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## The Impact of Medicare and Medicaid on Access to Medical Care

Medicare and Medicaid, initiated in 1966 under the Johnson Administration, were in the forefront of the Great Society programs designed to help the poor and disadvantaged enjoy the fruits of a growing and prosperous economy. They received the largest and most rapidly growing share of budgetary resources of all social programs enacted during that period. In fiscal 1975, governmental expenditures under the federal-state Medicaid program are expected to be \$13 billion, providing medical care services for 25 million low-income people; Medicare is expected to spend \$15 billion on medical care services for 24 million elderly and disabled people.

Concern with the high cost of these programs has almost eclipsed the substantial achievements of the programs in increasing access to medical care services by many persons who formerly had to seek charity care or do without much-needed care. To gain better

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perspective on the benefits of these programs, this paper will address three major questions:

1. What impact have Medicare and Medicaid had on use of medical services by the poor and elderly, particularly in relation to other persons with similar health problems?
2. What factors account for uneven utilization of medical services by persons eligible for Medicaid?
3. To what extent do socioeconomic and demographic characteristics continue to affect the utilization of health services by the elderly?

## 1. IMPACT OF MEDICARE AND MEDICAID ON USE OF MEDICAL SERVICES

Recent evidence indicates that Medicare and Medicaid have led to marked improvements in contact with the medical system by poor persons and greatly increased the access of the elderly of all income classes to institutional services such as hospital and nursing home care. Andersen *et al.* (1972) report that in 1970, 65 per cent of low-income persons saw a physician during the year, compared with 56 per cent in 1963.<sup>1</sup> They also point out that poor pregnant women began increasingly to visit physicians earlier—71 percent of low-income women received medical attention in the first trimester of pregnancy in 1970 as against 58 per cent in 1963. Results from National Health Surveys show that, while 11 out of every 100 elderly persons were hospitalized in 1962, 16 were hospitalized in 1968.<sup>2</sup>

Furthermore, these changes in use of services were not part of an overall pattern. Utilization by higher-income persons remained stable over the period or declined slightly. Therefore, the poor made striking gains in use of services relative to higher-income groups. As shown in Table 1, in fiscal 1964 high-income persons paid 19 per cent more visits to a physician than low-income persons; by 1971, more low-income persons than high-income persons were using such services.

There also were significant redistributions in institutional care. Pettingill (1972) reports that although days of hospital care for the aged increased at an annual rate of between 6 and 13 per cent in the first three years following the inception of Medicare, days of care by persons under age 65 declined steadily.<sup>3</sup> The share of hospital days spent by the elderly increased by six percentage points over

**TABLE 1 Physician Visits per Capita, by Age and Family-Income Group, Fiscal Year 1964, Calendar Year 1971**

Age and Income Group <sup>a</sup>	1964	1971
All ages	4.5	5.0
Low income	4.3	5.6
Middle income	4.5	4.7
High income	5.1	4.9
Ratio, high income to low income	1.19	.88
Under 15 years		
Low income	2.7	4.0
Middle income	2.8	4.1
High income	4.5	4.8
Ratio, high income to low income	1.67	1.20
15-64 years		
Low income	4.4	5.8
Middle income	4.7	4.9
High income	4.9	4.8
Ratio, high income to low income	1.11	.83
65 years and older		
Low income	6.3	6.7
Middle income	7.0	6.4
High income	7.3	7.5
Ratio, high income to low income	1.16	1.12

SOURCES: U.S. Department of Health, Education and Welfare, National Center for Health Statistics, *Volume of Physician Visits by Place of Visit and Type of Service*, United States, July 1963-June 1964, Series 10, No. 18, (1965) and unpublished tabulations for 1971.

<sup>a</sup> Low income is defined as under \$4,000 in 1964 and under \$5,000 in 1971. Middle income is defined as \$4,000-\$6,999 in 1964 and \$5,000-\$10,000 in 1971. High income is defined as \$7,000 and above in 1964 and \$10,000 and above in 1971.

this period. In later years, hospital care of younger age groups began to increase relatively faster, as might be expected as the adjustment to Medicare ended and private insurance coverage of the under age 65 group continued to expand.<sup>4</sup> In addition, Loewenstein has found that Medicare induced a marked increase in the use of extended care facilities by the elderly.<sup>5</sup> Administrative cutbacks in this benefit in 1969 later moderated these gains.

Although these data and studies give solid support to the contention that Medicare and Medicaid have been largely successful in achieving their goal of ensuring access to medical care services for covered persons, they are subject to several qualifications.

First, Medicaid does not provide medical care services for all poor persons, but only those falling within certain welfare categories, such as single-parent families, and the blind, disabled, and aged. In 1974, an estimated 9 million persons with incomes below the poverty level, or about 35 per cent of the poor, were ineligible for Medicaid. Therefore, gains in use of medical services may not be widely shared by all poor persons.

Second, greater equality in utilization of medical services among income classes may be misleading because poor persons generally have more severe health problems than higher-income persons, and persons receiving welfare are less healthy as a whole than other poor persons. Comparisons among persons of similar health status can therefore be expected to indicate much wider differences in use of services among income classes.

Third, even if utilization of services is adjusted for health needs of the population, the poor may still not participate in "mainstream" medicine, receiving care of comparable quality, convenience, and style to that received by more fortunate persons. Poor persons may continue to be treated in crowded and dreary clinics, enduring long waits and receiving few amenities. Care may be discontinuous, episodic, fragmented, and impersonal if patients see different physicians or health personnel at each visit. Any given level of care, as measured by physician visits or days of care in a hospital, may be less effective in terms of meeting the patient's health needs than the same level of care received by higher-income patients in more amenable settings.

Finally, even if Medicare and Medicaid have assisted poor and elderly persons as a whole in receiving care comparable to that received by others, racial discrimination or variations in the availability of medical resources may lead to a very uneven distribution of benefits among eligible persons.

To sort out the simultaneous influence of health status, income, coverage under public programs, sociodemographic factors, and availability of medical resources requires sophisticated techniques of analysis. Before turning to such an analysis, however, it is instructive to review briefly evidence on utilization rates and types of care received by persons of various income classes, once some adjustment is made for welfare eligibility and health status.

## **Welfare Status and Use of Medical Services**

Although the poor as a whole have made marked gains in the use of medical services relative to higher-income groups, not all poor persons have received benefits from the Medicaid program. For those excluded from coverage, utilization of physician services lags well behind other poor persons and higher-income persons.

Data from the 1969 Health Interview Survey (HIS) of the National Center for Health Statistics permit some comparison of medical care utilization of poor persons receiving welfare and other poor persons. This categorization provides a rough indication of coverage under Medicaid, but several problems should be kept in mind. At the beginning of 1969, eleven states did not have Medicaid programs (although all but two states had programs in effect at the beginning of 1970), so that some persons, although eligible for public assistance, were not receiving medical assistance at that time. Furthermore, some states covered medically needy persons under Medicaid as well as public assistance recipients, so that some of the utilization of services by poor persons not on welfare may be influenced by the Medicaid program. Nevertheless, examining these two groups of poor persons provides some rough evidence of utilization of medical services by persons eligible for Medicaid relative to other poor persons.

As shown in Table 2, data from the 1969 HIS indicate that persons with incomes below \$5,000 who were not on public assistance averaged 4.7 physician visits compared with 6.6 visits for those poor on welfare. The physician visit rate for poor persons not on welfare was actually less than that of persons with incomes above \$15,000—even before adjusting for the greater health problems of the poor. Thus, the conclusion that the poor now use services more than do higher-income persons is at least partially misleading because it does not distinguish among those eligible for Medicaid and other poor persons.

## **Health Status and Use of Services by Income Classes**

More important, however, is the fact that comparing use of medical services among income classes is misleading in any attempt to determine whether the poor now have equal access to medical care with higher-income persons inasmuch as such a comparison does not adjust for the more serious health problems of the poor.

**TABLE 2 Physician Visits by Family Income, Public Assistance Status, and Age Group, 1969<sup>a</sup>**

	All Persons		Under 17 Years		Age 17-44		Age 45-64		Age 65 and over	
	Unadjusted Status	Adjusted for Health Status	Unadjusted Status	Adjusted for Health Status	Unadjusted Status	Adjusted for Health Status	Unadjusted Status	Adjusted for Health Status	Unadjusted Status	Adjusted for Health Status
All family incomes	4.6	4.6	3.8	3.8	4.4	4.4	4.9	4.9	6.6	6.6
Under \$5,000	4.9	3.7	3.0	3.0	4.8	4.8	5.8	5.8	6.5	6.1
Aid	6.6	4.5	3.7	3.5	8.9	8.9	11.2	11.2	9.0	6.4
No aid	4.7	3.6	2.8	3.0	4.5	4.5	5.4	5.4	6.3	6.1
\$5,000-9,999	4.2	4.6	3.6	3.9	4.3	4.3	4.8	4.8	6.1	6.8
\$10,000-14,999	4.4	4.9	4.2	4.2	4.4	4.4	4.5	4.5	6.8	7.5
\$15,000 and over	4.8	5.2	4.6	4.5	4.4	4.4	4.7	4.7	9.6	10.4
Ratio, aid to no aid, income under \$5,000	1.40	1.25	1.34	1.19	2.00	2.00	2.08	2.08	1.43	1.05
Ratio, income over \$15,000 to no aid, income under \$5,000	1.02	1.44	1.67	1.53	1.00	1.00	.87	.87	1.52	1.72

SOURCE: Estimated from the 1969 Health Interview Survey, National Center for Health Statistics. See Appendix 2 for regressions.

<sup>a</sup>Excluding individuals reporting family income unknown, those under 17 for whom head of household education was unknown, and those 17 and older for whom individual education was unknown.

There are many dimensions of ill health and the "medical need" for care, ranging from discomfort, pain, and debilitating conditions to potentially fatal medical problems. Holding constant for health status in an examination of utilization patterns among income classes is difficult, both because data on these dimensions of health are limited and because the range and intensity of these conditions differ markedly so there is little consensus on which measures are most analytically appropriate.

A crude adjustment, however, can be made using data supplied in the 1969 HIS. The survey includes data on several dimensions of health status, including chronic conditions and limitation of activity that may be considered indicators of a "health stock" and number of days during the year in which activity is restricted, which reflects the incidence of more episodic illness. Obviously, even these measures of health status can vary markedly since two illnesses of the same duration may reflect quite different needs for medical care. Furthermore, some needs for medical care, such as maternity care, may be accompanied by very little restriction of activity. In spite of the limitations of these measures, however, they do permit us to gain some insight into the effect of substantial differences in need for services among income classes.

Table 2 indicates physician visit rates for persons of different income classes if they were to experience the average level of chronic conditions and restricted activity days of persons in their broad age group. These results were derived from ordinary least squares regressions reported in Appendix 2, Table 1.<sup>6</sup>

Adjustment for health status leads to a striking change in utilization patterns. Instead of following a U-shaped pattern with low-income persons using services more than middle-income persons, utilization increases uniformly with income. Poor persons eligible for welfare use physician services about the same as middle-income persons with comparable health problems, whereas those low-income persons not on public assistance lag substantially behind other poor and middle-income persons in use of services. Children in families with incomes above \$15,000 visit physicians 53 per cent more frequently than poor children not on welfare, whereas high-income elderly persons see physicians more than 72 per cent more often than poor elderly persons not on welfare.

## **Quality and Convenience of Medical Care**

Although the poor, particularly those on welfare, have made marked gains in use of medical services relative to other income



groups, there is evidence that the poor do not obtain care in the same setting, from the same kind of physicians, and with the same ease and convenience as higher-income persons. Instead, the poor—whether on welfare or not—are much more likely to receive care from general practitioners than from specialists, in a hospital outpatient department rather than in a physician's office, and after traveling long distances and waiting substantially longer for care.

As shown in Table 3, the poor receive 70 per cent of their care from general practitioners, compared with 41 per cent for persons with family incomes over \$15,000. Few poor children receive care from pediatricians. Higher-income women of child-bearing age are also twice as likely as are poor women to be cared for by specialists. The proportion of care received from specialists does not vary appreciably among the poor on welfare and other poor.

Some differences among income classes also exist in the place in which care is obtained. Persons with family incomes above \$15,000 receive 87 per cent of their physician care in private settings (office, home, or telephone call to private physician) compared with only 80 per cent for those with family incomes below \$5,000. The poor on welfare are even less likely to receive care in private settings—only 75 per cent.

It is hazardous to draw inferences about the quality and adequacy of care from these differences in the extent of specialist care and differences in the setting of treatment. It may well be, contrary to common belief, that specialist care for children and pregnant women is no more efficacious than care from a general practitioner;

**TABLE 3 Percentage of Physician Visits to Selected Kinds of Physicians, by Income, 1969**

	General Practitioner (all ages)	Pediatrician (under 17 years)	Obstetrician/ Gynecologist (women 17-44 years)
All persons	59	32	21
Under \$5,000	70	18	13
Aid	73	21	6
No aid	70	17	14
\$5,000-9,999	61	30	23
\$10,000-14,999	51	40	24
\$15,000 and over	41	39	23

SOURCE: Calculated from the 1969 Health Interview Survey, National Center for Health Statistics.

and care in a hospital outpatient department, incorporating the best of recent medical research, may be better than care from a private physician long since departed from medical school.

Nevertheless, it is fair to conclude that the poor do not receive the same kind of medical care received by most middle-income citizens. One manifestation of the pursuit of a desirable level of care and differences in the place in which care is obtained is the less convenient care received by low-income persons. The poor spend 50 per cent more time traveling and waiting to see a physician than do higher-income persons. Combined waiting and traveling time is also higher for the poor on welfare, a total of 81 minutes per visit compared with 66 minutes for other poor persons (and 43 minutes for those with family incomes above \$15,000). In addition to the higher prices for medical care, the poor also face substantial burdens on the nonmonetary resources of their households in seeking medical care. Furthermore, although welfare recipients for the most part pay no monetary price under Medicaid for health services, they have assumed higher nonmonetary costs.

## **2. DISTRIBUTION OF MEDICAID BENEFITS**

Although it is clear that the poor have made striking gains relative to higher-income groups in using medical services, it is also true that not all the poor have shared equally in these gains. Persons not receiving public assistance lag substantially behind Medicaid recipients in use of services. But even for those covered by Medicaid, program data suggest that benefits are very unevenly distributed. In this section we explore in greater detail the sources of variations in use of services among public assistance recipients and their experience relative to other low-income persons.

Medicaid is a federal-state program in which states have considerable leeway to determine eligibility for benefits, range of medical services covered, and limits on benefits for any given type of service. About half the states provide coverage for medically needy persons who, although not sufficiently poor to qualify for public assistance, are unable to meet the costs of medical bills.<sup>7</sup> Although all states are required to provide certain basic services such as hospital and physician care, some states also provide a wide range of supplementary services such as drugs, dental, and clinic services.

These optional features of the Medicaid program give rise to substantial interstate variation in benefits. In 1970 payments per child recipient, for example, ranged from \$43 in Mississippi to \$240 in Wisconsin.<sup>8</sup> Furthermore, most states in the Deep South cover only about one-tenth of poor children, whereas in the Northeast nearly all poor, and many near-poor, children receive services. Similar variations in benefits characterize the adult Medicaid categories.

Medicaid benefits not only are unevenly distributed by state, but whites and urban residents receive a disproportionately large share of them. Payments per white recipient are 75 per cent higher than payments per black recipient.<sup>9</sup> Rural residents get few benefits from the program. For example, poor children in rural areas have only 11 per cent of their medical expenditures met by Medicaid, compared with 75 per cent for poor children in central cities.<sup>10</sup>

These sources of variation in benefits may interact and reinforce one another. For example, benefits in the South may be low because of the high incidence of black or rural poor persons who receive little or no benefits because of family composition or discriminatory administration of the program. Similarly, the low proportion of benefits going to these groups may, in part, be a reflection of their greater concentration in states choosing to maintain only limited Medicaid programs.

Furthermore, some of the variation in benefits may be attributable to factors associated with location or race such as education, health status, or availability of medical resources. To better understand the independent influence of each of these factors, econometric techniques are used below to estimate the utilization of hospital and physician services by public assistance recipients.

## **Factors Determining Utilization of Medicaid Services**

Recipients of Medicaid benefits make no direct payment for services, and physicians are required to accept state-established reimbursement levels as payment in full for services. Therefore, there is no price mechanism by which quantity of services demanded is necessarily equated with quantity of services that providers are willing to supply.

Actual utilization of services, therefore, is the outcome of a rationing process that may be affected by desires of physicians regarding the patients they prefer to treat, willingness of patients to provide the time and effort required to obtain services, and proce-

dures established by states administering the program that may affect both the total quantity of services available and the distribution of those services among recipients. In addition, use of services may be related to alternatives available to recipients and providers. For example, poor persons in areas with charity hospital facilities, but with few physicians willing to participate in the program, may substitute hospital care for care from private physicians. Willingness of physicians to participate, on the other hand, may be influenced by numbers of physicians in the area, demand for their services by non-poor patients, and level of Medicaid reimbursement (which varies from state to state).

A complete model of utilization under Medicaid, therefore, would include (1) patient characteristics, including health status, age, sex, race, education, family size, and working status; (2) measures of physician preferences among patients, which might include many of the same patient characteristics as above; (3) availability of medical resources both to the entire population and to the poor covered by Medicaid; and (4) features of the program controlled by the states.

This model of the utilization of medical services under Medicaid was estimated with data on 3,163 public assistance recipients in the 1969 HIS.<sup>11</sup> The survey provides much of the detail on individual characteristics that is required for this analysis. The health status variables used were chronic conditions and restricted activity days. Rather than single variables indicating age and head of household education, dummy variables were used for several age and education groups to capture nonlinearities in these effects. In addition, another dummy variable was entered for females age 17 to 44 to reflect the greater utilization of prenatal and maternal care by this group. Cross-product terms of race and region were specified to more accurately indicate where racial inequalities may occur.<sup>12</sup>

Geographical identification of individuals interviewed in the survey is limited. Using what information was provided on the location of individuals, measures of the availability of physicians and short-term general hospital beds per 1,000 population were included as follows: for persons living in the twenty-two largest SMSA's, figures for these particular areas were used; for other persons, figures for the census region broken down by SMSA and non-SMSA residence were inserted.<sup>13</sup>

Variation attributable to state program features is reduced by restricting the sample to public assistance recipients, excluding medically needy persons covered by Medicaid in some states. In addition, the analysis focuses on hospital and physician services,

two basic services required by law and for which states may be expected to less frequently impose stringent restrictions on benefits.

A possible source of bias that may continue to exist in the results relates to the absence of Medicaid programs in eleven states at the beginning of the year of the survey. Since seven of these states were in the South, an attempt was made to alleviate this problem by introducing a dummy variable for residence in the South. This effort, however, proved to have no significant impact on the results and is not included in the results reported.

For comparison purposes, similar estimates of utilization are presented for low-income persons (family income below \$5,000) not receiving public assistance.<sup>14</sup> This is a heterogeneous group, including some medically needy Medicaid recipients, some working poor with private health insurance, and some poor without either public or private coverage. Although the incidence of Medicare and private insurance coverage in this group might be expected to have a substantial impact on the utilization of services by this group, such information was not available in the survey. Part of the role played by insurance coverage may, however, be reflected in the variable that reflects working status.

For each dependent variable—physician visits in the two weeks prior to the interview and hospital episodes and days for the preceding year—a large number of values are concentrated at zero. Since the classical least squares regression model is inappropriate in such cases, the Tobit estimation technique was used for this analysis.<sup>15</sup>

## Econometric Results for the Poor

The results of the Tobit estimation of physician and hospital utilization for public assistance recipients and other low-income persons are presented in Table 4. Chi-squares show that the characteristics included in the estimates contribute significantly to the explanation of the utilization of health services in all cases.

As shown in Table 4, both health status variables—restricted activity days and chronic conditions—are highly significant in explaining utilization by public assistance recipients and other low-income persons. The impact of health status is illustrated more clearly in Table 5, which gives the expected values for physician visits, hospital episodes, and hospital days for varying hypothetical levels of health status, with other independent variables held

**TABLE 4 Tobit Results—Public Assistance Recipients and Other Low-Income Persons, 1969<sup>a</sup>**

	Public Assistance Recipients			Other Low-Income Persons		
	Physician Visits	Hospital Episodes	Hospital Days	Physician Visits	Hospital Episodes	Hospital Days
Constant	-1.898 (7.04)	-2.842 (4.44)	-65.37 (5.14)	-3.362 (28.36)	-3.288 (15.91)	-54.52 (17.49)
Restricted activity days	0.135 (9.99)	0.137 (8.87)	2.63 (8.71)	0.198 (32.31)	0.130 (22.53)	1.99 (23.32)
Chronic conditions	0.316 (7.82)	0.196 (4.23)	3.21 (3.53)	0.341 (19.21)	0.252 (15.28)	3.93 (15.97)
Age 17-44	-0.363 (1.32)	-0.157 (0.51)	1.81 (0.30)	-0.164 (1.62)	0.242 (2.57)	4.67 (3.28)
Age 45-64	-0.172 (0.87)	0.065 (0.28)	3.71 (0.81)	-0.181 (2.19)	0.391 (5.09)	6.47 (5.59)
Age 65 and over	-0.424 (2.15)	0.121 (0.53)	5.92 (1.31)	-0.144 (1.75)	0.578 (7.57)	9.36 (8.14)
Female	-0.003 (0.02)	-0.380 (2.52)	-7.81 (2.62)	0.149 (2.60)	-0.199 (3.73)	-3.47 (4.34)
Female, age 17-44	0.952 (3.19)	1.960 (5.83)	29.33 (4.49)	0.519 (4.88)	1.241 (12.83)	15.30 (10.49)
Head of household education, 9-12 yrs.	-0.091 (0.76)	0.205 (1.51)	4.91 (1.83)	0.129 (2.45)	0.181 (3.77)	2.35 (3.25)
Head of household education, > 12 yrs.	0.565 (1.94)	0.001 ( $<0.01$ )	-1.88 (0.26)	0.097 (1.17)	-0.053 (0.69)	-0.93 (0.79)
Family size	-0.136 (4.28)	-0.105 (2.88)	-2.37 (3.26)	-0.078 (5.06)	0.006 (0.42)	0.01 (0.05)
Working	0.060 (0.26)	-0.099 (0.38)	-0.57 (0.11)	-0.019 (0.32)	-0.323 (5.77)	-5.32 (6.29)
Black-South	-0.242 (1.61)	-0.740 (3.77)	-10.50 (2.71)	-0.449 (5.60)	-0.510 (6.71)	-6.44 (5.60)
Black-outside South	-0.336 (2.30)	-0.173 (1.04)	-1.33 (0.41)	-0.050 (0.54)	-0.086 (0.96)	-1.37 (1.02)
Physicians	0.108 (1.01)	-0.187 (1.47)	-2.04 (0.82)	0.261 (5.39)	-0.066 (1.44)	0.24 (0.36)
Hospital beds	—	0.164 (1.11)	4.42 (1.52)	—	0.023 (0.52)	1.12 (1.64)
Chi-square	391	331	294	2274	1730	1734

NOTE: *t* statistics in parentheses.  
<sup>a</sup>Persons with family income under \$5,000.

**TABLE 5 Annual Predicted Utilization for Low-Income Persons by Health Status and Welfare Eligibility, Adjusted for Other Characteristics, 1969**

	Health Status <sup>a</sup>					
	Public Assistance Recipients			Other Low-Income Persons		
	Good	Average	Poor	Good	Average	Poor
Physician visits	4.09	4.95	7.10	2.69	3.36	5.12
Hospital admissions	.141	.162	.210	.090	.108	.151
Hospital days	2.40	2.72	3.47	1.18	1.42	2.04

<sup>a</sup> Average health status is defined as at the mean level of restricted activity days and chronic conditions for all low-income persons. Good health status is that at half the means. Poor health status is that at twice the means.

constant at their mean values for the whole low-income population. In every case public assistance recipients make more use of services than other low-income persons. For example, a poor person who is average with respect to health status would receive 52 per cent more physician visits and undergo nearly twice as many days of hospital care as a similar poor person not on welfare. Thus, by reducing the price of care to zero, Medicaid has had a substantial impact on utilization of those poor who are eligible for Medicaid benefits.

Although poor persons with more severe health problems make much wider use of medical services, public assistance recipients are somewhat less sensitive to health status as a determinant of utilization than other poor persons. This occurs largely because of the high levels of utilization among Medicaid recipients in relatively good health. For example, as health status deteriorates from "good" to "poor," physician visits by public assistance recipients increase by 74 per cent compared with 90 per cent for other low-income persons.

Similarly, public assistance recipients show little sensitivity to age as a determinant of either inpatient or outpatient care, after adjustment for health status. Only among the elderly, who receive significantly less ambulatory care than other public assistance recipients, does age have a significant impact. On the other hand, substantial differences occur by age for other poor persons. Children receive more ambulatory care than adults age 45 to 64 and hospitalization increases uniformly with age, even with adjustment for health status.

The dummy for women of ages 17 to 44 proves a good proxy for the special health care needs of females of child-bearing age for both groups. In this area the contrast in the amount of care received by Medicaid recipients and other poor women is especially sharp. The expected number of physician visits by females from 17 to 44 years old, for instance, is 8.8 and 4.7 per year for members of each group, respectively, when other variables are held constant at their mean values. As shown earlier, although women in this age group eligible for Medicaid have made substantial gains in the amount of care received, these gains are not equally reflected in the proportion of care received from specialists. Nonetheless, it can be assessed that maternity care has been one area in which Medicaid has been especially successful in meeting an important deficiency in the health care of the poor.

Females in other age groups have not shared equally under Medicaid. This suggests that the time constraints of women on public assistance may be more binding because their services are more needed in the home. The effect of the constraint of non-monetary resources in welfare households is also evident in the results for the family-size variable. Family size proves a significantly stronger constraint on the use of health services for Medicaid recipients than for other low-income persons. The interpretation of the last two variables is supported by evidence earlier cited on the higher traveling and waiting time spent by public assistance recipients.

The effect of constraints on household resources is also evident in the results for the variable indicating normal working status. Individuals not on public assistance who are regularly employed received significantly less care in hospitals than other poor persons. Among public assistance recipients, the working-status variable has no discernible effect largely because such a small proportion of the welfare population is in the labor force.

Interpretation of the results for head of household education must be tentative, although they do tend to show that persons in households in which the head has more education recognize the benefits of more health care, but also organize to receive care on a more efficient basis. For public assistance recipients, differences based on head of household education are apparent for those with education between nine and twelve years for hospitalization and those with better than a high school training for ambulatory care. Although prices do not serve as an incentive for such persons to be more efficient in obtaining care, as was also reflected in the relatively strong influence of family size, nonmonetary constraints



play a significant role in determining utilization in such households. In other low-income households, education of the head seems to contribute to utilization if it is limited to some high school level training. That the level of utilization should not differ between those in households where the head has more than and less than a high school education may reflect distortion created by the households in which the head is highly educated but is deferring medical attention with the expectation that the household's income will improve.

None of the availability variables substantially affect the utilization of health services, with the exception of ambulatory care received by non-welfare poor persons. In part, this may reflect the inappropriate measure of these variables, since the poor may be restricted to a subset of all providers such as county hospitals or those physicians practicing in low-income neighborhoods. There are also two economic forces that may contribute to this result. First, since Medicaid patients do not pay for the care, providers, especially with regard to ambulatory care, lack the ability to affect the utilization patterns of these persons by ordinary economic means. Second, hospitals may be quite arbitrary in their hospitalization of poor persons in seeking to fulfill their occupancy goals and charity obligations. Such behavior is plausible since low-income persons receive a large amount of ambulatory care at hospital outpatient departments, thus affording hospitals wide leverage over whether to admit these patients for inpatient treatment if there is a slack in occupancy levels.

Separate estimates of utilization were obtained omitting the availability measures and including dummy variables for nonmetropolitan residence in the South and outside the South. Ambulatory care was lower in the rural South, but rural poor outside the South did not use ambulatory services significantly differently from urban poor (see Appendix 3, Table 1). However, the rural South variable was not significant when the availability measures were also included (see Appendix 3, Table 2), perhaps because of the collinearity inherent in the construction of the availability measures.

The race variables reveal that the benefits of Medicaid have not been shared equally by blacks and whites even after individual and family characteristics have been taken into account. Black Medicaid recipients in all areas receive less ambulatory care, and black hospitalization rates are also lower in the South.<sup>16</sup> As shown in Table 6, blacks do receive more care with Medicaid than they would without it; the improvement in ambulatory care is greatest in the South and in hospital care outside the South. Medicaid also

**TABLE 6 Annual Predicted Utilization for Low-Income Persons, by Welfare Eligibility, Region, and Race, Adjusted for Other Characteristics**

	Public Assistance Recipients			Other Low-Income Persons		
	Physician Visits	Hospital Episodes	Hospital Days	Physician Visits	Hospital Episodes	Hospital Days
White	5.28	0.176	2.87	3.51	0.114	1.50
Black— South	4.23	0.089	1.73	2.33	0.067	0.95
Black— outside South	3.88	0.151	2.70	3.36	0.105	1.37

markedly increases utilization by whites. Outside the South, differences between the races are in fact greater for Medicaid recipients than for other low-income persons. Outside the South there is no significant difference in the number of physician visits between blacks and whites not on public assistance, whereas among welfare recipients physician visits among whites are 24 per cent higher than among blacks, holding other variables constant at the mean values for all low-income persons. White welfare recipients are admitted to hospitals nearly twice as often as black welfare recipients of similar characteristics in the South, while among non-welfare recipients admissions for whites are 70 per cent greater than for blacks.

Although it is not possible on the basis of this analysis to determine definitely what accounts for the racial differences, some explanations can be ruled out. For example, since education, family size, working status, and availability of medical resources are held constant, racial differences cannot be traced to these factors. The most plausible explanation for the difference is discrimination. Discrimination can be either overt or institutional.<sup>17</sup> Overt discriminatory practices are apparently still prevalent in some communities. For example, in one Alabama town, the four white physicians all maintain segregated waiting rooms, keep black patients waiting until all white patients have been seen, and then allocate the remainder of the working day to the care of black patients. Those patients for whom time does not permit treatment are requested to return the following day. Waiting times for black patients average between four and six hours.<sup>18</sup> Such discriminatory practices obviously limit utilization by blacks.

Frequently, however, discrimination is institutionalized, arising from segregated housing patterns, or past overt discriminatory practices that affect current patterns of physician location, hospital staffing patterns, referral patterns, and patient preferences. Hearings on Civil Rights Act enforcement in Medicare and Medicaid recently held by the House Judiciary Committee indicate that institutional discrimination is widespread. Among the causes cited are convenience of some institutions to black communities, familiarity with some institutions from past associations, absence of a private physician causing patients to turn to charity hospitals, short supply of physicians in minority neighborhoods, and patients not informed or aware that Medicaid benefits are available in private hospitals. Some practices, such as ambulance drivers taking black accident victims to charity hospitals and expansion of hospital staffs restricted to specialists (whereas black physicians tend to be general practitioners), may be either overt or "statistical" discrimination depending on whether the rules governing these decisions are devised for the purpose of excluding blacks from some facilities or simply work out on average to exclude blacks.<sup>19</sup>

In summary, substantial differences exist in the manner in which health services are allocated among persons eligible for Medicaid and other low-income persons. Health status, however, is the major determinant of utilization for both groups, although public assistance recipients' use of services is somewhat less sensitive to health status than that of other low-income persons. The poor not receiving public assistance receive substantially fewer services than those on welfare, even after adjustment for health status is made. Differences by age in utilization that are evident for the poor not on welfare are not apparent for those receiving public assistance. There is evidence that nonmonetary effects have substituted for monetary allocation of services among Medicaid recipients. As a result blacks, females other than those of child-bearing age, and those in large families have not equally shared the gains made under Medicaid.

### **3. DISTRIBUTION OF MEDICARE BENEFITS**

Unlike Medicaid, Medicare is a uniform, federal program providing medical care benefits to all elderly persons covered by the social security retirement program. Although the same set of benefits is available to all covered persons regardless of income, race, or

geographical location, wide differences also exist in the Medicare program in the use of services and receipt of payments on the basis of each of these factors. It was originally hoped that the removal of financial barriers to medical care would enable all elderly persons to receive medical care services largely on the basis of medical need. Yet, those elderly population groups in the poorest health are the lowest utilizers of medical care services under the program—the poor, blacks, rural residents, and residents of the South.

Data from the Medicare program indicate that in 1968 estimated potential reimbursement for supplemental medical insurance services per person enrolled was twice as high for elderly persons with incomes above \$15,000 as for persons with incomes below \$5,000. About half of this difference reflects differences in quantity of services, whereas the other half represents a higher payment level for services (which in turn may be accounted for by a more expensive mix of services, better care, or pure price differences). Whites receive 60 per cent more payments for physician services than elderly blacks, and more than double the payments per elderly black person enrolled in the South, with nearly all the difference representing differences in percentage of eligible persons receiving reimbursable services.<sup>20</sup> Elderly persons in nonmetropolitan counties average \$250 from Medicare annually compared with \$360 for the elderly in metropolitan counties with a central city.<sup>21</sup> Regional differences are also substantial. Physician benefits in the West were 40 per cent higher than in the South in 1968. About three-quarters of the variation in these benefits on the basis of location reflects differences in quantity of services received.<sup>22</sup>

Part of these large differences may be attributable to factors associated with income, race, and location—factors such as education, health status, and availability of medical resources. Again, to investigate the role played by each of these several factors, an econometric analysis of utilization of medical services by the elderly was made using the 1969 HIS.

Unlike the Medicaid program, Medicare beneficiaries pay a substantial portion of the cost of physician services. The elderly are required to pay the first \$60 of physician expenses during the year (\$50 in 1969), 20 per cent of all allowed charges in excess of the deductible, and any excess of the actual charge for a service over that determined by Medicare as reasonable. In 1972, on about 56 per cent of Medicare claims, physicians agreed to charge no more than Medicare allows; on the rest, they were not so restrained.<sup>23</sup> The price mechanism, therefore, may play a stronger role in allocating services to Medicare beneficiaries.

Two groups of elderly, however, are not subject to the deductible and coinsurance amounts: those elderly Medicaid recipients whose states "buy" them Medicare coverage and those elderly purchasing supplementary private health insurance. Unfortunately, the 1969 Health Interview Survey, although noting eligibility for public assistance, does not indicate which elderly persons have private insurance as well as Medicare. Since higher-income elderly persons are more likely to purchase supplementary private insurance, including income in an examination of utilization of medical services by the elderly will capture both the direct effect of income and possible lower net prices faced by higher-income persons who purchase insurance. The dummy variable for public assistance recipients should capture the effect of zero price for those elderly covered by Medicaid and Medicare.

Health status is measured, as in the Medicaid model, by restricted activity days and chronic conditions, as well as a dummy variable indicating some limitation of activity attributable to chronic conditions. Several additional proxies for health status are age, sex, and working status. The dummy variable for elderly persons who consider working as their usual activity may also reflect a greater time constraint for working persons. Since Medicare program data indicate that blacks in the South receive fewer benefits than blacks in other areas, and still less than whites, separate race dummies for the South and areas outside the South were included in the analysis. Because of the limited education of the elderly, education was captured by a dummy variable for all persons with nine or more years of education rather than more refined educational classes.

Availability of medical resources, measured by physicians per 1,000 persons and short-term general care hospital beds per 1,000 population, was also introduced into the model. The appropriateness of including both supply and demand variables in a market in which price plays a major role has been addressed in other studies. With respect to physician services, Feldstein (1970) theorizes that the physician sets both price and supply such that excess demand exists for his services, whereas the consumer is simply a price-taker.<sup>24</sup> Fuchs and Kramer (1972) suggest alternatively that demand is supply-induced. An increase in physicians per capita is likely to reduce travel and time costs to the patients. In addition, they argue, physicians may inflate demand when supply has some slack by using their discretionary power to recommend to a patient his need for more care.<sup>25</sup> Again, with respect to hospital utilization, several possible arguments are the existence of excess demand, the

physician-agent relationship, and the incompleteness of that relationship because of peer group pressure on the physician.<sup>26</sup>

Data used in the analysis are also from the 1969 Health Interview Survey of the National Center for Health Statistics. In 1969, the survey included 11,970 persons age 65 and over. Observations were excluded from this analysis for persons for whom either family income or education was unknown or not reported, reducing the sample size to 10,573. Like in the Medicaid estimates, Tobit regression analysis is employed.

### **Econometric Results for the Elderly**

Tobit regression results are given in Table 7 for physician visits, hospital days, and hospital episodes. Chi-square tests indicate the equations to be statistically significant.

All indicators of morbidity contribute positively to utilization and are highly significant. Age, however, has a negative coefficient in the physician visit equation and positive coefficients in the hospital equations. Measures of morbidity apparently control for health status sufficiently to permit the age variable to act predominantly as a measure of the physical accessibility of services to the elderly. Thus, the very old are less likely to seek ambulatory care but compensate somewhat by utilizing more institutional care.

Computed annualized values of physician visits are shown in Table 8 for different incomes and health status levels, holding other independent variables constant at their mean values. The striking observation is that health status does play the predominant role in determining the number of physician visits a person will make. Morbidity measures of twice the mean levels typically cause slightly less than twice as many visits as average morbidity characteristics. This relationship is stable for all income classes. Physician visits vary more among income classes for persons in better health, but no one in good health, for example, will ordinarily receive more physician services than an elderly person whose health is only average.

When adjustment is made for health status, physician visits increase uniformly with income. As shown in Table 8, persons in average health and with incomes above \$15,000 made 70 per cent more physician visits than low-income persons in similar health and not receiving public assistance. The increase in utilization for higher-income persons may occur either because the cost-sharing provisions of Medicare are less of a deterrent to use as income rises

**TABLE 7 Tobit Results, Persons Age 65 and Over, 1969**

	Physician Visits	Hospital Episodes	Hospital Days
Constant	-1.954 (4.85)	-3.282 (7.42)	-67.34 (8.53)
Chronic conditions	0.314 (13.91)	0.151 (6.90)	2.23 (5.71)
Limited in activity	0.302 (3.93)	0.602 (8.15)	11.98 (9.10)
Age	-0.018 (3.40)	0.008 (1.55)	0.15 (1.76)
Restricted activity days	0.120 (16.83)	0.115 (17.24)	2.02 (17.11)
Income \$5,000-10,000	0.148 (1.77)	0.253 (3.20)	3.71 (2.63)
Income \$10,000-15,000	0.301 (2.25)	0.398 (3.13)	4.14 (1.81)
Income \$15,000 +	0.720 (5.01)	0.493 (3.46)	7.98 (3.15)
Public assistance recipient	0.356 (2.60)	-0.056 (0.41)	-1.10 (0.45)
Family size	-0.066 (2.14)	0.015 (0.54)	0.43 (0.86)
Female	0.143 (2.16)	-0.062 (0.99)	-1.25 (1.12)
Individual education, 9 years and over	0.179 (2.66)	-0.021 (0.33)	-0.05 (0.04)
Working	-0.066 (0.68)	-0.306 (3.13)	-6.08 (3.45)
Black—South	-0.559 (3.40)	-0.664 (4.16)	-9.85 (3.47)
Black—outside South	-0.115 (0.62)	-0.050 (0.28)	1.78 (0.58)
Physicians	0.187 (2.80)	-0.297 (4.49)	-3.35 (2.86)
Hospital beds	—	0.072 (1.20)	2.29 (2.12)
Chi-square	899	811	786

NOTE: *t* statistics in parentheses.

**TABLE 8 Average Physician Visits for the Elderly, by Health Status and Family Income, Adjusted for Other Determinants**

Family Income	Health Status <sup>a</sup>		
	Good	Average	Poor
Under \$5,000			
No aid	2.78	5.64	10.47
Aid	3.86	7.52	13.42
\$ 5,000-9,999	3.14	6.60	11.70
\$10,000-14,999	3.75	7.27	12.98
\$15,000 and over	5.35	9.53	16.98

SOURCE: Calculated from Table 7 and tabulations from the 1969 HIS.

<sup>a</sup> Good health is defined as no chronic conditions, limitation of activity, or restricted activity days. Average and poor health are defined at the mean and twice the mean level of the three morbidity indicators used.

or because higher-income persons are more likely to purchase supplementary private insurance and hence face a lower net price.

The significance of the public assistance recipients variable suggests that reduction in net price has a positive impact on use of services. Persons on public assistance, and hence likely to have cost-sharing amounts paid by state Medicaid plans, receive 30 to 40 per cent more services than other low-income persons not receiving public assistance, holding constant for other determinants of utilization such as health status, age, sex, race, and education.

Utilization of hospital services also increases with income; however, the difference in average hospital days between the highest- and lowest-income groups is only 40 per cent as compared with a 70 per cent spread for outpatient visits (see Table 9). The lower income elasticity for hospital care may reflect the greater medical urgency of institutional care so that even lower-income persons will, for the most part, pay the hospital deductible (of \$44 in 1969).

Public assistance recipients do not differ significantly in hospitalization from other elderly persons with incomes under \$5,000, which is plausible for two reasons. There are no extra benefits for public assistance recipients under the hospital plan similar to the elimination of deductible and coinsurance amounts under the physician plan. In addition, the elderly on welfare are more likely to substitute physician visits for hospitalization, and thus they have less need to enter the hospital than poor persons not on welfare.

Racial differences in the South are substantial. Although their average health status is worse than for the population as a whole,<sup>27</sup>



**TABLE 9 Average Hospital Utilization for the Elderly, by Health Status and Family Income, Adjusted for Other Determinants**

Family Income	Health Status <sup>a</sup>		
	Good	Average	Poor
Hospital Episodes			
Under \$5,000	.114	.210	.362
\$ 5,000-9,999	.140	.250	.427
\$10,000-14,999	.159	.285	.472
\$15,000 and over	.177	.312	.512
Hospital Days			
Under \$5,000	2.31	4.21	7.21
\$ 5,000-9,999	2.78	4.93	8.16
\$10,000-14,999	2.85	5.02	8.29
\$15,000 and over	3.52	6.06	9.77

<sup>a</sup> See Table 8 for definitions of health status levels.

elderly Southern blacks receive fewer ambulatory services than any income group. Elderly blacks in average health in the South make half as many physician visits (2.91 visits per person) as other persons age 65 and over if their income is under \$5,000, and they receive no public assistance and make two-thirds as many visits (6.67 visits per person) as others if they are in the highest-income class. By contrast, differences in use of physicians by race are not evident outside the South. Medicare has made no attempt to insist that physicians not discriminate among patients on the basis of race, arguing that Medicare merely reimburses patients for services received and does not enter into contractual agreements with physicians.

Racial differences in hospital care also exist in the South, although Medicare has attempted to enforce nondiscriminatory practices in hospitals.<sup>28</sup> Elderly blacks in the South in average health spend 2.84 days in the hospital whereas other elderly persons average 4.60 days. This suggests that discrimination in hospitals may be as extensive as that shown by individual physicians in the South, although physicians are not required to assert compliance with provisions of the Civil Rights Act. In regions outside the South, blacks are not hospitalized significantly less than whites.

The availability of more physicians causes elderly persons to visit

physicians more often for reasons cited earlier. Table 10 shows, however, that the elasticity of supply is generally lower in those areas where the number of physicians per capita is the lowest (for average characteristics in those areas). An implication of this result is that there is perhaps a surfeit of physicians in the Northeast and urban parts of the West, since a large proportion of small changes in physician manpower in those areas may be absorbed by those covered by Medicare.

The elasticity of hospital episodes with respect to the availability of hospital beds is 0.47, whereas the elasticity estimated from the hospital day equation is 0.94. The hospital day elasticity does not vary much by region, ranging from a low of 0.88 in the West to a high of 1.01 in North Central states and is similar to the elasticity of 0.92 found by Feldstein for the whole population.<sup>29</sup>

The local supply of physicians contributes negatively to admissions, indicating that physicians are inclined to hospitalize only more severe cases among the elderly. Overall, the elasticity of hospital days with respect to physicians is  $-0.20$ , confirming Feldstein's suggestion that "better organization of physicians' services for Medicare patients could generally reduce costly hospital admission."<sup>30</sup>

Separate estimates of utilization omitting the availability measures reveals that elderly persons in nonmetropolitan areas of the South make significantly fewer physician visits than the urban elderly, but rural elderly both in the South and outside the South experience somewhat more hospital episodes than the urban elderly (see Appendix 3, Table 3). Including both the availability measures and the geographical variables, however, eliminates the significance of the geographical variables (see Appendix 3, Table 4).

**TABLE 10** Elasticities of Physician Utilization with Respect to Physicians per Capita for the Elderly, by Region and Residence for Characteristics in those Areas

	All Regions	Northeast	North Central	South	West
All residences	.80	1.00	.74	.61	.93
Urban	.81	1.02	.77	.62	.94
Rural	.54	.88	.57	.47	.57

SOURCE: Calculated with data from Table 7, tabulations from the 1969 HIS, Haug, Robark, and Martin, and *Distribution of Physicians in the United States, 1970* (Chicago American Medical Association, 1971).

Persons with more than eight years of education received significantly more ambulatory physician services, as did females. Education, although important in explaining physician visits, does not eliminate the significance of income as a major determinant of physician utilization. Neither education nor sex were significant in the hospital equations.

Elderly persons who still regularly work to earn an income are hospitalized less often and for shorter periods. The net effect of the financial constraint posed by losing time from being on the job is 38 per cent fewer hospital days than nonworking persons, holding other factors at their expected values. Working did not have an important effect on ambulatory care.

In summary, once adjustment is made for health status and other determinants, use of medical services increases uniformly with income. Elimination of cost-sharing requirements under the physician plan for Medicaid recipients, however, brings their utilization up to that of the middle-income elderly. The results suggest that discrimination against blacks in the South by physicians and hospitals may be substantial—racial differences cannot be attributed solely to differences in income or education. Use of both physician and hospital services by the elderly is sensitive to the availability of medical services.

#### **4. IMPLICATIONS FOR NATIONAL HEALTH INSURANCE**

An analysis of experience with utilization of medical services under Medicare and Medicaid yields three major implications in the current consideration of national health insurance. First, financing medical care can have, and has had, a major impact on helping covered persons receive needed medical care services. The major failure—at least of Medicaid—is not in what it tried to do, but in what was not attempted—namely, widespread coverage of all poor persons regardless of welfare status. As a consequence, those poor persons excluded from Medicaid—estimated at 9 million persons in 1974—have failed to achieve adequate and equitable access to medical services. Extension of medical care financing to these persons, either through reform of Medicaid or national health insurance, should be a top priority.

Second, experience with Medicare reveals that imposition of uniform cost-sharing provisions (deductible and coinsurance

amounts) results in wide disparities in use of medical services on the basis of income. However, eliminating these payments for Medicaid recipients enabled them to receive similar amounts of services as middle-income elderly persons. This suggests that eliminating or reducing cost-sharing provisions for all lower-income persons while retaining some cost-sharing for higher-income persons could help to achieve greater equality in access to care.

Third, both Medicare and Medicaid confirm that certain groups of persons, even if covered by medical care financing plans, lag behind in access to care. This is a serious problem for minorities, who appear to continue to face substantial discrimination in the medical care market. Rural residents and persons in the South also face barriers to utilization of services, largely as a result of a limited supply of medical manpower. Supplementary health care delivery programs designed to meet the special needs of these population groups must be an essential part of health care policy. Further research to determine the most effective approaches to improving the access to care of these groups is urgently needed.

## APPENDIX 1

### Definitions of Independent Variables

*Chronic conditions:* number of conditions (any departures from state of physical or mental well-being) occurring more than three months prior to interview or classified as chronic regardless of onset.<sup>a</sup>

*Limited in activity:* 1 if chronic conditions limit the amount or kind of major or minor activity normally performed; 0 otherwise.

*Age:* age in years at last birthday.

*Restricted activity days:* number of days in two weeks prior to the interview a person reduces amount or kind of normal activity because of a specific illness or injury.

*Income \$5,000-9,999:* 1 if family income is greater than or equal to \$5,000 and less than \$9,999; 0 otherwise.

*Income \$10,000-14,999:* 1 if family income is greater than or equal to \$10,000 and less than \$14,999; 0 otherwise.

*Income \$15,000+:* 1 if family income is greater than or equal to \$15,000; 0 otherwise.

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<sup>a</sup>See DHEW, "Current Estimates—1969," p. 41.

**Family size:** number of related household members; coded 8 if family has more than 8 members.

**Public assistance:** 1 if person is recipient of public assistance other than social security or pensions at time of interview and family income is less than \$5,000; 0 otherwise.

**Black—South:** 1 if black living in the South; 0 otherwise.

**Black—outside South:** 1 if black living outside the South; 0 otherwise.

**MDPC:** nonfederal patient care physicians per 1,000 population (see Section 1 for source and description of construction of this variable).

**BedPC:** number of nonfederal short-term general and other special hospital beds per 1,000 population (see Section 1 for source and description of construction of this variable).

**Education 9+ years:** 1 if education of individual is greater than 8 years; 0 otherwise.

**Work:** 1 if major activity in twelve months prior to interview was working to earn a living or working as paid for a family business or farm; 0 otherwise.

**Female:** 1 if female; 0 if male.

Source (unless otherwise noted above): U.S. Department of Health, Education and Welfare, National Center for Health Statistics, "Current Estimates from the Health Interview Survey—1969," *Vital and Health Statistics Series 10*, Number 63 (Washington, D.C.: U.S. Government Printing Office, 1971).

## APPENDIX 2

**TABLE 1 Ordinary Least Squares Estimates of Physician Visits, by Age Group, 1969<sup>a</sup>**

Physician Visits	All Persons	Under 17	17-44	45-64	65 and over
Constant	1.50 (16.52)	1.02 (7.07)	1.92 (11.91)	0.88 (4.00)	2.27 (8.13)
Income	1.01 (9.64)	0.93 (5.60)	0.32 (1.76)	1.22 (4.97)	0.73 (1.82)
Income \$5,000-9,999					
Income \$10,000-14,999	1.28 (10.90)	1.26 (6.97)	0.48 (2.37)	1.21 (4.43)	1.46 (2.20)
Income \$15,000+	1.60 (11.78)	1.58 (7.44)	0.72 (3.08)	1.56 (5.34)	4.36 (5.94)

**TABLE 1 (concluded)**

Physician Visits	All Persons	Under 17	17-44	45-64	65 and over
Aid	0.92 (3.60)	0.57 (1.78)	1.76 (3.18)	1.24 (1.60)	0.31 (0.40)
Restricted activity days	0.08 (110.56)	0.14 (93.39)	0.10 (72.26)	0.06 (46.88)	0.04 (21.72)
Chronic conditions	1.62 (41.46)	2.86 (23.47)	2.02 (26.36)	1.84 (24.49)	1.56 (14.17)
$\bar{R}^2$	.12	.19	.14	.13	.08

NOTE: *t* statistics in parentheses.

<sup>a</sup> Excluding individuals reporting family income unknown, those under 17 for whom head of household education was unknown, and those 17 and older for whom individual education was unknown.

**APPENDIX 3**

**TABLE 1 Tobit Results—Public Assistance Recipients and Other Low-Income Persons, 1969<sup>a</sup>**

	Public Assistance Recipients			Other Low-Income Persons		
	Physician Visits	Hospital Episodes	Hospital Days	Physician Visits	Hospital Episodes	Hospital Days
Constant	-1.718 (8.03)	-2.507 (10.25)	-51.29 (10.57)	-2.950 (27.89)	-3.264 (33.31)	-49.05 (33.20)
Restricted activity days	0.134 (9.95)	0.136 (8.81)	2.60 (8.63)	0.198 (32.32)	0.129 (22.50)	1.99 (23.29)
Chronic conditions	0.318 (7.88)	0.205 (4.44)	3.32 (3.66)	0.342 (19.20)	0.252 (15.29)	3.93 (15.96)
Age 17-44	-0.357 (1.30)	-0.162 (0.53)	1.63 (0.27)	-0.160 (1.58)	0.242 (2.56)	4.66 (3.28)
Age 45-64	-0.172 (0.87)	-0.073 (0.32)	3.65 (0.80)	-0.183 (2.21)	0.395 (5.13)	6.51 (5.62)
Age 65 and over	-0.410 (2.08)	-0.200 (0.87)	6.85 (1.52)	-0.147 (1.77)	0.580 (7.59)	9.44 (8.21)
Female	-0.007 (0.06)	-0.393 (2.62)	-8.06 (2.69)	0.150 (2.63)	-0.200 (3.74)	-3.48 (4.34)
Female, 17-44	0.956 (3.20)	1.961 (5.86)	29.55 (4.53)	0.514 (4.83)	1.241 (12.83)	15.27 (10.48)

**TABLE 1 (concluded)**

	Public Assistance Recipients			Other Low-Income Persons		
	Physician Visits	Hospital Episodes	Hospital Days	Physician Visits	Hospital Episodes	Hospital Days
Head of household education, 9-12 yrs.	-0.126 (1.04)	0.140 (1.02)	3.88 (1.42)	0.123 (2.33)	0.175 (3.63)	2.23 (3.06)
Head of household education > 12 yrs.	0.522 (1.79)	-0.081 (0.33)	-3.26 (0.45)	0.088 (1.05)	-0.063 (0.81)	-1.16 (0.99)
Family size	-0.137 (4.33)	-0.097 (2.69)	-2.33 (3.23)	-0.079 (5.12)	0.008 (0.57)	0.04 (0.17)
Working	0.055 (0.23)	-0.091 (0.35)	-0.50 (0.10)	-0.020 (0.32)	-0.323 (5.77)	-5.31 (6.27)
Black—South	-0.168 (1.08)	-0.558 (2.89)	-8.27 (2.16)	-0.454 (5.52)	-0.518 (6.84)	-6.90 (6.03)
Black—outside South	-0.315 (2.16)	-0.129 (0.80)	0.22 (0.07)	-0.025 (0.27)	-0.111 (1.27)	-1.44 (1.08)
Non SMSA—South	-0.245 (1.61)	-0.265 (1.45)	-5.13 (1.42)	-0.269 (4.41)	-0.003 (0.05)	-1.47 (1.77)
Non SMSA—outside South	0.094 (0.60)	0.552 (3.18)	9.34 (2.70)	-0.186 (3.06)	-0.029 (0.52)	-1.49 (1.78)
Chi-square	394	345	303	2268	1736	1728

NOTE: *t* statistics in parentheses.  
 \* Persons with family income under \$5,000.

**TABLE 2 Tobit Results—Public Assistance Recipients and Other Low-Income Persons, 1969<sup>a</sup>**

	Public Assistance Recipients			Other Low-Income Persons		
	Physician Visits	Hospital Episodes	Hospital Days	Physician Visits	Hospital Episodes	Hospital Days
Constant	-1.887 (4.88)	-1.874 (2.67)	-51.40 (3.69)	-3.302 (18.77)	-3.010 (11.71)	-50.10 (13.00)
Restricted activity days	0.134 (9.96)	0.135 (8.76)	2.60 (8.62)	0.198 (32.31)	0.130 (22.53)	1.99 (23.33)

**TABLE 2 (concluded)**

	Public Assistance Recipients			Other Low-Income Persons		
	Physician Visits	Hospital Episodes	Hospital Days	Physician Visits	Hospital Episodes	Hospital Days
Chronic conditions	0.319 (7.89)	0.203 (4.39)	3.32 (3.66)	0.342 (19.22)	0.252 (15.27)	3.93 (15.95)
Age 17-44	-0.359 (1.31)	-0.160 (0.52)	1.67 (0.28)	-0.163 (1.61)	0.244 (2.59)	4.70 (3.31)
Age 45-64	-0.170 (0.86)	0.068 (0.29)	3.64 (0.80)	-0.181 (2.18)	0.391 (5.08)	6.46 (5.58)
Age 65+	-0.404 (2.04)	0.182 (0.80)	6.81 (1.50)	-0.147 (1.78)	0.578 (7.56)	9.36 (8.13)
Female	-0.073 (0.06)	-0.396 (2.64)	-8.06 (2.70)	0.149 (2.60)	-0.199 (3.74)	-3.48 (4.35)
Female, age 17-44	0.954 (3.20)	1.967 (5.88)	29.54 (4.53)	0.518 (4.88)	1.238 (12.79)	15.22 (10.45)
Head of household education, 9-12 yrs.	-0.123 (1.01)	0.131 (0.96)	3.87 (1.42)	0.125 (2.37)	0.175 (3.62)	2.25 (3.10)
Head of household education, >12 yrs.	0.530 (1.81)	-0.096 (0.26)	-3.28 (0.45)	0.093 (1.12)	-0.066 (0.85)	-1.15 (0.98)
Family size	-0.134 (4.23)	-0.103 (2.83)	-2.34 (3.22)	-0.078 (5.03)	0.007 (0.48)	0.03 (0.12)
Working	0.060 (0.26)	-0.103 (0.39)	-0.53 (0.10)	-0.020 (0.32)	-0.324 (5.78)	-5.33 (6.30)
Black-South	-0.156 (0.99)	-0.605 (3.03)	-8.25 (2.09)	-0.439 (5.32)	-0.522 (6.81)	-6.71 (5.78)
Black-outside South	-0.321 (2.19)	-0.096 (0.57)	0.18 (0.05)	-0.052 (0.55)	-0.091 (1.01)	-1.47 (1.09)
Physicians	0.095 (0.53)	-0.198 (0.91)	-0.66 (0.16)	0.226 (2.52)	-0.273 (3.16)	-3.34 (2.60)
Hospital beds	—	-0.067 (0.41)	0.32 (0.10)	—	0.042 (0.83)	1.56 (2.04)
Non SMSA-South	-0.151 (0.65)	-0.480 (1.77)	-5.70 (1.06)	-0.062 (0.61)	-0.233 (2.43)	-3.91 (2.72)
Non SMSA-outside South	0.176 (0.79)	0.403 (1.51)	8.68 (1.63)	-0.015 (0.17)	-0.244 (2.82)	-4.45 (3.44)
Chi-square	374	337	303	2274	1740	1746

NOTE: † statistics in parentheses.  
 \* Persons with family income under \$5,000.



**TABLE 3 Tobit Results—Persons Age 65 and Over, 1969**

	Physician Visits	Hospital Episodes	Hospital Days
Constant	-1.691 (4.27)	-3.403 (9.15)	-62.43 (9.44)
Chronic conditions	0.315 (13.94)	0.153 (7.00)	2.25 (5.78)
Limited in activity	0.306 (3.98)	0.603 (8.16)	12.00 (9.11)
Age	-0.018 (3.42)	0.007 (1.51)	0.15 (1.75)
Restricted activity days	0.120 (16.82)	0.115 (17.23)	2.02 (17.11)
Income \$5,000-9,999	0.160 (1.91)	0.233 (2.95)	3.41 (2.42)
Income \$10,000-14,999	0.324 (2.42)	0.370 (2.91)	3.65 (1.59)
Income \$15,000+	0.743 (5.18)	0.457 (3.21)	7.42 (2.93)
Public assistance recipient	0.383 (2.79)	-0.063 (0.46)	-1.14 (0.47)
Family size	-0.067 (2.17)	0.020 (0.70)	-0.48 (0.96)
Female	0.143 (2.16)	-0.061 (0.97)	-1.24 (1.11)
Individual education, 9 years and over	0.178 (2.63)	-0.027 (0.42)	-0.29 (0.25)
Working	-0.065 (0.66)	-0.303 (3.09)	-5.96 (3.38)
Black—South	-0.521 (3.21)	-0.643 (4.03)	-9.98 (3.53)
Black—outside South	-0.095 (0.52)	-0.082 (0.47)	1.41 (0.46)
Non SMSA—South	-0.242 (2.66)	0.169 (2.01)	0.56 (0.37)
Non SMSA—outside South	-0.005 (0.06)	0.179 (2.43)	1.69 (1.28)
Chi-square	898	800	799

NOTE: t statistics in parentheses.

**TABLE 4 Tobit Results—Persons Age 65 and Over, 1969**

	Physician Visits	Hospital Episodes	Hospital Days
Constant	-2.072 (4.81)	-3.107 (6.55)	-63.22 (7.48)
Chronic conditions	0.317 (14.02)	0.151 (6.90)	2.23 (5.71)
Limited in activity	0.304 (3.95)	0.603 (8.17)	12.00 (9.11)
Age	-0.018 (3.45)	0.008 (1.57)	0.16 (1.79)
Restricted activity days	0.120 (16.82)	0.115 (17.24)	2.02 (17.11)
Income \$5,000-9,999	0.145 (1.73)	0.253 (3.20)	3.72 (2.64)
Income \$10,000-14,999	0.309 (2.30)	0.392 (3.08)	3.99 (1.74)
Income \$15,000+	0.721 (5.02)	0.492 (3.45)	7.94 (3.13)
Public assistance recipient	0.370 (2.69)	-0.044 (0.32)	-0.82 (0.34)
Family size	-0.063 (2.05)	0.015 (0.55)	0.43 (0.86)
Female	0.144 (2.17)	-0.064 (1.02)	-1.30 (1.17)
Individual education, 9 years and over	0.181 (2.67)	-0.025 (0.39)	-0.14 (0.12)
Working	-0.066 (0.67)	-0.304 (3.10)	-6.02 (3.42)
Black—South	-0.491 (2.93)	-0.670 (4.17)	-10.03 (3.52)
Black—outside South	-0.122 (0.67)	-0.055 (0.32)	1.64 (0.54)
Physicians	0.257 (2.26)	-0.422 (3.76)	-6.41 (3.23)
Hospital beds	—	0.079 (1.18)	2.50 (2.10)
Non SMSA—South	-0.015 (0.11)	-0.159 (1.24)	-3.82 (1.67)
Non SMSA—outside South	0.180 (1.59)	-0.137 (1.24)	-3.44 (1.75)
Chi-square	904	813	790

NOTE: *t* statistics in parentheses.

## NOTES

1. Ronald Andersen *et al.*, *Health Service Use: National Trends and Variations, 1953-1971*, U. S. Department of Health, Education and Welfare, October 1972, tables 5 and 15.
2. Charles L. Schultze *et al.*, *Setting National Priorities: The 1973 Budget* (Washington, D.C.: The Brookings Institution, 1972), p. 225.
3. Julian H. Pettingill, "Trends in Hospital Use by the Aged," *Social Security Bulletin* (July 1972), pp. 3-14.
4. Insurance payments per person under age 65 increased from \$62 in 1969 to \$100 in 1973, increasing the share of the total health bill paid by insurance from 29.9 per cent to 33.4 per cent. Barbara S. Cooper and Paula A. Piro, "Age Differences in Medical Care Spending," *Social Security Bulletin* (May 1974), pp. 3-14.
5. Regina Loewenstein, "Early Effects of Medicare on Health Care of the Aged," *Social Security Bulletin*, 34 (April 1971).
6. For example, to derive the adjusted figures for the under age 17 group, the coefficient on restricted activity days (0.14) was multiplied by the average number of restricted activity days for all children, and the coefficient on chronic conditions (2.86) was multiplied by the average number of chronic conditions in children. These terms were added to the constant term to derive the under \$5,000, no aid, adjusted visit rate. Adjusted visit rates for other income groups are greater than this rate by an amount equal to the corresponding coefficients in Appendix 2.
7. Medically needy persons eligible for Medicaid are those aged, blind, disabled, or families with dependent children whose income net of medical expenses is within 133 per cent of the public assistance support level.
8. Karen Davis, "National Health Insurance," in Barry Blechman *et al.*, *Setting National Priorities: The 1975 Budget* (Washington, D.C.: The Brookings Institution, 1974), Ch. 8.
9. See Karen Davis, "Financing Medical Care: Implications for Access to Primary Care," in Spyros Andreopoulos (editor), *Primary Medical Care* (New York: John Wiley, 1974).
10. Ronald Andersen *et al.*, *Expenditures for Personal Health Services: National Trends and Variations, 1953-1970*, U.S. Department of Health, Education and Welfare, Health Resources Administration, October 1973, Table A-11.
11. The sample excludes fifty-four individuals for whom head of household education was not reported.
12. Detailed specifications of the independent variables used are contained in Appendix 1.
13. Source: Haug, Robark, and Martin, *Distribution of Physicians in the United States, 1970* (Chicago: American Medical Association, 1971).
14. This sample comprised 25,673 individuals. An additional 497 individuals with head of household education unreported were omitted from the sample.
15. James Tobin, "Estimation of Relationships for Limited Dependent Variables," *Econometrica*, 26 (1958), pp. 24-36.

The tobit model specifies that an index  $I$  be generated such that:

$$\begin{aligned} Y_j &= 0 && \text{for } I_j \leq e_j \\ Y_j &= I_j - e_j && \text{for } I_j > e_j \end{aligned}$$

where  $Y$  is the value of the dependent variable,  $I$  is a linear continuation of the

independent variables to which  $Y$  is hypothetically related, and  $e$  is a  $N(0, S^2)$  variable. The predicted expected value of the dependent variable given the index  $\hat{I}$  is given by

$$\hat{Y}_j = \hat{I}_j F \left( \frac{\hat{I}_j}{S} \right) + \hat{s} f \left( \frac{\hat{I}_j}{S} \right)$$

where  $F$  and  $f$  are the standard normal cumulative distribution and standard normal density functions, respectively.

16. White utilization patterns did not show significant regional differences, and hence were constrained to be equal in the South and outside the South.
17. See Ray Marshall, "The Economics of Racial Discrimination," *Journal of Economic Literature* (September 1974), for a discussion of different types of discrimination.
18. Melbah McAfee, "Black Belt Community Health Center," paper presented at Conference on Hunger in the South, University of North Carolina, June 23, 1974.
19. U.S. House of Representatives, Committee on the Judiciary, *Hearings on Title VI Enforcement in Medicare and Medicaid Programs*, September 12, 17, 24, and October 1, 1973 (Washington, D.C.: U.S. Government Printing Office, 1974).
20. See Karen Davis, "Financing Medical Care: Implications for Access to Primary Care," in Spyros Andreopoulos (editor), *Primary Medical Care* (New York: John Wiley, 1974).
21. Eugene C. Carter, "Health Insurance for the Aged: Amounts Reimbursed by State," U. S. Department of Health, Education, and Welfare, Social Security Administration, Office of Research and Statistics, H1-32, October 19, 1971.
22. U.S. Department of Health, Education, and Welfare, Social Security Administration, Office of Research and Statistics, Medicare, 1968: Section 1, Summary, 1973.
23. Charles B. Waldhausen, "Assignment Rates for Supplementary Medical Insurance Claims, Calendar Years 1970-72," Social Security Administration, Office of Research and Statistics, H1-46, June 30, 1973.
24. Martin S. Feldstein, "The Rising Price of Physician Services," *Review of Economics and Statistics*, 52 (1970), pp. 121-133.
25. Victor R. Fuchs and Marcia J. Kramer, *Determinants of Expenditures for Physicians' Services in the United States, 1948-68* (New York: National Bureau of Economic Research, Occasional Paper No. 117, 1972).
26. Martin S. Feldstein, "Econometric Studies of Health Economics," Harvard Institute of Economic Research, Discussion Paper No. 291, 1973.
27. The only exception is for those few blacks in the South in the highest-income class. However, only 1 per cent of the black population in the South has family incomes of \$15,000 and above.
28. However, only 3 per cent of participating institutional providers are actually site visited to check for compliance. See House Judiciary Committee Hearings, *op cit*.
29. Martin S. Feldstein, "Hospital Cost Inflation: A Study of Nonprofit Price Dynamics," *American Economic Review*, 61 (1971), pp. 853-872.
30. Feldstein, "An Econometric Model of the Medicare System," p. 9.

# 10 || COMMENTS

**John Rafferty**

Department of Health, Education, and Welfare

## **SUMMARY**

The authors' purpose is to address three broad questions pertaining to the Medicare and Medicaid programs in the United States: What impact have these programs had on use of medical services by the poor and the elderly? What factors account for differences in the level of use of Medicaid by those who are eligible? To what extent do social and demographic characteristics affect the use of medical services by the elderly? The first three sections of the paper deal with each of these questions in turn, and a fourth section then discusses the implications of the empirical findings for a national health insurance program.

Section 1, which deals with the general impact of Medicare and Medicaid on use, draws from a variety of sources. The authors indicate that, since enactment of these programs, use of medical services by low-income individuals has increased, and that low-income persons have gained on those with higher incomes. However, as the authors stress in this section of the paper, this general observation may be quite misleading. First, Medicaid provides services only for certain categories of the poor, leaving approximately 9 million poor uncovered. Second, there is evidence that the poor receive lower-quality care and receive it in settings that are less convenient and less pleasant than is the case for the population at large. Third, the authors stress the fact that generalizations about levels of use by the poor and the elderly may be misleading because of differences in health status between these groups and the population at large; they show that, although the relationship between use levels and income levels tends to be U-shaped (with the poor and the wealthy receiving larger amounts of care than those in the middle-income groups), when health status is adjusted for, the relationship is positively sloped throughout.

In sections 2 and 3, which deal individually with Medicaid and Medicare, respectively, an econometric model is estimated. This is presented as an approximation to a more complete model, which is very briefly described, but which is not considered feasible. The model that is estimated for the Medicaid study consists of three independent regression equations, of which the independent variables are physician visits, hospital episodes, and hospital days; twenty independent variables, including measures of health status, measures of resource availability, and sociodemographic variables appear in each equation. The three equations are estimated first for public assistance recipients and then for other low-income persons, using Tobit analysis, and the resulting coefficients are then discussed. Among other things, they show

that large variations in use occur among Medicaid eligibles, that blacks lag substantially behind whites, that education increases the use of physician services but not hospital services, that larger families have lower hospitalization rates and ambulatory visits, and that health status is the major determinant of utilization among the poor. However, use of services by public assistance recipients is less sensitive to health status than is use by other low-income individuals, and the poor who are not on public assistance receive far fewer services than those on welfare, even after adjustment for health status and other characteristics.

Similar equations are estimated for the analysis of Medicare benefits in Section 3, although here the equations also include income variables, in an effort to capture not only the direct effect of income but also the possibly lower net prices that are faced by higher-income persons who are more likely to have supplementary insurance. In brief, with respect to Medicare, the authors find that, other things the same, the use of medical services by the elderly increases uniformly with income, but, for those individuals who are also covered by Medicaid as well as Medicare, the elimination of cost-sharing requirements appears to raise their utilization rate to that of the middle-income elderly. The authors find much lower levels of use by blacks in the South, both for physicians and hospital services, which they interpret as evidence of racial discrimination. They find that use of both physician and hospital services by the elderly is sensitive to the availability of medical services, but they also conclude that available hospital beds are rationed equitably between the elderly and other age groups.

In the final section the authors then discuss three general implications of their findings for national health insurance. First, although Medicare and Medicaid have helped covered individuals receive needed medical care, they indicate that Medicaid has failed by not covering all of the poor; coverage for these individuals, therefore, is indicated as a top priority for a national health insurance program. Second, they indicate that the cost-sharing provision of Medicare leads to a wide disparity in use on the basis of differences in income; therefore, a graduated cost-sharing arrangement would increase the equitability of access under a national health insurance plan. Third, experience with Medicare and Medicaid shows that some population groups will lag in utilization even if they are covered, as is the case for minority groups and residents of rural areas at the present time; therefore, supplementary programs for such groups would seem to be required under any national health insurance scheme.

## CRITIQUE

In this paper Karen Davis and Roger Reynolds have presented a very substantial amount of useful information on the Medicare and Medicaid programs, information that is not only of considerable policy importance, but also carries significant implications for future research. Since a discussant finds it necessary to focus on the weaknesses in, or the

necessary qualifications to, the research under review, such negative comments tend to occupy the major portion of the discussant's time; this, however, should not be allowed to detract from the usefulness of much of the work reported in this paper. Medicare and Medicaid represent the closest approximations to national health insurance in the experience of the United States, and since analyses of these programs have been very few and far between, this broad study is very welcome indeed.

One distinguishing feature of the paper, as alluded to in the summary above, is that it presents and discusses a considerable number of individual findings, far more than can be covered in this brief discussion. As a result, this review will be confined primarily to just a few of the broader, more general, considerations even though this may fail to do full justice to the amount of information the paper presents.

My major concern really has to do with the interpretation of the statistical results. First, I feel that this paper treads dangerously close to what another economist has called the "Regression Humbug Syndrome"; the equations that are estimated here do have the appearance of the reduced forms of supply-demand models, but we are given no explicit theoretical understructure for these regressions, nor a discussion of expected signs. The independent variables that appear in the equations appear to have been determined less on the basis of theoretical reasoning than on the basis of what data were available. In the absence of any explicit hypotheses to be tested, whatever significant relationships do drop out of the regressions are then discussed, and are explained on a more or less *ad hoc* basis. One danger is the tendency to conclude, implicitly, that if no significant relationship appeared, no such relationship exists, which may be quite untrue. This general approach may be more appropriate when the primary objective is prediction; here, however, where our interest is less in prediction than in explanation and understanding of structure, more explicit theoretical underpinnings would be desirable.

One example of the difficulties which may appear in connection with this kind of research approach is the interpretation of the finding of relatively low levels of utilization, of both physicians and hospitals, on the part of blacks in the South. The findings are very striking, and are of considerable interest and policy importance, but the interpretation of the cause of this disparity as clear, out-and-out racial *discrimination* is scientifically premature; at least, that the disparity in use is caused by discrimination cannot really be deduced from the present analysis, for we really don't know the degree to which the disparity is attributable to demand as opposed to supply factors. Indeed, the authors' interpretation does not seem like an entirely unreasonable one, but certainly at least one plausible alternative is that, because of *past* discrimination, blacks do not presently seek out care, so that the actual cause *today* is on the demand side rather than the supply side. This is not trivial, because the appropriate policy for correcting such disparities would be very different in each instance—requiring some kind of civil rights enforcement in the former, and perhaps outreach and educational efforts in the latter case.

The second critical point I'll make also pertains to interpretation of results, and I should hasten to add that although I feel that the point is important, it is a

much less pervasive problem in this paper than is the former one. This is simply a reminder that this study employs cross-sectional data, and that it is necessary to be particularly cautious when the results of such an analysis are used in discussions in which our real interest is in variations that actually occurred across time; the appropriateness of cross-sectional data depends on the degree to which those factors that determine the cross-sectional variation can reasonably be assumed to be the same factors that caused the changes over time. I will again give just one illustration of this particular problem, using a case in which I do have empirical reason for believing that the authors' interpretation of their findings is incorrect. This concerns the use of hospital services by the elderly, under Medicare. The authors conclude from the cross-sectional analysis that the elderly "do not receive care at the expense of younger persons needing medical care where supply is most deficient," and that "... available beds are rationed equitably among all age groups." Because of the weakness of the supply variables used for these estimates, this conclusion should be somewhat tentative, but nevertheless, it may well be that, cross-sectionally, use by the elderly responds to variations in supply in essentially the same way as use by the population as a whole. However, that is not really the question at issue; rather, we are concerned here with those changes over time that are directly attributable to the provision of health insurance for the elderly, which is not quite the same thing. In fact, I have looked into this specific question using time series data and obtained just the opposite result—that the introduction of Medicare coincided with very dramatic changes in hospital use by the non-elderly. Specifically, for patients under 65, diagnosis-specific lengths of stay were dramatically reduced immediately after introduction of Medicare, and, for this younger group, there was a substantial decline in admissions of the more discretionary types of cases. Whether or not this shift was "appropriate" in some sense is a separate question, but I believe there is no doubt that the increased use of hospitals by the elderly did come at the expense of younger patients, which is the opposite of what is suggested by the cross-sectional results. Thus, I would argue that the Davis-Reynolds finding may itself be quite valid, but its interpretation is not: The factors that determine the response of utilization to availability across regions are not the same as the factors that determined these responses over time when Medicare was introduced; and, the introduction of NHI, which will increase effective demand by some groups more than by others, should therefore also be expected to cause the increase in use by the more favored groups to come at the expense of others. Again, my point is simply that caution is necessary in generalizing these cross-sectional results to changes that occurred over time.

I will limit my critical comments to these two points, but I would like to address one other issue that I feel is very relevant here, an issue that is perhaps regarded by economists as the most pervasive and critical constraint on health economics research. This is the matter of limitations in the availability of statistical data. I believe that the authors of this present paper have effectively mined the data that were available to them, and many of the limitations of their study are a simple function of the limitations in those data.



However, I also think that in health economics we are at a point when we could benefit by observing the research approaches of people in other fields, such as sociology and psychology. Unlike economists, who have been prone to design their research around the data in hand, in these areas the research is often designed first, and then, perhaps as one step in that design process, the survey instrument or the particular mechanism whereby the necessary data will be generated is developed. Although our usual approach—that of massaging the secondary data we are able to acquire from others—has a pleasing ring of efficiency, there is a question involving how often that approach is really cost effective. Therefore, perhaps economists should become more willing to generate the data required to answer the questions they want to raise. This does raise the monetary costs of doing research, but it is pertinent to note that, at the Bureau of Health Services Research, the problem we have faced has been more often a problem of finding research proposals of high technical quality rather than finding the dollars to support well-designed projects based on high-quality data. I feel this point is quite relevant in this specific context; among the many contributions the authors make in their paper is to narrow old questions and identify new ones, but I really doubt if very much can be done about answering those questions without some fairly heroic efforts on the part of researchers themselves to generate the data that will be required.

## Dorothy P. Rice

Social Security Administration

As is usual with Dr. Karen Davis' work, this paper is a fine piece of empiricism. The findings are significant in an important sense: two large government programs—Medicare and Medicaid—are shown to have achieved what they set out to do. This may be surprising to some economists because when one searches the literature, one finds time and again that government programs too often fail in their objectives. The paper is important because it compares medical care use for the low-income population receiving welfare and other poor persons, leading to the conclusion that extension of medical care financing to those poor persons excluded from Medicaid should be a top priority reform.

After a few specific comments, I will compare some of the Davis-Reynolds findings with data from the Social Security Administration's Current Medicare Survey for the population aged 65 and over.

With respect to Medicaid, the authors adjust the 1969 Health Interview Survey for health status and show that physician visits increase with income if the low-income persons not on public assistance are separated and their

physician use is compared with that of persons with middle and higher family income. Although there is a verbal description of how the "adjusted for health status" physician visits were estimated for Table 2, it is still not clear what the equations in Appendix 2 mean. Therefore, the reader has to trust that the authors did the estimations correctly.

In explaining the factors determining the use of Medicaid services, the authors state "... there is no price mechanism by which quantity of services demanded is necessarily equated with quantity of services which providers are willing to supply." Although quantity demanded may not be a function of price, since the Medicaid recipient does not pay for services, the fact that fee schedules vary from state to state means that the quantity supplied may vary from state to state as a function of the fee schedule. The authors appear to recognize that physicians may prefer to treat some patients rather than others but do not explicitly include fees paid as a measure of physician preferences among patients. A variable for this might be included in the regression analysis in Table 4.

With respect to the Medicare program, the authors fail to point out that utilization trends observed for 1967-1969 do not hold for 1969-1971. Pettingill (quoted on page 392) also shows that Medicare admissions per 1,000 population rose at an average annual percentage change of 0.3 from 1969 to 1971 compared with 7.4 between 1967 and 1969. Covered days of care per 1,000 population increased 12.6 per cent per year from 1967 to 1969 but declined 3.4 per cent per year between 1969 and 1971. Average length of covered stay increased 4.8 per cent per year during the earlier period and declined 3.8 per cent per year in the later period. ECF admissions per 1,000 enrollees hit a peak in 1969, increasing by 15.7 per cent over 1968 but declined 10.2 per cent during 1969-1970 and 13.4 per cent during 1970-1971.<sup>1</sup> There was an initial impact of Medicare coverage during the first three years that has reversed direction or tapered off in subsequent years. The implications of these more recent changes are not discussed by the authors.

In the section on "Distribution of Medicare Benefits," Davis and Reynolds discuss data from the Medicare program but could do a great deal to make the actual meaning of their statements clear to the reader. For example, they state that "... whites receive 60 per cent more payments for physician services than elderly blacks." It is true that reimbursement for physician and other medical services per person enrolled under SMI in 1968 was 62 per cent higher for whites than for all other races, but there was only a 15 per cent difference in terms of reimbursement per person served.<sup>2</sup> The authors claim "nearly all of the difference" in reimbursement per person enrolled between whites and all other races represents "differences in percentage of eligible persons receiving reimbursable services." The authors should indicate how they determine this point. In 1968, reimbursement per person enrolled was \$78.76 among whites and \$48.44 among all other races. By definition,

$$\text{reimbursement per person enrolled} = \left( \frac{\text{number served}}{\text{number enrolled}} \right) \times \left( \text{reimbursement per person served} \right)$$

If we let  $P$  = reimbursement per person served

$$Q = \frac{\text{number served}}{\text{number enrolled}}$$

then the difference in reimbursement per person enrolled between whites and all other races can be expressed as

$$\Delta(PQ) = \Delta PQ_0 + \Delta QP_0 + \Delta P \Delta Q$$

where, for example,  $\Delta(PQ)$  represents the difference in reimbursement per person enrolled between whites and all other races,  $P_0$  represents reimbursement per person served among all other races, and  $Q_0$  represents the ratio of number served to number enrolled among all other races. With this equation, and assuming that the interaction term is distributed proportionately between the  $P$  and  $Q$  terms, we can determine the proportion of the difference in reimbursement per person enrolled between the races that is attributable to differences in reimbursement per person served and percentage of enrolled persons receiving reimbursable services. Taking the necessary data from the 1968 summary, we do not find that nearly all the difference stems from the proportion of enrollees served. Twenty-seven per cent is attributable to a difference in reimbursement per person served of \$199 among whites and \$173 among all other races.

Additional questionable statements are made by the authors with respect to the factors affecting geographical and income differences in Medicare reimbursements. Reimbursement depends on meeting the deductible and determining reasonable charges. Charges for some services may be disallowed more often than for other services and utilization of services may vary by geographic area, income class, etc. The extent to which charges are disallowed for a particular covered service may also vary by characteristics such as geographic area and income class.

Davis and Reynolds argue that economic forces may contribute to lack of significant coefficients among the availability variables in their regression equations for public assistance recipients and other low-income persons. More specifically, "since Medicaid patients do not pay for the care, providers, especially with regard to ambulatory care, lack the ability to affect the utilization patterns of these persons by ordinary economic means." What do the authors mean by "ordinary economic means?" We suspect they do not assume a typical competitive economic market with equilibrium prices and quantities responding to shifts in supply and demand. As the authors indicate, there is no one theory of market behavior that is generally accepted as describing the market for physicians' services. The market for hospital services is also complex, and interpretation of the coefficients of the availability variables requires a detailed examination of the markets for these services.

In their concluding remarks, the authors state that "imposition of uniform cost-sharing provisions (deductible and coinsurance amounts) results in wide disparities in use of medical services on the basis of income." They find utilization among the elderly related to income, but it does not follow that

cost-sharing provisions cause these disparities. Furthermore, after accounting for family size in determining whether a given annual family income was low or high, Peel and Scharff (1973) found no difference in the number of SMI services per user with charges between enrollees with high family incomes and those with low to moderate family incomes and no public medical assistance.<sup>3</sup> To the extent that medical care prices vary geographically, equality in access would also require coinsurance rates to vary with prices if an enrollee is not to pay more coinsurance for the same quantity of services where prices are higher.

It may be interesting to compare the Davis-Reynolds findings with unpublished data from SSA's Current Medicare Survey (CMS) of a sample of Medicare beneficiaries interviewed monthly for a period of fifteen months.

Davis and Reynolds find health status in terms of chronic conditions and restricted activity days positively related to utilization, with public assistance recipients using more services than other low-income persons and being less sensitive to health status in their utilization (tables 4, 5). Similar results are observed for Supplementary Medical Insurance enrollees in the accompanying table based on data from our Current Medicare Survey. Utilization of covered services increases as comparative health status deteriorates, with welfare recipients using many more services at each level of health. The gradients are quite steep for both groups, but less so for welfare recipients because of high utilization by welfare recipients with comparatively better health. These conclusions apply both to the percentage of enrollees served and the average number of services per person served. Utilization increases as health status deteriorates both because relatively more persons receive services and each recipient uses more.

Davis-Reynolds and CMS findings (not shown here) are consistent for health status and public assistance, and partly for race. Both surveys show direct relationships between utilization of physicians' care and covered services, respectively, and health status and public assistance. Davis and Reynolds report that blacks in the South make fewer physician visits, but no significant relation for blacks outside the South. But their black-outside South variable compares utilization by blacks outside the South with that of all other persons, including blacks in the South. It is difficult, therefore, to know just what relation exists between utilization by blacks compared with whites. The CMS table shows more covered services per person served for whites in each region, with the differences between whites and all other races greater in the Northeast and West than in the South. (Number of enrollees of all other races in the West is too small, however, to provide a reliable estimate.) Furthermore, the proportion of whites served exceeds the proportion of all other races by more in the Northeast and North Central than in the South.

One final point is worth mentioning. Davis and Reynolds find a negative relation between physician visits and age, whereas CMS shows a positive, although not highly significant, association. As they point out, however, age may capture the effect of health status if the latter is not controlled.

Davis and Reynolds conclude that "supplementary health care delivery programs" designed to meet the special needs of minorities, rural residents,

## Covered Medical Services under the Supplementary Medical Insurance Program, by Health Condition and Welfare Status, and by Region and Race, 1969

Health Condition and Region	Total		No Welfare		Some Welfare				
	Number Served (000's)	Percentage of Enrollees	Average Number of Services Served <sup>a</sup>	Number Served (000's)	Percentage of Enrollees	Average Number of Services Served <sup>a</sup>			
All health conditions <sup>b</sup>	13,963	77.7	16.7	11,633	75.6	14.2	2,330	90.3	28.9
Better than others	5,706	71.2	10.7	5,153	69.8	9.7	553	87.6	19.6
Same as others	6,082	80.0	14.7	4,980	78.4	13.2	1,096	88.2	21.6
Worse than others	2,175	92.4	37.7	1,494	90.7	32.8	681	96.6	48.2
		Total			White			All Other Races	
All regions	15,595	78.7	17.2	14,440	79.1	17.5	1,112	73.9	12.6
Northeast	4,252	80.1	20.3	4,077	80.8	20.5	157	67.1	13.2
North Central	4,406	76.2	16.6	4,191	76.5	16.7	205	70.9	16.2
South	4,536	78.4	14.5	3,841	78.8	14.9	684	75.8	12.0
West	2,402	81.6	17.8	2,332	81.6	18.1	67	82.7	6.9

<sup>a</sup> Includes in-hospital visits.  
<sup>b</sup> Excludes unknown conditions. Comparative health status is reported by the sample persons at the beginning of the survey.

and persons in the South must be an essential part of health care policy. This statement surely serves to whet the appetite. What are these supplementary programs? Are they medical service, manpower, or health insurance programs? Would they supplement or replace existing programs? How would they be financed?

Medicare and Medicaid have clearly accomplished a great deal toward increasing access to medical care. Nevertheless, substantial gaps exist for certain population groups. The solution to meet the special needs of these population groups clearly is not readily apparent.

## NOTES

1. Eugene Carter and Charles Fisher, "Health Insurance for the Aged: Hospital and Extended Care Admissions by State, Fiscal Year 1971," Social Security Administration, Health Insurance Statistics, HI-42, March 12, 1973.
2. U.S. Social Security Administration, Office of Research and Statistics, "Medicare: Health Insurance for the Aged, 1968, Section I: Summary," Washington, D.C., 1973, pp. 1-18, 19.
3. Evelyn Peel and Jack Scharff, "Impact of Cost-Sharing on Use of Ambulatory Services under Medicare, 1969," *Social Security Bulletin*, October 1973.

