Changes in Medicare skilled nursing facility benefit admissions

by Lisa C. Dubay

In this article, the changes in Medicare skilled nursing facility (SNF) benefit admissions from 1983 through 1985 are examined and factors that influence changes in access since the implementation of Medicare's prospective payment system are analyzed. During this period, use of the SNF benefit increased nationally by 21 percent. Multivariate analysis is used to determine factors associated with changes in admissions. Changes in SNF benefit admissions were found to be negatively associated with changes in area hospitals' lengths of stay and changes in hospitals' discharges. Medicaid reimbursement policies were also shown to affect changes in utilization.

Introduction

The Medicare skilled nursing facility (SNF) benefit was designed to provide a less costly alternative to the final days of hospital care. During the 1983-85 period, Medicare enrollees were eligible for this benefit if they had been hospitalized for at least 3 consecutive days, were admitted to an SNF within 30 days of discharge from the hospital, and required daily skilled nursing or rehabilitation services resulting from the condition for which they were hospitalized. The benefit was designed to cover 100 days of skilled nursing care; in reality, however, the average covered stay was only 29.6 days in 1983 (Health Care Financing Administration, 1985).

Prospective payment system

The time period studied is of particular interest because it encompasses years both before and after the implementation of the prospective payment system. Since the institution of PPS, hospitals have been paid a flat rate for each patient, depending on the patient's diagnosis-related group (DRG). This payment scheme creates an incentive to reduce length of stay by discharging patients as soon as it is medically justifiable. Not surprisingly, hospitals have responded to this incentive. Although hospital lengths of stay for Medicare admissions were declining prior to PPS (Table 1), the rate of decline has been much greater since its implementation. From fiscal year 1983 through 1985, Medicare lengths of stay declined by 16 percent, from 10 days to 8.4 days.

Under PPS, hospitals have a clear incentive to discharge patients to either nursing homes, home health agencies, or home more quickly than under cost-based reimbursement. Medicare patients may move from the hospital to nursing home as either Medicare, private, or Medicaid nursing home patients. However, hospitals' relative abilities to discharge patients to SNFs varies by geographic area simply because nursing home markets vary greatly (Kenney and Holahan, 1988).

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Nursing home market

Prior to the implementation of PPS, Medicare patients experienced difficulty gaining access to skilled nursing care for a variety of reasons. Medicaid is the largest single payer of nursing home costs, representing 41.8 percent of total nursing home expenditures in 1985, compared with 1.7 percent for Medicare (Waldo, Levit, and Lazenby, 1986). Consequently, Medicaid policies are important factors influencing the nursing home industry in a particular State. Given the considerable variation in State Medicaid policies, statewide nursing home markets throughout the country are quite diverse with respect to bed supply, staffing levels, and the configuration of the market.

This diversity results in differential access to care for both Medicare and Medicaid patients. Although the

Table 1

Average length of stay and percent change for Medicare beneficiaries in short-stay hospitals: United States, 1967-85

Year	Average length of stay	Percent change
Calendar year		
1967	13.8	—
1968	13.8	0.0
1969	13.5	–2.2
1970	13.0	–3.8
1971	12.5	–3.9
1972	12.1	–3.2
1973	11.7	–3.3
1974	11.5	–1.7
1975	11.2	–2.6
1976	11.1	–0.9
1977	10.9	–1.8
1978	10.8	–0.9
1979	10.7	–0.9
1980	10.6	–0.9
1981	10.5	–0.9
Fiscal year		
1981	10.5	—
1982	10.3	–1.9
1983	10.0	–2.9
1984	9.1	–9.0
1985	[1]8.4	–7.7

[1]Based on records processed at the Health Care Financing Administration through Dec. 1985.

SOURCES: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Medicare Provider Analysis and Review short-stay files; (Sulvetta, 1988.)

national average of beds per 1,000 persons age 65 or over was 49.19 in 1985, nursing home bed supply ranged from a high of 90.94 in Minnesota to a low of 22.51 in Florida (Table 2). The overall supply of beds is an important determinant of access to care for Medicare patients. If bed supply is limited, nursing homes will first satisfy private patient demand, and many public patients will have difficulty gaining access.

Because Medicare covers only care in SNFs, the configuration of the market in terms of SNFs and intermediate care facilities (ICFs) has important implications for access for Medicare patients. Nursing home beds can be certified to provide intermediate or skilled nursing care, the distinction between the two being primarily the type and intensity of the nursing services that are provided. Although difficult to quantify, this distinction varies greatly by State. Throughout the country there are wide discrepancies in the proportion of beds within a State that are certified as providing skilled care or intermediate care (Table 2).

Table 2

Nursing home bed supply, by type of bed and State: United States, 1985

State	Total certified beds per 1,000 elderly persons[1]	Percent of beds certified SNF[1]	Percent of beds certified by Medicare[1]	Medicare beds per 1,000 elderly	Percent of total SNFs certified by Medicare
Alabama	44.10	71.65	58.66	25.87	82.88
Alaska	32.71	95.14	26.62	8.71	27.78
Arizona	3.58	100.00	100.00	3.58	100.00
Arkansas	62.64	65.53	4.09	2.56	6.27
California	38.94	96.92	80.34	31.29	82.81
Colorado	60.41	79.97	24.22	14.63	30.28
Connecticut	62.73	79.98	74.62	46.81	93.30
Delaware	50.29	45.08	39.91	20.07	88.53
District of Columbia	35.70	27.76	27.76	9.91	100.00
Florida	22.51	97.52	50.22	11.31	51.50
Georgia	54.93	89.26	27.81	18.28	31.16
Hawaii	26.61	69.32	69.02	18.36	99.56
Idaho	37.98	97.13	73.49	27.91	76.65
Illinois	59.08	57.69	14.84	8.76	25.71
Indiana	69.29	23.59	21.06	14.59	89.29
Iowa	76.54	3.07	2.73	2.09	88.97
Kansas	78.51	11.35	5.40	4.24	47.62
Kentucky	41.62	20.75	20.75	8.64	100.00
Louisiana	67.10	8.30	8.11	5.44	97.64
Maine	60.83	4.60	4.00	2.43	86.92
Maryland	48.71	50.58	50.58	24.64	100.00
Massachusetts	57.31	44.52	14.66	8.40	32.93
Michigan	45.03	76.48	59.92	26.98	78.34
Minnesota	90.94	65.67	21.19	19.27	32.27
Mississippi	44.87	86.59	2.33	1.04	2.69
Missouri	44.83	64.89	25.53	11.44	39.34
Montana	65.28	59.93	33.52	21.88	55.92
Nebraska	78.72	18.24	7.17	5.64	39.28
Nevada	26.99	92.67	88.13	23.78	95.10
New Hampshire	58.38	9.85	7.61	4.44	77.21
New Jersey	36.35	91.06	41.45	15.06	45.52
New Mexico	38.25	7.82	7.45	2.85	95.17
New York	44.18	75.32	75.16	33.21	100.00
North Carolina	31.07	47.36	43.59	13.54	92.02
North Dakota	78.13	73.47	60.45	47.23	82.28
Ohio	60.38	52.92	52.46	31.68	99.12
Oklahoma	70.47	1.10	0.73	0.51	66.29
Oregon	36.17	14.56	11.50	4.16	79.02
Pennsylvania	47.69	51.17	40.92	19.52	80.00
Rhode Island	67.96	22.97	20.51	13.94	89.31
South Carolina	35.64	66.47	66.04	23.53	99.36
South Dakota	81.35	60.80	6.49	5.28	10.67
Tennessee	47.01	15.41	15.41	7.25	100.00
Texas	61.36	13.75	3.63	2.23	26.43
Utah	42.38	54.70	33.45	14.18	61.15
Vermont	48.94	21.44	19.07	9.33	88.96
Virginia	38.06	10.28	10.28	3.91	100.00
Washington	51.01	92.25	12.65	6.45	13.72
West Virginia	30.59	47.27	44.87	13.73	94.94
Wisconsin	85.26	94.04	16.48	14.05	17.53
Wyoming	51.17	85.48	19.50	9.98	22.81

[1] Includes dually certified beds.

NOTE: SNF is skilled nursing facility.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Medicare/Medicaid Automated Certification System; data developed by The Urban Institute, Washington, D.C., 1988.

There is also considerable statewide variation in the number of Medicare-certified skilled nursing beds (Table 2). Nursing home beds can be certified by either Medicaid or Medicare or both. Although Medicaid certifies both SNF and ICF beds, Medicare certifies only SNF beds. In 1985, the percent of SNF beds certified for Medicare ranged from 3 percent in Mississippi to 90-100 percent in the 16 States that require that all SNFs be certified by Medicare. However, certification does not guarantee participation. In 1983, fewer than 400 SNFs provided 40 percent of total Medicare SNF days (Health Care Financing Administration, 1985). Because the SNF benefit covers only skilled nursing care, the composition of the market both in terms of level of care and Medicare certification can contribute to the relative access of Medicare patients to SNF beds.

There are several aspects of a nursing home market that need be discussed to understand how Medicare and Medicaid reimbursement systems affect access to care for Medicare SNF benefit patients. In 1983 and 1985, Medicare reimbursed nursing homes on the basis of average facility costs up to a ceiling of 112 percent of average rural and urban freestanding nursing homes, with higher ceilings for hospital-based facilities. In 1983, with the exception of six States with case-mix reimbursement systems, Medicaid also reimbursed nursing homes, either prospectively or retrospectively, based on average costs of the industry or the facility. These types of reimbursement arrangements create incentives for nursing homes to accept lighter care public patients for whom they receive a payment equal to average cost. One consequence is that heavy-care patients whose costs are higher than average back up in hospitals. In areas with low bed supply, excess demand (as evidenced by nursing home waiting lists and hospital back-up queues), has enabled nursing homes to selectively admit patients, creating access and quality problems. In general, Medicare patients have greater medical and rehabilitation needs than non-Medicare SNF patients (Shaughnessy et al., 1985). These greater needs are likely to be associated with greater resource consumption relative to other SNF patients and consequently, higher costs. Yet Medicare reimburses nursing homes based on average costs, potentially rendering Medicare patients unattractive in relation to Medicaid or private patients. For these reasons, nursing homes in markets dominated by Medicaid have little incentive to accept Medicare or heavy-care Medicaid patients.

Because Medicaid accounts for approximately 41 percent of all nursing home revenues, Medicare rates are, to a large extent, driven by the Medicaid reimbursement system. In States where Medicaid reimbursement policies have held down industry costs, Medicare rates will also be low. In these States, it is more likely that the additional cost of a Medicare patient will exceed the average cost for a facility and that nursing homes will not have the staff and services necessary to admit and adequately care for high-need Medicare patients. Alternatively, if Medicaid rates in a State have been generous historically, a high-cost, well-staffed industry may exist, producing higher Medicare rates and a greater capacity for caring for Medicare patients.

The cost-containment incentives of Medicaid reimbursement systems also affect access to SNFs for Medicare patients. The generosity, relative to the cost of the industry, of a Medicaid reimbursement system depends, in part, upon whether it is retrospective, prospective, or flat rate, and on the ceilings and efficiency incentives built into the system (retrospective having the least cost-containment effects and flat-rate having the greatest). As cost-containment incentives increase, the ability of nursing homes to shift the costs of heavy-care Medicare patients to the Medicaid program diminishes. Therefore, access should be greatest in areas with retrospective reimbursement arrangements. In States with stringent prospective or flat-rate systems, however, a small number of facilities may specialize in Medicare patients and serve a disproportionate share of Medicare patients, providing some access regardless of the ability to shift costs. At the same time, the more generous the reimbursement system is for Medicaid patients, the higher are the opportunity costs of admitting Medicare patients.

Other changes

The increased demand for skilled nursing care expected under PPS, coupled with the already existing disincentives to admit Medicare SNF patients, raises serious concerns about access for patients using the Medicare SNF benefit since the implementation of PPS. Two changes outside the nursing home industry should be noted here, because each could potentially affect access to nursing homes for Medicare patients. First, from 1983 through 1985, home health agencies increased by 40.7 percent, and home health visits covered by Medicare increased by 21.0 percent (Dubay, 1988). Therefore, it is conceivable that home health agencies were able to meet part of the increased demand for post-acute services expected under PPS. Second, discharges from hospitals decreased by 5.9 percent from 1983 to 1985 (based on data from the American Hospital Association [1983, 1985]). Although hospitals are clearly admitting fewer patients, some of this change is the result of a shifting of some procedures from inpatient to outpatient settings. In areas where this has occurred the most, the patients remaining in inpatient settings are likely to have more complications and longer lengths of stay, creating the strongest pressure for early discharge. In fact, work by Farley has shown that, while hospital case mix remained fairly constant from 1980 to 1983, it increased by 6.3 percent from 1983 to 1985 (Farley, 1988). So while the number of patients discharged from hospitals has decreased since the implementation of PPS, these patients are sicker on average, at admission and discharge, than those before PPS were, are being discharged earlier (as demonstrated by reductions in length of stay), and may cause greater demand for skilled nursing care.

Data and analysis file construction

A facility-based matched file was developed for this project. To obtain ownership characteristics, the sample was limited to those facilities that filed Medicare cost reports in 1983. Nursing homes are required to submit Medicare cost reports after the number of Medicare days

they provide reaches a certain threshold. Therefore, the providers included in this analysis are generally those who are the largest providers of the Medicare SNF benefit. Medicare Provider Analysis and Review (MEDPAR) files were used to obtain Medicare SNF benefit admissions in 1983 and 1985. These data were then appended to the cost reports to produce an admission file containing 3,130 facilities representing 68.6 and 54.4 percent of MEDPAR recorded admissions in 1983 and 1985, respectively. The facilities in the sample have more certified beds and are more likely to be nonprofit rather than proprietary than are all Medicare-certified facilities (Table 3).

Several variables were developed at the market level and added to the files. Market areas were constructed at the three-digit ZIP Code level for rural areas and at an approximation of metropolitan statistical areas (MSAs), based on three-digit ZIP Codes, for urban regions. Although not a perfect measure of nursing home market areas, this arrangement seems to be a good proxy, because three-digit ZIP Codes and the approximations of MSAs are based on existing transportation hubs and natural lines of transportation. Consequently, they reflect the local economic pattern (Rand McNally, 1985). Although a more appropriate measure of nursing home markets may have been health services areas (HSAs), because they were designed to represent health care delivery markets, HSA-level nursing home bed supply and population data are not available. Nursing home market data were developed from 1983 and 1985 Medicare/Medicaid Automated Certification System (MMACS) files, and hospital length of stay and discharge data at the market level from the American Hospital Association's Annual Survey in 1983 and 1985. Variables were then added to the admission file, resulting in a file containing 3,052 facilities with no missing values. Thirty-three facilities were then deleted because they were above the outlier criteria, resulting in an analysis file of 3,019 facilities. In Table 4, the number of facilities in the sample is shown, along with the number of Medicare-certified facilities, total Medicare SNF admissions, and SNF admissions in the sample for both 1983 and 1985. A list of variables and their means and standard deviations used in the regression can be found in Table 5.

Table 3

Selected characteristics of the study sample and all Medicare-certified skilled nursing facilities (SNFs)

Characteristic	Sample	Medicare-certified SNFs
	Percent	
Proprietary	66.3	*68.8
Nonprofit	25.2	*23.4
Government	8.5	7.8
Hospital-based	12.0	10.3
Freestanding	88.0	89.7
	Mean number	
Certified beds	131.8	*117.4

*Significantly different at the 0.05 level.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Medicare/Medicaid Automated Certification System, 1986; data developed by The Urban Institute, Washington, D.C., 1988.

Table 4

Numeric and percent changes in the characteristics of skilled nursing facilities (SNFs) in the study sample: United States, 1983 and 1985

Characteristics	1983	1985	Percent change
	Number		
Facilities in the sample	3,019	3,019	—
Medicare-certified SNFs	5,760	6,423	11.5
Medicare SNF admissions in sample	203,583	194,900	−4.3
Total Medicare SNF admissions	296,909	358,107	20.6
Sample admissions as a percent of total admissions	68.6	54.4	—
Sample as percent of certified SNFs	52.4	47.0	—

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Medicare/Medicaid Automated Certification System skilled nursing facility files; data developed by The Urban Institute, Washington, D.C., 1988.

Hypotheses

Multivariate analysis was used to explore the variation in changes in Medicare admissions from 1983 to 1985. In the introductory section, it was argued that access to skilled nursing facilities by Medicare patients is tied to the nursing home market in which the patient is seeking care. For example, differences in individual States' Medicaid reimbursement systems create incentives within statewide nursing home markets, affecting the willingness of nursing homes to accept Medicare hospital patients. In addition, the bed supply of the local nursing home market may affect access to care for Medicare patients. To disentangle these effects, ordinary least-squares methods were used to estimate a facility-level admission equation that controls for local bed supply, State Medicaid reimbursement systems, the demand and changes in demand for nursing home care, nursing home characteristics, and Medicare reimbursement policies.

The percent change in Medicare SNF benefit admissions for the facility from 1983 to 1985 was used as a dependent variable in the regression analysis.

Nursing home bed supply

There are several measures of nursing home bed supply that might affect access to care for Medicare patients. Certified beds per 1,000 persons 65 years of age or over in the market area in 1983 and the percent of the market certified as SNFs in 1985 were used to measure nursing home bed supply. Ideally, the percentage of the market certified as SNFs for 1983 would have been used, however, these data were not available. It is assumed that this variable is not endogenous, because the behavior of individual nursing homes has little effect on the percent of the market that is SNF-certified. When bed supply is

Table 5

Regression variables and means to predict the change in Medicare skilled nursing facility (SNF) benefit admissions from 1983 to 1985

Variable	Mean	Standard deviation	Expected sign
Percent change in Medicare SNF benefit admissions in the facility from 1983 through 1985	0.1067	0.7458	—
Certified beds per 1,000 elderly in the nursing home market area in 1983	50.3760	17.8701	+
SNF beds as a percent of total certified beds in the nursing home market area in 1985	0.6735	0.2636	–
Binary variable indicating nursing home is located in a State with flat-rate Medicaid nursing home reimbursement system	0.1948	0.3961	+
Binary variable indicating nursing home is located in a State with prospective Medicaid nursing home reimbursement system	0.5565	0.4969	+
Binary variable indicating Medicaid nursing home reimbursement system changed from retrospective to prospective from 1983 to 1985	0.0066	0.0811	+
Binary variable indicating nursing home is located in a State with a Medicaid nursing home reimbursement system that makes case-mix adjustments	0.1669	0.3730	–
Binary variable indicating nursing home is located in a State where the Medicare cost-to-ceiling ratio is less than 0.90	0.2594	0.4384	–
Binary variable indicating nursing home is located in a State where the Medicare cost-to-ceiling ratio is greater than 1.05	0.2299	0.4208	+
The percent change in Medicare discharges in the market area 1983-85	–0.0370	0.1339	?
The percent change in Medicare average hospital length of stay in the market area 1983-85	–0.1228	0.0767	–
Medicare SNF admissions per certified bed in the nursing home in 1983	0.7756	1.7091	–
Weighted median income for persons 75 years of age or over and in the nursing home market area	11,985.95	2,214.27	–
Weighted percent of the population 75 years of age or over in the nursing home market area	5.0556	1.3235	+
Binary variable indicating nursing home is a government facility	0.0851	0.2791	–
Binary variable indicating nursing home is a nonprofit facility	0.2521	0.4345	–
Binary variable indicating nursing home is owned by a proprietary chain	0.3902	0.4879	?
Binary variable indicating nursing home is hospital-based	0.1202	0.3253	+
Binary variable indicating nursing home is located in a State with a PPS hospital waiver	0.1895	0.3919	–

NOTE: PPS is prospective payment system.

SOURCE: Dubay, L.: The Urban Institute, Washington, D.C., 1988.

relatively high, nursing homes in the market area may be more willing to admit Medicare patients. However, in areas with a higher percent of SNF beds, these admissions would be spread over a greater number of homes. Consequently, certified beds per 1,000 elderly is expected to be positively associated with the percent change in admissions, and the percent of the market certified as SNF is expected to be negatively associated.

Medicaid and Medicare reimbursement systems

Both the overall cost structure of the nursing home industry and the generosity of the present Medicaid reimbursement system should affect access for Medicare SNF benefit patients. The ratio of average per diem SNF costs to the Medicare cost ceiling for Medicare-certified SNFs in a given area should reflect the degree to which an area has high or low costs. Ideally, this variable would have been measured at the nursing-home-market level. Because these data were not available, statewide mean cost-to-ceiling ratios were used for this analysis. Unfortunately, this measure is not sensitive to important intrastate variations. Three binary variables were constructed to represent low-, moderate-, and high-cost States. The two included variables equal "1" in States with mean cost-to-ceiling ratios below 0.90 and above 1.05, respectively, and the omitted variable is "1" if the cost-to-ceiling ratio is between 0.90 and 1.05. Admissions of Medicare beneficiaries using the SNF benefit are expected to increase the most in States with high cost-to-ceiling ratios relative to those with low ratios. Nursing homes in areas with higher cost-to-ceiling ratios are more likely to have the resources to care for Medicare patients, while at the same time such homes have Medicare payments greater than or equal to the marginal costs of Medicare patients, allowing them in the short run to increase their admissions of Medicare patients more than those homes in low-cost States.

Nursing homes in States with strong Medicaid cost-containment incentives will have low Medicaid rates relative to the cost of operating in that area. After controlling for the degree to which these rates affect the overall cost structure of the industry, using cost-to-ceiling ratios, it is likely that in the short run, Medicare patients will become more appealing to nursing homes in areas with tightly constrained Medicaid rates resulting in higher admissions compared with areas with less constrained rates. Thus we expect Medicaid prospective or flat-rate reimbursement systems to lead to greater increases in Medicare admissions relative to those in retrospective States, in the short run. The longer run effect is less

likely to be positive because of the effect of facility costs, case mix, and staffing.

Historically, States have grouped homes by level of care, e.g., skilled or intermediate, for purposes of reimbursement, and have established different rates or ceilings for each. It is widely held that this type of grouping is quite crude in its ability to recognize the difference in the costs of caring for patients with different levels of impairment. Case-mix related systems, which provide an incentive to nursing homes to admit and care for high-need patients, exist in several States. The presence of Medicaid case-mix reimbursement arrangements is expected to be negatively associated with admissions, because Medicaid reimbursement will pay for the increased care needs generated by heavy-care Medicaid patients, while Medicare simply pays an average cost.

Demand for this benefit

From 1983 through 1985, four States (Maryland, Massachusetts, New Jersey, and New York) had been granted waivers from the Medicare PPS system, exempting them from Medicare PPS in order to operate hospital payment systems that covered all payers. The simultaneous existence of these all-payer systems and Medicare's PPS provides a unique opportunity to examine the effect of PPS on growth in Medicare SNF admissions. Although incentives to discharge patients early exist in some of these States, the fact that these reimbursement systems did not change from 1983 through 1985 allows us to isolate the effect of the change in incentives brought about by PPS. A binary variable indicating whether a nursing home is located in one of the four waiver States was included to control for this factor and is expected to be negatively associated with the change in SNF admissions.

According to AHA (1983; 1985) survey data, Medicare discharges from short-stay general hospitals fell approximately 6 percent from 1983 to 1985. (This decrease is comparable to Health Care Financing Administration data for the same period.) Because Medicare patients are eligible for the SNF benefit only after 3 days of hospitalization, changes in discharges reflect changes in demand. The percent change in discharges was calculated at the market level. Although the decline in hospital discharges may be, in part, the result of a shifting of procedures from inpatient to outpatient settings, the types of diagnoses that are most likely to result in utilization of the SNF benefit (e.g., stroke, hip fractures, and pneumonia) are unlikely to be targeted for care in outpatient settings. Therefore, if these changes in demand reflect a shifting of procedures from inpatient to outpatient settings, a change in demand for the SNF benefit would not have been expected, nor, consequently, would a significant relationship between the percent change in discharges and changes in admissions. However, if these changes reflect a national decline in hospital utilization, with all other things remaining the same, we would expect a positive association.

Hospital lengths of stay also declined from 1983 to 1985; however, there is variability in the size of the reductions across market areas. Areas where length of stay is reduced the most are expected to face an increased demand for the use of the SNF benefit. The percent change in short-term medical and surgical hospital lengths of stay for Medicare patients from 1983 to 1985 was included in the model. As length of stay is forced down by hospital incentives to discharge patients sooner, demand for SNF care is expected to increase. Changes in admissions to SNFs are expected to be negatively associated with changes in hospital lengths of stay.

Both the median income for persons 75 years or over and the percent of the population 75 years or over in the nursing home market area are included in the model to account for demand differences between nursing home markets. Median income is expected to be negatively correlated with the percent change in admissions resulting from a greater ability to rely on private funds in areas with higher median incomes.

Because persons 75 years or over are those most likely to use the SNF benefit, areas with the largest percentages of such people are expected to face the greatest demand for care. Therefore, nursing homes in these markets are expected to experience greater increases in SNF benefit utilization.

Facility characteristics

Expectations about the effects of ownership were not strong. However, nonprofit nursing homes have been shown to have higher costs, on average, than proprietary facilities (Cohen and Dubay, 1990). Because Medicare reimbursement is based on average costs, Medicare rates may come closer to meeting the costs of having Medicare patients in nonprofit facilities. Therefore, it was expected that nonprofits would be positively associated with the percent change in Medicare SNF benefit admissions, while government facilities were expected to be negatively associated. Binary ownership variables representing government and nonprofit facilities were constructed; proprietary nursing homes were the omitted category. In addition, a variable was constructed to indicate facilities operated by a chain.

Given that the admission of a Medicare patient to a hospital's SNF unit may be more cost effective for a hospital than maintaining said patient in an acute care bed, and given that a hospital operating an SNF is likely to exert some control over admissions to its SNF, admissions to hospital-based nursing homes were expected to increase from 1983 to 1985. Furthermore, hospital-based homes are reimbursed at a higher rate for Medicare patients than are freestanding facilities. Therefore, hospital-based status was expected to be positively associated with the percent change in Medicare SNF admissions.

Medicare SNF admissions in 1983 per certified bed were included in the model to control for the initial level of admissions. It was expected to be negatively associated with the percent change in admissions.

Results

The total number of Medicare SNF benefit admissions to all the facilities in this sample fell by 4.3 percent from

1983 to 1985. Individual facilities in the sample experienced, on average, a 10.7-percent increase in SNF benefit admissions during this period. These results indicate that facilities that in 1983 admitted the fewest SNF benefit patients increased admissions the most, and those nursing homes that admitted the largest number of SNF benefit patients in 1983 increased admissions the least or possibly decreased admissions.

As mentioned earlier, SNF admissions increased nationally by 20.6 percent, yet the sample of nursing homes used in this study showed a much smaller increase. This may have been the result of two factors. First, in 1980, legislation was enacted whereby small rural hospitals with fewer than 50 inpatient beds were allowed to care for nursing home patients in acute care beds. These beds are referred to as "swing beds." If a patient occupying a swing bed qualifies for the SNF benefit, the hospital receives a payment, separate from the DRG payment, that is equal to the average Medicaid SNF rate in the State. By December 1983, 149 hospitals were participating in the swing-bed program; by July of 1985, the number had increased by 362 percent to 688 (Shaughnessy, 1985). According to the MEDPAR data, approximately 6 percent of all SNF benefit admissions were to swing beds in 1985, but only 1 percent of all admissions in 1983 were to swing beds. Effectively, the certification of swing beds has meant an increase not only in the supply of nursing home beds potentially available to SNF benefit patients but also in the utilization of the benefit. However, because our sample was limited to Medicare-certified nursing homes, admissions to swing beds were not represented. The absence of these admissions from the sample accounts, in part, for the differences in admissions between the sample and the Nation as a whole.

Second, the nursing homes in the sample are the largest providers of the SNF benefit, yet it appears that these providers have shown the smallest increase in the number of Medicare patients they are willing to admit. This implies either that the number of smaller providers of the SNF benefit (those not in the sample) is increasing as is the number of Medicare patients they will admit, or that the number of providers willing to admit Medicare SNF benefit patients has increased. In fact, the number of Medicare-certified providers has grown from 5,760 in 1983 to 6,423 in 1985, an 11.5-percent increase.

Given the decline in admissions within this sample, it is important to understand the circumstances under which facilities are likely to increase admissions of Medicare patients in the post-PPS environment. Regression analysis allows us to examine how different factors affect these changes and to determine what types of facilities have increased or decreased admissions. However, factors associated with increased access are not necessarily associated with the greatest access to SNF benefit patients. The regression results can be found in Table 6.

A 1-percent decrease in hospital average length of stay within a nursing home's market area is associated with a 0.64-percent increase in SNF admissions. This implies that facilities in markets with greater reductions in lengths of stay had greater increases in Medicare SNF admissions. Moreover, increases in hospital discharges at the market level are also negatively associated with Medicare SNF admissions. One explanation for this may be that areas where hospitals were most successful at shifting procedures from inpatient to outpatient settings in order to maximize reimbursement under PPS may be areas in which hospitals also effectively maximize PPS revenues through other vehicles. For example, these hospitals may more efficiently discharge Medicare patients eligible for the SNF benefit to nursing homes by operating their own SNFs, developing arrangements with outside SNFs for preferential treatment of their patients, maintaining strong discharge-planning units, or simply discharging to SNFs patients who previously would have remained in the hospital. Each of these factors could potentially increase utilization of the SNF benefit.

The Medicaid reimbursement variables largely conformed to the stated hypotheses. In market areas within States with flat-rate reimbursement, SNF benefit admissions grew 25 percent, relative to nursing homes located in States with retrospective reimbursement.[1] These findings indicate that, when nursing homes are faced with increased demand from the early discharge of hospital patients (who can enter nursing homes as Medicare, Medicaid, or private patients), Medicare patients are relatively more attractive to facilities in areas with tight Medicaid reimbursement policies. Furthermore, admissions to facilities located in States with Medicaid case-mix reimbursement systems grew by 27 percent less than those in States without case-mix reimbursement. This effect may be, in part, the result of the relative attractiveness of heavy-care Medicaid patients under case-mix reimbursement. Neither a change from retrospective to prospective reimbursement nor the Medicare policy variables were related to changes in admissions.

Admissions to hospital-based facilities grew by 14.3 percent, relative to freestanding facilities. This finding suggests that, under PPS, hospitals are utilizing their own SNFs to facilitate the discharge of Medicare patients. Other research has shown the benefit to hospitals of this type of arrangement. In a study of hospital back-ups of Medicare patients, Welch and Dubay (1989) found that hospitals were able to decrease the costs of hospital back-up by operating their own SNFs, and Holahan et al. (1989) found that hospitals operating SNFs had a lower percent of Medicare patients awaiting post-hospital placements. Surprisingly, nursing home ownership had no effect on admissions.

The number of certified beds per elderly was positively associated with changes in Medicare SNF benefit admissions; this finding was significant at the 0.10 level. Nursing homes in areas with tightly constrained bed supplies had the least growth, demonstrating a greater willingness to take Medicare patients when the market is less tight.

The existence of a PPS waiver did not have a significant effect on the change in admissions. It is likely that, after controlling for the change in hospital lengths of stay and discharges, PPS will have little effect on

[1]The interpretation of positive coefficients for binary variables in this model is difficult. Clearly, positive coefficients indicate a greater increase in access from 1983 to 1985, relative to the omitted category. For the purposes of this article, positive coefficients for binary variables are interpreted as growth in admissions.

Table 6

Regression results predicting the change in Medicare skilled nursing facility (SNF) benefit admissions from 1983 to 1985

Variable	Parameter estimate	Standard error
Dependent variable Percent change in Medicare SNF benefit admissions in the facility from 1983 through 1985		
Intercept	0.1202	0.1285
Certified beds per 1,000 elderly in the nursing home market area in 1983	0.0015	*0.0008
SNF beds as a percent of total certified beds in the nursing home market area in 1985	−0.0315	0.0640
Binary variable indicating nursing home is located in a State with a Medicaid nursing home reimbursement system that makes case-mix adjustments	−0.2710	***0.0422
Binary variable indicating nursing home is located in a State with prospective Medicaid nursing home reimbursement system	−0.0540	0.0371
Binary variable indicating nursing home is located in a State with flat-rate Medicaid nursing home reimbursement system	0.2548	***0.0586
Binary variable indicating Medicaid nursing home reimbursement system changed from retrospective to prospective from 1983 to 1985	0.2132	0.1767
Binary variable indicating nursing home is located in a State where the Medicare cost-to-ceiling ratio is less than 0.90	−0.0245	0.0398
Binary variable indicating nursing home is located in a State where the Medicare cost-to-ceiling ratio is greater than 1.05	0.0347	0.0529
Binary variable indicating nursing home is located in a State with a PPS hospital waiver	0.0791	0.0551
Binary variable indicating nursing home is hospital-based	0.1433	***0.0490
Binary variable indicating nursing home is owned by a proprietary chain	−0.0349	0.0300
Binary variable indicating nursing home is a nonprofit facility	−0.0276	0.0350
Binary variable indicating nursing home is a government facility	−0.0335	0.0544
Weighted median income for persons 75 or over in the nursing home market area	−0.000007	0.000007
Weighted percent of the population 75 or over in the nursing home market area	0.0096	0.0112
Medicare SNF admissions per certified bed in the nursing home in 1983	−0.0421	***0.0083
The percent change in Medicare discharges in the market area 1983-85	−0.2222	**0.1032
The percent change in Medicare average hospital length of stay in the market area 1983-85	−0.6412	***0.2157
N = 3019 F = 10.27 R-square = 0.0581		

*Significant at the 0.10 level.
**Significant at the 0.05 level.
***Significant at the 0.01 level.

NOTE: PPS is prospective payment system.

SOURCE: Dubay, L.: The Urban Institute, Washington, D.C., 1988.

changes in Medicare SNF benefit admissions. The percent of the population 75 years of age or over and the weighted median income in a market were also not significant.

Conclusions

From 1983 to 1985, Medicare-covered SNF benefit admissions increased nationally by 20.6 percent. Although it is obvious that more Medicare patients were admitted to nursing homes under the SNF benefit, the implications of this increase for access are not as straightforward. Ideally, data on hospital case mix, particularly for diagnoses most likely to result in the use of the SNF benefit, as well as on the change in the number of patients requiring but not receiving care through the SNF benefit, would enable the author to draw a firmer conclusion.

What is clear is that providers did respond in a systematic way to PPS-induced changes in demand. In areas where hospital length of stay was reduced the most, nursing homes had the greatest increases in admissions. This result shows that hospitals did successfully use the SNF benefit to reduce Medicare beneficiaries' hospital stays. The negative association between changes in hospital discharges and changes in nursing home admissions has some interesting implications. The findings suggest that the ability of hospitals in an area to shift some of their patients from inpatient to outpatient settings, as measured by changes in discharges, may be an indication of hospitals' ability to manage patient care in a manner that maximizes revenues under PPS. This efficiency appears to result in increased SNF benefit admissions, which may be the result of either greater success in the placement of patients in nursing home beds or the early discharge of patients, who would previously have remained in the hospital, to nursing homes.

Medicaid reimbursement policies were shown to be important determinants of changes in admissions. In States where Medicaid cost-containment incentives were greatest, Medicare SNF benefit patients experienced the greatest increases in admissions after the implementation

of PPS. Both the reimbursement policy and nursing home bed supply results illustrate how the impact of national policy changes may have different effects on access in different areas because of the variation in States' Medicaid policies and nursing home industries. Consequently, these factors should be taken into account when developing or implementing new programs designed to increase access or expand benefits.

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