, because patients younger than 65 years qualify for Medicare based on disability or end-stage renal disease and differ from older patients, we repeated our analyses excluding Medicare patients younger than 65 years.

Table 2. Reasons for Discharge From Home Care Before and After the 1997 Balanced Budget Act*

Reason for Discharge	Patients, % 1996 (Before) (n = 1853)†	1998 (After) (n = 2002)‡
Goals met	64.9	66.8
Hospitalized	14.5	12.9
Placed in nursing home	5.9	4.0
Moved	3.2	2.2
Died	4.2	3.8
Other	7.3	10.4

*Percentages are all weighted to reflect national estimates. Comparison between 1996 and 1998 was significant at $P<.001$. Due to large sample size, some small differences are statistically significant but may not be clinically relevant.
†In 1996, 1853 home care patients represented an estimated 4.2 million patients discharged from home care nationwide. Reason for discharge was unknown or missing for 13 discharged patients in 1996.
‡In 1998, 2002 home care patients represented an estimated 5.1 million patients discharged from home care nationwide. Reason for discharge was unknown or missing for 16 discharged patients in 1998.

RESULTS

Effect of Survey Year on Home Care Enrollment

The 1996 and 1998 surveys included 4127 and 4051 home care patients with Medicare coverage, respectively, representing an estimated 5.8 million and 6.3 million home care patients nationwide. From 1996 to 1998, the estimated number of current patients decreased from 1.5 to 1.1 million, and the estimated number of discharged patients increased from 4.3 to 5.2 million.

The increase in the number of home care patients from 1996 to 1998 was driven by an increase in the number of patients in for-profit HHAs. The number of patients receiving care from for-profit HHAs increased from an estimated 1.9 million to an estimated 2.4 million, while the number of patients receiving care from not-for-profit HHAs remained about the same at an estimated 3.9 million.

Effect of Survey Year on Patient and Agency Characteristics

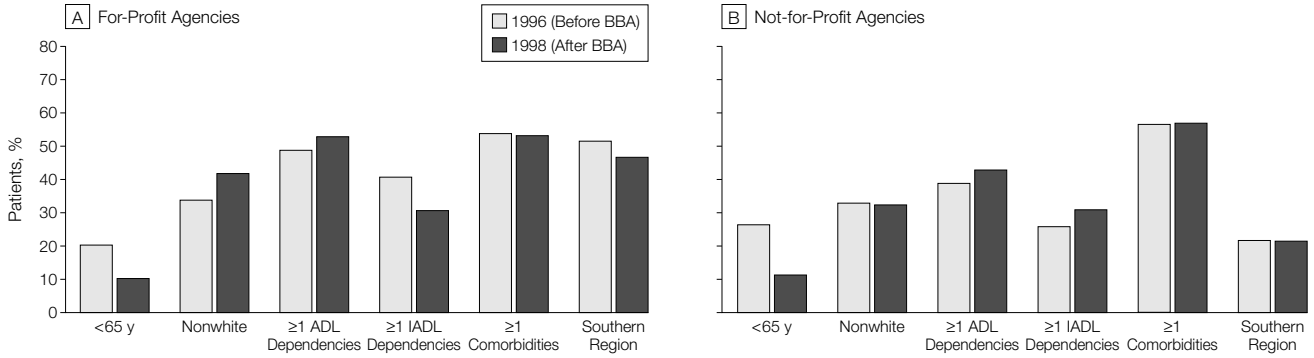
Characteristics of home care patients with Medicare coverage before and after the 1997 BBA are presented in TABLE 1. Patient and agency characteristics remained similar between 1996 and 1998 except that the percentage of patients younger than 65 years decreased, the regional distribution of patients changed, and the percentage of patients receiving care from for-profit agencies increased.

Among patients who were discharged from home care, the reasons for discharge were similar before and after the 1997 BBA (TABLE 2). The majority of patients had their goals met. There were differences between reasons for discharge in for-profit vs not-for-profit HHAs in 1996; however, these differences were no longer evident in 1998.

FIGURE 1 shows characteristics of Medicare patients in for-profit and not-for-profit agencies before and after the 1997 BBA. After the 1997 BBA, patients in for-profit agencies were less likely to be younger than 65 years, to have 1 or more IADL dependencies, or to live in the southern region, and were more likely to be nonwhite and to have 1 or more ADL dependencies. Patients in not-for-profit HHAs were less likely to be younger than 65 years after the BBA and more likely to have 1 or more ADL and IADL dependencies.

In 1996, for-profit HHAs had a smaller percentage of younger Medicare patients than not-for-profit HHAs, but by 1998 both types of agencies had a reduced percentage of younger patients. Overall, compared with patients in not-for-profit agencies, patients receiving care from for-profit agencies were more likely to be nonwhite, to have 1 or more ADL dependencies, and to live in the southern re-

Figure 1. Characteristics of Medicare Patients in For-Profit and Not-for-Profit Agencies Before and After the 1997 Balanced Budget Act (BBA)



A, For-profit agencies before and after the 1997 BBA. B, Not-for-profit agencies before and after the 1997 BBA. Percentages are all weighted to reflect national estimates. All comparisons between 1996 and 1998 were significant at $P<.001$. Due to large sample sizes, some small differences are statistically significant but may not be clinically relevant. ADL indicates activities of daily living; IADL, instrumental ADL.

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gion; those in not-for-profit agencies were more likely to have 1 or more comorbidities.

Effect of Survey Year on Length of Stay in Home Care

From 1996 to 1998, unadjusted estimated median length of stay decreased for all home care patients by 16 days ($P=.002$) (TABLE 3). For patients in for-profit HHAs, median length of stay decreased by 56 days (51% decrease, $P=.002$), whereas for those in not-for-profit HHAs, median length of stay decreased by 10 days (22% decrease, $P=.042$).

Prior to the 1997 BBA, there was a sizable difference in median length of stay between for-profit and not-for-profit HHAs (111 days vs 46 days; difference in medians, 65 days; $P=.002$). After the 1997 BBA, the difference in median length of stay between for-profit and not-for-profit HHAs narrowed (55 days vs 36 days; difference in medians, 19 days; $P=.03$).

The changes in length of stay after the 1997 BBA are illustrated in FIGURE 2. Time to discharge from home care overall, in for-profit HHAs, and in not-for-profit HHAs are shown.

Associations of patient and agency characteristics with length of stay in home care are shown in TABLE 4. Unadjusted Kaplan-Meier estimates of length of stay in home care are shown for all variables in our multivariable model. In the Cox proportional hazards model of time to discharge from home care, hazard ratios less than 1 signify a smaller hazard of being discharged and a longer length of stay in home care. Post-BBA year (1998) was associated with a shorter length of stay in home care (aHR for home care discharge, 1.39 [95% CI, 1.19-1.61]), and for-profit status was associated with a longer length of stay in home care (aHR, 0.82 [95% CI, 0.71-0.94]). In a separate analysis, an interaction term between survey year and profit status was not significant. Other factors associated with length of stay in home care included race/ethnicity, congestive heart failure, diabetes, dependency in ADLs and IADLs, referral source for home care, southern region, and rural residence.

In additional analyses evaluating secular trends in home care use, we found length of stay decreased among non-Medicare patients (aHR, 1.23 [95% CI, 0.97-1.56]) between 1996 and 1998, but the decrease was smaller than that observed in Medicare patients whose home care reimbursement was directly affected by the 1997 BBA. During the same time, length of stay decreased modestly among non-Medicare patients cared for by HHAs with high Medicare volumes (aHR, 1.20 [95% CI, 0.92-1.56]), and length of stay did not decrease among non-Medicare patients in HHAs with low Medicare volumes (aHR, 0.72 [95% CI, 0.52-1.00]).

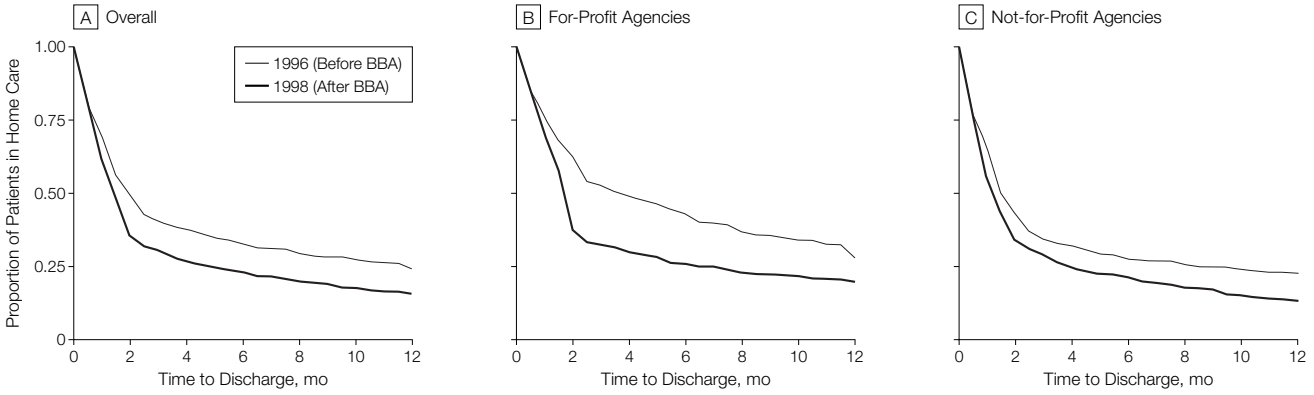
When Medicare patients younger than 65 years were eliminated from the Cox proportional hazards model, the effect of the 1997 BBA was augmented (aHR, 1.58 [95% CI, 1.38-1.82]), but the other effect estimates did not change substantially.

Table 3. Unadjusted Median Length of Stay in Home Care Before and After the 1997 Balanced Budget Act*

	Length of Stay, Median (IQR), d		
	1996 (Before) (n = 4127)†	1998 (After) (n = 4051)‡	*P* Value
Overall	60 (22-356)	44 (19-146)	.002
For-profit	111 (33-437)	55 (25-194)	.002
Not-for-profit	46 (18-253)	36 (17-119)	.042

Abbreviation: IQR, interquartile range.
*Unadjusted medians are weighted to reflect national estimates.
†In 1996, 4127 home care patients represented 5.8 million home care patients nationwide.
‡In 1998, 4051 home care patients represented 6.3 million home care patients nationwide.

Figure 2. Kaplan-Meier Survival Curves Showing the Effect of the 1997 Balanced Budget Act (BBA) on Time to Discharge From Home Care



A, After the 1997 BBA, overall length of stay in home care decreased ($P=.002$). B, After the 1997 BBA, median length of stay in home care decreased by 51% in for-profit agencies ($P=.002$); C, after the 1997 BBA, median length of stay in home care decreased by 22% in not-for-profit agencies ($P=.042$). The Kaplan-Meier analyses are weighted to reflect national estimates, therefore the actual numbers of persons at risk are not shown.

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Table 4. Associations of Patient and Agency Characteristics With Length of Stay in Home Care

Characteristics	Unadjusted Median Length of Stay (IQR), d	Adjusted Hazard Ratio (95% CI) for Home Care Discharge*
Year		
1996 (before BBA)	60 (22-356)	1.00
1998 (before BBA)	44 (19-146)	1.39 (1.19-1.61)
Home health agency ownership		
Not-for-profit	42 (17-171)	1.00
For-profit	59 (29-356)	0.82 (0.71-0.94)
Age, y		
<65	32 (14-149)	1.17 (0.97-1.42)
65-74	49 (20-228)	1.00
75-84	53 (24-215)	1.03 (0.90-1.19)
≥85	59 (20-286)	1.06 (0.90-1.24)
Sex		
Female	52 (21-280)	1.00
Male	45 (19-157)	1.07 (0.95-1.20)
Race/ethnicity		
White	53 (21-281)	1.00
Black	54 (24-385)	1.04 (0.89-1.22)
Hispanic	42 (16-60)	1.56 (1.13-2.16)
Other†	43 (21-56)	1.49 (1.11-1.99)
Unknown	39 (17-93)	1.11 (0.92-1.34)
Residence		
Private/rented residence	48 (20-220)	1.00
Retirement/assisted living/ residential care home	58 (28-391)	0.92 (0.76-1.11)
Comorbid conditions		
Congestive heart failure		
No	47 (19-216)	1.00
Yes	59 (25-281)	0.84 (0.71-0.99)
Chronic obstructive pulmonary disease		
No	47 (20-232)	1.00
Yes	60 (27-323)	0.86 (0.72-1.02)
Diabetes		
No	46 (19-192)	1.00
Yes	67 (27-370)	0.80 (0.70-0.91)
Cancer		
No	50 (21-248)	1.00
Yes	43 (16-120)	1.13 (0.96-1.33)
No. of ADL dependencies		
0	36 (16-115)	1.00
1	45 (21-91)	1.00 (0.80-1.25)
≥2	71 (35-492)	0.70 (0.61-0.80)
No. of IADL dependencies		
0	42 (17-152)	1.00
1	61 (28-378)	0.84 (0.73-0.97)
≥2	93 (33-784)	0.75 (0.61-0.92)
Vision		
No difficulty	46 (20-183)	1.00
Difficulty	63 (24-521)	0.93 (0.82-1.05)

(continued)

COMMENT

After the 1997 BBA, length of stay in home care decreased among Medicare patients, particularly among those receiving care from for-profit HHAs. Our results support previous research showing that limiting reimbursement for health care services results in decreased utilization.[21-26] A diagnosis-related group–based prospective payment system for inpatient hospitalizations was implemented in 1983. The hospital prospective payment system was found to reduce hospital admissions,[21,23] length of stay,[21,22,24,25] patient days,[21,23] and costs of care.[23,24,26] For home care, the total number of patients increased, but days in home care per patient decreased.

Our finding of an increase in the number of home care patients from 1996 to 1998 was driven by an increase in the number of patients in for-profit HHAs. There are several possible explanations for these findings. The increase may have been due to concomitant changes in other policies (such as prospective payment systems for other postacute care services), secular trends, or possibly for-profit HHAs attempting to recoup lost revenues and maximize profits by increasing the total number of home care patients served.

The percentage of home care patients younger than 65 years decreased substantially from 1996 to 1998 in both for-profit and not-for-profit HHAs. This decrease in the percentage of Medicare disabled home care patients may have been due to the enforcement of Medicare home care eligibility criteria that occurred during this time. The needs of home care patients must be part-time or intermittent; many Medicare disabled patients have chronic long-term needs. However, the decrease may also be due to patient selection by the HHAs or may be a reflection of access problems to home care for disabled Medicare beneficiaries.

Although the BBA did not affect reimbursement for non-Medicare patients, because Medicare is the single largest payer for home care services, the BBA might have a spillover effect on non-Medicare patients. This spillover effect might be least evident among non-Medicare patients in HHAs with low volumes of Medicare patients. In fact, the BBA had an attenuated effect on reducing length of stay for non-Medicare patients and did not decrease length of stay among non-Medicare patients in HHAs with low Medicare volumes.

Receiving care from a for-profit HHA was associated with longer length of stay in home care, even after adjustment for

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patient demographics, diagnoses, functional status, and post-BBA year. Longer length of stay in for-profit HHAs may have been due to higher quality of care, case-mix differences, or unnecessary services. Although we could not evaluate quality of care with our data, for-profit status in other segments of health care has been associated with worse quality of care,[27-32] increased mortality,[29,33,34] worse access to care,[35] and worse patient satisfaction.[36] Moreover, according to a 1995 report from the Office of the Inspector General, increased utilization in for-profit HHAs before the BBA was not found to result from higher quality of care.[37]

We examined case-mix differences by comparing patients in for-profit HHAs with those in not-for-profit HHAs. In unadjusted results, we found that patients cared for by for-profit HHAs were more likely to be nonwhite and to have 1 or more ADL dependencies, but patients cared for by not-for-profit HHAs were more likely to have 1 or more comorbidities. In addition, many more patients in for-profit HHAs lived in the southern region, which has been associated with increased home care utilization.[38] However, even after adjusting for all of these factors and others, we found that the increased length of stay in for-profit HHAs persisted. Our current findings support pre-BBA government reports that found increased utilization in for-profit HHAs was not due to differences in beneficiary characteristics,[37] primary diagnoses,[37,39,40] or region of residence.[40]

Policymakers seem to have achieved their goal of reducing Medicare expenditures for home health care. However, little is known about the quality of current home care services or patient outcomes after discharge from home care. While declines in Medicare spending were consistent with the goals of the BBA, fiscal pressures and agency closures may have led some agencies to overreact to the home health interim payment system and to avoid high-cost patients[41] and provide shorter, less expensive episodes of care.

Our study has several important limitations. First and perhaps most important, because our analysis is a comparison of 2 snapshots in time, our finding of decreased length of stay in home care could be due to factors other than the BBA, including antifraud initiatives, other policy changes (such as short stay transfer policy), or even regression to the mean. We performed several analyses to assess secular trends and found that the greatest impact of the 1997 BBA on length of stay in our analyses was on Medicare patients. Because the BBA affected home care reimbursement only for Medicare patients, this lends support to the hypothesis that the BBA triggered the declines in length of stay.

Second, we did not have access to claims data to measure actual home care utilization (numbers of visits and expenditures), and we used length of stay in home care as a proxy for utilization. However, a recent study based on administrative claims data from the Centers for Medicare and Medicaid Services documenting a 39% decrease in the number of home health visits per user after the BBA[42] is consistent with our results.

Third, we were unable to determine if there were any patients and/or agencies that were included in both years. If so, our parameter estimates would not be affected, but we may have slightly underestimated the SEs. We suspect that the risk of selecting the same agency in both years is small, and it is unlikely that any of the same patients were sampled in both years.

Fourth, we were unable to determine the impact of shortened length of stay in home care on quality of care and patient outcomes. We lack information on the appropriateness of care by the HHAs and were unable to judge the appropriateness of longer length of stay in for-profit agencies. We were also unable to assess the appropriateness of the increased number of patients in for-profit agencies in 1998. Finally, we were unable to account for other patient and agency characteristics that might be important. For example, we were unable to account for proximity to other agencies with different types of ownership.

The full impact of the new home health payment system has not been

Table 4. Associations of Patient and Agency Characteristics With Length of Stay in Home Care (cont)

Characteristics	Unadjusted Median Length of Stay (IQR), d	Adjusted Hazard Ratio (95% CI) for Home Care Discharge*
Hearing		
No difficulty	47 (20-190)	1.00
Difficulty	63 (24-420)	0.91 (0.78-1.05)
Referral source for home care		
Physician	57 (24-351)	1.00
Self/family	182 (53-701)	0.73 (0.57-0.93)
Nursing home	55 (17-339)	1.07 (0.77-1.49)
Hospital	39 (16-104)	1.22 (1.03-1.45)
Agency	48 (23-129)	1.31 (0.98-1.75)
Other‡	56 (28-577)	0.94 (0.73-1.19)
Region		
Northeast	40 (16-104)	1.00
Midwest	48 (20-192)	0.92 (0.73-1.17)
South	86 (32-474)	0.76 (0.62-0.94)
West	36 (17-101)	1.13 (0.89-1.43)
Residence		
Urban	45 (18-176)	1.00
Rural	92 (29-587)	0.77 (0.68-0.87)

Abbreviations: ADL, activities of daily living; BBA, Balanced Budget Act; CI, confidence interval; IADL, instrumental ADL; IQR, interquartile range.
*An adjusted hazard ratio >1 signifies a larger hazard of being discharged (shorter length of stay in home care); an adjusted hazard ratio <1 signifies a smaller hazard of being discharged (longer length of stay in home care).
†Other includes American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, other.
‡Other includes friend/neighbor, religious organization, health maintenance organization, social service agency, health department, other.

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evaluated. Some of the shortened length of stay in home care following implementation of the BBA was probably appropriate, given evidence of fraud and abuse in the system.[3] However, in addition to eliminating unnecessary services and increasing efficiency in home care, the BBA may have reduced Medicare beneficiary access to necessary services, resulting in unintended adverse consequences for beneficiaries.

Beneficiaries whose medical care is considered too costly may be refused access to home care.[11-13] These beneficiaries are probably most at risk of suffering an adverse event. While patients who are discharged from the hospital have the safety net of home health care and skilled nursing facilities, patients who are discharged from home health care services have no comparable protection.

The home health prospective payment system went into effect on October 1, 2000, and a further cut in prospective payment system payments took effect October 1, 2002.[43] Given the large number of Medicare beneficiaries that use home health care and the aging of the population, future studies are needed to assess the effect of shortened length of stay on quality of care and patient outcomes.

Author Contributions: *Study concept and design:* Murkofsky, Phillips, Hamel.
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Obtained funding: Murkofsky, Phillips.
Administrative, technical, or material support: Murkofsky, Phillips, McCarthy.
Study supervision: Phillips, Hamel.
Funding/Support: Dr Murkofsky was supported in part by institutional National Research Service Award training grant 5T32PE11001 and by institutional Mentored Clinical Scientist Development Program Award 5K12AG00294 from the National Institute on Aging when this research was conducted. Dr Murkofsky is the recipient of a Harvard/Hartford Center of Excellence Advanced Research Fellowship. Dr Hamel is funded by the Paul Beeson Physician Faculty Scholars in Aging program.

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