
Variations in Medicare Access and Satisfaction by Health Status: 1991-93

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This article examines Medicare access, use, and satisfaction before and after implementation of the Medicare Fee Schedule (MFS), based on 3 years of data from the Medicare Current Beneficiary Survey (MCBS). Descriptive and multivariate analysis revealed that access has not deteriorated from 1991 to 1993; Medicare beneficiaries are reporting increased satisfaction—especially with the costs of care—as well as reporting fewer barriers to care. Moreover, the gaps in levels of satisfaction and frequency of perceived barriers have narrowed among those in better and poorer health, suggesting that the program has become more equitable over time.

INTRODUCTION

There can be no doubt that the Medicare program has improved access to care among the elderly and disabled, especially those with low income (Madans and Kleinman, 1980). However, significant gaps remain by gender, race, income, and supplemental insurance coverage (Health Care Financing Administration, 1994; Physician Payment Review Commission, 1995). For example, black beneficiaries are less likely to receive high technology or newer services, even after controlling for variations in morbidity (Udvarhelyi et al., 1992; Escarce et al., 1993).

With the implementation of the MFS in 1992, concerns were raised that disparities

in access might increase even further if certain populations, particularly those in greatest medical need, were unable to obtain necessary medical care. In particular, there were concerns that access might deteriorate for Medicare beneficiaries living in geographic areas in which physicians would receive fee reductions. Other concerns centered around restricted access to certain types of procedures which had fee reductions because they were considered overpriced.

This article examines trends in utilization, access, and satisfaction within the Medicare population from 1991 through 1993, that is, the year prior to, the year of, and the year after the introduction of the MFS. The longitudinal nature of the data provides an opportunity to determine whether access has changed with the introduction of the MFS. On one hand, with the increase of fees for primary care services, access may be improved. On the other hand, fee reductions imposed on urban physicians and certain overpriced procedures, could result in reduced access or shifts in the locus of care from office-based to hospital-based settings.

This article has two main objectives. The first is to examine the equitability of access within the Medicare population.¹ By this

¹Equitable access has been defined as "enough care to . . . facilitate a reasonable full and satisfying life. That level can be termed 'an adequate level of health care.'" (President's commission for the Study of Ethical problems in Medicine and Biomedical and Behavioral Research, 1983). This definition has two major implications. First, it does not generate an open-ended obligation to provide as much care as individuals want. Second, it allows some individuals to exceed an "adequate" level of care, which may be unequal but not inequitable by definition. An equitable distribution, therefore, is one in which illness is the major determinant of use, and such factors as income, insurance, race, provider availability, and individual health beliefs has a weaker association (Andersen, 1975).

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we mean the extent to which access is determined by "medical need" (as proxied by self-reported health status and level of dependency), as opposed to socioeconomic factors, such as race, income, and supplemental insurance coverage. To elucidate the relationship between health status and access, we derive predicted probabilities and quantities of use, holding constant other characteristics of the Medicare population, such as their race or ethnicity, income, Medicare supplemental insurance coverage, and geographic location. This enables us to determine whether access may be considered inequitable according to health status.

The second objective is to examine how access may have changed with the introduction of the MFS. In particular, we examine whether access has become more or less equitable over time. We employ a multivariate analytic framework that enables us to disentangle baseline differences in health care access from those brought about by changes in the Medicare payment system.

The analysis is based on the MCBS, a survey of Medicare beneficiaries sponsored by HCFA, that gathers detailed information on utilization, access, and satisfaction within the Medicare population. The MCBS is designed as a 4-year continuing sample with replacement, enabling longitudinal analysis of access impacts. It offers a number of advantages over Medicare claims data. First, claims data do not contain complete utilization data for enrollees in health maintenance organizations (HMOs). The MCBS contains self-reported information on access and utilization by all Medicare enrollees. Second, the MCBS gathers information on utilization of covered and non-covered services; claims would reflect covered services only. Third, the MCBS gathers detailed information on health status, supplemental insurance coverage, income, and other demographic characteristics that may explain variations in

utilization within the Medicare population. Fourth, the MCBS offers a variety of access and satisfaction indicators that can be tracked over time. Fifth, the survey data are matched to Medicare claims data for survey participants. Together, the survey and claims data provide a richer understanding of the determinants of access and utilization.

METHODS

Sample

This analysis is based on data from Rounds 1, 4, and 7 of the MCBS. Round 1 was conducted between September-December 1991, Round 4 was fielded 1 year later, and Round 7 yet another year later. The Round 1 sample included 11,735 interviews with individuals residing in the community; of these, 8,293 (71 percent) responded to Round 7 of the survey. This analysis includes non-institutionalized Medicare beneficiaries who participated in all three rounds of the survey. Medicare beneficiaries in Puerto Rico are excluded, as well as those whose Medicare coverage dates were unknown (based on HCFA's administrative data). Institutionalized Medicare beneficiaries are excluded because they were not administered the Access to Care Supplement during Rounds 1, 4, and 7 of the MCBS.

The sample is a cohort of continuously enrolled Medicare beneficiaries from 1991 through 1993 (excluding those who died in any of those 3 years. We also exclude those who died in 1994 because they would have been high-volume users in 1993 (Lubitz and Riley, 1993). In other words, we have omitted a source of bias from the 1993 results which would inflate the level of use in 1993, relative to that in 1991 (because 1992 deaths were omitted to create the panel). The sample size for this analysis is 7,651.

Construction of Utilization Measures

Measures of health care utilization are based on both self-reported survey data and administrative claims data. Probability of physician use is based on self reports; however, the data collection procedures differed for the 1991 versus 1992 and 1993 data. In Round 1 of the survey, respondents were asked whether they had a visit to an emergency room (ER), outpatient department (OPD), or physician during the previous year. The 1992 and 1993 data reflect the aggregation of responses from Rounds 2, 3, and 4 for 1992 (and Rounds 5, 6, and 7 for 1993), in which respondents were asked whether they had made a visit during the 4-month reference period for each round. The 1992 and 1993 data indicate consistently higher rates of utilization than the 1991 data. This may be a function of the shorter recall periods for the 1992 and 1993 data.

Barriers to care are measured by whether respondents reported they had a health problem in the previous year and did not receive care. The indicator excludes those who said they did not receive care because the problem was not serious.

Indicators of the level of outpatient use as well as rates of inpatient use were derived from Medicare claims, using 1991-93 National Claims History (NCH) data for individuals in the MCBS sample. Individuals who were enrolled in HMOs were excluded from the calculations. In addition, individuals with only Part A Medicare coverage were excluded from calculations of office visits and consultations, and individuals with only Part B Medicare coverage were excluded from the calculations of inpatient admission rates.

The NCH Physician/Supplier file was used to count the number of office visits and consultations. The number of services with Current Procedural Terminology, 4th Edition (CPT-4) procedure codes 90000-

90080 and 90600-90643, and office as the place of service, were aggregated for each individual.² Admissions to acute-care hospitals were identified through NCH inpatient hospital and skilled nursing facility records for the MCBS population.

Statistical Procedures

Because of the complex sample design (clustering, stratification, and unequal probabilities of selection), it is inappropriate to use statistical procedures that assume simple random sampling (Adler, 1994). Weighting and standard error adjustments have been made using SUDAAN software, developed by Shah et al. (1992).³ The data have been age-adjusted using the direct method of standardization. To control for aging of the population, all statistics are standardized according to the baseline (1991) age distribution. Tests of statistical significance were conducted both cross-sectionally and longitudinally.

RESULTS

Characteristics of the Non-Institutionalized Medicare Population

The non-institutionalized Medicare population was comprised primarily of elderly individuals (65 years of age or over), who constituted 92 percent of the enrollees in 1993 (Table 1). Women represented more than one-half (57.8 percent)

²Beginning in 1992, we also included the new CPT-4 codes for evaluation and management services: 99201-99215, 99241-99255, and 99261-99263.

³Weighted means and proportions and their associated standard errors were generated with PROC DESCRIPT. All means and proportions are age-adjusted using the direct method of standardization. T-tests were performed using the weighted means and adjusted standard errors. Cross tabulations were performed with PROC CROSSTAB. Chi-square tests are generated by the procedure. Logistic regression analysis was performed with PROC RLOGIST. Beta coefficients, adjusted standard errors, and adjusted p-values are produced. Weighted least squares regression was performed on the natural logarithm of visit counts using PROC REGRESS.

Table 1
Characteristics of the Non-Institutionalized Medicare Population: 1993¹

Characteristic	All Medicare Beneficiaries (n = 7,651)	Disabled (Under 65 Years of Age) (n = 1,314)	Elderly (65 Years of Age or Over) (n = 6,337)
Age		Percent	
Under 45 Years	2.8	33.5	—
45-64 Years	5.5	66.5	—
65-69 Years	15.7	—	17.1
70-74 Years	30.3	—	33.0
75-79 Years	22.1	—	24.1
80-84 Years	14.5	—	15.9
85 Years or Over	9.1	—	10.0
Gender			
Male	42.2	62.2	40.4
Female	57.8	37.8	59.6
Race/Ethnicity			
White	85.1	72.7	86.3
Black	9.0	18.7	8.1
Hispanic	4.1	6.5	3.9
Other	1.8	2.1	1.8
Educational Attainment			
1-6 Years	11.4	16.3	11.0
7-11 Years	30.8	32.0	30.6
12 Years	31.7	34.9	31.5
More Than 12 Years	26.1	16.8	26.9
Living Arrangement			
Living With Spouse	55.3	41.9	56.5
Living With Others	18.8	42.3	16.6
Living Alone	26.0	15.9	26.9
Living Children			
One or More	86.2	64.7	88.1
None	13.9	35.3	11.9
Income Status			
\$10,000 or Less	45.5	63.5	43.9
\$10,001 to \$20,000	31.0	22.0	31.8
\$20,001 to \$35,000	15.2	10.9	15.6
\$35,000 or More	8.3	3.7	8.8
Insurance Coverage			
Medicare Only	8.5	23.7	7.1
Medicare and Medicaid	8.3	28.7	6.4
Medicare and Private Coverage	72.9	32.6	76.5
Medicare and Other Coverage	10.4	15.0	9.9
Medicare Fee Schedule Payment Change, 1996			
More Than 10 Percent Reduction	19.7	15.2	20.1
5.01-10 Percent Reduction	28.1	28.2	28.1
2.01-5 Percent Reduction	11.8	11.1	11.8
2 Percent Reduction-			
2 Percent Increase	9.2	8.0	9.4
2.01- 5 Percent Increase	12.6	14.2	12.4
5.01-10 Percent Increase	9.7	11.0	9.6
More Than 10 Percent Increase	8.9	12.3	8.6

See footnote at end of table.

Table 1—Continued
Characteristics of the Non-Institutionalized Medicare Population: 1993¹

Characteristic	All Medicare Beneficiaries (n = 7,651)	Disabled (Under 65 Years of Age) (n = 1,314)	Elderly (65 Years of Age or Over) (n = 6,337)
Perceived Health Status		Percent	
Excellent	17.2	7.1	18.1
Very Good	26.2	12.4	27.4
Good	31.0	26.7	31.4
Fair	18.5	30.5	17.4
Poor	7.2	23.2	5.7
Level of Dependency			
None	62.7	33.6	65.4
IADLs only	6.9	19.1	5.7
1-2 ADLs	20.4	28.1	19.7
3-4 ADLs	6.6	12.8	6.1
5-6 ADLs	3.4	6.3	3.1
Census Division			
New England	3.6	2.7	3.7
Middle Atlantic	17.9	16.3	18.0
East North Central	17.8	16.9	17.8
West North Central	6.6	6.0	6.7
South Atlantic	19.8	24.1	19.4
East South Central	5.9	9.4	5.6
West South Central	9.9	8.5	10.0
Mountain	5.9	5.8	5.9
Pacific	12.7	10.3	12.9
Residence			
Urban	72.3	66.9	72.8
Rural	27.7	33.1	27.2

¹Includes non-institutionalized Medicare beneficiaries who participated in Rounds 1, 4, and 7 of the Medicare Current Beneficiary Survey and were alive as of January 1, 1995. The weighted population projection is 25.31 million Medicare beneficiaries, of which 2.44 million enrollees are under 65 years of age and 22.87 million enrollees are 65 years of age or over.

SOURCE: Health Care Financing Administration, Office of the Actuary: Medicare Current Beneficiary Survey Round 7.

of all non-institutionalized enrollees; men, however, represented a disproportionate share of the disabled. About 85 percent of the population was non-Hispanic white persons and the remaining 15 percent included individuals of other races and ethnicities. Minorities were disproportionately represented among the disabled (under 65 years of age). The disabled had lower educational attainment, perhaps reflecting the inclusion of dependent adults who were disabled in childhood (Lubitz and Pine, 1986). The elderly were more likely than the disabled to live with a spouse or live alone.

As might be expected, the disabled had a lower income distribution, with 86 percent having incomes of \$20,000 or less per year (compared with 76 percent of the elderly).

Similarly, the availability of supplemental insurance coverage varied, with 24 percent of the disabled but only 7 percent of the elderly having no supplemental coverage. In addition, the disabled were more than 4 times more likely than the elderly to have dual Medicaid eligibility. Three-fourths of the elderly, but only one-third of the disabled, had private medigap coverage.

Nearly 60 percent of the non-institutionalized Medicare population resided in areas that were expected to experience more than a 2-percent reduction in Medicare fees. About 12 percent were in areas expecting a small fee reduction (2.01-5 percent); one-fourth (28 percent) were in medium fee reduction areas (5.01-10 percent); and nearly 20 percent were in high

⁴Values for 1992 are not shown in Table 2 but are available from the authors upon request.

fee reduction areas (more than 10 percent). Of the remainder, 13 percent were in areas that were expected to have increases of 2.01-5 percent, and 19 percent were in areas that were expected to have increases greater than 5 percent, whereas 9 percent resided in areas expecting no more than a 2-percent change in either direction. The disabled were slightly more likely than the elderly to live in areas with expected increases in average Medicare fees.

The disabled were in poorer health than the elderly, as measured by both perceived health status and limitation of activity. For example, 23 percent of the disabled versus 6 percent of the elderly self-reported their general health status as "poor." Moreover, two-thirds of the disabled but only one-third of the elderly reported any limitation in the instrumental activities of daily living (IADLs) or activities of daily living (ADLs).

Finally, the geographic distribution was fairly similar between the two groups, although the disabled were slightly more likely to reside in rural areas.

Descriptive Analysis of Changes in Utilization, Access, and Satisfaction

Table 2 presents utilization, access, and satisfaction indicators for 1991 and 1993. The Table presents not only averages for the Medicare population as a whole, but also disaggregated for the disabled (under 65 years of age) and elderly (65 years of age or over) Medicare beneficiaries.

The likelihood of physician use increased significantly between 1991-92 and then again between 1992-93.⁴ For example, 86.1 percent of Medicare beneficiaries had a physician visit in 1991, 90.1 percent in 1992, and 91.2 percent in 1993. These increases were concentrated in the elderly, with smaller (non-significant) increases among the disabled.

The likelihood of ambulatory visits to hospital-based settings also increased sig-

nificantly during the 3-year period.⁵ In 1991, 27 percent of Medicare beneficiaries had a visit to an OPD, compared with 36 percent in 1993. By 1993, the elderly and disabled had similar probabilities of OPD use. The percent of Medicare beneficiaries with an ER visit increased from 17 percent to 21 percent, again reflecting increases within the elderly population. ER use among disabled beneficiaries was 41 percent higher than among the elderly, perhaps because of their complex medical needs or because of barriers to office-based care.

According to Medicare claims data for the survey sample, the average number of office visits per user increased significantly from 6.1 to 6.6 visits. Thus, both utilization rates and levels increased significantly between 1991-93. There were no significant differences in the average number of visits per elderly or disabled user. The rate of hospitalization increased between 1991-93 from 13.7 percent to 16.4 percent. All of the significant changes in inpatient admission rates were accounted for by the elderly.

The likelihood of a flu shot during the previous winter increased between 1991-93 from 40.4 percent to 50.2 percent. The rate of increase was higher among the elderly, presumably because they are at higher risk as a group (U.S. Preventive Services Task Force, 1989). Effective May 1, 1993, flu injections became reimbursed under Medicare, suggesting that the rate may increase even higher in the future.

Mammography screening among women decreased between 1991-92 (40 percent versus 34.3 percent) and was stable in 1993 (34.2 percent). However, this is likely a function of the reimbursement regulations and not necessarily an indicator of declining access. Effective January 1, 1991,

⁵Significant increases in ER and OPD use were exhibited in both the self-reported survey data and the claims data.

Table 2
Utilization, Access, and Satisfaction Indicators, by Age: 1991 and 1993

Indicator	All		Disabled (Under 65 Years of Age)		Elderly (65 Years of Age or Over)	
	1991	1993	1991	1993	1991	1993
Physician Use						
			Percent			
Physician Visit (Any Setting)	86.1	191.2	*85.9	*88.2	86.1	191.4
Physician Visit in Non-Hospital Setting	83.2	188.6	*81.0	*81.9	83.5	188.8
Outpatient Department Visit	26.6	135.5	*32.7	136.5	25.9	135.9
Emergency Room Visit	17.3	120.8	*27.8	*28.6	16.1	120.3
			Number of Visits			
Average Number of Visits per User	6.1	16.6	6.2	16.5	6.1	16.6
Hospital Use						
			Percent			
Percent With Hospitalization	13.7	116.4	*16.9	17.1	13.4	116.4
Preventive Use						
Percent With Flu Shot in Previous Winter	40.4	150.2	*24.1	*28.2	42.2	151.6
Percent of Women With Mammogram in Previous Year	40.0	134.2	*31.3	*28.4	41.0	134.5
Percent of Women With Pap Smear in Previous Year	49.3	131.6	53.7	*39.4	48.9	131.4
Barriers to Care						
Percent Reporting a Health Problem and Not Receiving Care	9.6	16.7	*22.6	*17.1	8.2	16.3
Satisfaction With Care						
Quality of Medical Care	94.6	196.2	*88.9	*92.6	95.2	196.3
Availability of Medical Care	88.4	194.3	*82.3	*88.5	89.1	194.8
Ease of Getting to Doctor	92.8	194.2	*84.1	*89.5	93.7	194.6
Costs of Medical Care	71.0	183.5	*61.6	*73.8	72.0	183.8

* Significantly different from those 65 years of age or over ($p < 0.05$).

† Significantly different between 1991-93 ($p < 0.05$).

NOTE: Data are age-adjusted using the direct method of standardization.

SOURCES: Health Care Financing Administration, Office of the Actuary: Medicare Current Beneficiary Survey Rounds 1 and 7; Health Care Financing Administration, Bureau of Data Management and Strategy: Medicare National Claims History file (MCBS Population Cohort).

screening mammography was added as a new Medicare Part B benefit. The frequency of screening is based on a woman's risk of developing breast cancer, as well as her age. For women 65 years of age or older, the procedure is limited to one per 23-month period. Thus women who were screened in 1991 would not be rescreened until 1993, unless they were at high risk.

Pap smears were reimbursed under Medicare as of July 1, 1990, and are covered at 3-year intervals, except for women at high risk of developing cervical cancer. This would explain in part the decrease in the percent of women receiving a Pap smear in 1991 (49 percent) versus 1992 (33 percent) and 1993 (32 percent).

Perceptions of barriers to care have decreased from 9.6 percent to 6.7 percent

of the non-institutionalized Medicare population, suggesting that overall concerns about access following the implementation of the MFS are unfounded. Nevertheless, the disabled reported barriers 3 times more often than the elderly (17 percent versus 6 percent in 1993).

Finally, satisfaction with care seems to have improved significantly along all four dimensions measured (quality, availability, ease, and costs).⁶ The most significant improvement is observed in the level of satisfaction with the costs of care. Perhaps reductions in Medicare copayments resulting from the fee schedule account for increased satisfaction with costs.

⁶Observed increases in satisfaction may be an artifact of the survey itself, whereby respondents' perceptions of the program are affected by the survey intervention, rather than because of actual changes in the program. This is known as the Hawthorne effect.

Additionally, reductions in balance billing and increases in physician participation rates may account for increased satisfaction with costs.⁷ The disabled, however, continued to be less satisfied with their medical care than the elderly. For example, 74 percent of the disabled, but 84 percent of the elderly, were satisfied with the costs of medical care in 1993.

Variations by Health Status

Health status generally is considered the strongest predictor of health care utilization (Andersen, 1975). This section presents utilization, access, and satisfaction patterns for two self-reported health status measures: general perceived health status and level of dependency (activity limitations).

Self-Reported General Health Status

Table 3 shows that the probability and volume of physician use increased as health status declined. For example, 86.6 percent of those with excellent or very good health made a physician visit in 1993, compared with 96.1 percent of those with fair or poor health. In addition, the average number of visits per user differed by 1 1/2 times (5.3 versus 8.4). Fourteen percent of those with excellent or very good health, but 33.6 percent of those with fair or poor health, made an ER visit. Similarly, 9.3 percent of those with excellent or very good health versus 28.2 percent of those with fair or poor health had a hospitalization in 1993.

Between 1991-93, the likelihood of a physician visit increased for all Medicare beneficiaries. The probabilities of ER and OPD use also increased significantly for all

groups. The average number of office visits per user increased significantly between 1991-93 for beneficiaries with excellent or very good and good health, but not for those with fair or poor health (although the absolute increase in use was the same across the three groups, averaging one-half visit per user). The likelihood of hospitalization increased between 1991-93 for beneficiaries with good, fair, or poor health, but not for those with excellent or very good health.

In general, the likelihood of preventive use increased between 1991-93, regardless of health status. By 1993, there were no health status differentials in the likelihood of having a flu shot. Similarly, by 1993, the likelihood of having a Pap smear or mammogram did not vary substantially, with one exception. Women in fair or poor health remained less likely to have a Pap smear than those in excellent or very good health.

Barriers to care and levels of satisfaction also varied by health status. About 1 in 27 enrollees with excellent or very good health reported a barrier in 1993, compared with about 1 in 8 of those with fair or poor health. All three groups reported barriers to care were lower in 1993 than in 1991.⁸

Satisfaction with quality, availability, convenience, and costs also declined with health status. In 1991, 78 percent of those with excellent or very good health, but only 61 percent of those with fair or poor health, were satisfied with the costs of medical care. However, this gap narrowed over the 2-year time period. Those with fair or poor health—high users of medical care—had a 15.7-percentage point increase in satisfaction between 1991-93 compared with an 8.3-percentage point increase for those with excellent or very good health.

⁷The maximum balance bill was reduced from 125 percent of the allowed charge in 1991 to 120 percent in 1992, and to 115 percent in 1993. In addition, the physician participation rate rose from 44.0 percent in 1991 to 48.3 percent in 1992, and to 55.5 percent in 1993.

⁸When rates were calculated for each of the five health status categories separately (data not shown), only beneficiaries in very good, good, and fair health reported a decrease in the extent of barriers to care between 1991-93.

Table 3

Utilization, Access, and Satisfaction Indicators, by Self-Reported Health Status: 1991 and 1993

Indicator	Excellent/ Very Good Health		Good Health		Fair/ Poor Health	
	1991	1993	1991	1993	1991	1993
Physician Use						
	Percent					
Physician Visit (Any Setting)	80.0	186.6	*88.3	*93.2	*91.8	*96.1
Physician Visit in Non-Hospital Setting	77.3	184.1	*85.8	*91.2	*88.3	*92.5
Outpatient Department Visit	21.5	129.4	*27.2	*36.3	*33.5	*45.5
Emergency Room Visit	12.0	114.0	*16.9	*20.2	*26.1	*33.6
	In Number of Visits					
Average Number of Visits per User	4.9	15.3	6.3	*6.8	*7.9	*8.4
Hospital Use						
	Percent					
Percent With Hospitalization	8.7	9.3	*13.6	*16.8	*21.6	*28.2
Preventive Use						
Percent With Flu Shot in Previous Winter	38.6	149.2	*41.5	149.7	40.3	151.5
Percent of Women With Mammogram in Previous Year	43.3	134.8	*35.5	33.4	*38.3	133.6
Percent of Women With Pap Smear in Previous Year	51.5	133.2	*46.3	132.0	*46.7	*28.4
Barriers to Care						
Percent Reporting a Health Problem and Not Receiving Care	4.8	13.7	*8.8	14.7	*17.5	*12.9
Satisfaction With Care						
Quality of Medical Care	96.6	197.6	96.1	97.1	*90.4	*92.9
Availability of Medical Care	89.9	195.0	89.8	194.9	*86.8	193.2
Ease of Getting to Doctor	95.4	96.2	*93.8	195.1	*87.8	*90.1
Costs of Medical Care	78.2	187.5	*70.8	*84.4	*60.6	*76.3

* Significantly different from those 65 years of age or over ($p > 0.05$).

† Significantly different between 1991-93 ($p > 0.05$).

NOTE: Data are age-adjusted using the direct method of standardization.

SOURCES: Health Care Financing Administration, Office of the Actuary: Medicare Current Beneficiary Survey Rounds 1 and 7; Health Care Financing Administration, Bureau of Data Management and Strategy: Medicare National Claims History file (MCBS Population Cohort).

Level of Dependency

An alternative health status measure is the level of dependency (activity limitations). Our measure of the level of dependency incorporates information on IADLs and ADLs. Individuals with no ADL limitations or IADLs only were grouped together. The next category included beneficiaries that have one or two ADL limitations. The third category included beneficiaries who have three or more ADLs. Individuals with no limitations or IADLs only were considered to have better health than those with ADL limitations. Barring difficulties in obtaining transportation to a provider, we expected beneficiaries with three or more ADLs to have higher utilization rates than those with no limitations or IADLs only.

Conversely, we expected beneficiaries with three or more ADLs to face barriers to care more often than those with no limitations or IADLs only.

Table 4 indicates that beneficiaries grouped by self-reported level of dependency had similar patterns of utilization, access, and satisfaction as when grouped by self-reported general health status. For example, for a given year, the likelihood of having a physician visit was higher for beneficiaries with ADLs than those with no ADL limitations or IADLs only. Moreover, the likelihood of having a physician visit increased as the number of ADLs increased. The likelihood of a visit generally increased for all three levels of dependency between 1991-93.

As expected, beneficiaries with higher

Table 4
Utilization, Access, and Satisfaction Indicators, by Level of Dependency: 1991 and 1993

Indicator	None/IADLs Only		1-2 ADLs		3 ADLs or More	
	1991	1993	1991	1993	1991	1993
Physician Use						
			Percent			
Physician Visit (Any Setting)	83.6	189.8	*89.6	*93.8	*95.3	*96.4
Physician Visit in Non-Hospital Setting	80.7	187.7	*86.5	*90.5	*92.4	*92.1
Outpatient Department Visit	24.1	132.9	*30.6	*41.3	*35.9	*47.3
Emergency Room Visit	14.1	116.9	*21.2	*28.3	*28.4	*36.7
			In Number of Visits			
Average Number of Visits per User	5.5	16.2	*7.0	*7.5	*7.8	*7.9
Hospital Use						
			Percent			
Percent With Hospitalization	10.6	113.0	*17.2	*20.3	*26.8	*35.6
Preventive Use						
Percent With Flu Shot in Previous Winter	40.3	149.6	40.8	150.9	39.1	151.5
Percent of Women With Mammogram in Previous Year	41.0	134.9	40.2	135.9	37.0	*27.1
Percent of Women With Pap Smear in Previous Year	49.8	132.0	49.4	133.4	46.7	*23.0
Barriers to Care						
Percent Reporting a Health Problem and Not Receiving Care	6.1	14.6	*13.7	*10.5	*21.7	*14.3
Satisfaction With Care						
Quality of Medical Care	96.1	197.1	*93.2	*94.0	*89.8	*94.0
Availability of Medical Care	90.2	195.7	*87.1	*91.6	*81.9	*91.6
Ease of Getting to Doctor	95.1	196.2	*90.1	*90.3	*84.5	*87.3
Costs of Medical Care	75.6	186.2	*65.3	*77.9	*54.4	*75.1

* Significantly different from those with None/IADLs Only ($p > 0.05$).

† Significantly different between 1991-93 ($p > 0.05$).

NOTE: Data are age-adjusted using the direct method of standardization. IADL is independent activity of daily living. ADL is activity of daily living.

SOURCES: Health Care Financing Administration, Office of the Actuary: Medicare Current Beneficiary Survey Rounds 1 and 7; Health Care Financing Administration, Bureau of Data Management and Strategy: Medicare National Claims History file (MCBS Population Cohort).

counts of ADLs were more likely to report facing barriers to care than those with no ADL limitations or IADLs only. Further, all three groups reported that the likelihood of facing barriers to care fell between 1991-93.

Satisfaction with care was higher for beneficiaries with no limitations or IADLs only, than for those with ADLs. Beneficiaries were generally more satisfied with care in 1993 than in 1991, regardless of the level of dependency.

MULTIVARIATE ANALYSIS

Multivariate Model

Logistic regressions were performed on the probability of a physician visit in any setting (any visit), ER visit, OPD visit, inpatient admission, and satisfaction with quali-

ty, cost, and availability of care. In addition, weighted least squares regression was performed on the number of visits per user.⁹

The unit of analysis is a person-year. Thus, data for each beneficiary were pooled for 1991, 1992, and 1993. The multivariate model includes predisposing, enabling, and need characteristics that are hypothesized to affect the probability or volume of use. Predisposing characteristics include age, gender, race or ethnicity, educational status, and living arrangement. Enabling characteristics include financial variables (income status, supplemental coverage), and physician availability (physicians per capita in the county of residence). Need characteristics include both perceived health status and the level of dependency. Two dummy variables

⁹The number of visits is expressed in logarithmic form, given the non-normal distribution.

representing 1992 and 1993 were constructed to capture time trends. To control for the implementation of the MFS, a variable representing the expected change in physician fees by area was interacted with the two time-period dummy variables (see the Technical Note for details). We also control for geographic location (Census division and urban-rural location).¹⁰

Multivariate Results

The main multivariate logistic and weighted least squares (WLS) regression results are presented in Table 5.¹¹ With only one exception (the likelihood of an inpatient stay in 1992), the likelihood of utilization, the number of office visits and consults, and satisfaction all increased during 1992 and 1993. Barriers to care also declined during 1992 and 1993. Most of the increase in the probability of utilization or in the degree of satisfaction ranged from 1 to 5 percentage points, although some were higher. These secular increases in utilization and improvements in satisfaction were not usually.

Utilization, access, and satisfaction almost always differed by self-reported health status, all other things being equal. For instance, the probability of having a physician visit, an OPD visit, or an ER visit increased as health status declined. However, satisfaction with quality, availability, and costs of care declined as health status declined. Those in poorer health more often reported barriers to care than beneficiaries with better health.

¹⁰As might be expected, the geographic variables were correlated with the Medicare payment change dummy variables. However, the results on the fee schedule variables are not altered with the inclusion of the geographic variables.

¹¹We were faced with the choice of controlling for the panel aspects of the MCBS data or its complex sampling design. Because of our concern of obtaining properly estimated standard errors, we opted to control for the complex sampling design through SUDAAN.

Utilization, access, and satisfaction also almost always differed by the level of dependency. The probability of having a physician visit, of having an OPD visit, or of having an ER visit increased as the level of dependency increased up to 4 ADLs, but not beyond 5-6 ADLs, because mobility may be limited at very high levels of inactivity. Satisfaction with quality, availability, and costs of care declined as the level of dependency increased, but only up to 4 ADLs. Satisfaction with quality of care, however, was lowest for those with the highest level of dependency (5-6 ADLs). Barriers to care were reported more often as the level of dependency increased, *ceteris paribus*.

Using the regression coefficients from Table 5 and the means of the independent variables, the top panel of Table 6 shows the predicted levels of utilization, access, and satisfaction by self-reported general health status in 1991-93. By evaluating the regressions at their means, we can control for between-group variations on such variables as income, supplemental insurance, race or ethnicity, and geographic location, and isolate the effects of health status. In 1991, for example, the probability of having a physician visit was 0.752 for those in excellent health versus 0.914 for those in poor health. The probability of a visit in 1993 rose to 0.830 and 0.945 for those in excellent and poor health, respectively. Comparing the predicted probabilities on the visit measures between those in excellent and poor health suggests that the gap narrowed slightly from 1991 to 1993 (that is, those in excellent health had a larger increase in the probability of a visit relative to those in poor health). Yet, those in poor health reported more significant increases in their level of satisfaction, offsetting any potential concerns about erosion of relative access. For example, the predicted probability of being satisfied with the cost of care

Table 5
Determinants of Access, Utilization, and Satisfaction in the Medicare Population

Independent Variable	Logistic Regression							WLS	
	Any Physician Visit	Outpatient Department Visit	Emergency Room Visit	Inpatient Stay	Satisfied With Quality	Satisfied With Availability	Satisfied With Costs	Number of Faced Barriers to Care	Office Visits/Consults per User (Log)
Year (1991 Omitted)									
1992	***0.3407 (0.0476)	***0.5090 (0.0444)	***0.2608 (0.0428)	0.0282 (0.0508)	***0.2817 (0.0844)	***0.4885 (0.1016)	***0.4701 (0.0479)	***-0.1972 (0.0592)	***0.0720 (0.0132)
1993	***0.4760 (0.0420)	***0.4839 (0.0455)	***0.2573 (0.0518)	***0.1770 (0.0497)	***0.2886 (0.0830)	***0.6899 (0.1030)	***0.7450 (0.0520)	***-0.3121 (0.0557)	***0.0525 (0.0146)
Medicare Payment Change	-0.0070 (0.0043)	0.0029 (0.0043)	0.0048 (0.0040)	0.0012 (0.0049)	0.0087 (0.0062)	**0.0236 (0.0098)	0.0045 (0.0044)	0.0026 (0.0082)	* -0.0035 (0.0018)
Interaction of Year * Medicare Payment Change (1991 Omitted)									
1992	0.0022 (0.0045)	0.0049 (0.0047)	-0.0012 (0.0043)	-0.0067 (0.0047)	-0.0027 (0.0078)	-0.0160 (0.0114)	** -0.0124 (0.0048)	-0.0030 (0.0079)	-0.0014 (0.0013)
1993	0.0012 (0.0044)	0.0051 (0.0050)	0.0048 (0.0046)	-0.0025 (0.0060)	-0.0050 (0.0077)	0.0047 (0.0100)	0.0017 (0.0053)	* -0.0138 (0.0087)	-0.0027 (0.0017)
Age	-0.0213 (0.0138)	***0.0409 (0.0097)	***-0.0547 (0.0089)	***-0.0314 (0.0118)	0.0149 (0.0214)	0.0206 (0.0196)	-0.0070 (0.0111)	***0.0537 (0.0150)	***0.0193 (0.0048)
Age-Squared	***0.0003 (0.0001)	***-0.0004 (0.0001)	***0.0004 (0.0001)	***0.0003 (0.0001)	-0.0001 (0.0002)	0.0000 (0.0002)	0.0001 (0.0001)	***-0.0007 (0.0001)	** -0.0001 (0.0000)
Gender (Female Omitted)									
Male	***-0.4746 (0.0517)	-0.0486 (0.0411)	*0.0839 (0.0492)	***0.1980 (0.0568)	-0.1204 (0.0908)	0.0895 (0.0936)	***0.1893 (0.0509)	***-0.3377 (0.0685)	** -0.0413 (0.0201)
Race/Ethnicity (White Omitted)									
Black	-0.2151 (0.1308)	*0.1317 (0.0774)	***0.2299 (0.0830)	***-0.2498 (0.0874)	*-0.2148 (0.1198)	0.1579 (0.1698)	*-0.1247 (0.0729)	*-0.2121 (0.1176)	0.0165 (0.0336)
Hispanic	-0.1873 (0.1621)	-0.0446 (0.1189)	-0.0849 (0.1146)	** -0.3023 (0.1198)	0.0017 (0.2107)	0.3387 (0.2276)	*0.1983 (0.1043)	0.0573 (0.1490)	0.0491 (0.0551)
Other	0.1622 (0.2201)	-0.0152 (0.1679)	0.0261 (0.1921)	*-0.3299 (0.1827)	-0.1128 (0.2565)	-0.0420 (0.2622)	0.0405 (0.1814)	0.1865 (0.2430)	0.0265 (0.0826)

See notes at the end of table.

Table 5—Continued
Determinants of Access, Utilization, and Satisfaction in the Medicare Population

Independent Variable	Logistic Regression							WLS	
	Any Physician Visit	Outpatient Department Visit	Emergency Room Visit	Inpatient Stay	Satisfied With Quality	Satisfied With Availability	Satisfied With Costs	Number of Faced Barriers to Care	Office Visits/Consults per User (Log)
Educational Status (More Than 12 Years Omitted)									
Less Than 12 Years	***-0.3899 (0.0722)	***-0.3271 (0.0511)	*0.0927 (0.0545)	-0.1102 (0.0722)	0.0874 (0.1085)	***0.4645 (0.1311)	0.0647 (0.0629)	0.0621 (0.1125)	-0.0321 (0.0283)
12 Years	***-0.3396 (0.0756)	***-0.2036 (0.0524)	-0.0747 (0.0640)	-0.0980 (0.0653)	-0.1121 (0.1185)	***0.3417 (0.1140)	*0.1131 (0.0650)	-0.1370 (0.1022)	-0.0228 (0.0272)
Living Arrangement (Living Alone Omitted)									
Living With Spouse	0.0255 (0.0871)	0.0037 (0.0536)	***-0.2120 (0.0557)	*-0.0899 (0.0523)	***0.3033 (0.1000)	-0.0610 (0.1088)	***-0.2164 (0.0566)	**0.1958 (0.0862)	***-0.0611 (0.0230)
Living With Other	**0.1993 (0.0807)	-0.0388 (0.0588)	-0.0449 (0.0611)	-0.0611 (0.0636)	0.1507 (0.1177)	0.0191 (0.1131)	-0.0390 (0.0622)	-0.0726 (0.0917)	***-0.1026 (0.0251)
Income Status (More Than \$35,000 Omitted)									
\$10,000 or Less	***-0.5839 (0.1144)	***-0.2988 (0.0844)	-0.0803 (0.0927)	-0.0509 (0.1081)	**0.4668 (0.2051)	-0.0226 (0.1462)	***-0.5311 (0.0912)	**0.3631 (0.1468)	0.0017 (0.0301)
\$10,001-\$20,000	***-0.4033 (0.1259)	-0.1212 (0.0771)	-0.0244 (0.0951)	0.0274 (0.1080)	-0.2582 (0.2000)	-0.0099 (0.1649)	**0.3804 (0.0739)	**0.3197 (0.1387)	0.0387 (0.0300)
\$20,001-\$35,000	-0.1625 (0.1304)	-0.0821 (0.0728)	0.0614 (0.0913)	-0.0269 (0.1040)	*-0.3975 (0.2157)	0.0784 (0.1625)	*-0.1561 (0.0851)	0.1363 (0.1401)	0.0310 (0.0307)
Supplemental Coverage (No Supplemental Coverage Omitted)									
Medicaid	***0.8275 (0.1075)	0.0603 (0.0834)	***0.3625 (0.0957)	***0.5574 (0.1125)	***0.3913 (0.1473)	0.1004 (0.1669)	***1.4665 (0.1221)	***-0.6045 (0.1271)	***0.3582 (0.0390)
Private	***1.0828 (0.0952)	0.0654 (0.0684)	0.1065 (0.0724)	***0.2992 (0.1011)	*0.2050 (0.1046)	0.0198 (0.1414)	***0.3750 (0.0742)	***-0.5677 (0.0893)	***0.2175 (0.0368)
Other or Combination	***1.0113 (0.1291)	**0.2266 (0.0964)	***0.4011 (0.0997)	***0.3979 (0.1193)	0.0377 (0.1497)	0.2347 (0.2014)	***0.5888 (0.1055)	***-0.5780 (0.1300)	***0.2783 (0.0449)
Regular Source of Care (No Regular Source Omitted)									
Physician's Office	NA	NA	NA	NA	NA	NA	NA	NA	***0.4126 (0.0369)
Other Place With Regular Physician	NA	NA	NA	NA	NA	NA	NA	NA	***0.2808 (0.0389)
Other Place Without Regular Physician	NA	NA	NA	NA	NA	NA	NA	NA	-0.0048

See notes at the end of table.

Table 5—Continued
Determinants of Access, Utilization, and Satisfaction in the Medicare Population

Independent Variable	Logistic Regression							WLS	
	Any Physician Visit	Outpatient Department Visit	Emergency Room Visit	Inpatient Stay	Satisfied With Quality	Satisfied With Availability	Satisfied With Costs	Number of Faced Barriers to Care	Office Visits/Consults per User (Log)
Physicians per Capita	-0.2700 (0.2718)	***0.6130 (0.1961)	**0.4044 (0.2017)	0.2225 (0.1689)	*0.6444 (0.3664)	**0.9764 (0.3801)	-0.3448 (0.2294)	0.2939 (0.2941)	0.0942 (0.1096)
Perceived Health Status (Excellent Health Status Omitted)									
Very Good	***0.4227 (0.0571)	***0.2721 (0.0549)	***0.3178 (0.0645)	***0.2664 (0.0798)	-0.0910 (0.1415)	-0.2247 (0.1480)	**0.1713 (0.0696)	**0.4162 (0.1309)	***0.1311 (0.0210)
Good	***0.9995 (0.0763)	***0.4821 (0.0565)	***0.5482 (0.0656)	***0.7064 (0.0757)	**0.2617 (0.1302)	-0.1636 (0.1598)	***0.4029 (0.0743)	***0.6929 (0.1390)	***0.3243 (0.0263)
Fair	***1.2363 (0.0785)	***0.7926 (0.0637)	***0.9056 (0.0728)	***0.9836 (0.0875)	***0.8584 (0.1454)	*0.2746 (0.1472)	***0.6864 (0.0913)	***1.2374 (0.1483)	***0.4988 (0.0277)
Poor	***1.2508 (0.1228)	***0.9956 (0.0920)	***1.2931 (0.0940)	***1.4532 (0.0950)	***1.3955 (0.1538)	***0.6002 (0.1688)	***1.0257 (0.0900)	***1.5406 (0.1490)	***0.6242 (0.0384)
Level of Dependency (No ADL/IADL Omitted)									
IADL Only	**0.2324 (0.0921)	0.0401 (0.0664)	***0.2177 (0.0718)	***0.3161 (0.0824)	***0.3517 (0.1121)	***0.4936 (0.1618)	-0.1134 (0.0841)	**0.2815 (0.1203)	***0.1014 (0.0288)
1-2 ADLs	***0.2872 (0.0624)	***0.1258 (0.0439)	***0.3086 (0.0505)	***0.3258 (0.0650)	***0.4183 (0.0875)	***0.4602 (0.0926)	***0.3797 (0.0551)	***0.6082 (0.0800)	***0.0814 (0.0194)
3-4 ADLs	***0.5874 (0.1161)	***0.1957 (0.0732)	***0.5022 (0.0718)	***0.6158 (0.0790)	***0.4968 (0.1626)	***0.6979 (0.1416)	***0.6101 (0.0705)	***0.8833 (0.1179)	**0.0705 (0.0289)
5-6 ADLs	0.1298 (0.1566)	0.1317 (0.0901)	***0.6897 (0.0944)	***0.9435 (0.0948)	***0.5290 (0.1705)	***0.6707 (0.1768)	***0.5783 (0.1129)	***0.9322 (0.1558)	-0.0475 (0.0363)
Geographic Location (Pacific Omitted)									
New England	0.0497 (0.1533)	0.0508 (0.1302)	0.2112 (0.1740)	-0.0501 (0.1113)	*0.8321 (0.4413)	-0.2502 (0.3624)	0.1504 (0.2726)	-0.0925 (0.1622)	***-0.1886 (0.0562)
Middle Atlantic	0.0953 (0.1154)	0.0285 (0.0930)	-0.0975 (0.0786)	***0.2469 (0.0787)	*0.3004 (0.1561)	**0.3702 (0.1603)	**0.2731 (0.1122)	0.0527 (0.1186)	-0.0159 (0.0372)
East North Central	-0.0125 (0.0943)	***0.2411 (0.0920)	-0.1046 (0.0781)	0.1134 (0.0824)	0.1435 (0.1690)	0.1767 (0.1652)	*0.1852 (0.1049)	-0.0594 (0.1316)	***-0.1609 (0.0387)
West North Central	0.1180 (0.1578)	-0.1896 (0.2796)	***0.4063 (0.0946)	-0.0720 (0.1728)	**0.6405 (0.2540)	0.0735 (0.3464)	0.0548 (0.1526)	***0.5463 (0.1386)	***0.2244 (0.0572)
South Atlantic	*0.2278 (0.1193)	-0.1503 (0.1001)	**0.2105 (0.0865)	-0.0181 (0.0870)	0.1370 (0.1575)	0.0821 (0.1426)	-0.1690 (0.1102)	*0.1901 (0.1128)	**0.1075 (0.0430)

See notes at the end of table.

Table 5—Continued
Determinants of Access, Utilization, and Satisfaction in the Medicare Population

Independent Variable	Logistic Regression							WLS	
	Any Physician Visit	Outpatient Department Visit	Emergency Room Visit	Inpatient Stay	Satisfied With Quality	Satisfied With Availability	Satisfied With Costs	Number of Faced Barriers to Care	Office Visits/Consults per User (Log)
East South Central	-0.1372 (0.1297)	** -0.2973 (0.1228)	* -0.2355 (0.1249)	0.2508 (0.1022)	0.1048 (0.2022)	**0.5383 (0.2112)	0.2153 (0.1415)	** -0.3037 (0.1327)	*** -0.1952 (0.0488)
West South Central	-0.1399 (0.1197)	* -0.1871 (0.1121)	* -0.1457 (0.0769)	0.0546 (0.0770)	0.1904 (0.1647)	-0.3282 (0.2138)	-0.1676 (0.1374)	0.0342 (0.1227)	*** -0.2265 (0.0444)
Mountain	-0.1801 (0.1503)	-0.0099 (0.1958)	0.1629 (0.1033)	-0.0879 (0.1995)	-0.0488 (0.2454)	0.2715 (0.1691)	-0.0912 (0.1531)	-0.0928 (0.1212)	* -0.1757 (0.0945)
Urban (Rural Omitted)	0.0128 (0.0936)	** -0.2642 (0.1047)	0.0797 (0.0753)	-0.0949 (0.0712)	-0.0614 (0.1191)	0.1627 (0.1575)	0.0853 (0.0886)	-0.1813 (0.1118)	-0.0024 (0.0268)
Intercept	**0.8835 (0.4224)	*** -2.2052 (0.3431)	-0.4744 (0.3380)	*** -2.5487 (0.4188)	***2.6612 (0.7487)	0.5995 (0.6743)	***1.2737 (0.4155)	*** -3.2626 (0.4279)	-0.2004 (0.1564)
(Pseudo) R-squared	0.0793	0.0425	0.0594	0.0536	0.0301	0.0347	0.0754	0.0801	0.1144
n	21,830	21,916	21,930	21,940	21,895	11,425	21,836	21,911	16,244
Minus log-likelihood	7,948	13,449	10,283	8,382	3,626	2,962	10,593	5,374	NA

*Significant at the 0.10 level.

**Significant at the 0.05 level.

***Significant at the 0.01 level.

NOTES: Standard errors are in parentheses. WLS is weighted least squares regression. NA is not applicable. IADL is independent activity of daily living. ADL is activity of daily living.

SOURCES: Health Care Financing Administration, Office of the Actuary: Medicare Current Beneficiary Survey, Rounds 1, 4, and 7; Health Care Financing Administration, Bureau of Data Management and Strategy: Medicare National Claims History file (MCBS Population Cohort).

increased by 15 percent between 1991-93 for beneficiaries with excellent health compared with an increase of 33 percent for those with poor health.

The bottom panel of Table 6 shows the predicted probabilities of utilization, access, and satisfaction by the level of dependency. The relationships are similar to those observed for general health status, whereby those who were very dependent had higher probabilities or levels of use (and lower levels of satisfaction) than those who were not dependent. For example, the predicted probability of an ER visit was higher for beneficiaries with 5-6 ADLs (0.28 in 1993) than for those with no ADL limitations (0.163). Similarly, the predicted probabilities for an ER visit increased between 1991-93 for all five levels of dependency categories. The predicted probability of being satisfied with the availability of care, for example, increased by 4 percent between 1991-93 for beneficiaries with no limitations, compared with an increase of 7.4 percent for those with 5-6 ADLs. As with general health status, the gap in use and satisfaction generally narrowed from 1991 to 1993 (albeit slightly) between the most and least dependent.

Age is often considered another proxy for health status. Age's relationship to health status within the Medicare population, however, takes on a non-linear relationship. Beneficiaries under 65 years of age who are eligible because of disability are less healthy than the young elderly; and as the elderly age, their health status declines. As shown in Table 5, the effect of age varied depending on the type of utilization. As age increased, the likelihood of an ER visit and inpatient stay decreased, but the rate of decline slowed with age. For OPD visits and the number of physician visits or consults, the relationship was of the opposite nature. Reported barriers to care increased with age, but the rate of decline slowed with age.

Men were less likely than women to have a physician visit and to have fewer physician visits and consults. Perhaps this explains why men were more likely than women to have an ER visit or inpatient stay. However, men were less likely than women to report facing barriers to care.

Relative to white beneficiaries, black beneficiaries were more likely to have an outpatient visit and an ER visit. Conversely, white beneficiaries were more likely to have an inpatient stay. Black beneficiaries were less satisfied with the quality and the cost of care, yet they were less likely than white beneficiaries to report barriers to care.

The effect of income on utilization, access, and satisfaction does not vary uniformly. Relative to beneficiaries with incomes greater than \$35,000 per year, those in the lowest income class (\$10,000 or less) were more likely to report barriers to care and were less likely: (1) to have any physician visit, (2) to have an outpatient visit, and (3) to be satisfied with the quality and cost of care. Those in the next lowest income group (\$10,000-\$20,000) had experiences similar to the lowest income group except there were no significant difference in the likelihood of outpatient visits and the satisfaction with the quality of care. Although the probability of utilization did not differ from the highest income group, those in the \$20,000-\$35,000 income group were less satisfied with the quality and costs of care.

The presence of supplementary health insurance beyond the standard Medicare Parts A and B coverage had an effect on the utilization, access, and satisfaction with care (except availability). Having any supplementary insurance increased the probability of having a physician visit or inpatient stay, increased the number of visits and consults, and generally increased satisfaction. Moreover, those with supplemental insurance were less likely to report a barrier to care.

Table 6
Predicted Probabilities and Utilization Levels, by Health Status

Indicator	Self-Reported Health Status									
	Excellent		Very Good		Good		Fair		Poor	
	1991	1993	1991	1993	1991	1993	1991	1993	1991	1993
Predicted Probabilities										
Any Physician Visit	0.752	0.830	0.823	0.881	0.892	0.930	0.913	0.944	0.914	0.945
Outpatient Department Visit	0.146	0.215	0.184	0.265	0.217	0.307	0.274	0.377	0.317	0.426
Emergency Room Visit	0.095	0.118	0.126	0.155	0.153	0.188	0.206	0.249	0.276	0.328
Inpatient Stay	0.056	0.066	0.072	0.085	0.107	0.126	0.136	0.160	0.202	0.233
Satisfied With Quality	0.963	0.973	0.960	0.970	0.953	0.965	0.917	0.938	0.866	0.898
Satisfied With Availability	0.923	0.960	0.906	0.950	0.911	0.953	0.901	0.948	0.869	0.929
Satisfied With Costs	0.754	0.865	0.720	0.844	0.672	0.811	0.606	0.763	0.523	0.697
Faced Barriers to Care	0.029	0.022	0.043	0.033	0.056	0.043	0.093	0.072	0.122	0.095
Predicted Utilization Level										
Office Visits per User	3.063	3.249	3.492	3.704	4.237	4.493	5.044	5.350	5.718	6.065
Indicator	Level of Dependency									
	None		IADLs Only		1-2 ADLs		3-4 ADLs		5-6 ADLs	
	1991	1993	1991	1993	1991	1993	1991	1993	1991	1993
Predicted Probabilities										
Any Physician Visit	0.848	0.900	0.876	0.919	0.882	0.923	0.910	0.942	0.864	0.911
Outpatient Department Visit	0.202	0.288	0.208	0.296	0.223	0.314	0.235	0.330	0.224	0.316
Emergency Room Visit	0.132	0.163	0.159	0.195	0.172	0.210	0.201	0.243	0.233	0.280
Inpatient Stay	0.082	0.097	0.109	0.128	0.110	0.129	0.141	0.165	0.186	0.216
Satisfied With Quality	0.955	0.967	0.938	0.953	0.934	0.950	0.929	0.946	0.927	0.945
Satisfied With Availability	0.923	0.960	0.880	0.935	0.884	0.937	0.857	0.922	0.860	0.924
Satisfied With Costs	0.710	0.837	0.687	0.821	0.627	0.779	0.571	0.736	0.579	0.743
Faced Barriers to Care	0.043	0.033	0.057	0.044	0.077	0.060	0.099	0.077	0.103	0.081
Predicted Utilization Level										
Office Visits per User	3.945	4.184	4.366	4.631	4.280	4.539	4.233	4.490	3.762	3.990

NOTE: Predicted values derived from regression coefficients presented in Table 5 and variable means. IADL is independent activity of daily living. ADL is activity of daily living.

SOURCES: Health Care Financing Administration, Office of the Actuary: Medicare Current Beneficiary Survey, Rounds 1, 4, and 7; Health Care Financing Administration, Bureau of Data Management and Strategy: Medicare National Claims History file (MCBS Population Cohort).

Higher physicians per capita did not affect the likelihood of any physician visit or the number of visits and consults. It did, however, increase the likelihood of an outpatient visit and lowered the likelihood of an ER visit. More physicians per capita were also associated with greater satisfaction with the quality and availability of care. There were no systematic effects on utilization, access, and satisfaction by census division or urbanicity.

Regular source of care was included among the independent variables only for the regression on the number of visits and consults. Regular source of care was included because the access literature suggests that having a regular source may improve continuity and coordination of care. That is, having a regular source may decrease unnecessary utilization of outpatient clinics and ERs and facilitate access to specialists. As expected, having a regular physician (regardless of place) increased the number of visits and consults with the strongest effect for those with a physician's private office as the usual source.¹²

DISCUSSION

The main objectives of this article were to examine the variations in Medicare access and satisfaction according to health status, as measured by (1) self-reported general health status, and (2) level of dependency. Clearly, we see that the level of health service use was strongly associated with the level of illness. Those who were sicker used more services. However, those who were sicker also expressed lower levels of satisfaction and more often reported barriers to care. An encouraging trend, however, is that those who were in poor health or who had a high level of dependency have shown improvements in their level of satisfaction and reductions in their

perceived barriers to care, thus narrowing the gap with those who were in excellent health or who had no activity limitations.

Indeed, the time trend was quite strong, such that beneficiaries in all health status categories had higher likelihoods of visiting providers in 1993 than in 1991. Similarly, regardless of health status, beneficiaries were more likely to report being satisfied with care in 1993 than in 1991. Again, regardless of health status, beneficiaries were less likely to report facing a barrier to care in 1993 than in 1991.

There was little or no impact by the MFS on the likelihood of a visit, the number of visits and consults, and the satisfaction with care. Indeed, the secular time trend effects more than offset any MFS effects. This study clearly shows that implementation of the MFS did not result in widespread deteriorations in access and satisfaction among those who would be particularly vulnerable, namely those in poorer health or with greater functional limitations. In general, the gap in utilization, access, and satisfaction between beneficiaries with the best health and those with the worst health narrowed between 1991-93. The gap in the probability of use narrowed primarily because beneficiaries with better health had larger increases in the probability of use between 1991-93 than those with poorer health. In contrast, the gap in satisfaction between 1991-93 narrowed because beneficiaries with poorer health had larger increases in satisfaction than those with better health. The gap in the number of office visits and consultations for users did not change.

The narrowing of the gap in utilization, which came primarily as a result of increases in use among those in better health, is an unexpected finding. The interpretation of this result is not straightforward, on one hand, those in excellent health could have had a deterioration in their "average"

¹²A regression that excluded regular source resulted in only minor changes in other regression coefficients.

health status, thus warranting greater physician contact. On the other hand, those with better health could have displayed a more elastic response to lower prices than those with poorer health. Another possible explanation is that fee increases for primary care services largely benefitted those in better health. More disaggregated analysis of the content and mix of services is required to better understand the changes in utilization according to health status.

As was expected, this analysis shows that other factors besides health status were associated with access and satisfaction. Low-income Medicare beneficiaries had a lower likelihood of a physician visit, lower levels of satisfaction (especially with the costs of care), and were more likely to report barriers to care. Interestingly, income was not a significant determinant of ER use, inpatient use, or the number of visits per user. Nor did satisfaction with the availability of care vary by income. Thus, low income seems to serve primarily as a financial barrier to entering the system.

Having supplemental insurance coverage—whether public or private—seems to enhance access and result generally in higher levels of satisfaction and fewer perceived barriers to care. Those with no supplemental coverage had a lower probability of any physician visit during the year as well as a lower likelihood of an inpatient stay. One possible interpretation is that this variable is proxying for health status to some extent (that is, those with no supplemental coverage are healthier than those with supplemental coverage and hence have less “need” for care). However, those with no supplemental insurance had a significantly higher likelihood of experiencing unmet need.

We have found little if any evidence of racial or ethnic differences in access and use. Black Medicare beneficiaries had higher rates of ER use (*ceteris paribus*);

however, this was not accompanied by higher rates of dissatisfaction with the availability of care, nor more frequent reports of barriers to care (in fact, they were slightly less likely than white beneficiaries to report barriers).

A strength of this article has been the use of multiple measures of access, satisfaction, and utilization. On the other hand, our “aggregate measures” of access may mask differentials in access to specific procedures, for example, “referral sensitive surgeries” (Institute of Medicine, 1993). Other caveats should be noted as well. This analysis is based on data for three years—the year before, the first year, and 1 year after MFS implementation. Physician payment changes may impact utilization differently over time, and the long-run impacts are unknown at this point. There may be other confounding factors in the short run which we could not fully capture. Additionally, the measure of expected Medicare payment change is exactly that—expected and not actual. Measurement error on this key variable may result in measurement error in the regression analysis.

In conclusion, with the implementation of the MFS, access, use, and satisfaction have not deteriorated during the 3-year period included in this study. Indeed, we have shown that Medicare beneficiaries are reporting increased satisfaction with many aspects of their health care—especially the costs of care—as well as reporting fewer barriers to care in the post-MFS period. Moreover, the gaps in levels of satisfaction and frequency of perceived barriers have narrowed among those in better and poorer health, suggesting that the program has become “more equitable” over time.

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TECHNICAL NOTE

Medicare Fee Schedule Impacts

This analysis uses HCFA's measure of the expected impact of the MFS on physician fees. These were constructed at the MSA level for urban areas and at the State level for rural areas. Two measures were available—for the first year of the phase-in (1992) and for the fully phased fee schedule (1996). For the purpose of this analysis, we use the measure for the fully phased fee schedule. This measure has a number of limitations: (1) it is a general measure of the expected impacts, rather than procedure- or specialty-specific; (2) it reflects expected rather than actual impacts; and (3) the geographic unit is based on where the beneficiary lives and not necessarily where the provider practices. Despite these caveats, it is the only measure currently available to researchers for measuring MFS impacts.

Negative values of HCFA's measure of the expected impact of the MFS (EIMFS) indicate that, on average, physician fees in an area are expected to be lower than they would have been in the absence of the MFS. Conversely, positive values of EIMFS indicate that, on average, physician fees to an area are expected to be higher than they would have been in the absence of the MFS. Entering EIMFS by itself into a regression would not capture any dynamic (e.g., transitory or lagged) effects of the MFS on utilization, access, and satisfaction. Thus, to capture the dynamic effects of the MFS, EIMFS is interacted with the 2-year dummy variables. This specification

allows the following interpretation of the 2-year dummy variables, EIMFS, and the interaction between the year dummies and the EIMFS.

- The 2-year dummy variables capture the secular trend between 1991-93.
- EIMFS captures the cross-sectional differences across geographic areas during the baseline period (1991).
- The interaction terms between the yearly trend and EIMFS indicate whether the MFS has an impact on utilization and satisfaction, above and beyond the secular trend and independent of the pre-existing differences across areas receiving differential payment changes.

The interaction terms are, thus, the primary variables of interest for isolating the impact of the MFS on utilization, access, and satisfaction. MFS impacts were examined more comprehensively in a related study (Rosenbach, Adamache, and Khandker, 1995).

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