Use of Health Services by the Elderly in Low-Income Communities

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PROVIDING ALL INDIVIDUALS WITH EQUAL ACCESS to a minimum level of health care is a complex problem. To some extent identifying this problem has helped initiate many activities directed toward providing health services to the disadvantaged population. These efforts have taken the form of service programs, increasing the availability of services to the poor in inner-city neighborhoods, and removing some of the financial barriers to care by instituting Medicare and Medicaid for the elderly in need of medical attention.

In the past two decades, a lessening of the gap in health care received by poor and by nonpoor families has been realized (Andersen et al., 1978; Davis, 1975; Kovar, 1979). However, the related impact on health services utilization by health insurance coverage and usual sources of care have not been completely assessed in previous studies. Several studies have examined the differential access to medical care and reported that the removal of the cost barrier from the disadvantaged population alone would not guarantee equal access to care (Diehr et al., 1975; Greenlick et al., 1972; Wan, 1977). Moreover, the providing of broad-based publicly financed medical coverage has not

completely alleviated the problems of inaccessibility prevailing in the low-income area (Okada and Sparer, 1976; Aday, 1975; Taylor et al., 1975). Thus, access to care is a complicated problem generated from different socioeconomic, cultural, psychological, and organizational barriers to the utilization of health services, not merely the physical presence or absence of resources and health care facilities. Explaining this problem requires a multivariate analysis of its correlates and consequences in the use of health services.

In recent years, the multivariate approach has been widely applied in health services research and has greatly enhanced our understanding of causal relationships between social and health factors and utilization behavior (Berki and Kobashigawa, 1976; Galvin and Fan, 1975; Andersen and Aday, 1978; Wan and Soifer, 1974; Wan, 1982; Wolinsky, 1977). Although these empirical studies have reflected the advancement of causal modeling in health services research, they have relied upon data obtained from surveys of a general population and have limited their measures of utilization behavior primarily to physician use. Consequently, little is known about the use of ambulatory care and short-term hospitalization by the elderly who live in low-income communities.

The problems in access to health care by the elderly are very well documented in ambulatory care research (Beck, 1973; Donabedian, 1973; Ferguson et al., 1976; Kane et al., 1976; Reynolds, 1976; German et al., 1976). However, a few studies have dealt specifically with the question of how a full range of variables relating to access to medical care and health status affects physician utilization and short-term hospitalization. For example, in a careful multivariate analysis of utilization patterns of physician and hospital services for the elderly, using 1969 data from the Health Interview Survey, Davis and Reynolds (1976) found that health status was the most important predictor of physician and hospital utilization when other sociodemographic and health resource factors were taken into account. They further concluded that some inequalities in utilization of health services still persist in the elderly population covered by Medicare. German et al. (1976), in examining the effect of regular care source on ambulatory care for chronically ill older persons in East Baltimore, reported that, irrespective of the differences in age, sex, and living arrangement, a relatively higher utilization rate of ambulatory services was found among elderly individuals enrolling in a newly organized

health maintenance organization than among those receiving care through more traditional sources.

In a recent study of the use of ambulatory care services by 1,182 elders in Baltimore County, Maryland, Wan and Odell (1981) found that need for services as evidenced by physical and psychological functioning was the most important predictor of use of physician services and hospitalization. They further reported that knowledge about the community service networks was highly predictive of use of social but not health services. This study has demonstrated the need for a systematic assessment of regular sources of care in order to formulate outreach health care programs in the community.

Important as these findings are, a major question pertaining to the differential effect of determinants on health services utilization by the noninstitutionalized elderly living in poor urban neighborhoods still remains to be answered. Further, we should examine how some aspects of access to care and patient characteristics of the elderly affect the utilization of ambulatory care and short-term hospitalization.

This analysis is part of a large study investigating health care of noninstitutionalized populations in five neighborhood health center service areas. More specifically, we attempt to examine factors affecting the extent to which noninstitutionalized elderly persons use ambulatory care and short-term hospitalization.

Data and Methods

Data Source

The primary source of data for this analysis is a community health survey of populations in low-income areas, conducted by Westat Research, Inc., for the National Center for Health Services Research. The purpose of this survey was to identify demographic characteristics, health services utilization, and health status of the residents in selected urban neighborhood health center services areas (Atlanta, Georgia; Charleston, South Carolina; Kansas City, Missouri; East Palo Alto, California; and Boston, Massachusetts) in order to provide information for program planning and evaluation.

A multistage probability sample of the occupied dwelling units in each of the five selected service (catchment) areas was employed.

Interviews were completed in August of 1975, using as the respondent the one person from each dwelling unit who was best able to report on health matters concerning family members. Questionnaires were completed for 7,596 households that yielded information in the catchment areas. The overall completion rate of the survey was 80 percent, with the lowest in Kansas City (71 percent) and the highest in Atlanta (92 percent). Among those not interviewed, 7 percent were not at home after repeated calls; 10 percent were refusals; and 3 percent were those for whom other difficulties were encountered in the interview. Since this study focused on utilization of health services by the elderly, the sample was restricted to persons aged 65 and older, and included 1,987 elderly individuals living in low-income urban areas.

Measurement of Variables

The concept of access to care is operationally defined as the availability of the health facilities necessary for an individual's regular care, or health insurance coverage enabling a person to receive needed services. Three indicators of access to care used as independent variables are regular source of care, health insurance coverage, and annual family income. The usual source of care refers to the regular use of a private clinic, hospital ambulatory care, neighborhood health center, or public health clinic. Health insurance coverage is defined as an insurance plan covering hospitalization (HI) and/or supplementary medical insurance plan (SMI) covering physicians' visits or outpatient services. Insurance coverage is classified into seven categories: HI only; HI with an unknown status for other coverages; HI and SMI with no additional insurance coverages; HI and SMI with additional private insurance; HI and SMI with Medicaid; HI and SMI with public assistance; and private health insurance only. Income refers to annual family income and is categorized into five subgroups: under $5,000; $5,000–$9,999; $10,000–$14,999; $15,000 and more; and income not reported.

The health status indicators were selected. The first refers to the total number of episodic illnesses (acute or usually lasting at least two consecutive days) reported within a year. The second is measured by the effect of chronic conditions (lasting more than six months) on performance of major activities and/or other activities. A person who could perform neither major or other activities is defined as "severely

disabled"; a person who was limited in type or amount of major activity is defined as "moderately limited"; a person who was limited in the type or amount of other activity is defined as "minor or mildly limited"; and a person who had no activity limitation is defined as "not limited." The sociodemographic factors used included age, sex, race, and education.

The dependent variables employed are an elderly individual's total number of physician contacts and the total number of hospital days during the twelve months preceding the interview. An identical set of independent variables was included in a multivariate analysis of physician use and of short-term hospitalization for the elderly. A preliminary analysis revealed that age, sex, and education variables had a negligible influence on both types of health services utilization. Subsequently, they were excluded in the final regression analysis as reported in this study. Race appeared to exert a relatively important effect so that it was included as a control variable in order to determine the relative importance of access to care and health status variables affecting the extent to which blacks differ from whites in utilization of ambulatory physician care and short-stay hospitalization.

Multiple classification analysis (MCA) was the major analytic method employed. The MCA technique shows the nature of the effects of the predictor taken by itself and of each predictor after adjustment for its intercorrelations with other predictors in the analysis. The positive or negative adjusted deviation from the grand mean, which is the difference between the predicted value of each subclass and the grand mean after other predictors are held constant, measures the increased or decreased utilization rate. The deviation in combination with the grand mean was then expressed as the adjusted mean for each subclass of a predictor (independent variable).

Results

The number and percentage distributions of regular users of specific health care facilities classified by social and health attributes of the elderly are displayed in Table 1. Disproportionately more persons used private physicians (47.9 percent) as their regular source of care. Persons who were more likely to use private physicians were characterized as

being 80 years old or older (50 percent), being a white female (68.4 percent), having completed 13 years or more of education (69.5 percent), having annual family income of $15,000 or more (66.3 percent), having no episodic illness in the past year (49 percent), having a minor chronic disability (56.7 percent), and having a voluntary insurance plan (74 percent) in addition to Medicare A and B coverages.

Regular users of neighborhood health centers were more likely to be characterized as follows: aged 75–79 (15.3 percent); being a black female (27.5 percent); completed less than 9 years of education (23.2 percent); having annual family income less than $5,000 (19.6 percent); having one episodic illness in the past year (16 percent); having a moderate disability (18.7 percent); and having insurance plans covered by Medicare and Medicaid (27 percent) or public assistance (28.6 percent).

Data in Table 1 also revealed that the higher the educational level, the more likely it was for the user to have a private physician as a regular source of care; and that the less educated were more likely to use hospital ambulatory facilities and neighborhood health centers. Individuals who had more illnesses and a severe disability were less likely to use a private physician and more likely to use hospital ambulatory services. People with private insurance were more likely to use private physicians, whereas those with public insurance (Medicaid or other government programs) were more likely to use hospital ambulatory care and neighborhood health centers.

Table 2 shows selected social and health characteristics of the elderly by race. Whites were twice as likely as blacks to have a private physician as their regular source of care, while blacks were twice as likely as whites to use hospital ambulatory care. Blacks were four to five times more likely than whites to use neighborhood health centers, and also were two to three times more likely to use neighborhood health centers than whites with public insurance.

Table 3 shows that 46 percent of 1,987 elderly persons reported activity limitations attributable to chronic conditions and 22 percent of them reported having had at least one acute illness during the year. Table 3 also displays the percentage distributions of the elderly for several sociodemographic characteristics: age, sex and race, education, annual family income, and health insurance coverage. The elderly with a severe chronic disability differed in several respects from those

TABLE 1

Number and Percentage Distributions of Regular Users of Specific Health Care Facilities by Social and Health Characteristics of the Elderly

Characteristics	Total		Regular Care Source*				
	N	%	Private Physician	Hospital Ambulatory Care	Neighborhood Health Center	Public Health Clinic	No Regular Source
Total	1,987	100.0	47.9	25.7	14.2	3.2	9.0
Age:							
65–69	748	37.6	45.9	27.1	14.4	3.7	8.8
70–74	566	28.5	49.8	26.1	14.1	2.5	7.4
75–79	339	17.1	47.2	25.1	15.3	2.4	10.0
80+	334	16.8	50.0	22.2	12.9	3.9	11.1
Sex-Race:							
Black-male	343	17.3	28.6	40.5	18.4	4.1	8.5
White-male	394	19.8	58.1	18.5	5.3	4.8	13.2
Black-female	608	30.6	30.6	34.4	27.5	2.0	5.6
White-female	642	32.3	68.4	13.9	5.0	2.8	10.0
Education:							
<9 years	669	33.7	32.6	34.2	23.2	2.8	7.2
9–11 years	802	40.4	50.4	25.1	12.3	3.1	9.1
12 years	257	12.9	58.4	16.7	7.8	4.3	12.8
13+ years	259	13.0	69.5	14.2	3.4	3.1	9.6
Annual Family Income:							
<$5,000	1,007	50.7	39.3	28.8	19.6	2.7	9.6
$5,000–9,999	307	15.5	52.4	21.8	10.7	5.9	9.1

$10,000–14,999	103	5.2	54.3	26.2	7.8	5.8	5.8
$15,000+	66	3.3	66.7	18.2	3.0	7.6	4.6
Unknown	504	25.3	58.5	22.6	8.5	1.4	8.9
Number of Episodic Illnesses:							
None	1,550	78.0	49.0	23.6	13.8	3.0	10.6
One	312	15.7	46.8	29.2	16.0	4.2	3.8
Two or more	125	6.3	37.6	42.4	15.2	2.4	2.4
Level of Disability:							
Severe limitations	555	27.9	39.8	36.8	15.7	3.2	4.5
Moderate limitations	321	16.2	44.5	29.6	18.7	2.5	4.7
Minor limitations	30	1.5	56.7	23.3	16.7	0.0	3.3
No limitations	1,081	54.4	52.8	18.9	12.1	3.4	12.8
Health Insurance Coverage†							
HI only	60	3.0	36.7	31.7	16.7	1.7	13.3
HI (other coverages unknown)	233	11.7	42.9	29.2	14.2	3.9	9.9
HI & SMI (no additional insurance)	635	32.0	37.2	32.4	15.4	3.6	11.3
HI & SMI (with private insurance)	550	27.7	74.0	10.2	4.3	3.5	8.0
HI & SMI (Medicaid)	218	11.0	34.4	32.6	27.0	0.5	5.5
HI & SMI (public assistance)	196	9.9	28.1	36.7	28.6	1.5	5.1
Private insurance only	95	4.8	60.0	18.9	3.2	7.4	10.5

† HI denotes hospital insurance; SMI denotes supplementary medical insurance.
* Figures are row percentages.

TABLE 2
Social and Health Characteristics of the Elderly by Race

Characteristics	Black		White	
	Number	Percent	Number	Percent
Health Insurance Coverage†				
HI only	29	3.0	31	3.0
HI (other coverages unknown)	127	13.4	106	10.2
HI & SMI (no additional insurance)	352	37.0	283	27.3
HI & SMI (with private insurance)	110	11.6	440	42.5
HI & SMI (Medicaid)	154	16.2	64	6.2
HI & SMI (public assistance)	135	14.2	61	5.9
Private insurance only	44	4.6	51	4.9
Usual Source of Care				
Private physician	284	29.9	668	64.5
Hospital ambulatory care	348	36.6	162	15.6
Neighborhood health center	230	24.2	53	5.1

Public health clinic	26	2.7	37	3.6
No regular care source	63	6.6	116	11.2
Annual Family Income				
<$5,000	235	24.7	269	26.0
$5,000–9,999	518	54.5	489	47.2
$10,000–14,999	139	14.6	168	16.2
$15,000	38	4.0	65	6.3
Unknown	21	2.2	45	4.3
Episodic Illness				
None	747	78.5	803	77.5
Once	135	14.2	177	17.1
Two or more times	69	7.3	56	5.4
Level of Disability				
Severe limitations	323	34.0	232	22.4
Moderate limitations	161	16.9	160	15.4
Minor limitations	14	1.5	16	1.5
No limitations	453	47.6	628	60.6
Total Number	951	100.0	1,036	100.0

† HI denotes hospital insurance; SMI denotes supplementary medical insurance.

TABLE 3

Health Status by Social and Demographic Characteristics of the Elderly (N = 1,987)

Characteristics	Level of Chronic Disability*				Episodic Illness (Acute)*		
	Severe	Moderate	Minor	None	2+	Once	None
Total Percent (Number)	27.9 (555)	16.2 (321)	1.5 (30)	54.4 (1,081)	6.3 (125)	15.7 (312)	78.0 (1,550)
Age:							
65–69	25.0	14.7	1.5	58.8	7.1	18.0	74.9
70–74	25.4	17.1	1.6	55.8	5.5	14.7	79.9
75–79	32.2	16.5	0.9	50.4	7.7	11.5	80.8
80+	34.4	17.4	2.1	46.1	4.5	16.5	79.0
Sex-Race:							
Black-male	45.2	10.2	0.3	44.3	6.1	13.4	80.5
White-male	26.9	9.9	2.0	61.2	5.6	15.7	78.7
Black-female	27.6	20.7	2.1	49.5	7.9	14.6	77.5
White-female	19.6	18.8	1.2	60.3	5.3	17.9	76.8
Education:							
<9 years	33.3	18.7	1.6	46.3	7.8	14.3	77.9
9–11 years	29.3	15.7	1.4	53.6	5.1	17.3	77.6
12 years	20.2	17.1	1.2	61.5	4.3	17.5	78.2
13+ years	17.4	10.0	1.9	70.7	8.1	12.4	79.5

Annual Family Income:							
<$5,000	32.5	18.5	1.2	47.9	7.2	17.5	75.3
$5,000–9,999	26.4	16.0	2.0	55.7	5.5	13.0	81.4
$10,000–14,999	21.4	9.7	1.0	68.0	4.9	15.5	79.6
$15,000+	28.8	10.6	0.0	60.6	0.0	18.2	81.8
Unknown	21.0	13.7	2.2	63.1	6.0	13.5	80.6
Health Insurance Coverage:†							
HI only	21.7	25.0	0.0	53.3	5.0	6.7	88.3
HI (other coverages unknown)	29.2	21.9	1.7	47.2	6.0	18.0	76.0
HI & SMI (no additional insurance)	30.2	12.9	1.3	55.6	6.0	15.0	79.1
HI & SMI (with private insurance)	17.5	14.0	1.8	66.7	5.8	15.6	78.5
HI & SMI (Medicaid)	40.4	17.9	0.9	40.8	6.9	15.1	78.0
HI & SMI (public assistance)	42.3	21.9	2.6	33.2	9.2	19.4	71.4
Private insurance only	15.8	14.7	1.1	68.4	5.3	14.7	80.0

† HI denotes hospital insurance; SMI denotes supplementary medical insurance.
* Figures are row percentages.

with no activity limitation. They were older, fewer were white, fewer had completed higher levels of education, fewer had higher annual incomes, and more of them had Medicaid or received public assistance. Similarly, it is not surprising to find that persons who had poor health, indicated by having had at least two episodic illnesses in a year, were very different from those who had good health (no acute illnesses) with respect to their sociodemographic characteristics.

To facilitate presentation of the findings, two types of health services, ambulatory physician care and short-stay hospitalization, are analyzed separately for samples of elderly blacks and elderly whites. Access to care and health status factors are used as independent variables in the multiple classification analysis.

Ambulatory Physician Care

Noninstitutionalized elderly persons had an average of 6.2 physician contacts within a year. Slightly more physician contacts were reported for blacks (6.86) than for whites (5.59).

The summary statistics from multiple classification analysis of the independent variables affecting the number of physician contacts are presented in Table 4. The effects of all five independent variables were statistically significant in the total sample, and showed that the subclass mean of at least one category of each of the independent variables was different from the grand mean, when the effects of other variables are taken into account. They accounted for 15 percent of the variance in physician contacts, 13 percent for blacks, and 19 percent for whites. In comparing the magnitude of beta coefficients for the total sample, the order of importance was ranked for the five predictors according to the increment that each variable contributes to the variation on the number of physician contacts: 1) level of chronic disability, 2) number of episodic illnesses, 3) usual source of care, 4) health insurance coverage, and 5) annual family income. A careful inspection of Table 4 shows that health-status variables exerted more influence than did access-to-care variables, irrespective of race. Health-insurance-coverage variables had a negligible effect among whites, whereas annual-family-income variables had a negligible effect among blacks when other variables were controlled in the analysis.

From the adjusted mean number of physician contacts, the characteristics of those with the highest utilization of ambulatory physician

TABLE 4

Multiple Classification Analysis of the Effects of Access to Medical Care and Health Status Variables on Physician Contacts for the Elderly, by Race

Independent Variables	Total		Black		White	
	Eta²	Beta²	Eta²	Beta²	Eta²	Beta²
Health Insurance						
Coverage	0.026	0.012*	0.029	0.017*	0.014	0.008
Usual Source of Care	0.040	0.020*	0.032	0.014*	0.048	0.029*
Annual Family Income	0.008	0.004*	0.008	0.005	0.012	0.010*
Number of Episodic						
Illnesses	0.063	0.036*	0.048	0.027*	0.084	0.053*
Level of Chronic						
Disability	0.078	0.040*	0.068	0.036*	0.084	0.048*
R²:		0.153		0.133		0.185

	Total	Black	White
Number of persons	1,987	951	1,036
Mean of annualized physician contacts	6.20	6.86	5.59

Note:

* Significant at 0.05 or lower level.

care, as compared with the average (6.20 contacts), can be identified as follows: 1) receiving Medicare and Medicaid (8.37); 2) using neighborhood health centers as the regular source of care (7.64); 3) having annual family income of $15,000+ (7.89); 4) having two or more episodic illnesses in a year (12.13); and 5) having severe chronic conditions (8.40). There were differences in utilization of ambulatory care between elderly blacks and elderly whites (Table 5). These differences were identified by computing the ratio of black to white adjusted mean number of physician contacts for each subclass of the independent variable. Overall, elderly blacks appeared more likely to use ambulatory care than elderly whites. However, with some exceptions, racial difference in the use of ambulatory care is less apparent among those who had a private insurance plan, regularly used public health clinics, had family income of $15,000 or more, and had two or more episodic illnesses within a year.

It is important to note that a strong inverse relationship is found between the level of health and physician use among the elderly, irrespective of race, and the differential access to care that existed in these low-income urban areas. This finding has lent some support to the assumption that equitable utilization of physician services is primarily a function of the amount of illness that people experience (Andersen and Aday, 1978). Further, it seems reasonable to explain the racial difference (blacks had a greater number of physician visits than whites) in use of ambulatory care in terms of concerted efforts made by neighborhood health centers that help to reduce inequity in the health care system. For example, low-income elderly blacks who had a dual insurance coverage from Medicare and Medicaid and who used neighborhood health centers as a regular source of care would frequently use ambulatory care. It is also believed that the removal of financial barriers and the innovative (outreach) approach of neighborhood health centers in low-income areas had provided needed services to the poor and elderly individuals in urban communities.

Short-Stay Hospital Utilization

Table 6 presents results from the multiple classification analysis of hospital days used. For 1,987 elderly persons each averaging 5.28 days of hospitalization, blacks averaged 4.91 days and whites averaged

5.61 days. Relatively small variance (8 percent) was explained by the five independent variables. The net effect of health status indicators, number of episodic illnesses and level of chronic disability, was statistically significant and contributed positively to the number of hospital days. It is interesting to note that for elderly blacks the chronic disability variable (beta^2 = 0.023) accounted for more variance than did the episodic illness variable (beta^2 = 0.017) and was the strongest predictor of hospitalization. For whites a reverse order of importance for these health indicators emerged; the episodic illness variable (beta^2 = 0.044) was the strongest predictor and the chronic disability variable (beta^2 = 0.014) ranked third in importance with respect to adjusted mean length (days) of hospitalization. These findings suggest that race affects the differential response to illness in the utilization of inpatient services.

The regular source of care, an important access factor, exerted a significant effect on hospital utilization, irrespective of race. The net effects of health insurance coverage and annual family income were not statistically significant. With the Medicare health insurance plan covering inpatient services for the elderly and/or the absence of income as a deterrent factor for seeking necessary hospitalization, it is not surprising to find that these enabling factors would have a negligible effect on hospital days.

Table 7 reports mean hospital day results for blacks and whites in low-income areas. Although no significant difference in hospital utilization was reported by persons with different health insurance coverages, slightly fewer hospital days were found among persons with health insurance only and among those with Part A Medicare and Medicaid, or among public assistance recipients.

Persons with a regular source of care used significantly more hospital days than those with no source of care. Among users of specific health facilities, those using hospital ambulatory services as their regular source of care were most likely to have had longer stays in the hospital. Income subgroups showed only small differences in the adjusted mean length of hospitalization (hospital days).

In examining the health status differential in the length of hospitalization, we found that individuals with a severe disability were more than twice as likely as those without any chronic disability to have a longer stay in hospitals. Persons with more frequent illnesses

TABLE 5

Mean and Adjusted Mean* of Physician Contacts for the Elderly, by Access to Medical Care and Health Status Variables and by Race

Independent Variables	Total		Black		White		Ratio Black/White (Adjusted Mean)
	Mean	Adjusted Mean	Mean	Adjusted Mean	Mean	Adjusted Mean	
Health Insurance Coverage†							
HI only	4.67	4.93	4.85	5.29	4.33	4.50	0.94
HI (other coverages unknown)	5.31	5.07	5.57	5.52	4.99	4.62	1.24
HI & SMI (no additional insurance)	5.29	5.45	5.73	5.99	4.74	5.00	1.10
HI & SMI (with private insurance)	6.10	6.66	6.97	7.72	5.88	6.03	0.82
HI & SMI (Medicaid)	9.15	8.37	9.96	9.36	7.19	6.63	1.20
HI & SMI (public assistance)	8.48	7.09	8.51	7.38	8.40	7.23	1.81
Private insurance only	4.51	5.33	4.61	6.16	4.42	4.50	0.86
Usual Source of Care							
Private physician	6.08	6.37	6.16	6.57	6.04	6.17	1.06
Hospital ambulatory care	7.07	6.26	7.60	7.07	5.94	4.68	1.51
Neighborhood health center	8.23	7.64	8.27	8.02	8.02	7.35	1.09

Public health clinic	7.19	7.33	6.73	7.03	7.52	7.46	0.94
No regular care source	.81	2.42	0.85	2.69	0.79	2.12	1.27
Annual Family Income							
<$5,000	6.64	6.23	7.21	6.74	6.03	5.79	1.16
$5,000–9,999	6.73	6.91	8.02	8.38	5.66	5.60	1.50
$10,000–14,999	5.89	6.58	6.57	6.82	5.48	6.29	1.08
$15,000	7.38	7.89	5.85	6.62	8.09	8.31	0.80
Unknown	4.91	5.42	5.54	6.24	4.36	4.60	1.36
Episodic Illness							
None	5.12	5.42	5.90	6.20	4.39	4.68	1.32
Once	8.57	7.69	8.59	7.78	8.55	7.55	1.03
Two or more times	13.67	12.13	13.85	12.16	13.45	12.37	0.98
Level of Disability							
Severe limitations	9.25	8.40	9.65	8.93	8.68	7.75	1.15
Moderate limitations	8.66	8.08	8.68	8.21	8.64	8.06	1.02
Minor limitations	5.87	5.13	8.14	7.14	3.88	3.47	2.06
No limitations	3.91	4.54	4.19	4.90	3.71	4.22	1.16
Total Number	1,987		951		1,036		
Grand Mean	6.20		6.86		5.59		

† HI denotes hospital insurance; SMI denotes supplementary medical insurance.
* Means were adjusted for the effects of all other independent variables in this table by multiple classification analysis.

TABLE 6

Multiple Classification Analysis of the Effects of Access to Medical Care Status Variables on the Number of Days in Short-Term Hospitals for the Elderly, by Race

Independent Variables	Total		Black		White	
	Eta²	Beta²	Eta²	Beta²	Eta²	Beta²
Health Insurance						
Coverage	0.001	0.004	0.001	0.004	0.005	0.004
Usual Source of Care	0.026	0.017*	0.029	0.011*	0.029	0.020*
Annual Family Income	0.001	0.000	0.004	0.002	0.002	0.009
Number of Episodic						
Illnesses	0.044	0.029*	0.029	0.017*	0.063	0.044*
Level of Chronic						
Disability	0.032	0.017*	0.036	0.023*	0.032	0.014*
R²:		0.081		0.078		0.100

Note:

	Total	Black	White
Number of persons	1,987	951	1,036
Mean of short-term hospital stay (nights)	5.28	4.91	5.61

* Significant at 0.05 or lower level.

(two or more episodes) were four times more likely than those without any episode during the survey year to use more hospital days. Furthermore, those with frequent illnesses used a greater number of hospital days than the severely disabled. One interpretation of this finding is that short-stay hospitalization on the whole reflects serious exacerbations and/or occurrences of episodic illnesses. These persons require immediate medical attention, whereas the chronically ill are more likely to be handled outside the hospital.

The adjusted mean length of hospitalization differed markedly between whites and blacks. Several striking findings appear from comparing adjusted means: 1) Whites having health insurance only used fewer hospital days. 2) Whites used significantly more hospital days than blacks, irrespective of the usual source of care. 3) Whites whose family incomes were $15,000 and more had the longest stay in hospitals as compared with other income groups, whereas blacks with similar incomes had the shortest stay. 4) For persons having two or more episodic illnesses, substantially more whites than blacks were hospitalized for a longer period as compared with the average. 5) Racial differences in hospitalization were more striking among the mildly disabled persons.

Summary and Conclusions

The sociodemographic variables included in this analysis have provided a basis for interpreting the differential access to specific health care facilities in low-income urban areas where the severity of health problems of the disadvantaged population is aggravated by other socially handicapping characteristics. These characteristics include advanced age, lower level of education, and inadequate insurance coverage for ambulatory services. Among 1,987 elderly persons studied, the regular user of a neighborhood health center was more likely to be black than white, earn under $5,000 a year, have less than nine years of schooling, and receive Medicaid or public assistance. Similarly, persons affiliated with hospital ambulatory clinics as a regular source of care were likely to be between 65 and 69 years of age, black males, have less than nine years of schooling, earn less than $5,000 a year, and have had two or more acute illnesses within a year and a severe chronic disability. These persons were likely either to have Medicaid or to have no insurance plan to cover outpatient services.

TABLE 7

Mean and Adjusted Mean* Number of Days in Short-Term Hospitals for the Elderly, by Access to Medical Care and Health Status Variables and by Race

Independent Variables	Total		Black		White		Ratio
	Mean	Adjusted Mean	Mean	Adjusted Mean	Mean	Adjusted Mean	Black/White (Adjusted Mean)
Health Insurance Coverage†							
HI only	3.40	3.94	3.41	3.91	3.39	3.59	1.09
HI (other coverages unknown)	4.65	4.25	5.65	5.67	3.44	2.78	2.04
HI & SMI (no additional insurance)	5.84	5.46	5.07	5.02	6.79	6.18	0.81
HI & SMI (with private insurance)	5.14	6.69	5.45	6.73	5.05	6.18	1.09
HI & SMI (Medicaid)	5.46	4.25	4.58	3.87	7.55	6.31	0.61
HI & SMI (public assistance)	5.32	3.22	4.16	3.20	7.87	4.35	0.74
Private insurance only	4.58	5.93	4.59	6.82	4.57	5.29	1.29
Usual Source of Care							
Private physician	3.74	3.84	2.48	2.79	4.26	4.32	0.65
Hospital ambulatory care	10.18	9.28	8.78	7.98	13.17	11.92	0.67
Neighborhood health center	4.08	4.32	3.52	3.86	6.47	5.97	0.65

Public health clinic	3.21	2.66	3.34	2.29	3.11	2.98	0.77
No regular care source	2.16	3.98	0.20	2.40	3.22	4.91	0.49
Annual Family Income							
<$5,000	5.75	5.26	5.49	4.69	6.02	5.22	0.90
$5,000–9,999	5.32	5.81	5.10	5.41	5.49	6.17	0.88
$10,000–14,999	4.71	5.05	2.23	7.36	3.23	3.96	1.86
$15,000	4.97	5.53	2.04	2.94	6.33	6.87	9.43
Unknown	4.46	5.02	3.40	3.91	5.39	6.16	0.63
Episodic Illness							
None	3.30	3.64	3.31	3.72	3.28	3.65	1.02
Once	10.59	9.76	9.59	8.41	11.34	10.44	0.81
Two or more times	16.59	14.39	13.07	10.97	20.93	18.43	0.60
Level of Disability							
Severe limitations	10.57	9.27	9.69	8.69	11.78	9.97	0.87
Moderate limitations	5.02	4.36	3.86	3.73	6.18	4.80	0.78
Minor limitations	3.54	2.62	0.00	0.01	6.62	5.86	17.06
No limitations	2.69	3.58	2.03	2.81	3.16	4.20	0.67
Total Number		1,987		951		1,036	
Grand Mean	5.28		4.91		5.61		

† HI denotes hospital insurance; SMI denotes supplementary medical insurance.
* Means were adjusted for the effects of all other independent variables in this table by multiple classification analysis.

We found that the severely disabled accounted for 28 percent of the total study sample. Moreover, disproportionately more severely disabled persons were aged 80 and over, black males, having less than nine years of schooling, earning less than $5,000 a year, and have Medicaid or receive public assistance. However, no discernable sociodemographic differences in the distribution of episodic illness were found.

In the multivariate analysis, a limited amount of total variance in the health service utilization was explained by access to care and health status variables. For the ambulatory care utilization, the effects of the five independent variables were statistically significant. However, the major part of the variance was explained by the health status measures, chronic disability and acute illness. It is important to note that access to medical care, as measured by usual source of care and insurance coverage, did correlate with more frequent visits to physicians. For example, those with a regular source of care were three times as frequent users of ambulatory care as those with no regular source. Medicaid recipients and those with access to neighborhood health centers were the most frequent users of ambulatory physician care, irrespective of race. Furthermore, for a given level of health, blacks had a greater number of physician contacts than whites. This may be explained by the fact that poor elderly blacks have significantly benefited from the advent of Medicaid or public assistance and also have taken advantage of various services provided by the neighborhood health center. One inference that can be drawn is that the removal of financial barriers, coupled with a concerted effort toward making health services readily available to the medically needy, has greatly facilitated the use of ambulatory physician care.

For the short-stay hospital utilization, two health status variables and one indicator of access to care (usual care source) were statistically significant in accounting for the variation in hospital days. In general, elderly blacks had relatively shorter stays in hospitals than whites. From this differential pattern, the following may be inferred: 1) Elderly blacks may perceive the need for hospitalization differently from elderly whites so that their lower hospitalization rate may be a function of their reluctance to seek inpatient services. 2) Racial disparities in insurance benefits may also cause the differential in hospitalization (Davis, 1975). 3) Initially, greater use of ambulatory care by elderly blacks may reduce their use of inpatient services,

particularly since services are readily available for them in neighborhood health centers. 4) Because of discriminatory practices, some elderly blacks are less likely to be hospitalized than are elderly whites, irrespective of the need for hospitalization.

Future research on racial disparities in the use of hospital care among the elderly should focus upon a broad range of social, cultural, psychological, and organizational barriers to seeking care. In addition, efforts should be directed toward 1) providing education for the consumer explaining how to enter the appropriate health care system and how to obtain needed services; 2) improving the medical education process regarding access barriers and communication gaps between provider and patient; 3) eliminating structural impediments in access to health care through redistributing and reallocating health resources; 4) formulating effectively coordinated service programs in the community, such as a health information and referral network; 5) equalizing Medicare benefits through changes in the cost-sharing provisions, as suggested by Davis (1975); and 6) identifying the service delivery problems with greater consideration of the diversity of cultural and ethnic backgrounds of the elderly.

As a final note, health services research on noninstitutionalized elderly persons can greatly improve our understanding of the deterrent factors in the use of health services. In order to solve the health care problems of the elderly, we need a better understanding of the determinants of health services utilization, which in turn requires a multivariate approach to assess personal and societal factors affecting the excessive as well as the deficient use of specific health services (Kronenfeld, 1980; Roos and Shapiro, 1981; Russell, 1981; Shanas and Maddox, 1976; Ward, 1977; Wolinsky, 1978).

References

Aday, L.A. 1976. The Impact of Health Policy on Access to Medical Care. *Milbank Memorial Fund Quarterly/Health and Society* 54(Spring):215–233.

Andersen, R., and Aday, L.A. 1978. Access to Medical Care in the United States: Realized and Potential. *Medical Care* 16(July):533–546.

——, Lion, J., and Anderson, O.W. 1976. *Two Decades of Health Service: Social Survey Trend in Use and Expenditure.* Cambridge, Mass.: Ballinger.

Beck, R.G. 1973. Economic Class and Access to Physician Services under Public Medical Care Insurance. *International Journal of Health Services* 3(3):341–355.

Berki, S., and Kobashigawa, B. 1976. Socioeconomic and Need Determinants of Ambulatory Care Use: Path Analysis of the 1970 Health Interview Survey Data. *Medical Care* 14(May):405–421.

Blazer, D. 1980. Life Events, Mental Health Functioning and the Use of Health Care Services by the Elderly. *American Journal of Public Health* 70(Nov.):1174–1179.

Davis, K. 1975. Equal Treatment and Unequal Benefits: the Medicare Program. *Milbank Memorial Fund Quarterly/Health and Society* 53(Fall):449–488.

————. 1976. The Impact of Medicare and Medicaid on Access to Health Care. In Rosett, N. ed., The Role of Health Insurance in the Health Service Sector. New York: National Bureau of Economic research.

————, and Reynolds, R. 1975. Medicare and the Utilization of Health Care Services by the Elderly. *Journal of Human Resources* 10(3):361–377.

Diehr, P., Jackson, K.O., and Boscha, M.V. 1975. Impact of Outreach Services on Enrollees of a Prepaid Health Insurance Program. *Journal of Health and Social Behavior* 16(Sept.):326–340.

Donabedian, A. 1973. Aspects of Medical Care Administration. Cambridge, Mass.: Harvard University Press.

Ferguson, C., Lee, M.L., and Wallace, R. 1976. Effects of Medicare on Hospital Use: A Disease-Specific Study. *Medical Care* 14(July):574–589.

Galvin, M.E., and Fan, M. 1975. The Utilization of Physicians' Services in Los Angeles County, 1973. *Journal of Health and Social Behavior* 16(March):74–94.

German, P.S., Skinner, E.A., and Shapiro, S. 1976. Ambulatory Care for Chronic Conditions in an Inner-City Elderly Population. *American Journal of Public Health* 66(July):660–666.

Greenlick, M.R., Freeborn, D.K., Colombo, T.J., and Prussin, J.A. 1972. Comparing the Use of Medical Care Services by a Medically Indigent and a General Membership Group Practice Program. *Medical Care* 10(March):187–200.

Kane, R.L., Woolley, F.R., Gardner, H.J., Snell, G.F., Leight, E.H., and Castle, C.H. 1976. Measuring Outcomes of Care in an Ambulatory Primary Care Population. *Journal of Community Health* 1(4):223–240.

Kovar, M.G. 1979. Health of the Elderly and Use of Health Services. *Public Health Reports* 92(1):9–19.

Kronenfeld, J.J. 1980. Sources of Ambulatory Care and Utilization Models. *Health Services Research* 15(Spring):3–20.

Okada, L.M. and Sparer, G. 1976. Access to Usual Source of Care by Race and Income in Ten Urban Areas. *Journal of Community Health* 1(3):163–174.

Reynolds, R.A. 1976. Improving Access to Health Care among the Poor: The Neighborhood Health Center Experience. *Milbank Memorial Fund Quarterly/Health and Society* 54(Winter):57–82.

Roos, N.P. and Shapiro, E. 1981. The Manitoba Longitudinal Study on Aging. *Medical Care* 19(June):644–657.

Russell, L.B. 1981. An Aging Population and the Use of Medical Care. *Medical Care* 19(June):633–643.

Shanas, E., and Maddox, G.L. 1976. Aging, Health and the Organization of Health Resources. In Binstock, R., and Shannas, E., eds., *Handbook of Aging and the Social Sciences*. New York: Van Nostrand Reinhold.

Taylor, D.G., Aday, L.A., and Andersen, R. 1975. A Social Indicator of Access to Medical Care. *Journal of Health and Social Behavior* 16(March):38–49.

Wan, T.T.H. 1977. The Differential Use of Health Services. *Urban Health* 6(1):47–49.

———. 1982. *Stressful Life Events, Social Support Networks, and Gerontological Health: A Prospective Study*. Lexington, Mass.: Lexington Books.

———, and Odell, B.G. 1981. Factors Affecting the Use of Social and Health Services among the Elderly. *Ageing and Society* 1(March):95–115.

———, and Soifer, S. 1974. Determinants of Physician Utilization: A Causal Analysis. *Journal of Health and Social Behavior* 15(June):100–108.

Ward, R.A. 1977. Services for Older People: An Integrated Framework for Research. *Journal of Health and Social Behavior* 18(March):61–70.

Wolinsky, F. 1978. Assessing the Effect of Predisposing, Enabling, and Illness-Morbidity Characteristics on Health Service Utilization. *Journal of Health and Social Behavior* 19(December):384–396.

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