Impact of Medicare on the Use of Medical Services by Disabled Beneficiaries, 1972-1974

by Ronald W. Deacon

The extension of Medicare coverage in 1973 to disabled persons receiving cash benefits under the Social Security Act provided an opportunity to examine the impact of health insurance coverage on utilization and expenses for Part B services. Data on medical services used both before and after coverage, collected through the Current Medicare Survey, were analyzed. Results indicate that access to care (as measured by the number of persons using services) increased slightly, while the rate of use did not. The large increase in the number of persons eligible for Medicare reflected the large increase in the number of cash beneficiaries. Significant increases also were found in the amount charged for medical services. The absence of large increases in access and service use may be attributed, in part, to the already existing source of third party payment available to disabled cash beneficiaries in 1972, before Medicare coverage.

The debate concerning national health insurance and the potential impact of various proposals for it raise a series of questions: Will the program improve access? Will the newly entitled population use more services than before? Will there be shifts in the types of services used? What will happen to medical care prices and expenditures?

Some insight into these issues can be gained by observing results of changes which have already taken place in the public health insurance field. The U.S. pattern of gradually extending public health insurance protection to subgroups of the population provides an opportunity to study changes in health care demand and spending which occur after extension of coverage.

One such opportunity was the Medicare program, first introduced in 1966 to the aged. When coverage was extended in 1973 to the disabled, a special survey —the subject of this paper—was undertaken to examine how access to care for this group changed, whether utilization increased, whether shifts in the type of services used occurred, and how much medical care prices and expenditures increased.

In focusing on utilization and expenses before and after Medicare was introduced to the disabled, primary factors examined are access to care, intensity of use, and physicians' prices. Also included is a description of changes in utilization of medical services by a group of disabled beneficiaries who, before Medicare coverage, had access to care from the Veterans Administration. This account is primarily descriptive; information is not available to determine causal factors underlying the observed changes.

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Background

Previous Studies

The potential impact of new health insurance coverage has been studied from many perspectives. The large-scale Rand Health Insurance Experiment, involving 3200 families, tests the probable effects—upon both the beneficiary and health care delivery system—of different features of health insurance programs including cost-sharing, benefit structures, and organization of services (HMO versus fee-for-service) (Newhouse, 1974).

Canada's national health insurance program has been the subject of many investigations. A survey of households and physicians in Quebec conducted before and after the introduction of Quebec Health Insurance revealed no overall increase in utilization of physician services. There were some changes, however, in the patterns of physicians' practice. For example, Enterline et al. (1973) found that physicians spent more time seeing patients in their office and less time seeing patients in the hospital, at home, or in telephone consultations.

Synthesizing the results of this and other Canadian studies, Marmar (1977) concluded that the U.S. should expect only modest changes in the overall utilization of physician services under national health insurance coverage. Pre-existing health insurance, barriers to care which financing will not change, and the rationing which doctors will impose will, in effect, hold down utilization increases.

Newhouse *et al.* (1974) predicted that changes in demand for health care services under any type of new national health program would be influenced by the extent of prior health insurance coverage. He predicted that a fairly small increase will occur in demand for hospital services because present insurance coverage for such services is nearly complete, while a fairly large increase will occur in demand for ambulatory services because present coverage is small.

The impact of the introduction of Medicare to the aged has also been studied from many perspectives. Pettengill's (1972) study of hospital utilization found modest increases in the use of hospitals the first year after the program began. Another study covering physicians' services found that in the period immediately following the introduction of Medicare, per capita use of physicians' services by the aged declined initially. Also observed was a shift in services from the hospitals to the physicians' offices and nursing homes (Health Insurance Benefit Advisory Council, 1973).

Methods Used

When it appeared likely that Medicare would be amended to include the disabled population receiving benefits under the Social Security program, baseline data on the use of medical services were collected in 1972 from a sample of disabled cash beneficiaries who met the eligibility qualifications of the then pending legislation. The 1972 sample consisted of about 2,000 persons who had been receiving cash benefits for at least 24 months. To compare utilization after Medicare was extended to the disabled, a second sample of about 2,000 beneficiaries was interviewed in 1974.[1]

The Current Medicare Survey (CMS)—a continuing survey taken during the period 1966 through 1977—was used to collect the "before and "after" data. Data were collected by household interviews from a panel drawn each year and included those services covered by Part B (Supplementary Medical Insurance) of Medicare and noncovered medical services as well.

Covered medical services consist of two major types: (1) physician services and (2) services other than physician. The first group, by far the largest in terms of volume, can occur in several settings (e.g., short-stay hospitals, nursing homes, physician's offices, outpatient departments, home) and may be either surgical or nonsurgical in nature. The second type of covered service includes the rental or purchase of durable medical equipment, medical supplies, ambulance services, and services rendered by medical personnel (e.g., nurses, therapists, home health aides, and speech pathologists).

Noncovered services include prescription drugs, services by medical practitioners such as podiatrists, chiropodists, and optometrists, and certain services by physicians such as eye examinations for prescribing glasses, hearing examinations, and routine physical examinations.

[1] Medicare coverage of the disabled actually commenced July 1973 so that the first full year of coverage was 1974.

Although data on Part A services were not collected by the CMS, this is not considered a serious limitation to this study. Generally, the greatest changes in utilization will occur for services with the least insurance coverage.

Because survey data are obtained by interviewing a sample of beneficiaries, the data presented in this report are subject to response errors and sampling variability which are discussed in the Technical Note at the end of this report. The level of significance for all tests involving differences between estimates is 5 percent, and any differences pointed out in the text are statistically significant.

Findings

Before discussing the changes that occurred in service utilization and expenses incurred after Medicare coverage, some characteristics of disabled beneficiaries are presented. Although no attempt is made here to determine the relationship between beneficiaries' medical and socioeconomic characteristics and resulting changes in beneficiaries' use of services after coverage, it is nevertheless useful to describe their characteristics in 1972, especially income and insurance coverage and conditions causing disability.

Characteristics of the Disabled—1972

As shown below, almost two-thirds of the group were men, of which approximately one-third were veterans. Nearly 80 percent of the disabled were between 45 and 64, and 35 percent were between 60 and 64. Approximately 15 percent of the disabled were nonwhite, a figure higher than that for aged enrollees (8 percent nonwhites in 1972). Ten percent of the disabled were institutionalized, also higher than for the aged (6 percent institutionalized in 1972). Nearly 82 percent of the disabled had family incomes below $7,500.

Information on private health insurance coverage and Medicaid coverage are also shown above. It can be observed that in 1972, 61.6 percent of the disabled had no private health insurance for any type of medical service; 38.1 percent had insurance covering hospital costs; 31.5 percent had insurance covering physician costs asociated with surgery; and only 8.5 percent had insurance covering general physician services.[2] Welfare or Medicaid payments for some of their medical services were received by 32 percent of the disabled.

These survey responses indicate that a substantial number of disabled Social Security cash beneficiaries in 1972 had a source of third party payment available to them. That is, 32 percent of the disabled used Medicaid or welfare as a source of payment; approximately 25 percent of the total group were veterans eligible for VA medical benefits; and nearly 32 percent had private health insurance covering at least physician services associated with surgery. Although there was undoubtedly some overlap in people using more than one source of third party payment, it is likely that a considerable proportion of the disabled had a potential source of payment for required medical services.

Characteristics of Disabled Beneficiaries

Age	*Percent*
Under 35	9.5
35–44	11.4
45–54	24.2
55–59	20.2
60–64	34.7
Sex	
Men	64.8
Women	35.2
Race	
White	85.5
Nonwhite	14.5
Income	
less than $3000	35.8
$3,000-4,999	27.8
$5,000-7,499	17.6
over $7,500	18.8
Veteran Status (Men only)	
Nonveterans	62.1
Veterans	37.9
Private Health Insurance Coverage	
No plan	61.6
Hospital care only	6.5
Surgeon care only	.2
Physician care only	0
Hospital-Surgeon care only	23.1
Hospital-Physician care only	.3
Surgeon-Physician care only	0
Hospital, Surgeon and Physician	8.2
Medicaid or Other Public Payments	
One or more bills paid	32.0
No bills paid	68.0
Institutional Status	
Institutionalized	10.0
Noninstitutionalized	90.0

Although the Current Medicare Survey did not seek information on the medical conditions causing disability or on the conditions relating to the use of medical services, information is available on the medical conditions of the disabled from a Social Security Administration survey. The data show that cardiovascular and musculoskeletal disorders ranked the highest as conditions causing disability.[3] A table of the distribution of disorders is shown below for two groups of disabled beneficiaries. Conditions of those disabled longer than 24 months had a slightly different distribution, with musculoskeletal, mental, and nervous disorders accounting for a higher percentage in this group than in those disabled less than 24 months.

Chronic Condition	*Length of Entitlement* (in percent)	
	1-23 months	*24 months or more*
Musculoskeletal	29.2	31.1
Cardiovascular	40.5	32.7
Respiratory	10.8	7.8
Digestive	.5	1.9
Mental	4.9	10.8
Nervous	1.0	6.1
Urogenital	3.6	1.2
Neoplasms	.6	1.4
Endocrine	.3	1.5
Other	8.6	5.4
Total	100.0	100.0

[2] It is not known how many disabled had no health insurance coverage for services rendered by medical personnel other than physicians and for durable medical equipment and medical supply services.

[3] Data from the Social Security Administration 1972 Survey of Disabled and Nondisabled Adults, Division of Disability Studies, Office of Research and Statistics, Social Security Administration. For a discussion of the chronic diseases and impairments of the disabled see Krute, Aaron and Burdette, Mary Ellen "1972 Survey of Disabled and Non-disabled Adults: Chronic Disease, Injury, and Work Disability," *Social Security Bulletin*, April 1978.

Overview—Changes in Utilization of and Expenses for Medical Services

As the data will show, large increases occurred between 1972 and 1974 in both the total number of medical services utilized by the disabled and charges incurred for these services. Figure 1 shows that substantially more medical services (covered and noncovered) were used by the disabled in 1974 compared to 1972 (68.6 million services in 1972 and 86.8 million services in 1974). The increase in charges incurred for medical services between 1972 and 1974 was 65 percent ($467 million in 1972 and $771 million in 1974).

Services used and charges incurred by the disabled increased more for covered services than for noncovered services. The number of covered services increased 34 percent (31.5 million in 1972 and 42.3 million in 1974), while the number of noncovered services increased 20 percent (37.1 million in 1972 and 44.5 million in 1974). Charges incurred for covered services increased 80 percent ($279 million in 1972 and $501 million in 1974), while charges incurred for noncovered services increased 44 percent ($188 million in 1972 and $270 million in 1974).

Subsequent sections (1) focus on factors contributing to changes in the utilization and expenses incurred for medical services by the disabled, (2) measure the impact of coverage upon a specific group of disabled persons—Veterans—who previously had access to free care, and (3) describe changes in the disabled beneficiaries' share of total Medicare services and charges.

Changes in Utilization of Medical Services

The utilization of all types of medical services incurred by the disabled in 1972 and 1974 are shown in Table 1. A higher proportion of disabled beneficiaries used covered (SMI) services in 1974 than in 1972 (87.8 percent compared to 84.7 percent). As indicated in Table 2, where use of covered services is described by demographic characteristics, the increase in the proportion who used covered services was particularly noticeable among beneficiaries under 35 years of age (70.6 percent in 1972; 85.6 percent in 1974). Increases, though smaller, were also observed among men (83.3 percent in 1972; 86.8 percent in 1974), residents of nonmetropolitan areas (82.8 percent in 1972; 87.2 percent in 1974), and residents of the North Central census region (79.6 percent in 1972; 87.2 percent in 1974).

The average number of covered services used by each disabled beneficiary was not significantly different in 1972 compared to 1974 (22.8 services per user in 1972; 24.3 services per user in 1974) nor was the mix of covered and noncovered services different. There also were no significant changes in these two measurements with respect to age, sex, race, or residence of beneficiaries.

The Current Medicare Survey also provided an opportunity to compare the rate of use of covered services by aged and disabled beneficiaries. As indicated below, on a per user basis, the disabled used approximately 50 percent more services than the aged. Since the disabled, under the Social Security program, have chronic health conditions preventing them from engaging in substantial work activity, it is not surprising that they used more services on a per capita basis than the aged, many of whom have no significant illness or disability.

	Services per User	
	1972	1974
Aged	14.7	16.0
Disabled	22.8	24.3

Factors Contributing to Overall Increase

Total services used by the disabled beneficiaries are a function of three factors: the number of beneficiaries; the proportion of beneficiaries using services; and the average number of services received by each user. By decomposing total services into its three factors, it is possible to determine the effect of increases in each factor upon the overall increase. (For additional information, see Springer et al., 1965.) This is demonstrated below:

Total services can be expressed as:

(1) $Y=B \times U \times S$

where Y = total covered services received by the disabled
B = number of disabled beneficiaries
U = proportion of beneficiaries utilizing covered services
S = average number of covered services received per user

The increase in total covered services is given by:

(2) $\Delta Y=B_0U_0\Delta S+U_0S_0\Delta B+B_0S_0\Delta U+S_0\Delta B\Delta U+B_0\Delta U\Delta S+U_0\Delta B\Delta S+\Delta B\Delta U\Delta S$

where Δ terms represent changes from 1972 to 1974 and o subscripts represent the 1972 base levels.

The table below indicates the effect of increases in each factor.

Factors	Contribution (percent)
Increases in:	
Number of Beneficiaries	64
Proportion Using Services	11
Services Per Person	19
Interaction (Higher Order Terms)	6
Total	100

The increase in total covered services from 31.5 million in 1972 to 42.3 million in 1974 was due primarily (64 percent contribution) to the increase in eligible beneficiaries which occurred over this period. An additional 400,000 disabled persons became eligible for Medicare, reflecting a similarly large increase from 1970 to 1972 in the number of persons who became eligible for Social Security disability cash benefits. Reasons suggested for the growth in enrollment during this period have been changes in economic conditions, awareness of the program, changes in program provisions, and changes in program administration (Lando and Krute, 1976).

Physician Services

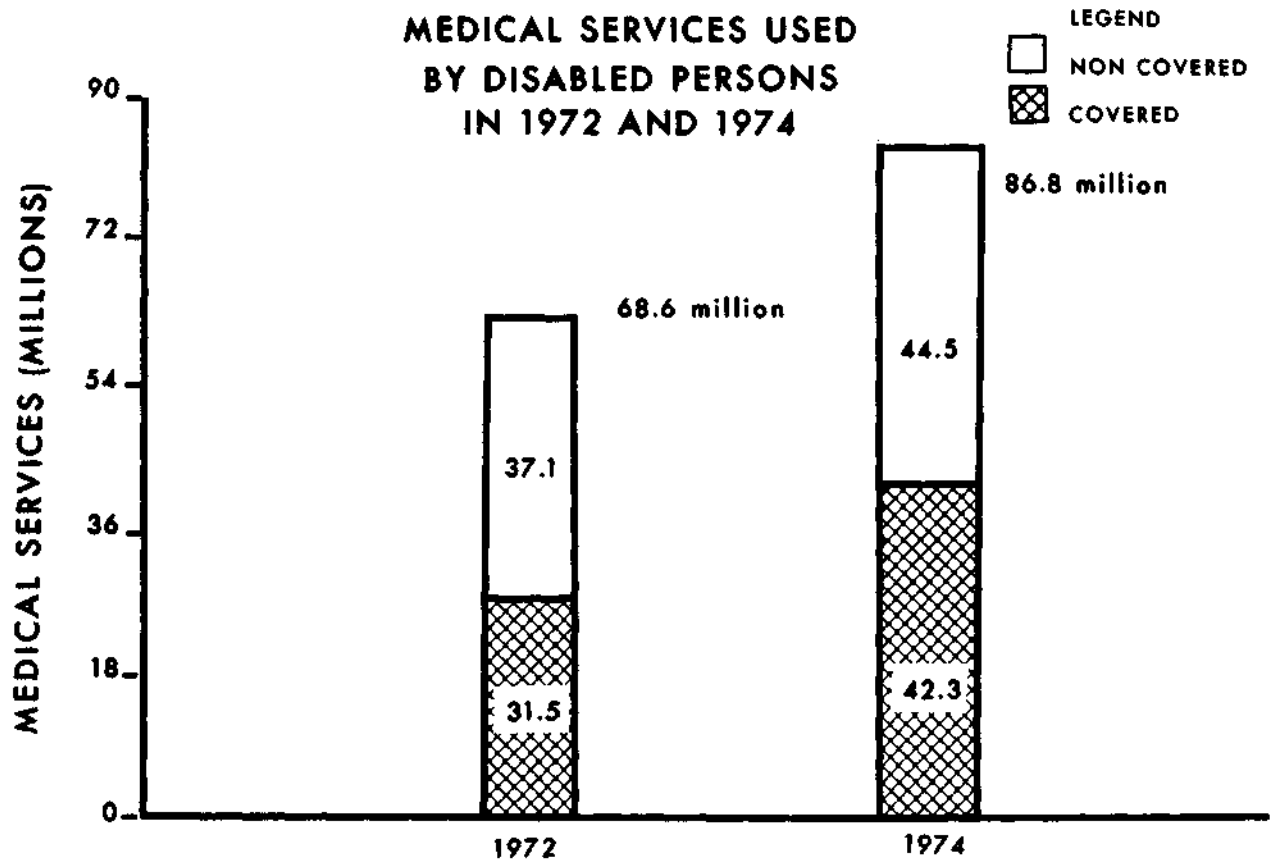
Similar to program utilization by the aged, physician services constituted the major share of covered (SMI) services used by the disabled both in 1972 and 1974 (89.9 percent in 1972 and 85.5 percent in 1974).[4]

The percentage of beneficiaries receiving physician services increased from 1972 to 1974 (83.6 percent in 1972 and 86.7 percent in 1974); however, the number of physician services per user did not change between 1972 and 1974 (20.8 services per user in 1972 and 21.0 services per user in 1974) nor did the proportion of physician services to all covered services significantly change (89.9 percent in 1972 and 85.5 percent in 1974) (Table 1).

A much higher proportion of disabled beneficiaries under 35 years used physician services in 1974 than in 1972 (69.4 percent in 1972 and 82.4 percent in 1974). For all ages, a slightly higher percentage of beneficiaries who were male, white, residents of metropolitan areas, and residents of the North Central region used physician services in 1974 than in 1972 (Table 3).

[4] For the aged, physician services comprised 91 percent of the total covered services in 1972 and 88 percent in 1974.

FIG. 1 Medical Services Used and Charges Incurred by the Disabled, 1972-74



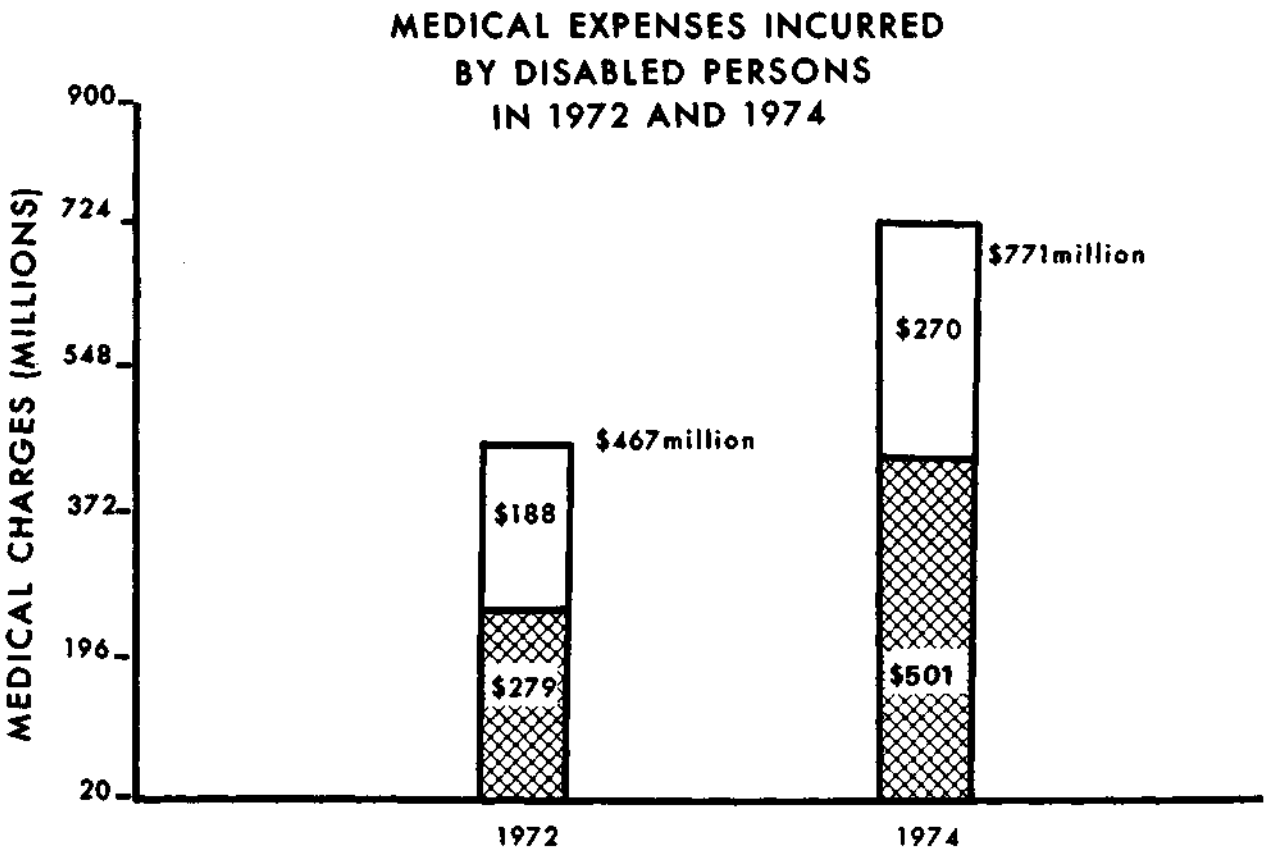


Table 1

Use of Medical Services by Disabled Beneficiaries in 1972 and 1974

Type of Medical Service	1972				1974			
	Users		Services		Users		Services	
	Total (000)	Percent of Enrollees	Total (000)	Per User	Total (000)	Percent of Enrollees	Total (000)	Per User
All Services	1510	92.7	68560	45.4	1877	94.5	86843	46.3
Covered Services	1380	84.7	31482	22.8	1744	87.8	42342	24.3
Physician Services	1362	83.6	28287	20.8	1722	86.7	36189	21.0
In-Hospital	442	27.1	14836	33.6	563	28.3	18871	33.5
Surgical	140	8.6	3510	25.0	204	10.3	5905	29.0
Nonsurgical	352	21.6	11326	32.1	445	22.4	12962	29.1
Out of Hospital	1300	79.8	13451	10.3	1674	84.3	17319	10.3
Home	85	5.2	304	3.6	104	5.2	283	2.7
Office	996	61.2	7612	7.6	1343	67.6	9504	7.1
Outpatient	542	33.2	2698	5.0	793	39.9	4148	5.2
Nursing Home	125	7.7	2675	21.3	124	6.2	3196	25.9
Other	80	4.9	161	2.0	104	5.2	188	1.8
Other Covered Serivces	556	34.1	3195	5.7	786	39.6	6153	7.8
Medical Personnel	389	23.9	2379	6.1	604	30.4	5015	8.3
Durable Medical Equipment	87	5.3	366	4.2	110	5.5	448	4.1
Ambulance	99	6.1	193	2.0	153	7.7	273	1.8
Other	104	6.4	257	2.5	141	7.1	416	3.0
Noncovered Services	1425	87.4	37078	26.0	1797	89.9	44501	24.8
Drugs	1311	80.5	32433	24.7	1703	85.7	39249	23.0
Other	743	45.6	4644	6.3	1001	50.4	5252	5.2
Practitioners	294	18.0	2269	7.7	324	16.3	1486	4.6
Visits or Services	628	38.6	2375	3.8	917	46.2	3766	4.1

Table 2

Disabled Users of Covered Services by Demographic Characteristics, 1972 and 1974

Demographic Characteristics	1972			1974		
	Enrollees (000)	Users (000)	Percentage of Enrollees	Enrollees (000)	Users (000)	Percentage of Enrollees
Age						
Under 35	154.4	109	70.6	217.2	186	85.6
35-44	186.2	148	79.3	196.1	166	84.6
45-54	393.7	336	85.3	459.5	404	87.9
55-59	328.9	293	89.1	386.4	350	90.6
60-64	565.8	494	87.3	727.2	638	87.1
Sex						
Men	1055.0	879	83.3	1265.7	1099	86.8
Women	574.1	501	87.3	720.7	645	89.5
Race						
White	1393.5	1180	84.7	1692.3	1489	91.4
Nonwhite	235.6	200	85.0	294.1	256	87.0
Area						
Metropolitan	943.8	813	86.1	1206.7	1053	87.3
Nonmetropolitan	685.3	567	82.8	792.0	691	87.2
Census Region:						
Northeast	360.4	315	87.4	440.4	386	87.6
North Central	394.1	314	79.6	477.3	416	87.2
South	609.9	519	85.1	744.5	660	88.6
West	264.7	232	87.7	324.2	283	87.3
All Persons	1629.0	1380	84.7	1986.4	1744	87.8

Table 3

Disabled Users of Physican Services by Demographic Characteristics, 1972 and 1974

Demographic Characteristics	1972 Users (000)	1972 Percentage of Enrollees	1974 Users (000)	1974 Percentage of Enrollees
Age				
Under 35	107	69.4	179	82.4
35-44	142	76.2	163	83.1
45-54	331	84.1	399	86.8
55-59	292	88.8	349	90.3
60-64	490	86.6	632	86.9
Sex				
Men	867	82.2	1086	85.8
Women	495	86.3	636	88.2
Race				
White	1163	83.4	1468	86.7
Nonwhite	200	84.7	254	86.4
Area				
Metropolitan	801	84.8	1041	86.2
Nonmetropolitan	561	81.9	682	86.1
Census Region:				
Northeast	306	85.0	381	86.5
North Central	312	79.2	410	85.9
South	513	84.1	651	87.4
West	230	87.0	280	86.4
All Persons	1362	83.6	1722	86.7

By age, sex, race, and area of residence there were no significant changes in the average number of physician services used by disabled beneficiaries nor in the proportion of physician services to total covered (SMI) services.

In-Hospital Physician Services

Approximately half of all physician services to the disabled were performed in the hospital with no change in the proportion of in-hospital services to total physician services from 1972 to 1974 (52.4 percent in 1972 and 52.1 percent in 1974) (Table 1). The proportion of beneficiaries who used in-hospital physician services and the average number of services received did not significantly change from 1972 to 1974. In 1972, 27.1 percent of the disabled beneficiaries used in-hospital physician services at an average utilization rate of 33.6 services per user. In 1974, 28.3 percent of the disabled beneficiaries used in-hospital physician services receiving an average number of 33.5 services per user.

Between 1972 and 1974 there also was no statistically significant change in the percentage of beneficiaries who utilized surgical and nonsurgical physician services in the hospital nor in the utilization rates for both types of services (Table 1).

Out-of-Hospital Physician Services

The percentage of disabled beneficiaries utilizing physician services out of the hospital increased from 79.8 percent in 1972 to 84.3 percent in 1974 (Table 1). Average rates of service utilization did not change (10.3 services per user both in 1972 and 1974) nor did out-of-hospital physician services as a proportion of all physician services (47.6 percent of all physician services in 1972 and 47.9 percent in 1974).

The proportion of disabled beneficiaries utilizing physician services out of the hospital increased for these groups: those under age 35, men, whites, nonmetropolitan residents, and residents in the North Central region (Table 4).

Table 4

Disabled Users of Out-of-Hospital Physician Services by Demographic Characteristics, 1972 and 1974

Demographic Characteristics	1972 Users (000)	1972 Percentage of Enrollees	1974 Users (000)	1974 Percentage of Enrollees
Age				
Under 35	107	65.8	169	77.8
35-44	131	70.6	158	80.6
45-54	316	80.2	392	85.3
55-59	281	85.3	338	87.5
60-64	471	83.2	618	85.0
Sex				
Men	819	77.6	1053	83.2
Women	481	83.7	622	86.3
Race				
White	1107	79.5	1429	84.4
Nonwhite	192	81.6	245	83.3
Area				
Metropolitan	762	80.7	1008	83.5
Nonmetropolitan	538	78.5	666	84.1
Census Region:				
Northeast	281	78.0	365	82.9
North Central	298	75.6	398	83.4
South	496	81.4	638	85.7
West	224	84.7	274	84.5
All Persons	1300	79.8	1674	84.3

A larger percentage of the disabled beneficiaries in 1974 received services in physicians' offices and outpatient departments than in 1972. In 1972, 61.2 percent of all disabled beneficiaries saw a physician in the office, and 33.2 percent saw the physician in an outpatient department of a hospital. In 1974, 67.6 percent of all disabled beneficiaries saw a physician in the office, and 39.9 percent saw the physician in an outpatient department. Although more of the eligible beneficiaries saw physicians in the office and outpatient department, the average number of services received did not increase (Table 1).

Covered Nonphysician Services

In 1974, as in 1972, only a small portion of the covered medical services used by disabled beneficiaries were not physician services (15 percent in 1974 and 10 percent in 1972). A higher proportion of the disabled beneficiaries in 1974 used covered nonphysician services than in 1972 (39.6 percent used nonphysician services in 1974 and 34.1 percent in 1972); however, the change in the average number of services per user was not statistically significant (7.8 services per user in 1974 and 5.7 services in 1972) (Table 1).

About three-quarters of the nonphysician medical services rendered to the disabled in 1972 and 1974 were by medical personnel other than physicians (e.g., nurses, therapists, and speech pathologists). The increase between 1972 and 1974 in the proportion of disabled beneficiaries using services of medical personnel was slightly more than 6 percentage points (23.9 percent in 1972 and 30.4 percent in 1974) (Table 1).

The type of medical persons rendering care and the percentage distribution of services rendered by them is shown below.

Medical Personnel	Percentage Distribution 1972	1974
All types	100.0	100.0
Self-employed physical therapist	[1]	2.2
Physical therapist, speech pathologist	28.6	29.5
Nurse (other than hospital)	27.0	24.5
Other (Lab and X-ray technician, prosthetist)	44.4	43.8

[1] Coverage was possible only after the 1972 Amendments to the Social Security Act.

Increases in the proportion of beneficiaries using nonphysician services and in particular services by other medical personnel were observed among beneficiaries under 35 years, both sexes, white, metropolitan residents, and Northeast residents (Table 5).

Prior to Medicare, it is likely that the majority of disabled beneficiaries did not have insurance coverage for services rendered by medical personnel other than physicians with a resultant lower use of these services. With Medicare coverage, financial barriers to these service were lowered, no doubt reflected in the attendant increase in the number of persons using these services.

Noncovered Services

As indicated in Table 1, the proportion of disabled beneficiaries who used noncovered services in 1974 (89.9 percent) was slightly higher than that in 1972 (87.4 percent). Similar to the findings for covered services, there was no significant change in the average utilization rates (26.0 services per user in 1972 and 24.8 services per user in 1974).

Table 5

Disabled Users of Services by Medical Personnel by Demographic Characteristics, 1972 and 1974

Demographic Characteristics	1972 Users (000)	1972 Percentage of Enrollees	1974 Users (000)	1974 Percentage of Enrollees
Age				
Under 35	25	16.0	56	25.8
35-44	44	23.4	61	31.1
45-54	104	26.4	145	31.6
55-59	68	20.8	118	30.5
60-64	148	26.2	225	30.9
Sex				
Men	245	23.2	352	27.8
Women	144	25.0	252	35.0
Race				
White	333	23.9	530	31.3
Nonwhite	55	23.5	75	25.5
Area				
Metropolitan	233	24.7	398	32.9
Nonmetropolitan	155	22.6	207	26.1
Census Region:				
Northeast	87	24.2	161	36.6
North Central	94	23.9	139	29.1
South	139	22.8	192	26.8
West	68	25.7	112	34.5
All Persons	389	23.9	604	30.4

The number of disabled beneficiaries who used noncovered services includes those who used both covered and noncovered services and those who used only noncovered services. A finer breakdown of data on persons using services revealed that the proportion of disabled beneficiaries who used both types of services increased from 79.5 percent in 1972 to 83.8 percent in 1974 while the proportion who used only noncovered services decreased from 8 percent to 6.7 percent. Since the use of a covered service often necessitates the use of a noncovered service (for example, prescription drugs), it is likely that the increase noted in Table 1 in the proportion of disabled beneficiaries who used noncovered services from 1972 to 1974 primarily reflects the increase in the proportion of users of covered services.

Specifically, the proportion of beneficiaries using noncovered services increased for prescription drug services (80.5 percent in 1972 and 85.7 percent in 1974) and other noncovered services [5] (45.6 percent

[5] Other noncovered services include services by noncovered practitioners and medical services and supplies not covered by SMI.

in 1972; 50.4 percent in 1974). Again there were no changes with respect to the average number of each type of noncovered service used by the disabled (Table 1).

Factors Contributing to Increases in Expenses for Medical Services

Charges incurred for SMI services by disabled beneficiaries in 1972 and 1974 are shown in Table 6. Total charges increased from $279 million in 1972 to $501 million in 1974. Decomposing total charges into its component factors in a manner similar to that done for total services, the effect of increases in each factor upon the increase in total charges is shown below.

Factors	Contribution (percent)
Increases in:	
Number of beneficiaries	29
Proportion Using Services	5
Services Per Person	8
Charge Per Service	41
Interaction (Higher Order Terms)	17
Total	100

The largest contribution among the factors relating to the increase in total covered charges was the increase in the average amount charged for covered services which increased from $8.90 in 1972 to $11.80 in 1974. Of the total increase in charges, 41 percent can be attributed directly to the increase in average service charges. The other large contributor was the increase in the number of eligible beneficiaries which accounted directly for 29 percent of the total increase in charges. Increases in the proportion of beneficiaries utilizing SMI services and the average number of SMI services utilized together accounted for only 13 percent of the total increase. These findings tend to confirm those of Anderson *et al.* (1976), who reported that price increases contributed substantially more to overall expenditure increases after Medicare coverage to the aged than did user increases.

Physician Services

Using the same technique as above to decompose total charges for physican services, the following results were obtained.

Factors	Contribution (percent)
Increases in:	
Number of Beneficiaries	31
Proportion Using Physician Services	5
Services Per Person	1
Charge Per Physician Service	48
Interaction (Higher Order Terms)	15
Total	100

Forty-eight percent of the overall increase in total charges incurred for physician services ($251 million in 1972 and $438 million in 1974) was also due to a large increase in the average charge per service. The average charge for physician services increased from $8.90 in 1972 to $12.10 in 1974.

The average amount charged for physician services received both in and out of the hospital increased from 1972 to 1974. Average charges for in-hospital physician services increased by 45 percent and for out-of-hospital physician services increased by 28 percent (Table 6). The mix of in-hospital and out-of-hospital physician services did not change from 1972 to 1974; however, there is no way of knowing how the mix of physicians by specialty changed over the period.

The 3-year interval in this study (1972-1974) coincided with a period of heightened inflation of medical costs. During Phase II of the Economic Stabilization Program (ESP) (November 1971-January 1973), the composite physician fee index registered an annualized rate of increase of 2.4 percent.

The rate began to accelerate with the gradual lifting of controls in Phase III (January-June 1973) and Phase IV (June 1973-April 1974) rising to 4.1 percent in Phase III and to 6.8 percent in Phase IV. According to HEW's Office of Research and Statistics (1975), after the lifting of controls, physicians increased their fees at an annual rate of 19.1 percent (April-July 1974).

To determine if the increases observed in physicians' charges for the disabled during the period 1972-74 were similar to the increases that occurred for the aged under Medicare, data were gathered from the Current Medicare Survey for the aged for the same period.

Physician Charges (Disabled vs. Aged Beneficiaries)

From 1972 to 1974 the physicians' fee component of the consumer price index incresed by 12.8 percent (133.8 in 1972 and 150.9 in 1974). The average charge for a physician service increased by 16 percent for Medicare's aged and by 36 percent for Medicare's disabled. The overall increase in average charges for the aged was not substantially different from that indicated by the CPI; however, in all categories of physician services, increases from 1972 to 1974 were considerably greater for the disabled than for the aged as shown on the following page (See also Table 6.)

Any increases in average charges during this period would not necessarily be the same for both groups of the Medicare beneficiary population because of differences in the mix of services received, but some of the additional increase experienced by the disabled is likely the effect of extending Medicare SMI to the disabled.

It is plausible that prior to Medicare, physicians kept fees for the disabled relatively low so as to be more affordable; then with Medicare reimbursement available, physicians raised those fees considerably to put them more in line with fees for comparable services to the aged.

Type of Physician Service		Aged Average Charge 1972	Aged Average Charge 1974	Aged % Change	Disabled Average Charge 1972	Disabled Average Charge 1974	Disabled % Change
All Services		$13.60	$15.80	16.2	$ 8.90	$12.10	36.0
In Hospital	Surgical Services	$27.70	$31.30	13.0	$19.90	$22.70	14.1
	Nonsurgical Services	$ 9.70	$11.50	18.6	$ 5.80	$ 8.80	51.7
Out-of-Hospital	Office	$11.30	$13.20	16.8	$ 9.70	$12.00	23.7
	Outpatient	$14.60	$16.60	13.7	$ 9.20	$12.10	31.5
	Nursing Home	$ 9.70	$ 9.30	−4.1	$ 4.70	$ 6.30	34.0

Nonphysician Services

Average charges for nonphysician (SMI) services did not significantly increase from 1972 to 1974; however, as was noted previously, the proportion of beneficiaries who used nonphysician services did increase. As a result almost three-quarters of the increase that occurred for charges incurred for covered nonphysician services was due directly to the increase in the number of services used and only 14 percent to the change in average service charges.

Factors	Contribution (percent)
Increases in:	
Number of Nonphysician Services Used	74
Charge Per Nonphysician Service	14
Interaction (High Order Terms)	12
Total	100

Services Provided to Veterans

The table below contains data on persons using covered services but who do not receive bills. The primary reason for not receiving a bill was that the services were provided by the Veterans Administration or Armed Forces. Other reasons were that services were covered by Workmen's Compensation or research grants. In 1972, 8.3 percent of the disabled Social Security cash beneficiaries received the types of services covered under Medicare but did not expect to receive a bill for some or all of the services. In 1974, after Medicare insurance became available to disabled beneficiaries, 5.6 percent did not expect to receive a bill for some or all of the services.

While there was a decrease in the proportion of beneficiaries not receiving bills for covered services, the proportion of total covered services received with no bill expected did not significantly change (21.1 percent in 1972 and 19.2 percent in 1974).

Year	Persons using Covered services: Total (000)	Not expecting bills: Total (000)	Not expecting bills: Percent	Covered services: Total (000)	No bills expected: Total (000)	No bills expected: Percent
1972	1,380	114	8.3	31,482	6,629	21.1
1974	1,744	97	5.6	42,342	8,150	19.2

As indicated in the table below, the major reason that bills were not expected for covered services was that the services were provided by the Veterans Administration and Armed Forces. In 1972, 85.1 percent of all services with no bill expected were received in VA and Armed Forces facilities, and this proportion did not change in 1974 (85.2 percent in 1974). These medical resources were available to eligible disabled persons in 1974 just as they were in 1972. The disabled persons who were able to utilize these resources in 1972 apparently did not switch over to the new Medicare resource in 1974.

Reason no bill is expected	Percent of covered services with no bills expected 1972	1974
Veterans Administration and Armed Forces	85.1	85.2
Workman's Compensation	4.4	4.8
Free Services	4.8	6.0
Research Grants	1.9	3.3
Other	3.8	.7

Disabled Enrollees' Share of Total Medicare Services

Table 7 contains utilization data for both aged and disabled beneficiaries for years 1972 and 1974. Several observations can be made concerning the effect of Medicare coverage for the disabled upon total Medicare experience. In 1972, before actual coverage, 7.6 percent of total charges for SMI services, and 7.9 percent of potentially reimbursable expenses would have been attributed to disabled beneficiaries. After coverage in 1974, the percent of total SMI charges for the disabled increased to 10.0 percent and the percent of potentially reimbursable expenses increased to 10.4 percent. The proportion of total SMI services used by the disabled in 1974, 12.7 percent, was not significantly different from the 11.1 percent in 1972. In terms of program liability, the disabled represented a larger dollar obligation in 1974 than would have been the case in 1972.

Table 6

Charges Incurred for Medical Services by Disabled Beneficiaries in 1972 and 1974

Type of Medical Service	1972			1974		
	Total $ (000)	$ Per User	$ Per Service	Total $ (000)	$ Per User	$ Per Service
All Services	467,249	309.40	6.80	771,403	411.00	8.90
Covered Services	278,655	201.90	8.90	501,095	287.30	11.80
Physician Services	250,928	184.20	8.90	438,281	254.50	12.10
In-Hospital	135,486	306.50	9.10	248,222	440.90	13.20
Surgical	69,775	498.40	19.90	133,959	656.70	22.70
Nonsurgical	65,711	186.70	5.80	114,263	256.80	8.80
Out of Hospital	115,443	88.80	8.60	190,060	113.50	11.00
Home	2,942	34.60	9.70	3,319	32.00	11.70
Office	73,914	74.20	9.70	114,224	85.10	12.00
Outpatient	24,726	45.60	9.20	49,976	63.00	12.10
Nursing Home	12,452	98.80	4.70	20,011	161.40	6.30
Other	1,409	17.60	8.80	2,530	24.30	13.50
Other Covered Service	27,726	49.90	8.70	62,813	80.00	10.20
Medical Personnel	14,908	38.30	6.30	39,901	66.10	8.00
Durable Medical Equipment	5,047	58.00	13.80	8,789	79.90	19.60
Ambulance	3,813	38.50	19.80	6,302	41.20	23.10
Other	3,959	38.10	15.40	7,821	55.50	18.80
Noncovered Services	188,595	132.40	5.10	270,308	150.40	6.10
Drugs	137,549	104.90	4.20	183,452	107.70	4.70
Other	51,046	68.70	11.00	86,857	86.80	16.50
Practitioners	12,305	41.90	5.40	18,760	57.90	12.60
Visits or Services	38,740	61.70	16.30	68,097	74.30	18.10

Table 7

Disabled Enrollees' Share of Total Medicare Services

	Total (Aged and Disabled)				Amounts Attributed to the Disabled			
	1972		1974		1972		1974	
	No. (million)	Percent	No. (million)	Percent	No. (million)	Percent	No. (million)	Percent
Number of SMI Services	282.5	100.0	334.8	100.0	31.5	11.1	42.4	12.7
Charges for SMI Services	$3,682.8	100.0	$5,035.2	100.0	$278.7	7.6	$501.1	10.0
Potential Reimbursement for SMI Services	$2,406.4	100.0	$3,303.8	100.0	$189.1	7.9	$345.1	10.4

Conclusions

The extension in 1973 of Medicare coverage to the disabled was restricted to disabled persons who had been entitled to Social Security cash benefits for at least 24 months. This restriction was to ensure that only those whose disabilities had proven to be severe and long lasting would be provided protection against large medical expenditures. As expected, this disabled subgroup of the population was composed of high users of medical services both before and after Medicare; however, upon the extension of Medicare coverage, they did not increase their individual use of services. Access to care, as measured by the percentage of enrollees who used services, increased slightly. Although the disabled had low incomes and little private health insurance coverage for general physician services, they apparently had been satisfying their needs in some manner prior to Medicare. A fairly high percentage of the disabled did receive welfare payments for medical services and a sizeable number were veterans. These factors may be one reason why average rates of service use did not increase substantially.

The categories of service where slight increases in access to care occurred were physician services performed out of the hospital and nonphysician covered services in general. These are the types of services for which disabled persons might be least likely to have had medical insurance coverage. The increases in utilization observed for the under-35 age group (but not for the older working-age group) also may have occurred because this group was least likely to have had medical insurance. The use of noncovered services also increased, probably reflecting services prescribed by physicians.

It is quite obvious from the large increase between 1972 and 1974 in charges incurred for SMI services that the inclusion of the disabled under Medicare increased program costs considerably. Close scrutiny of the factors contributing to this increase indicate that it was not due to any large increase in the proportion of beneficiaries who used medical services or the rate at which medical services were used, but rather to the large increases in the number of eligible beneficiaries and in physicians' charges.

If extensions of coverage to additional groups in the population are contemplated in the future, as they are in nearly all national health proposals, careful consideration should be given to controlling price increases. In this analysis of Medicare coverage for the disabled, it is this factor, and not utilization, that was instrumental in pushing up total charges for medical services and, in turn, Medicare program costs.

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Technical Note

Source of Data

The Current Medicare Survey (CMS) used a two-stage probability sample design. The sample represented all disabled medical insurance enrollees in the 50 States and the District of Columbia.[1] The first-stage sample consisted of 105 primary sampling units (PSU's). Each PSU consisted of a standard metropolitan statistical area (SMSA), a single county or several adjacent counties. Within these first-stage units, a systematic sample of persons was selected from a 5-percent sample of persons enrolled in the medical insurance program for whom all bills were assembled and used in the statistical system. The selection of this 5-percent sample was based on the last two digits of the health insurance claim number.

For the Current Medicare Survey, sample persons were selected for interviews starting in October of each year and remained in the survey for 15 months. A 15-month cycle was used because any covered medical expenses incurred by an individual in the last 3 months of a calendar year which are applied to the deductible for that year may be carried over and applied to the deductible for the next calendar year.

Data from these sample persons were collected through monthly personal interviews conducted by the Bureau of the Census. The interviews provided information about the use of medical care and related services during the preceding month.

Reliability of Estimates

Since the estimates in this report are based on a sample of enrolled persons, they may differ somewhat from the figures that would have been obtained if the same data had been collected for the entire universe of enrolled persons and the same collection procedures used. The data may also differ from the results of statistical compilation of data from the administrative records. As in any data collection, the results are subject to errors of response, reporting, processing, and sampling variability.

The estimates developed from the CMS are based in part on the memory or knowledge of each respondent. The memory factor in data derived from field surveys probably produces underestimates, because the tendency is to forget minor or irregular items. On the other hand, the recall factor is aided by successive visits to the same sample enrollees and the use of a diary form left with the enrollee. As the enrollee uses any medical service, he is encouraged to record information about this service on the diary form. The successive visits also may have provided a basis for greater understanding of procedures involved in program participation, which may also affect the estimates derived from this survey. Some errors may also result from misunderstanding as to the scope of the program's coverage.

[1] Excludes End Stage Renal Disease beneficiaries.

The standard error is primarily a measure of sampling variability, that is, of the variations that occur by chance because a sample rather than the whole universe was used. As calculated for this report, the standard error also partially measures the effect of response errors but does not measure any systematic biases in the data. The chances are about 68 out of 100 that an estimate from the sample would differ from the result for the entire universe, with the same procedures and methods used, by less than the standard error. Chances are about 95 out of 100 that the differences would be less than twice the standard error. Chances are about 99 out of 100 that the differences would be less than 2½ times the standard error.

The generalized tables of standard errors of numbers of persons, dollar amounts, and medical services shown on the following pages provide an indication of the order of magnitude of the standard errors rather than the standard error of any specific estimate. For ease in some uses of the data, the relative variance of each estimate is also shown. This coefficient is simply the estimated variance divided by the square of the estimate.

In order to derive standard errors that would be applicable to the wide variety of items presented and that could be prepared at moderate cost, a group of items was selected for which approximations to the standard errors have been estimated. It is possible to generalize the standard errors of the estimated number of enrolled persons having various program or demographic characteristics. Similarly, it has been possible to generalize the standard errors of estimates for charge data and for medical services.

Table A may be used for approximate standard errors of the estimated number of enrollees with various program or demographic characteristics. Table B is for charges, while tables C, D and E contain approximate standard errors of estimated number of services. Table F is for percentages (the reliability of an estimated percentage depends on both the size of the percentage and its denominator).

Table A

Approximate standard error and relative variance of estimated number of SMI enrollees having various program or demographic characteristics

(68 chances out of 100)

Size of estimate (In thousands)	Standard error (In thousands)	Relative variance
20	5	0.0625
50	7	.0196
100	10	.0100
200	15	.0056
500	25	.0025
1000	40	.0016
2000	60	.0009

Table B

Approximate standard error and relative variance of estimates of SMI-covered charges or noncovered charges

(68 chances out of 100)

Size of estimate (in millions)	Total charges and deductible met: Standard error (in millions)	Total charges and deductible met: Relative variance	Deductible not met: Standard error (in millions)	Deductible not met: Relative variance
1	[1]	[1]	.2	.0400
2	[1]	[1]	.3	.0225
5	[1]	[1]	.5	.0100
10	3	.0900	.8	.0064
20	5	.0625	1.2	.0036
50	7	.0196	[1]	[1]
100	10	.0100	[1]	[1]
200	14	.0049	[1]	[1]
500	20	.0016	[1]	[1]

[1] Value not computed

Table C

Approximate standard error and relative variance of estimates of SMI-covered services except surgical services

(68 chances out of 100)

Size of estimate (in millions)	Standard error (in millions)	Relative variance
2	.4	.0400
5	.7	.0196
10	.9	.0081
20	1.3	.0042
50	2.0	.0016

Table D

Approximate standard error and relative variance of estimates of SMI-covered surgical services

(68 chances out of 100)

Size of estimate (in thousands)	Standard error (in thousands)	variance Relative
50	20	.1600
100	30	.0900
200	45	.0506
500	70	.0196
1000	110	.0121

Table E

Approximate standard error and relative variance of estimates of noncovered services

(68 chances out of 100)

Size of estimate (in thousands)	Standard error (in thousands)	Relative variance
200	45	.0506
500	70	.0196
1000	110	.0121
2000	175	.0077
5000	350	.0049

Examples of Computations of Standard Errors

To estimate standard errors of numbers not presented specifically in the tables, linear interpolation may be used. Illustration: From Table 6, disabled enrollees used SMI services whose charges amounted to $278,655,000 during 1972. Reading Table B one finds:

Estimate	Standard error
$200,000,000	$14,000,000
$500,000,000	$20,000,000

Linear interpolation indicates that the standard error sought is approximately 15,573,000. We may be 68-percent confident that total SMI charges were between $263,082,000 and $294,228,000 in 1972. Similar calculations may be made for persons (see Table A) and for services (use Tables C, D, E).

Standard Error of Percentages

To determine the standard error of a percentage, use Table F. Illustration: From Table 1, an estimated 84.7 percent of disabled enrollees used at least one SMI-covered service during 1972. The denominator, persons ever enrolled for medical insurance was 1,629,000. Reading and interpolating in Table F an estimated 84.7 percent with a denominator of 1,629,000 persons has a standard error of .9 percent. Thus, a 68-percent confidence interval for the percent of users of SMI services during 1972 is 83.8 to 85.6 percent.

Standard Error of Averages

To estimate the standard error of an average, multiply the average by the square root of the sum of the relative variances of the average's numerator and denominator. Illustration: From Table 1 disabled persons who used SMI services in 1972 used an average of 22.8 covered services per person—that is, 31,482,000 services divided by 1,380,000 persons. From Table C the relative variance of 31,482,000 is about .0032, while from Table A the relative variance of 1,380,000 is about .0013. Multiplying the average (22.8) times the square root of the sum of .0032 and .0013 yields a standard error of about 1.5 services. Thus, a 68-percent confidence interval is 21.3 to 24.3 covered services per person.

Table F

Approximate standard error of estimates of percentage based on persons, charges, or services

(68 chances out of 100)

Type of estimate	Denominator of percentage								
Enrollees (in thousands)	..	..	20	50	100	200	500	1000	2000
Charges (in millions)	..	10	20	50	100	200	500	..	..
SMI services other than surgical (in millions)	..	..	2	5	10	20	50	..	..
SMI surgical services (in thousands)	50	100	200	500	1000	..	..	..	..
Noncovered services (in thousands)	..	..	200	500	1000	2000	5000	..	..
Estimated percentage	**Standard error of percentage**								
2 or 98	5.9	4.6	3.1	2.0	1.4	1.0	.6	.4	.3
5 or 95	9.3	7.2	4.9	3.1	2.2	1.5	1.0	.7	.5
10 or 90	12.7	9.9	6.7	4.2	3.0	2.1	1.3	.9	.7
25 or 75	18.4	14.4	9.7	6.1	4.3	3.1	1.9	1.4	1.0
50	21.2	16.6	11.2	7.1	5.0	3.5	2.2	1.6	1.1

Standard Error of Differences

To estimate the standard error of the difference of any two estimates (A-B, where A and B are estimates of totals, averages, percentages, etc.) calculate the square root of the sum of the squares of the standard errors of the two estimates. In symbols, the estimated standard error of A-B is:

$$SE_{A-B} = \sqrt{SE_A^2 + SE_B^2}$$

For example, from Table 1, disabled persons in 1974 used an average 24.3 covered services; the corresponding value in 1972 was 22.8 covered services per person. The difference is calculated as A−B=24.3−22.8=1.5. The standard error of A is about 1.4 (see above paragraphs concerning the standard error of an average) while the standard error of B is an estimated 1.5. The standard error of A−B is therefore computed as:

$$SE_{A-B} = \sqrt{(1.4)^2 + (1.5)^2} = 2.1$$

The 68-percent confidence interval is given by 3.6 to −.6 (i.e., 1.5±2.1).

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