Medicare Patients: Geographic Differences in Hospital Discharge Rates and Multiple Stays

by MARIAN GORNICK*

Marked regional variations are found in patterns of use of short-stay hospitals by Medicare patients Variations found in the rate of hospitalization, as measured by the number of discharges per 1,000 enrollees, and on the upward trend in that rate are the focus here The data indicate that reductions in length of stay are offset by the rising number of admissions

An examination of multiple stays—a major factor in the number of discharges—shows that States with high rates of discharges have high percentages of patients with multiple stays Furthermore, in these States the percentage of multiple stays is high, no matter what the diagnosis In other States, the rate is low for all diagnoses These findings suggest that options exist for the provision of care for the same or similar conditions and that geographic patterns appear in the use of those options An urgent need exists for research to establish the variables affecting utilization and to explore ways of changing some of the patterns of delivering services

AS THE NATION'S concern increasingly focuses on health care issues, including the implementation of some form of national health insurance, a greater urgency arises to identify all the factors that affect the continuing escalation in health care costs Interest is directed specifically at hospital services because they account for the major share of health care spending In addition, hospital costs have accelerated faster than overall medical care prices and faster than the rise in the prices of total goods and services in the economy

In the decade 1965–75, outlays for hospital care rose from 34 percent to 39 percent of total health care expenditures Increases in hospital charges— as measured by the semiprivate room-charge component of the Consumer Price Index—were held to about 7 percent annually during the period of the economic stabilization program (August 1971–April 1974). In 1975, however, these charges jumped 16 4 percent—nearly as much as the 17 3-percent rise in fiscal year 1967, the first

full year of Medicare and Medicaid operations

The continued growth in public spending for health care services gives rise to several concerns One is that too small a share of public funds will be allocated to other health-related activities such as public health, education, and research

Another underlying concern is that an increasing concentration of resources on personal health care services implies some failure in the use of resources as well as in the prevention of illness To curb rising health expenditures, changes in individual habits and behavior are needed along with improvements in the health care system

Questions arise about the use of hospital services To what degree does the admission of patients within a geographic area depend on the area's customary or traditional practice of medicine or on the socioeconomic and demographic characteristics of its population—rather than on the patient's condition? To what degree is the duration of the hospital stay dependent on factors other than the patient's condition? [1]

Particular concern also centers on hospital services involving surgery Several studies have shown that the rate of certain surgical procedures varies significantly with service area,[2] raising the issue of whether these differences reflect instances of unnecessary surgery Concerns about the use of health care services thus extend to quality and appropriateness of care

The program of health insurance for the aged and disabled (Medicare) provides an opportunity to examine patterns of hospital service use nationwide Central records of all hospital stays covered by the program are maintained Previous reports examining Medicare discharges have fo-

[1] For an analysis of the factors involved, see J D Restuccia and Don C Holloway, "Barriers to Appropriate Utilization of an Acute Facility," *Medical Care*, July 1976, and James G Zimmer, "Length of Stay and Hospital Bed Misutilization," *Medical Care*, May 1974

[2] See J E Wennberg and Alan Gittelsohn, "Health Care Delivery in Maine I Patterns of Use of Common Surgical Procedures," *Journal of Maine Medical Association*, May 1975

cused on the wide geographic variations found in the average length of stay [3] Attention has also been drawn to the downward trend in the average length of stay, which has fallen 2 full days since 1969 Yet observation of trends in length of stay can be misleading because changes in discharge rates—as measured by the number of discharges per 1,000 persons enrolled for coverage—can off-set gains made in conserving hospital days by reducing length of stay

This article focuses on geographic patterns and changes in hospital discharge rates It also examines the relationship between the rates of hospitalization and multiple hospitalization In addition, it provides information on the number of days of care used per 1,000 Medicare enrollees The purpose here is to highlight different patterns in the use of short-stay hospital services A determination of the variables that cause, influence, or are related to utilization factors is not intended here

SOURCES OF DATA

Each year since the inception of the Medicare program, more than 5 million discharges from short-stay hospitals [4] were recorded for Medicare

[3] See Marian Gornick, "Regional Differences in Length of Hospital Stays, 1969–71," *Social Security Bulletin,* July 1975

[4] For Medicare, short-stay hospitals are those in which the average length of stay is less than 30 days, for persons aged 65 and over, more than 98 percent of all hospital stays under Medicare are in short-stay hospitals

enrollees aged 65 and over Discharge records for a 20-percent sample of these enrollees are used here (see the technical note, pages 38–40) Processing time for most discharges is comparatively short, a small percentage of claims are delayed more than a year Consequently, to report annual discharge rates, discharge data are accumulated 2 full calendar years after the close of the service year, at which time it is estimated that the data in the files are 99 percent complete Discharge rates are presented here through 1972 Special tabulations generated to study factors involved in multiple hospitalizations use discharge data through 1973

EARLIER FINDINGS ON LENGTH OF STAY

Data for Medicare patients show that since 1969 the average length of stay in short-stay hospitals has been declining each year It declined in all age groups, for men and women, for both race groups, and for patients with and without surgery (table 1) Data for 1974 and later years, although incomplete, show a continuing decline in average length of stay Hospital data for the total population in the United States also show declines in average length of stay in short-stay hospitals in this same period [5]

Striking geographic differences in average length of stay have been widely reported Medicare data grouped by the four U S census regions show that length of stay in the Northeast region averages 5 days longer than in the West As the following figures show, average length of stay

TABLE 1 —Mean length of stay in short-stay hospitals for Medicare patients aged 65 and over, by patient characteristics, 1967–73

Patient Characteristics	Mean length of stay (in days)						
	1967	1968	1969	1970	1971	1972	1973
United States	13 8	13 8	13 5	13 0	12 5	12 1	11 8
Sex							
Men	13 3	13 2	13 0	12 5	12 0	11 7	11 4
Women	14 2	14 2	13 9	13 4	12 8	12 4	12 1
Age							
65–66	12 5	12 4	12 1	11 7	11 3	11 0	10 8
67–68	12 5	12 5	12 4	11 9	11 5	11 2	11 0
69–70	12 9	12 8	12 8	12 3	11 8	11 5	11 2
71–72	13 2	13 2	13 0	12 6	12 1	11 8	11 5
73–74	13 6	13 6	13 3	12 9	12 3	12 0	11 8
75–79	14 2	14 1	13 9	13 4	12 8	12 5	12 1
80–84	15 0	14 9	14 7	14 0	13 4	12 9	12 6
85 and over	15 9	15 7	15 3	14 5	13 7	13 2	12 9
Race							
White	13 6	13 6	13 4	12 9	12 4	12 0	11 7
All other	14 9	15 0	15 0	14 3	13 7	13 3	13 3
Surgical status							
Without surgery	13 1	13 2	13 0	12 5	11 9	11 5	11 0
With surgery	15 2	14 9	14 8	14 2	13 8	13 4	13 5

Region	Mean length of stay (in days)		
	1967	1973	Rank, 1967 and 1973
United States	13 8	11 8	
Northeast	16 1	14 3	1
North Central	14 6	12 2	2
South	12 3	10 8	3
West	11 8	9 5	4

decreased for Medicare enrollees aged 65 and over, in each region, although the areas themselves remained constant in rank order

[5] See National Center for Health Statistics, *Utilization of Short-Stay Hospitals Annual Summary for the United States, 1974* (Vital and Health Statistics Series 13, No 26, September 1976, and earlier issues)

In an earlier study, Medicare data for patients with selected diagnoses have been compared by region and by age group, whether surgery was performed, and whether there were multiple diagnoses Regional differences in length of stay were not explained by these patient characteristics [6]

State Variations

State Medicare data show an even wider range in average length of stay Differences each year have been consistently greatest between New York and Washington (table 2) In New York the average length of stay in 1972 was more than 8 days longer than in Washington In both States, average length of stay was less in 1972 than in 1967, although in New York the decline was minimal
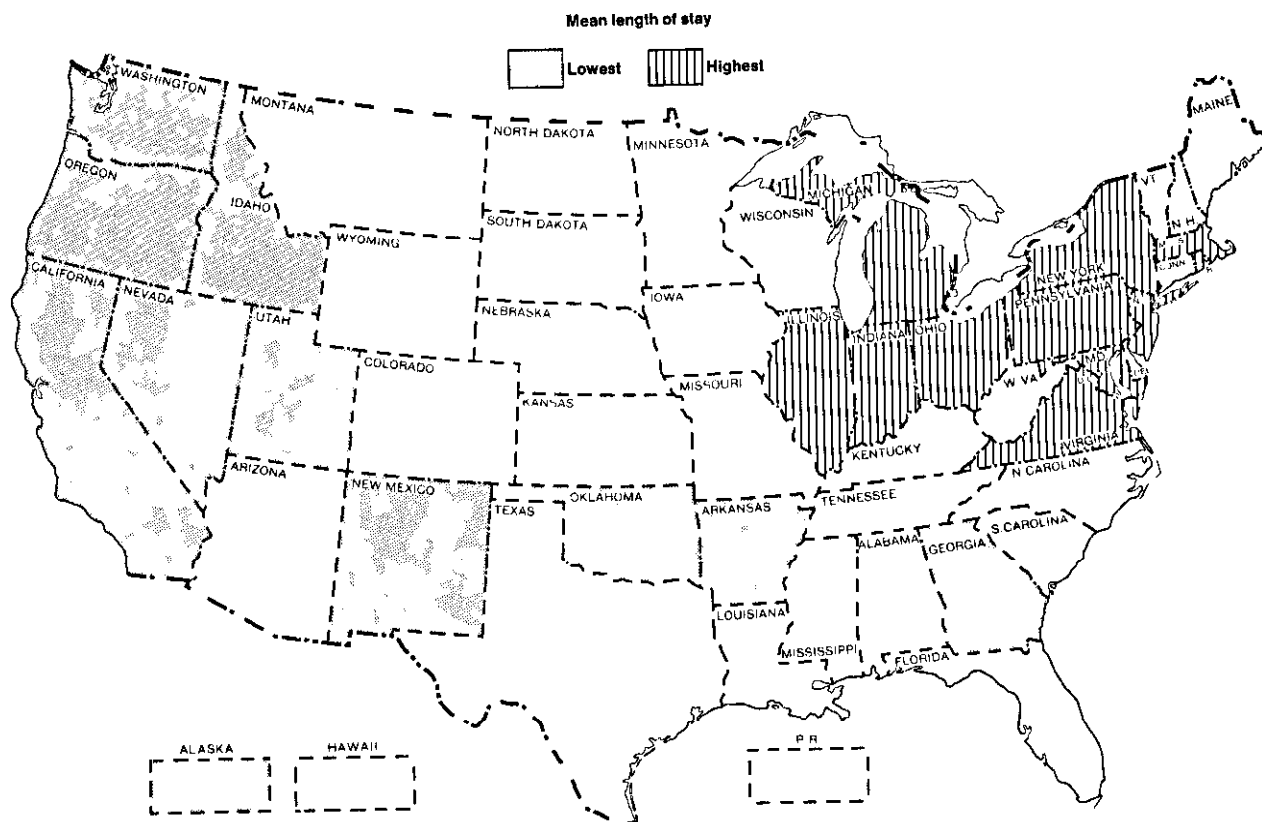
The rank order of the States is similar for both

[6] See Marian Gornick, *op cit*

TABLE 2 —Mean length of stay in short-stay hospitals for Medicare patients aged 65 and over and rank by State, 1967 and 1972, by highest- and lowest-ranking States, 1972

State	Mean length of stay (in days)		Rank	
	1972	1967	1972	1967
Highest rank				
New York	16 4	16 9	1	1
New Jersey	14 2	15 4	2	6
Pennsylvania	14 1	16 6	3	2
Rhode Island	13 9	16 4	4	3
Massachusetts	13 8	15 6	5	5
Virginia	13 4	14 5	6	12
Illinois	13 3	15 7	8	4
Michigan	13 3	14 9	8	9
Maryland	13 3	15 0	8	7
Ohio	12 9	14 9	10 5	9
Indiana	12 9	14 7	10 5	11
Lowest rank				
Washington	8 3	9 6	50	50
Alaska	8 8	14 0	49	20
Utah	9 3	11 0	48	46 5
Idaho	9 4	11 0	47	46 5
Oregon	9 5	10 9	46	48
Oklahoma	9 6	11 1	45	44 5
California	9 8	12 0	43 5	39
New Mexico	9 8	12 0	43 5	39
Georgia	10 0	11 1	41	44 5
Arkansas	10 0	11 3	41	42
Nevada	10 0	13 8	41	25

years The highest-ranking States are all in the Northeast and North Central States, as chart 1

CHART 1 —Mean length of stay in short-stay hospitals for Medicare patients aged 65 and over, in highest- and lowest-ranking States, 1972

Mean length of stay

Lowest   Highest

shows The lowest-ranking States are in the West and South

In table 3, average length of stay is shown along with the rank order of the States for each year in the period 1967–72 Average length of stay in the 50 States shows a consistent trend A slight rise in 1968 is followed by a slow but steady decline each year thereafter A consistent pattern in the rank order of the States also appears, with the relative position of each State in 1972 generally close to its relative position in 1967

TABLE 3.—Mean length of stay in short-stay hospitals for Medicare patients aged 65 and over and rank by State, 1967-72

Region, division, and State	Mean length of stay (in days)						Rank					
	1967	1968	1969	1970	1971	1972	1967	1968	1969	1970	1971	1972
United States	13 8	13 8	13 5	13 0	12 5	12 1						
Northeast	16 1	16 2	16 1	15 6	15 1	14 6						
New England	14 9	14 8	14 6	13 9	13 5	13 0						
Maine	13 4	13 1	12 9	12 1	11 3	10 8	29	28	26 5	27	28 5	29 5
New Hampshire	13 9	14 2	13 4	12 5	12 3	11 5	22 5	17	21	23 5	17	20 5
Vermont	14 9	15 0	14 7	13 5	12 2	11 6	9	10	10 5	14	19	18 5
Massachusetts	15 6	15 4	15 3	14 6	14 2	13 8	5	6	3 5	5	4	5
Rhode Island	16 4	15 4	15 0	14 2	13 6	13 9	3	6	6	9 5	8 5	4
Connecticut	14 0	14 1	14 2	13 8	13 7	12 8	20	18 5	14	12 5	6 5	12
Middle Atlantic	16 5	16 7	16 7	16 2	15 6	15 2						
New York	16 9	17 3	17 7	17 1	16 7	16 4	1	1	1	1	1	1
New Jersey	15 4	15 4	15 1	15 0	14 5	14 2	6	6	5	3 5	3	2
Pennsylvania	16 6	16 5	16 1	15 4	14 7	14 1	2	2	2	2	2	3
North Central	14 6	14 6	14 3	13 7	13 0	12 6						
East North Central	15 0	15 1	14 2	14 2	13 5	13 0						
Ohio	14 9	14 6	14 4	13 8	13 4	12 9	9	13	13	12 5	12	10 5
Indiana	14 7	15 1	14 8	14 3	13 5	12 9	11	8 5	8 5	7	10 5	10 5
Illinois	15 7	15 9	15 3	15 0	14 1	13 3	4	3	3 5	3 5	5	8
Michigan	14 9	14 9	14 6	13 9	13 3	13 3	9	11	12	11	13	8
Wisconsin	14 2	14 3	13 8	13 4	12 8	12 5	16 5	15	17	15	15	14
West North Central	14 0	13 8	13 6	12 8	12 2	11 8						
Minnesota	13 9	13 7	13 5	13 2	12 2	11 8	22 5	22	19	17	19	17
Iowa	13 7	13 6	13 2	12 5	12 1	11 4	27 5	24 5	24 5	23 5	21	23 5
Missouri	14 4	14 3	14 1	13 3	13 1	12 7	13 5	15	15	16	14	13
North Dakota	14 4	13 9	13 3	12 2	11 0	10 4	13 5	22	23	26	32 5	37
South Dakota	13 0	13 0	12 6	11 4	10 9	10 8	31	29	28	34	36 5	29 5
Nebraska	14 1	13 3	13 2	12 3	11 7	11 4	18	26	24 5	25	25	23 5
Kansas	14 3	14 0	13 8	12 6	11 8	11 4	15	20	17	22	24	23 5
South	12 3	12 4	12 2	11 8	11 4	11 0						
South Atlantic	13 3	13 4	13 1	12 6	12 0	11 6						
Delaware	14 2	15 5	14 7	14 3	13 5	12 3	16 5	4	10 5	7	10 5	16
Maryland	15 0	15 1	14 9	14 2	13 6	13 3	7	8 5	7	9 5	8 5	8
District of Columbia	16 7	16 7	16 6	16 6	15 4	15 0						
Virginia	14 5	14 8	14 8	14 3	13 7	13 4	12	12	8 5	7	6 5	6
West Virginia	13 7	13 6	13 4	12 8	12 0	11 6	27 5	24 5	21	20 5	22 5	18 5
North Carolina	13 8	14 1	13 4	12 9	12 6	12 4	25	18 5	21	18 5	16	15
South Carolina	14 0	14 3	13 8	12 9	12 0	11 5	20	15	17	18 5	22 5	20 5
Georgia	11 1	11 2	11 0	10 6	10 3	10 0	44 5	43	43	43	42	41
Florida	12 5	12 5	12 3	11 9	11 2	10 8	34	34	32	29	30 5	29 5
East South Central	12 1	12 3	12 1	11 7	11 3	11 0						
Kentucky	11 9	11 9	11 6	11 3	11 2	10 9	41	38 5	37	35 5	30 5	26 5
Tennessee	12 5	12 7	12 5	12 0	11 4	11 4	34	31	29 5	28	26 5	23 5
Alabama	12 2	12 1	12 4	11 8	11 3	10 9	37	36 5	31	30	28 5	26 5
Mississippi	12 0	12 5	12 1	11 5	11 1	10 8	39	34	33 5	32 5	32 5	29 5
West South Central	11 1	11 3	11 2	10 9	10 6	10 3						
Arkansas	11 3	11 4	11 5	10 9	10 4	10 0	42	41 5	38 5	41	40	41
Louisiana	10 6	10 8	10 6	10 4	10 3	10 1	49	46	47 5	46	42	39
Oklahoma	11 1	11 0	10 8	10 6	10 1	9 6	44 5	44 5	45	43	44 5	45
Texas	11 2	11 5	11 5	11 1	10 9	10 7	43	40	38 5	39	36 5	32
West	11 8	11 4	11 0	10 5	10 0	9 7						
Mountain	12 3	12 2	11 6	11 0	10 6	10 2						
Montana	12 5	12 7	11 8	11 3	10 7	10 5	34	31	36	35 5	38 5	34 5
Idaho	11 0	10 7	10 0	9 6	9 4	9 4	46 5	48	49	49	48 5	47
Wyoming	12 8	11 9	11 1	11 2	10 7	10 4	32	38 5	41 5	37 5	38 5	37
Colorado	12 4	12 5	12 1	11 5	11 0	10 4	36	34	33 5	32 5	32 5	37
New Mexico	12 0	12 1	11 3	10 5	9 9	9 8	39	36 5	40	45	46	43 5
Arizona	13 2	12 7	11 9	11 2	11 1	10 6	30	31	35	37 5	32 5	33
Utah	11 0	10 7	10 8	10 1	9 4	9 3	46 5	48	45	47 5	48 5	48
Nevada	13 8	13 7	12 5	11 0	10 3	10 0	25	22	29 5	40	42	41
Pacific	11 6	11 1	10 8	10 3	9 9	9 5						
Washington	9 6	9 5	9 4	8 9	8 6	8 3	50	50	50	50	50	50
Oregon	10 9	10 7	10 6	10 1	9 8	9 5	48	48	47 5	47 5	47	46
California	12 0	11 4	11 1	10 6	10 1	9 8	39	41 5	41 5	43	44 5	43 5
Alaska	14 0	11 0	10 8	11 6	12 2	8 8	20	44 5	45	31	19	49
Hawaii	13 8	13 2	12 9	12 8	11 4	10 5	25	27	26 5	20 5	26 5	34 5

Average Stay and Discharge Status

Unexpectedly the average length of stay declined for patients discharged at death as well as for those discharged alive, as the following figures show

Discharge status	Mean length of stay (in days)					
	1967	1968	1969	1970	1971	1972
Alive	13 8	13 7	13 5	12 9	12 4	12 0
Dead....	13 9	14 2	14 0	13 3	12 8	12 5

The trend of declining average length of stay for all patients results from changes in the distributions of discharges by length of stay (table 4) For both types of discharge the number of very-long-stay cases (beyond 35 days) was smaller in 1972 than in 1967 During this period the number of live discharges increased 27 8 percent while the number of discharges that occurred at the time of death increased only 7 3 percent

The decline in average length of stay for Medicare patients may to some extent reflect improved services and more efficient use of hospital services The fact that patients who died also had shorter average stays demonstrates that a decrease in length of stay does not necessarily reflect more effective therapy Rather, it suggests a change in the case mix or in the manner in which the hospital is used, with decreased use for long-term, chronic illnesses (whether or not terminal) and greater use for acute conditions requiring short-term, intensive care (including terminal cases)

TRENDS IN HOSPITALIZATION RATE

Analysis of Medicare data shows that the number of discharges per 1,000 enrollees is higher now than when the program began The number of enrollees aged 65 and over went from 19 5 million in 1967 to 21 1 million in 1972, an increase of 8 percent In the same period the total number of discharges from short-stay hospitals rose from 5 1 million to 6 4 million, a 26-percent rise Consequently, the number of discharges per 1,000 enrollees increased more than 16 percent during this period Hospital data for the total population in the United States also show growth in the number of short-stay hospital discharges per 1,000 population [7]

For the period 1967–72, data on the number of discharges per 1,000 enrollees, by sex, age, race, and surgical and discharge status are found in table 5 Each year the discharge rate was consistently greater for men than for women and for white persons than for persons of all other races The rate of hospitalization increased substantially with age

When Medicare began, the overall discharge rate was 261 7 discharges per 1,000 enrollees The rate increased for 1968 and 1969 and leveled out for 1970 and 1971 In 1972 the discharge rate began to rise again, increasing to 304 6 per 1,000 enrollees Although figures for recent years are not yet complete, the data indicate a continuing rise in hospitalization rates Overall, the increase in the discharge rate from 1967 to 1972 was 16 4

---

[7] See National Center for Health Statistics, op cit

TABLE 4 —Number and percentage distribution of discharges from short-stay hospitals for Medicare patients aged 65 and over, by length of stay and discharge status, 1967 and 1972

[Numbers in thousands]

Length of stay (in days)	Alive					Dead				
	1967		1972		Percentage change	1967		1972		Percentage change
	Number	Percent	Number	Percent		Number	Percent	Number	Percent	
Total	4,557 4	100 0	5 822 8	100 0	27 8	497 5	100 0	533 8	100 0	7 3
1 or less	130 0	2 9	152 0	2 6	16 9	99 5	20 0	113 1	21 2	13 7
2–3..	497 6	10 9	682 0	11 7	37 1	64 6	13 0	71 9	13 5	11 3
4–5	593 3	13 0	834 9	14 3	40 7	46 0	9 2	51 4	9 6	11 7
6–7	589 5	12 9	787 6	13 5	33 6	37 2	7 5	41 3	7 7	11 0
8–10.....	711 2	15 6	950 0	16 3	33 6	44 5	8 9	50 8	9 5	14 2
11–14....	642 9	14 1	846 9	14 5	31 7	46 9	9 4	50 4	9 4	7 5
15–21	631 4	13 9	804 5	13 8	27 4	54 0	10 9	57 3	10 7	6 1
22–28..	317 4	7 0	368 1	6 3	16 0	34 0	6 8	35 5	6 7	4 4
29–35..........	167 1	3 7	173 3	3 0	3 7	22 8	4 6	21 8	4 1	−4 4
36–42	94 0	2 1	89 4	1 5	−4 9	15 0	3 0	13 5	2 5	−10 0
43 or more..	183 1	4 0	134 3	2 3	−26 7	33 2	6 7	26 8	5 0	−19 3

Patient characteristics	Discharges per 1,000 enrollees						
	Number						Per-cent-age change, 1967–72
	1967	1968	1969	1970	1971	1972	
All areas	259 3	284 2	295 2	293 2	288 1	301 0	16 1
United States	261 7	286 9	298 2	296 3	291 2	304 6	16 4
Sex							
Men	280 2	307 3	319 1	317 9	313 3	328 8	17 3
Women	244 0	267 4	278 0	275 5	270 1	281 4	15 3
Age							
65–66	199 7	220 3	234 4	234 7	231 6	241 2	20 8
67–68	212 5	229 8	241 8	241 7	234 3	246 4	16 0
69–70	222 5	246 9	255 8	257 1	251 9	262 1	17 8
71–72	236 6	259 0	273 0	274 3	266 3	280 6	18 6
73–74	255 9	277 4	287 6	286 6	284 2	301 9	18 0
75–79	290 6	315 7	323 7	321 5	314 9	329 2	13 3
80–84	337 1	367 7	376 8	367 6	362 0	374 3	11 0
85 and over	370 1	409 0	413 7	396 8	391 2	401 7	8 5
Race							
White	265 5	290 6	301 6	299 3	293 2	307 0	15 6
All other	189 4	221 6	228 9	228 3	225 3	241 1	27 3
Surgical status							
Without surgery	176 7	197 9	205 4	203 0	201 2	208 0	17 7
With surgery	82 6	86 3	89 8	90 3	86 9	93 1	12 6
Discharge status							
Alive	233 8	257 2	267 9	266 9	262 9	275 8	17 9
Dead	25 5	27 1	27 4	26 3	25 2	25 3	0

percent, and the percentage increase was similar for both men and women The discharge rate increased substantially more for persons under age 75 than for those aged 75 and over Further, the increase in discharges for persons of races other than white (27 3 percent) was considerably greater than for white persons (15 6 percent) Much of this difference was due to the high rate of increase in hospitalization for nonwhites in the period 1967–68, which may reflect an initial period of response to access to services as the program got underway

Increases were relatively greater for nonsurgical cases (17 7 percent) than for surgical cases (12 6 percent) The discharge rate for live patients increased 17 9 percent while the rate for discharges at death was relatively constant These rate changes suggest that the increased number of hospitalizations ending with the death of the patient was proportional to the growth in enrollment, but the increase in live discharges was substantially larger than the growth in population

Regional Variations in Discharge Rates

As noted earlier, wide geographic variations exist in the length of the hospital stay Similarly, hospitalization rates vary widely across the Nation The discharge rate has been consistently highest in the South and lowest in the Northeast, as the following data show.

Region	Discharges per 1,000 enrollees			
	Number		Percentage increase	Rank 1967 and 1972
	1967	1972		
United States	261 7	304 6	16 4	
Northeast	217 4	261 0	20 1	4
North Central	276 6	320 8	16 0	2
South	282 9	328 6	16 2	1
West	267 7	299 9	12 0	3

The rate of hospitalization is strikingly different from State to State (table 6) In 1972, in the highest-ranking State—North Dakota—the rate was 425 6 discharges per 1,000 enrollees, almost twice the rate of the lowest-ranking State—Maryland—which had 235 9 discharges per 1,000 enrollees

The accessibility of medical care resources to the population—including both distance and travel time—is often suggested as a factor affecting the use of services Chart 2 shows that the highest discharge rates are found in the Mountain, West North Central, and West South Central States where the population is sparsest The low-

State	Discharges per 1,000 enrollees				Population [1]	
	Number		Rank		Per square mile	Per cent in rural areas
	1972	1967	1972	1967		
Highest rank						
North Dakota	425 6	417 7	1	1	9	55 7
South Dakota	424 0	389 5	2	3	9	55 4
Montana	421 4	416 0	3	2	5	46 6
Wyoming	412 9	381 8	4	4	4	39 5
Mississippi	391 1	300 4	5	15	48	55 5
Arkansas	389 9	322 2	6	9	39	50 0
Kansas	376 9	330 3	7	7 5	28	33 9
Oklahoma	376 7	352 8	8	6	39	32 0
Texas	375 3	306 0	9	13	45	20 3
Nebraska	369 8	315 9	10	11	20	38 5
Lowest rank						
Maryland	235 9	198 4	50	48	411	23 4
Delaware	243 7	200 4	49	47	291	27 8
New York	246 7	202 9	48	46	382	14 4
New Jersey	250 2	193 7	47	49	979	11 1
Utah	251 3	245 5	46	38	14	19 6
Rhode Island	254 1	210 7	45	45	928	12 9
Connecticut	254 9	227 6	44	42	633	22 6
Hawaii	266 5	267 7	43	30	129	16 9
Pennsylvania	269 1	226 8	42	43	265	28 5
South Carolina	274 1	266 8	41	32 5	90	52 4

[1] 1970 U S Census
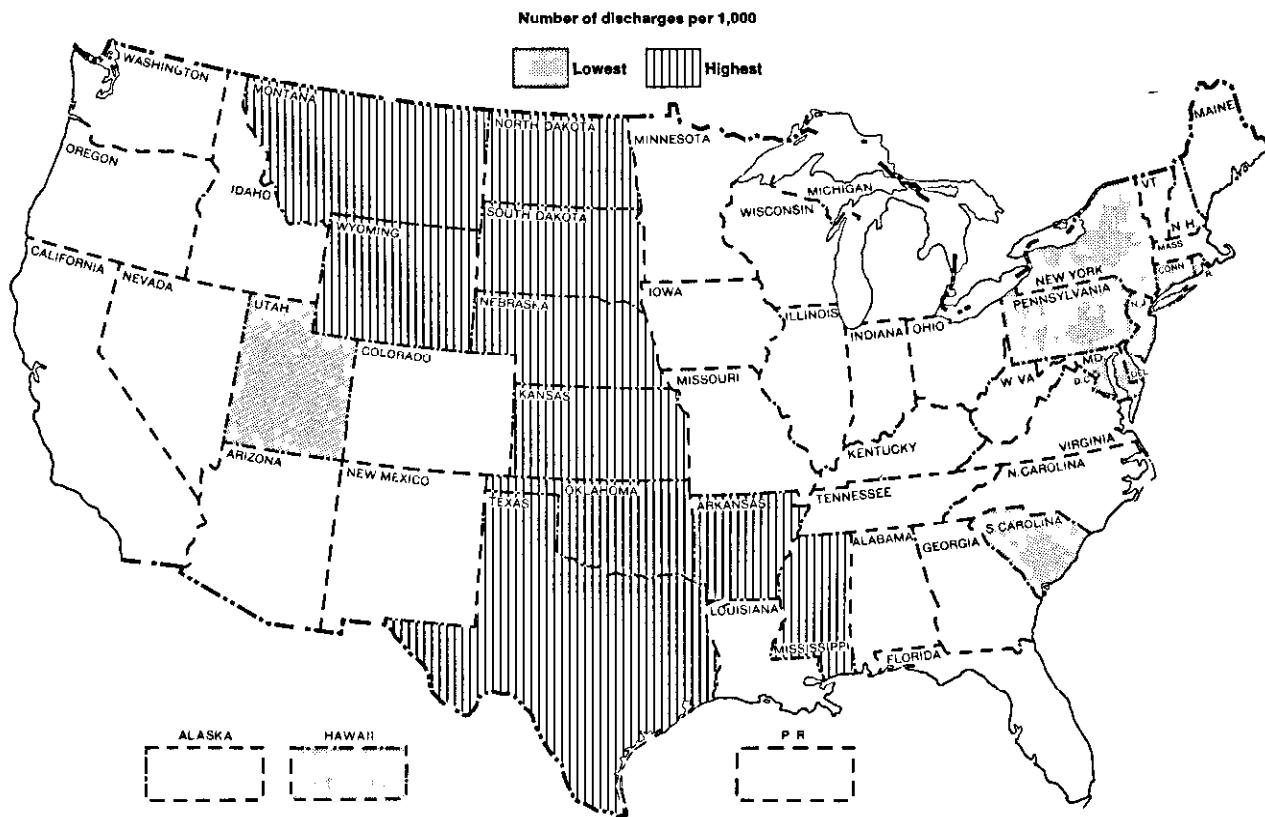
est rates occur predominantly in the Northeast States where the population is dense

Two measures given in table 6 relate to the distribution of the population—population per square mile (density) and percentage residing in rural areas Population density is generally much less and the percentage living in rural areas is much higher in States with high numbers of discharges per 1,000, compared with the low-ranking States Evidently, where distances to health care resources are relatively great, more health care is provided on an inpatient basis than where the distances to services are less

The ranking of an area by rate of hospitalization is often the reverse of its ranking by length of stay In the Northeast States the discharge rate is generally low and mean length of stay is high In much of the South (excluding the Middle Atlantic States) the discharge rate is relatively high and mean length of stay is relatively low

Comparison of the data in charts 1 and 2 indi-

cates that Rhode Island, New York, New Jersey, Pennsylvania, and Maryland have a pattern of comparatively few hospitalizations for relatively long stays The reverse is true in Oklahoma and Arkansas, where comparatively more hospitalizations are for relatively short stays Chart 3 illustrates the complexities of the relationship between the number of discharges per 1,000 enrollees and mean length of stay for all the States in 1972

Utah stands out as the unique example of a State with both relatively few hospitalizations and relatively short hospital stays As a result, Utah had the fewest days of care per 1,000 enrollees in 1970–72 In the Nation as a whole, the number of days of care per 1,000 enrollees in 1972 was 3,677 9, in Utah the rate was 2,324 8 days per 1,000 enrollees—almost 40 percent less than the national rate

Some explanation for Utah's low hospital utilization may lie in the health status of the population One study has compared death rates in Utah

CHART 3.—Number of discharges per 1,000 enrollees and mean length of stay (in days) in short-stay hospitals for Medicare patients aged 65 and over, by State, 1972

Discharges per 1,000 (ranked)		State	Mean Length of Stay

Discharges per 1,000 (ranked) scale: 400, 300, 200

Mean Length of Stay scale: 7, 9, 11, 13, 15, 17

States (top to bottom):
Md, Del, N Y, N J, Utah, R I, Conn, Hawaii, Pa, S C, Mass, Alaska, Calif, Ohio, Mich, Oreg, Ind, Fla, Va, N C, N H, Wash, Ariz, Wis, Ill, Maine, Idaho, Ga, Tenn, Ala, N Mex, Nev, Mo, Ky, Minn, Colo, La, Iowa, Vt, W Va, Nebr, Texas, Okla, Kans, Ark, Miss, Wyo, Mont, S Dak, N Dak
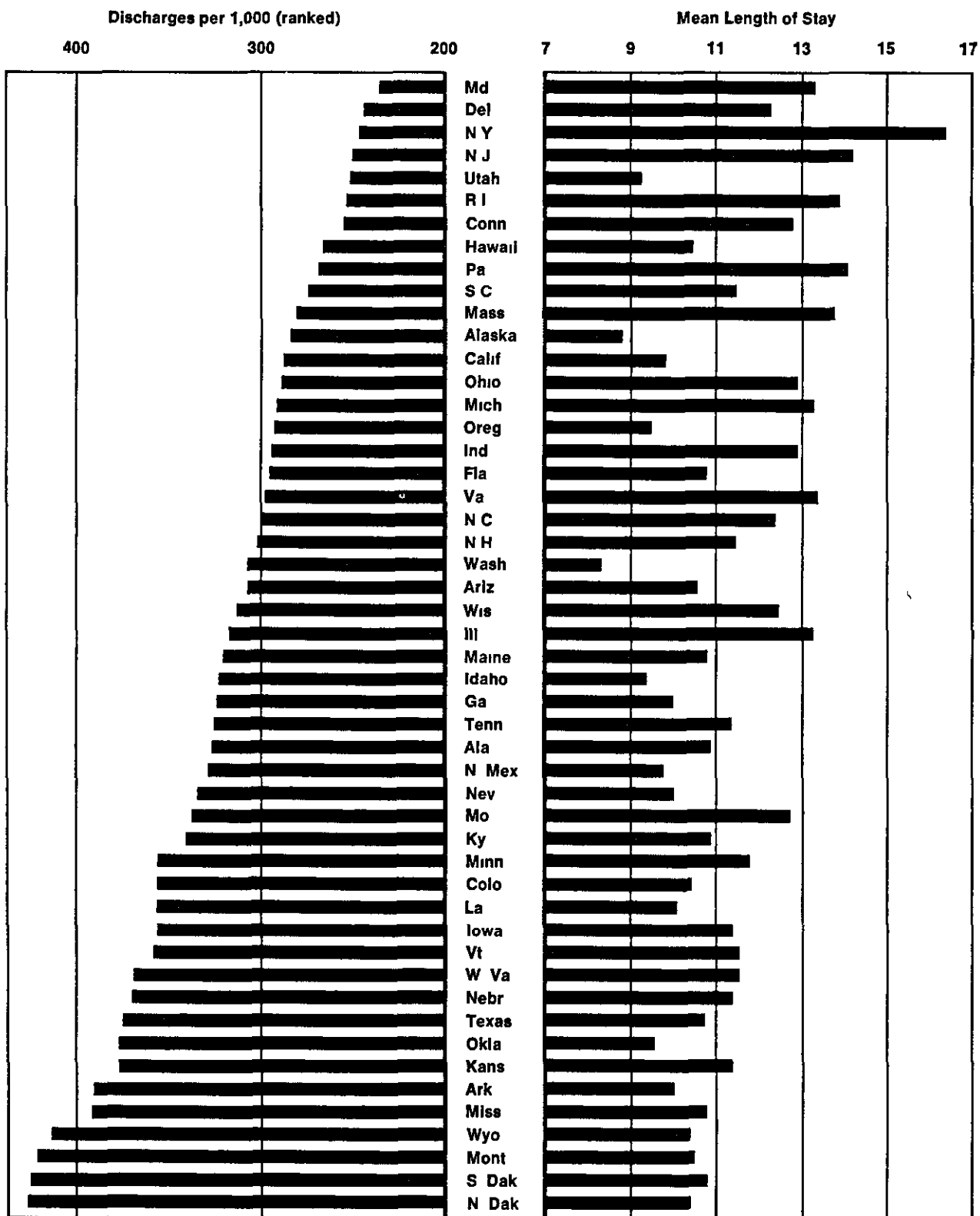
and Nevada [8] These two adjacent States are alike with respect to income, education, degree of urbanization, climate, and other characteristics that are thought to be causes of variations in mortality Yet in every age group Nevada's death rates substantially exceed those of Utah, as the following figures show

Age group	Ratio of death rates[1] in Nevada to those in Utah	
	Males	Females
Under 1	1 42	1 35
1-19	1 16	1 26
20-29	1 44	1 42
30-39	1 37	1 42
40-49	1 54	1 69
50-59	1 38	1 28
60-69	1 26	1 17
70-79	1 20	1 06

[1] See Victor R Fuchs, *ibid*

The author attributes these differences in death rates to differences in life styles Alcohol and tobacco consumption and marital and geographic stability are cited as strongly contrasting factors for these two States This theory is of particular interest in light of Medicare data that show that hospital care was used by enrollees in Nevada at a consistently greater rate than in Utah The rates in 1972 were 3,346 days per 1,000 enrollees in Nevada and 2,325 in Utah—44 percent more in Nevada One extension of the theory might be that lifestyle affects hospitalization rates as well as mortality Utah's experience further suggests that some basic quantity of hospital services is required but that greater use is not directly related to higher health status

In nearly every State the number of discharges in 1972 was greater than in 1967, although some fluctuation in rates existed in the years between 1967 and 1972 (table 7) Data for 1973 and later years, though not yet complete, show a continuing upward trend in discharge rates

Nonsurgical and Surgical Discharge Rates

For Medicare patients aged 65 and over, surgical discharges comprise about 30 percent of total discharges Several observations can be made

from the data presented in table 8 The range in discharge rates is significantly greater for nonsurgical discharges than for surgical discharges The rate of nonsurgical discharges in Montana, the highest-ranking State, was more than double the rate in Maryland, the lowest-ranking State For surgical discharges the rate in South Dakota, the highest-ranking State, was 69 percent higher than it was in South Carolina, the lowest-ranking State

Nonsurgical cases comprise 70 percent of all discharges Thus it is not unexpected that the States ranking high (or low) in total discharge rates have similar ranking for nonsurgical discharge rates The corresponding statement cannot be made for surgical discharge rates Two States ranking among highest in total discharge rates— Mississippi and Arkansas—rank among the lowest in surgical discharge rates Nor are the States ranking lowest in total discharge rates (primarily in the Northeast) the same as those ranking lowest in surgical discharge rates (all except Alaska in the South) The total discharge rate thus reflects primarily the nonsurgical discharge rate, but the surgical and nonsurgical rates exhibit no obvious relationship

MULTIPLE HOSPITALIZATION

Special tabulations were designed to learn what factors relate to repeated hospitalization of the Medicare population [9] To determine how often patients experienced multiple stays, an aggregate was made of all discharges for the same patient during a specified period, without regard to the causes of hospitalization The data base consisted of discharges for a 20-percent sample of Medicare enrollees

The number of discharges for each patient was computed for 1972 The data showed that 73 percent had one stay only and 27 percent had two or more hospitalizations in that year Persons with multiple stays accounted for 48 percent of all discharges Similar percentages were found for 1973 When the data were merged for the 2-year

[8] See Victor R Fuchs, "A Tale of Two States," in *Who Shall Live? Health Economics and Social Choice*, Basic Books, Inc , 1974, pages 52–55

period 1972–73, the rate of multiple hospitalization and the proportion of all discharges attributable to those with multiple stays increased substantially The data for that period indicate that repeated hospitalization of the Medicare population is a significant factor in the use of hospital services About 36 percent of all hospitalized enrollees had two or more hospital stays during the 2-year period, and these patients accounted for more than 61 percent of all discharges

TABLE 7.—Number of discharges from short-stay hospitals per 1,000 Medicare enrollees aged 65 and over and rank by State, 1967–72

Region, division, and State	Discharges per 1,000 enrollees											
	Number						Rank					
	1967	1968	1969	1970	1971	1972	1967	1968	1969	1970	1971	1972
United States	261 7	286 9	298 2	296 3	291 2	304 6						
Northeast	217 4	241 7	251 4	247 1	248 1	261 0						
New England	243 0	254 5	278 3	257 4	265 2	280 3						
Maine	290 6	302 4	339 9	314 7	305 9	320 2	18	27	18	26	26	25
New Hampshire	258 7	270 9	300 3	280 1	295 8	302 1	34	37	33	35	29	30
Vermont	283 6	315 4	345 1	343 8	350 7	3o8 7	22	22	16	18	12	12
Massachusetts	241 1	2o3 6	275 6	252 2	263 2	279 7	41	43	41	44	42	40
Rhode Island	210 7	230 9	242 7	231 9	235 6	254 1	45	45	46	48	47 5	45
Connecticut	227 6	230 0	253 6	233 0	239 8	254 9	42	47 5	45	47	45	44
Middle Atlantic	209 1	237 6	242 7	243 8	242 5	254 6						
New York	202 9	230 6	235 5	236 2	235 6	246 7	46	46	47	45	47 5	48
New Jersey	193 7	230 0	234 2	235 8	235 4	250 2	49	47 5	48	46	49	47
Pennsylvania	226 8	252 5	258 5	259 9	257 2	269 1	43	44	44	42	44	42
North Central	276 6	297 2	309 1	310 5	304 0	320 8						
East North Central	263 6	275 8	286 4	289 3	284 7	300 9						
Ohio	244 2	260 2	263 8	270 7	267 9	287 9	40	42	43	39	39	37
Indiana	245 0	262 8	273 4	276 7	280 9	294 0	39	40 5	42	37	36	34
Illinois	271 8	290 4	304 3	3o6 8	298 4	317 2	29	32	30	29	27	26
Michigan	266 8	262 8	281 5	278 5	272 6	291 7	32 5	40 5	39	36	37	36
Wisconsin	300 0	309 3	314 2	318 6	311 6	312 8	16	23	28	25	22	27
West North Central	302 3	339 5	353 9	352 5	342 3	360 2						
Minnesota	291 1	341 8	347 8	354 4	343 0	355 6	17	11	14	11	15	16
Iowa	289 4	338 8	354 0	350 1	334 7	356 0	19	14	12	14	17	13 5
Missouri	274 4	305 5	324 0	323 6	317 1	337 9	26	25	24	22	20	18
North Dakota	417 7	437 9	433 9	432 2	402 6	425 6	1	1	2	2	4	1
South Dakota	389 5	399 4	408 9	399 9	408 1	424 0	3	3	4	4	2	2
Nebraska	315 9	342 4	360 9	352 3	348 2	369 8	11	10	10	13	13	10
Kansas	330 3	362 8	384 0	379 0	364 3	376 9	7 5	8	6	7	8	7
South	282 9	315 1	325 6	325 7	317 1	328 6						
South Atlantic	259 5	283 7	293 9	292 1	284 1	294 8						
Delaware	200 4	209 1	228 6	228 5	237 0	243 7	47	50	49	49	46	49
Maryland	198 4	215 7	225 7	223 9	219 1	235 9	48	49	50	50	50	50
District of Columbia	197 1	201 3	220 4	209 4	209 3	221 1						
Virginia	253 0	276 6	286 4	286 2	291 7	297 4	36	36	36	34	32	32
West Virginia	318 1	340 6	350 2	352 7	355 6	369 4	10	13	13	12	10	11
North Carolina	278 4	291 0	303 3	302 9	294 9	299 2	25	30	31	30	30	31
South Carolina	266 8	293 3	30o 5	289 0	266 8	274 1	32 5	29	29	33	40	41
Georgia	282 0	317 0	322 4	321 5	310 1	323 8	23	21	25	24	24	23
Florida	257 1	287 0	297 0	295 9	282 4	295 0	35	33	34	31	35	33
East South Central	292 5	323 1	335 8	341 0	330 4	341 6						
Kentucky	304 8	328 3	337 3	335 9	316 1	340 2	14	18	20	20	21	17
Tennessee	288 0	322 5	329 2	321 7	311 1	326 5	20	19	22	23	23	22
Alabama	279 4	30o 9	325 7	338 3	327 6	326 9	24	24	23	19	18	21
Mississippi	300 4	341 0	359 7	385 8	389 5	391 1	15	12	11	5	5	5
West South Central	312 1	357 9	367 8	367 9	360 4	374 2						
Arkansas	322 2	355 8	365 8	378 1	377 5	389 9	9	9	9	8	6	6
Louisiana	283 9	318 8	332 8	34o 7	346 9	356 0	21	20	21	16	14	13 5
Oklahoma	352 8	378 1	391 1	384 7	372 4	376 7	6	5	5	6	7	8
Texas	306 0	364 5	372 0	367 2	356 9	375 3	13	7	7	9	9	9
West	267 7	290 7	304 5	295 5	288 7	299 9						
Mountain	321 5	343 9	351 5	343 9	328 6	334 4						
Montana	416 0	429 9	439 3	434 0	416 5	421 4	2	2	1	1	1	3
Idaho	330 3	333 6	340 9	327 7	321 9	323 3	7 5	16	17	21	19	24
Wyoming	381 8	399 0	430 7	425 5	404 2	412 9	4	4	3	3	3	4
Colorado	362 5	372 1	3,1 0	363 9	350 6	355 8	5	6	8	10	11	15
New Mexico	309 1	337 5	339 3	344 1	309 4	328 6	12	15	19	17	25	20
Arizona	273 1	303 3	319 7	312 4	294 3	307 5	28	26	26	27	31	28
Utah	245 5	268 8	276 5	257 9	259 5	251 3	38	38 5	40	43	43	46
Nevada	191 6	329 4	346 6	349 8	341 5	334 9	50	17	15	15	16	19
Pacific	252 3	275 5	290 9	281 3	276 9	289 6						
Washington	267 6	300 8	316 4	309 0	296 1	306 8	31	28	27	28	28	29
Oregon	273 8	290 8	301 2	293 7	286 7	293 0	27	31	32	32	33	35
California	246 5	268 8	285 2	275 1	272 5	28o 6	37	38 5	37	38	38	38
Alaska	222 9	277 2	291 2	269 9	282 5	283 6	44	35	35	41	34	39
Hawaii	267 7	280 4	282 5	270 4	263 9	266 5	30	34	38	40	41	43

As this tabulation reveals, 6 percent of the hospitalized group had four or more stays in that

Number of hospital stays, 1972-73	Patients		Discharges	
	Number	Percent	Number	Percent
Total	7 571,175	100 0	12 434 970	100 0
1	4 813,955	63 6	4,813,955	38 7
2	1,664,330	22 0	3,328,660	26 8
3	623 485	8 2	1 870 455	15 0
4 or more	469,405	6 2	2,421,900	19 5

period These patients accounted for nearly 20 percent of all hospital stays

The South, the region with the highest overall rate of discharges per 1,000 enrollees, had the highest percentage of patients with multiple stays (38 1) Conversely, the Northeast, the region with the lowest rate of discharges per 1,000 enrollees, had the lowest percentage of patients with multiple stays (33 2). The tabulation below shows the

Region	Percent of patients with multiple stays			
	Total	2 stays	3 stays	4 stays or more
United States	36 4	22 0	8 2	6 2
Northeast	33 2	21 3	7 2	4 7
North Central	36 8	22 2	8 3	6 3
South	38 2	22 2	8 8	7 2
West	37 1	22 2	8 5	6 4

percentage of patients with two, three, and four or more stays in each region during the 2-year period

Substantial State differences are found in the percentage of patients with multiple stays In the highest-ranking States, more than 40 percent of the patients hospitalized during the period 1972–73 had two or more stays, compared with the lowest-ranking States where less than 34 percent had multiple stays The highest- and lowest-ranking States in the percentage of patients with multiple stays (table 9) and the States with the highest and lowest rate of discharges per 1,000 enrollees are nearly the same The rate of multiple hospitalization in an area thus correlates with the rate of hospitalization

The percentage of persons enrolled in 1973 who were hospitalized at least once during the year also is shown in table 9 In States with the highest rate of multiple stays, 24–27 percent of the Medicare population were hospitalized at least once, compared with only 15–21 percent who were hospitalized at least once in the lowest-ranking States In areas with high discharge rates, therefore, a higher proportion of persons uses inpatient care at least once and a higher proportion uses inpatient care more than once These data suggest that such factors as distance, resources, and the patterns of medical practice that cause or influence persons to be admitted for inpatient hospital services once also cause or influence repeated hospitalizations

It can be observed from the data in table 10 that the mean length of stay in any one State shows little variation regardless of the number

TABLE 8 —Number of discharges from short-stay hospitals per 1,000 Medicare enrollees aged 65 and over by surgery status in highest- and lowest-ranking States, 1967 and 1972

State	Discharges per 1,000 enrollees			
	Number		Rank	
	1972	1967	1972	1967
	Without surgery			
Highest rank				
Montana	315 9	313 2	1	1
Wyoming	312 2	283 6	2	3
North Dakota	309 6	306 3	3	2
Arkansas	307 7	247 5	4	7
South Dakota	307 0	277 1	5	4
Mississippi	306 2	240 4	6	9
Oklahoma	282 8	268 8	7	5
Texas	277 8	224 1	8 5	14
Kansas	277 8	244 8	8 5	8
Nebraska	274 8	225 1	10	13
Lowest rank				
Maryland	145 1	116 2	50	50
Rhode Island	157 4	127 4	49	47
New York	159 2	127 9	48	46
Delaware	159 6	126 5	47	48
Utah	160 5	153 6	46	42
New Jersey	161 0	124 5	45	49
Connecticut	163 0	141 9	44	44
Pennsylvania	172 1	143 4	43	43
Hawaii	177 6	182 8	42	29
California	185 9	155 7	41	41
	With surgery			
Highest rank				
South Dakota	117 0	112 4	1	2
North Dakota	116 1	111 4	2	3
Vermont	108 2	91 8	3	11
Minnesota	107 1	87 6	4	18
Montana	105 5	102 8	5	4
Colorado	104 4	114 9	6	1
Maine	103 6	84 3	7	24 5
Florida	102 2	90 5	8	15
Illinois	100 9	89 9	9	17
California	100 8	90 8	10	13 5
Lowest rank				
South Carolina	69 4	65 7	50	47
Alabama	80 3	68 1	49	46
Kentucky	81 4	76 0	48	39
Arkansas	82 2	74 6	47	42
Delaware	84 1	73 9	46	43
Mississippi	84 9	60 0	45	48
Alaska	85 9	58 5	44	49
Tennessee	86 2	78 8	43	36
Georgia	87 2	74 8	42	41
North Carolina	87 3	80 7	41	35

TABLE 9 —Percent of Medicare patients aged 65 and over with multiple stays in short-stay hospitals, in highest- and lowest-ranking States, 1972-73

State	Percent of patients with multiple stays,[1] 1972-73				Percent of enrollees hospitalized at least once, 1973
	All multiple stays	2 stays	3 stays	4 stays or more	
Highest rank					
North Dakota	44 5	24 7	9 7	10 1	27 1
South Dakota	43 8	23 7	10 3	9 8	26 6
Montana	43 7	24 0	9 8	9 8	26 1
Wyoming	43 3	24 7	10 0	8 7	24 8
Mississippi	42 9	23 5	10 1	9 4	26 3
Arkansas	42 7	22 8	10 0	9 9	25 8
Texas	41 5	23 0	9 8	8 7	25 7
Nebraska	41 5	23 2	9 7	8 5	25 3
Kansas	40 6	23 2	9 3	8 1	23 9
Colorado	40 3	23 1	9 5	7 7	25 4
Lowest rank					
Maryland	29 4	19 6	6 0	3 8	14 7
New Jersey	31 8	21 0	6 7	4 2	18 2
Connecticut	31 9	20 6	6 8	4 5	18 1
Rhode Island	32 2	20 5	7 4	4 3	19 1
New York	32 4	21 1	7 0	4 4	18 3
Delaware	32 5	20 1	7 2	5 2	18 5
Utah	33 0	21 4	7 2	4 4	19 6
Pennsylvania	33 4	21 5	7 2	4 7	20 1
Hawaii	33 5	19 9	7 8	5 8	18 2
Ohio	33 8	21 4	7 6	4 9	20 5

[1] Base is total of all persons hospitalized

or order of the stays, although the higher-ranking States consistently have a lower average length of stay One question sometimes raised is Does a low average length of stay combined with a high rate of multiple hospitalization reflect the practice of discharging patients too soon with a subsequent risk of readmitting some of them to complete their recovery?

A further question might be raised Would case review indicate a pattern of admitting a significant number of patients for diagnostic services and later readmitting them for medical or surgical services? Either practice might produce a higher-than-average proportion of subsequent admissions occurring after only a short period of time elapsed

Interval Between Hospital Stays

To learn how soon a subsequent admission occurred for patients with multiple hospitalizations in 1972-73, the length of time between discharge and the next hospitalization was recorded As the following figures show, on the average,

Number of days elapsed between stays	Percentage distribution of reentries				
	United States	North-east	North Central	South	West
Total	100 0	100 0	100 0	100 0	100 0
0-21	24 7	21 8	24 9	25 6	26 5
0	3 6	3 0	4 0	3 9	3 2
1	1 1	9	1 1	1 2	1 3
2-7	7 5	6 2	7 5	7 7	8 6
8-14	7 0	6 4	6 9	7 2	7 6
15-21	5 5	5 3	5 4	5 6	5 8
22-28	4 6	4 6	4 6	4 7	4 6
29-35	4 0	4 0	3 9	4 0	4 1
36-42	3 5	3 5	3 5	3 5	3 5
43-49	3 1	3 2	3 0	3 2	3 1
50-56	2 9	2 9	2 8	2 9	2 8
57-60	1 5	1 5	1 5	1 5	1 5
61-89	9 4	9 8	9 3	9 3	9 1
90-119	7 6	7 9	7 6	7 6	7 3
120 or more	38 6	40 9	38 9	37 7	37 2

TABLE 10 —Mean length of stay for Medicare patients aged 65 and over with multiple stays in short-stay hospitals, by order of stay, in highest- and lowest-ranking States, 1972-73

State	Mean length of stay (in days), by order of stay									
	1 stay	2 stays		3 stays			4 stays or more			
		1st	2d	1st	2d	3d	1st	2d	3d	4th
Highest rank										
North Dakota	10 2	10 8	10 7	9 8	10 9	11 2	9 7	10 3	10 8	10 1
South Dakota	10 4	10 7	10 8	11 2	10 5	10 7	10 8	10 2	10 1	10 2
Montana	9 8	10 0	9 8	9 8	9 9	10 2	9 3	8 8	9 3	9 2
Wyoming	10 9	11 1	11 3	10 4	10 9	11 1	10 1	9 3	11 7	8 8
Mississippi	10 1	10 7	10 8	10 7	11 2	11 4	10 3	10 7	10 8	10 7
Arkansas	9 5	10 0	10 3	10 1	10 8	10 7	9 6	9 5	10 2	9 4
Texas	10 1	10 7	10 8	10 7	11 3	11 2	10 4	10 3	10 6	10 4
Nebraska	11 0	11 6	11 6	11 6	11 3	11 5	10 6	10 8	11 0	10 9
Kansas	11 1	11 5	11 5	11 8	12 1	12 4	10 7	10 6	11 0	11 0
Colorado	9 7	10 2	10 1	10 6	11 0	10 8	10 3	10 1	10 5	10 4
Lowest rank										
Maryland	13 2	13 5	13 0	13 6	13 3	13 5	13 3	12 2	12 5	12 6
New Jersey	14 0	14 6	14 1	14 4	14 7	14 4	14 2	13 9	14 1	13 2
Connecticut	12 3	13 2	12 6	12 9	12 6	12 7	12 3	11 9	12 0	11 4
Rhode Island	13 5	14 1	13 5	14 4	12 8	13 7	13 6	13 5	12 4	12 6
New York	16 6	16 7	16 2	16 2	16 2	16 3	15 2	14 8	14 9	14 8
Delaware	12 7	13 0	13 1	12 7	13 2	12 7	12 7	13 1	11 4	14 0
Utah	8 8	8 9	9 5	8 9	9 5	9 7	9 9	9 0	9 5	8 7
Pennsylvania	13 5	14 6	13 7	14 5	14 3	13 6	14 3	13 4	13 4	13 1
Hawaii	11 8	10 1	10 2	10 5	10 9	10 9	11 5	9 9	10 3	9 1
Ohio	12 5	13 3	12 7	13 1	13 0	12 8	12 6	12 4	12 5	11 7

3 6 percent of succeeding admissions occurred on the same day as discharge These figures reflect some instances of transfer from one hospital to another, which under the Medicare billing system requires a discharge notice from the first hospital and an admission notice from the second For 1 1 percent of the patients with multiple stays, another admission occurred on the day after discharge Nationally, 24 7 percent of multiple stays during 1972–73 occurred within 21 days of discharge In the Northeast the proportion was less—21 8 percent—and in the West it was higher —26 5 percent

The data on elapsed time between stays in table 11 indicate a decided pattern in the timing of admissions Reentry to the hospital occurs relatively sooner in a State with a low mean length of stay, in a State with a high rate of discharge, and in a State with a high percentage of patients with multiple stays In such States about 27–31 percent of the reentries occurred within 3 weeks

And, conversely, in a State with a relatively high mean length of stay, in a State with a low discharge rate, and in a State with a low percentage of patients with multiple stays, reentry to the hospital does not occur as soon In these States (except Utah) only about 19–23 percent of the reentries happened within 3 weeks of the discharge.

Causes of Hospitalization

Further tabulations took into account the primary discharge diagnosis in order to determine additional factors related to multiple hospitalization Discharges were grouped in 166 categories consisting of a single diagnosis or diagnostic group The 30 diagnoses that appeared most frequently are presented in table 12 These diagnoses or diagnostic groups accounted for more than 50

TABLE 11 —Number and percentage distribution of reentries to short-stay hospitals for Medicare patients aged 65 and over, by number of days elapsed between stays in highest- and lowest-ranking States, 1972–73

States	Number of reentries	Total	Percentage distribution of reentries, by number of days elapsed between stays														
			0-21	0	1	2-7	8-14	15-21	22-28	29-35	36-42	43-49	50-56	57-60	61-89	90-119	120 or more
Total	4 716,295	100 0	24 8	3 6	1 1	7 5	7 0	5 5	4 6	4 0	3 5	3 1	2 9	1 5	9 4	7 6	38 6
Rank by mean length of stay																	
Highest																	
New York	317,110	100 0	21 9	3 3	0 9	6 0	6 4	5 3	4 5	3 9	3 6	3 1	2 9	1 4	9 8	7 8	41 1
New Jersey	112,630	100 0	20 9	2 4	9	6 1	6 3	5 2	4 3	4 1	3 7	3 4	3 0	1 5	9 5	7 8	41 8
Pennsylvania	239 845	100 0	21 3	2 9	9	6 1	6 2	5 2	4 6	4 1	3 6	3 2	3 0	1 5	9 9	8 0	40 7
Rhode Island	17,590	100 0	19 2	1 8	7	5 4	6 5	4 8	4 8	3 8	3 2	2 6	2 6	1 3	9 7	8 2	44 5
Massachusetts	125 360	100 0	21 7	2 7	1 0	6 2	6 7	5 2	4 7	3 9	3 3	3 1	2 9	1 5	10 4	7 8	40 8
Lowest																	
Washington	75,710	100 0	27 8	3 1	1 3	9 7	7 9	5 9	4 9	4 0	3 6	3 1	2 7	1 5	8 8	7 5	36 0
Alaska	1,365	100 0	27 1	3 3	1 1	7 3	8 4	7 0	2 2	4 0	4 0	3 3	2 6	2 2	10 6	10 3	33 7
Utah	14,810	100 0	26 8	3 8	1 1	8 3	7 6	5 8	4 9	3 3	3 6	2 5	2 8	1 1	9 3	7 4	38 2
Idaho	19,130	100 0	31 2	6 4	1 6	8 8	8 2	6 2	4 4	4 0	3 4	3 1	3 3	1 3	8 2	6 8	34 3
Oregon	55 710	100 0	28 8	3 3	1 5	9 4	8 1	6 5	4 4	4 3	3 5	3 3	3 0	1 6	9 0	6 6	35 5
Rank by discharges per 1,000 enrollees																	
Highest																	
North Dakota	26,930	100 0	29 4	4 8	1 4	8 7	8 3	6 2	4 8	3 5	3 7	3 2	2 5	1 4	9 3	6 5	35 6
South Dakota	30 695	100 0	29 7	5 0	1 2	9 2	8 0	6 3	5 0	4 0	3 2	2 8	2 7	1 6	8 6	7 0	35 4
Montana	26,750	100 0	29 5	4 3	1 6	9 7	8 1	5 8	4 6	4 5	3 3	3 0	2 7	1 6	9 2	6 8	34 7
Wyoming	10,770	100 0	31 2	4 4	1 7	10 3	8 8	5 9	5 2	3 5	3 8	3 2	2 6	1 2	8 5	6 6	34 1
Mississippi	81,130	100 0	27 0	4 8	1 3	7 8	7 5	5 7	4 4	3 6	3 6	3 2	3 0	1 5	9 5	7 4	36 8
Lowest																	
Maryland	38,175	100 0	21 1	2 6	9	6 3	6 3	5 0	4 5	3 9	3 3	2 9	2 8	1 4	9 5	7 8	42 8
Delaware	7,120	100 0	22 5	2 7	9	6 5	8 0	4 4	4 7	4 1	3 9	3 4	3 5	1 3	9 0	9 3	38 3
New York	317 110	100 0	21 9	3 3	9	6 0	6 4	5 3	4 5	3 9	3 6	3 1	2 9	1 4	9 8	7 8	41 1
New Jersey	112,630	100 0	20 9	2 4	9	6 1	6 3	5 2	4 3	4 1	3 7	3 4	3 0	1 5	9 5	7 8	41 8
Utah	14,810	100 0	26 8	3 8	1 1	8 3	7 6	5 8	4 9	3 3	3 6	2 5	2 8	1 1	9 3	7 4	38 2
Rank by percent of multiple stays																	
Highest																	
North Dakota	26 930	100 0	29 4	4 8	1 4	8 7	8 3	6 2	4 8	3 5	3 7	3 2	2 5	1 4	9 3	6 5	35 6
South Dakota	30 695	100 0	29 7	5 0	1 2	9 2	8 0	6 3	5 0	4 0	3 2	2 8	2 7	1 6	8 6	7 0	35 4
Montana	26,750	100 0	29 5	4 3	1 6	9 7	8 1	5 8	4 6	4 5	3 3	3 0	2 7	1 6	9 2	6 8	34 7
Wyoming	10,770	100 0	31 2	4 4	1 7	10 3	8 8	5 9	5 2	3 5	3 8	3 2	2 6	1 2	8 5	6 6	34 1
Mississippi	81,130	100 0	27 0	4 8	1 3	7 8	7 5	5 7	4 4	3 6	3 6	3 2	3 0	1 5	9 5	7 4	36 8
Lowest																	
Maryland	38,175	100 0	21 1	2 6	9	6 3	6 3	5 0	4 5	3 9	3 3	2 9	2 8	1 4	9 5	7 8	42 8
New Jersey	112,630	100 0	20 9	2 4	9	6 1	6 3	5 2	4 3	4 1	3 7	3 4	3 0	1 5	9 5	7 8	41 8
Connecticut	48 165	100 0	20 2	1 5	9	6 4	6 2	5 2	4 4	4 0	3 6	3 1	3 1	1 8	9 4	7 8	42 6
Rhode Island	17,590	100 0	19 2	1 8	7	5 4	6 5	4 8	4 8	3 8	3 2	2 6	2 6	1 3	9 7	8 2	44 5
New York	317,110	100 0	21 9	3 3	9	6 0	6 4	5 3	4 5	3 9	3 6	3 1	2 9	1 4	9 8	7 8	41 1

TABLE 12 —Most frequent diagnoses for Medicare patients aged 65 and over discharged from short-stay hospitals, with single and multiple discharges, 1972–73

| Diagnosis or diagnostic group | Code [1] | Total discharges | Number of— | | Ratio of number of multiple to single discharges |
			Single discharges	Multiple discharges	
Total__ __ _ __ __ _ __ __ __ __ __ __ _ __ __ __	_____ __ _ _____	6 314,950	5,504,375	810,575	0 147
Chronic ischemic heart disease _____ __ _ _ ____ _ _ _	412	1,330 340	1,042,585	287,755	276
Cataract __ _ _ _____ _ _ ____ __ _ __ __ _ _ __	374	388,480	336 145	52,335	156
Pneumonia_ _ _ _ __ __ __ __ __ __ _	480–486	375,110	346 945	28,165	081
Acute myocardial infarction __ _ __ _ _ _ _ _ _	410	365 645	339 130	26,515	078
Ill defined cerebrovascular disease ___ _ _ __ _ _ __ _	436–438	356,215	324,020	32,195	099
Diabetes mellitus _ _ _ _ _ _ _ _ _ _ ___ _ _	250	337 020	273 435	63 585	233
Hyperplasia of prostate _ _ _ __ _ _ _ _ _ _ _	600	272 165	254,115	18 050	071
Diverticula of intestine_ _ _ _ __ _ _ _ _ _ ____	562	195 900	177,520	18 380	104
Congestive heart failure __ _ __ _ _ _ __ __ __	427 0	195 550	171 640	23,910	139
Cholelithiasis _ __ _ _ _ _ _ _ __ _ _	574	187 080	170,515	16 565	097
Generalized ischemic cerebrovascular disease _ _ _ _	437	170,940	158 480	12,460	079
Fracture, other and unspecified part of neck of femur, closed __	820 4	162,205	150 940	11,265	075
Acute and unqualified bronchitis and bronchiolitis ___ _ __	466,490	159,880	142 810	17,070	120
Inguinal hernia w/o mention of obstruction_ _ __ _	550	158 875	153,275	5 600	037
Gastroenteritis and colitis _ ___ _ _ __ __ __ __ __	009 2	140 525	131 895	8,630	065
Cerebral thrombosis _ _ _ _ _ __ __ ___ __	433	136 075	127,865	8 210	064
Malignant neoplasm of trachea, bronchous, and lung _ _ _ _	162	121,185	81,920	39 265	479
Emphysema _ _ _ _ _ _ _ _ _ _ _ _	492	115,915	92 545	23 370	253
Malignant neoplasm of prostate _ _ _ _ _ _ _ _	185	114,195	83 385	30,810	369
Osteoarthritis _ _ _ _ _ __ __ ___ _ _ __ __	713 0	102 970	94 515	8 455	089
Arteriosclerosis __ _ _ _ _ _ __ ___ _ _ _	440	101,195	94 600	6,595	070
Malignant neoplasm of breast _ _ _ _ _ __ ___ _	174	100,335	80,620	19 815	246
Essential benign hypertension _ _ _ _ __ _ _ __ _	401	98 715	93,270	5 445	058
Diaphragmatic hernia w/o mention of obstruction _ __ _ ____	551 3	98,470	92 020	6,450	070
Ulcer of duodenum _ _ _ _ _ _ _ __ _ _ __ _	532	95,705	87,125	8,580	098
Intestinal obstruction w/o mention of hernia ___ _ _ _ _	560	95 505	86,945	8 560	098
Influenza _ _ _ _ _ _ _ _ __ __ __ __ __	470–474	91,050	87 355	3,695	042
Cholecystitis and cholangitis w/o mention of calculus__ _	575	86,730	80,380	6,350	079
Urinary tract infection, not elsewhere classified __ _ _ __ _	599 0	81,445	75,860	5,585	074
Other acute and subacute forms of ischemic heart disease ___ _	411	79,530	72,620	6,910	095

[1] Based on Eighth Revision of the International Classification of Diseases Adapted

percent of all hospitalizations during the period 1972–73 As the data indicate, chronic ischemic heart disease was the primary discharge diagnosis, accounting for more than 10 percent of all discharges

Many of the diagnoses listed are causes of hospitalization predominantly among the aged National data for 1972 [10] show that patients aged 65 and over accounted for more than 70 percent of all discharges with a first-listed diagnosis of malignant neoplasm of prostate (79 9 percent), fracture of neck of femur (78 3 percent), arteriosclerosis (75 5 percent), congestive heart failure (73 0 percent), and cerebrovascular disease (70 5 percent) The aged also accounted for a high proportion of cases of cataract (69 4 percent) and hyperplasia of prostate (67 4 percent)

Single and multiple discharges were classified in the following way If a person was hospitalized only once for a specific condition, the discharge was counted once in the "single discharges"

[10] See National Center for Health Statistics, *Inpatient Utilization of Short-Stay Hospitals by Diagnosis, United States–1972* (Vital and Health Statistics Series 13, No 20, November 1975)

column If a person had two (or three, etc) discharges for the same diagnosis, the discharges were counted as two (or three, etc) discharges in the "multiple discharges" column The data in table 12 show the distributions of this classification To compare the impact of multiple discharges for a particular diagnosis, the ratio of the count in the multiple column to that in the single column was computed The ratio of multiple discharges to single discharges was 147 for all 30 diagnoses Inguinal hernia without mention of obstruction had the lowest ratio (.037) of multiple to single discharges Malignant neoplasm of the trachea, bronchus, and lung had the highest (479).

To identify other conditions frequently causing multiple stays the diagnostic groupings were ranked by the ratio of multiple to single discharges The 30 diagnoses with the highest ratios are shown in table 13 Leukemia ranks first with a ratio of 693, and multiple myeloma is second Neoplasms are heavily represented as leading causes of multiple hospitalization Conditions other than neoplasms that frequently cause multiple stays among the aged are asthma and alcoholism

TABLE 13 —Diagnoses for Medicare patients aged 65 and over discharged from short-stay hospitals, with highest ratio of multiple to single discharges, 1972–73

Diagnosis or diagnostic group	Code [1]	Total discharges	Number of—		Ratio of number of multiple to single discharges
			Single discharges	Multiple discharges	
Leukemia	204–207	38 090	22,505	15,585	0 693
Multiple myeloma	203	16 935	10,080	6,855	680
Malignant neoplasm of bladder	188	75 265	47 810	27,455	574
Malignant neoplasm of esophagus	150	12 465	8 165	4 300	527
Lymphosarcoma and reticulum sarcoma	200	17,450	11 480	5 970	520
Malignant neoplasm of cervix uteri	180	18,685	12 435	6 250	503
Malignant neoplasm of uterus except cervix	182	30 415	20,315	10,100	497
Hodgkin s disease and other neoplasms of lymphoid tissue	201,202	18,935	12 795	6 140	480
Malignant neoplasm of trachea, bronchus, and lung	162	121 185	81,920	39,265	479
Malignant neoplasm of ovary	183 0	15 690	10,675	5,015	470
Malignant neoplasm of larynx	161	12 955	8,950	4 005	447
Asthma	493	51,060	36 460	14 600	400
Malignant neoplasm of prostate	185	114 195	83,385	30,810	369
Malignant neoplasm of stomach	151	33,255	24 350	8 905	366
Alcoholism	303	26,795	19 900	6,895	346
Malignant neoplasm of buccal cavity and pharynx	140–149	26,165	19,610	6,555	334
Malignant neoplasm of kidney, except pelvis	189 0	12 180	9 145	3 035	332
Neoplasms of unspecified nature of bladder	237 6	23,015	17,480	5,535	317
Malignant neoplasm of pancreas	157	27,365	20 995	6,370	303
Chronic ischemic heart disease	412	1,330,340	1,042,585	287,755	276
Cirrhosis of liver	571	35 580	27,955	7,625	273
Malignant neoplasm of rectum and rectosigmoid junction	154	44,955	35 455	9 500	268
Chronic rheumatic heart disease	393–398	42 680	33,750	8,930	265
All other and unspecified anemias, except iron deficiency and pernicious anemia	281 1–281 9 282–285	78 075	61,810	16 265	263
Emphysema	492	115,915	92,545	23 370	253
Malignant neoplasm of breast	174	100,335	80 520	19 815	246
Chronic and unqualified nephritis	582,583	15,060	12 085	2,975	246
Diabetes mellitus	250	337,020	273,435	63 585	233
Malignant neoplasm of unspecified part of large intestine	153 8	51 275	41,790	9,485	227
Rheumatoid arthritis and allied conditions	712	44,045	36,120	7,925	219

[1] See table 12, footnote 1

Hospitalizations for Selected Diagnoses

Specific conditions were studied to see if a State pattern exists for the differences found in the percentage of patients with multiple stays Five diagnoses were selected among the leading causes of hospitalization Chronic ischemic heart disease, pneumonia, ill-defined cerebrovascular disease, congestive heart failure, and hyperplasia of prostate Five conditions with high ratios of multiple to single discharges also were chosen (for statistical purposes limited to diagnoses with the highest number of discharges) Emphysema, diabetes mellitus, malignant neoplasm of trachea, bronchus, and lung, malignant neoplasm of breast, and malignant neoplasm of prostate

For the highest- and lowest-ranking States in the overall percentage of patients with multiple stays, the number of persons discharged with each diagnosis was tabulated along with the percentage with more than one stay (table 14) In general, States with high percentages of multiple stays had high percentages for every diagnosis, and the opposite was true for the low-ranking States

The mean percentage for each diagnosis in the 10 high-ranking States, also shown in table 14, can be compared with the corresponding mean for the low-ranking States For every diagnosis the mean values are higher for the high-ranking States than they are for the low-ranking States

The pattern is even more pronounced when the ratios of the number of multiple discharges to single discharges are compared (table 15) The high-ranking States show considerably larger means for every diagnosis than do the low-ranking States States with a high rate of multiple hospitalization thus tend to maintain that high rate regardless of the diagnosis

DAYS OF CARE

The number of days of care per 1,000 population is the product of the discharge rate and the mean length of stay The data in table 16 indicate clearly that the overall use of hospital days of care per 1,000 enrollees in 1972 was no less than in 1967 The figures demonstrate that the rising

Table 14 —Number of Medicare patients aged 65 and over and percent with multiple stays in short-stay hospitals, by selected diagnoses, in highest- and lowest-ranking States, 1972-73

State	Chronic ischemic heart disease (412)	Pneumonia (480-486)	Ill-defined cerebrovascular disease (430-438)	Diabetes mellitus (250)	Congestive heart failure (427 0)	Hyperplasia of prostate (600)	Emphysema (492)	Malignant neoplasm of— Breast (174)	Trachea, bronchus, and lung (162)	Prostate (185)
	Number of patients									
United States	1,033,475	344,930	323,000	269,315	170,810	252,460	92,175	80,335	81,730	82,925
Highest rank [1]										
North Dakota	3,505	2,405	1 640	1,140	665	1,170	185	265	215	400
South Dakota	4,665	2,500	1 500	1,000	625	1 455	450	290	340	520
Montana	3 535	1 680	1,355	1,030	920	1,080	505	350	185	450
Wyoming	1,745	750	665	360	395	400	260	90	120	100
Mississippi	14 075	5,775	4,790	4 060	2,620	2 750	1,475	645	730	985
Arkansas	16 995	7,160	6,375	4,005	2,840	3,010	1,625	675	885	985
Texas	54 890	23 520	20,975	15,880	11 825	12,980	6,975	3 610	4 820	4,040
Nebraska	8,655	3 505	3 465	2,625	1 425	2 515	870	820	755	865
Kansas	14 850	5,020	4,480	4 005	1,885	3 455	1,335	1,050	970	1,185
Louisiana	19 740	6,540	5,855	5,330	3,535	4,045	1,885	950	1 425	1,680
Lowest rank [1]										
Maryland	13 435	3 375	3 170	2,735	1 725	3 240	715	1,005	1,135	965
New Jersey	35 835	6 840	9,505	8 690	5,980	8,455	2,215	2,785	2 770	2 680
Connecticut	12,860	3 560	3 305	3,125	1,985	3 160	800	1 290	1,195	1,140
Rhode Island	4 925	1 545	1,510	1,300	930	1,205	260	455	450	335
New York	86,290	23,905	25,865	21 705	15,835	22,350	6,105	8,275	7,455	6,545
Delaware	2,045	575	715	510	570	580	205	185	175	140
Utah	2,995	960	960	945	555	1,035	205	285	185	265
Pennsylvania	67 890	17,260	16,980	18 655	8,970	15,860	4,225	5,360	4 915	4,660
Hawaii	1,500	660	670	545	270	415	100	90	150	145
Ohio	51,745	15 440	15,620	14,725	8 085	11,845	4,885	4,010	4 120	3,965
	Percent with multiple stays									
United States	18 7	7 1	8 5	16 8	10 7	6 6	16 4	16 7	32 8	24 4
Highest rank [1]										
North Dakota	20 5	11 2	15 9	21 5	9 0	9 4	19 9	18 9	32 6	22 5
South Dakota	23 5	9 2	10 3	18 0	10 4	6 9	12 2	17 2	36 8	30 8
Montana	20 2	8 0	10 0	18 0	13 0	13 0	14 9	22 9	37 8	30 0
Wyoming	19 5	7 3	7 5	12 5	22 8	11 3	21 2	22 2	35 0	40 0
Mississippi	20 0	8 7	11 7	20 2	14 3	8 5	19 0	20 9	36 3	31 5
Arkansas	24 2	10 0	11 8	20 8	12 1	8 0	20 0	16 3	39 5	29 9
Texas	19 5	7 6	10 9	18 9	13 5	7 0	19 4	21 9	35 4	26 5
Nebraska	17 3	8 3	11 3	16 4	11 2	10 1	17 8	22 6	38 4	28 3
Kansas	21 9	8 0	9 6	17 9	9 3	6 4	18 7	20 0	39 7	24 1
Louisiana	20 0	10 3	9 1	17 5	14 4	8 5	19 1	13 7	34 0	29 2
Mean	20 5	8 6	10 9	18 7	13 1	7 9	18 9	20 1	36 3	27 8
Lowest rank [1]										
Maryland	16 5	5 6	6 8	10 4	9 3	5 2	11 2	10 9	24 7	17 1
New Jersey	16 6	4 4	5 6	12 9	9 4	5 0	12 4	15 1	31 2	20 3
Connecticut	17 3	6 6	5 1	14 7	11 1	6 2	10 6	17 4	27 6	23 2
Rhode Island	18 0	3 6	8 6	12 3	12 9	4 6	5 8	11 0	24 4	17 9
New York	15 8	5 0	6 5	15 3	9 1	5 9	16 4	15 9	28 4	23 8
Delaware	14 9	7 0	11 9	17 6	11 4	12 9	14 6	10 8	34 3	28 6
Utah	15 4	8 9	2 6	10 6	9 9	6 3	14 6	14 0	21 6	9 4
Pennsylvania	17 7	5 8	6 9	16 6	9 6	5 5	15 5	16 9	31 8	20 7
Hawaii	19 4	6 8	9 7	18 3	14 8	3 6	0 0	44 4	33 3	27 6
Ohio	17 7	5 9	6 9	14 8	8 9	6 2	17 9	14 6	31 7	23 5
Mean	16 9	5 5	6 6	15 0	9 5	5 8	15 4	15 6	29 8	22 0

[1] For all diagnoses

discharge rate offset the downward trend in length of stay

SUMMARY AND CONCLUSIONS

Marked regional variations are found in the patterns of use of short-stay hospitals by Medicare patients It has been widely reported that average length of stay has been declining steadily since 1969 Little attention has been focused, however, on the marked geographic variations found in the rate of hospitalization, as measured by the number of discharges per 1,000 enrollees, or on the upward trend in that rate The number of discharges per 1,000 Medicare enrollees increased more than 16 percent in the period 1967-72 and continues to rise Consequently, apparent gains made in reducing hospital use through re-

TABLE 15 —Number of discharges from short-stay hospitals for Medicare patients aged 65 and over and ratio of multiple to single discharges, by selected diagnoses, in highest- and lowest-ranking States, 1972-73

State	Chronic ischemic heart disease (412)	Pneumonia (480–486)	Ill-defined cerebrovascular disease (436–438)	Diabetes mellitus (250)	Congestive heart failure (427 0)	Hyperplasia of prostate (600)	Emphysema (492)	Malignant neoplasm of—		
								Breast (174)	Trachea, bronchus, and lung (162)	Prostate (185)
					Number of discharges					
United States	1,330,340	375,110	356,215	337,020	195,550	272,165	115,915	100 335	121,185	114,195
Highest rank [1]										
North Dakota	4,650	2,735	1,955	1 495	775	1 325	230	320	305	560
South Dakota	6,335	2,800	1 690	1 260	725	1,590	580	340	495	755
Montana	4,570	1,855	1,500	1 305	1,105	1,235	645	495	280	675
Wyoming	2,200	815	725	415	505	430	335	115	175	165
Mississippi	18,700	6,360	5 425	5 355	3,135	3 005	1,965	860	1 150	1 480
Arkansas	24,085	8 075	7,225	5,235	3,455	3,285	2,135	845	1 375	1,430
Texas	71 080	25 640	23,765	20,390	13,975	14,020	9 060	4 860	7,605	5,585
Nebraska	10 835	3 820	3,910	3,235	1,630	2 835	1 090	1,105	1,220	1,255
Kansas	19,975	5,485	5,005	4 935	2 125	3 670	1,705	1,410	1 565	1 650
Louisiana	26,035	7,305	6,465	6 680	4 305	4,430	2,460	1,165	2,290	2,475
Lowest rank [1]										
Maryland	16 440	3 560	3,400	3,095	1,895	3,430	795	1,165	1,500	1,190
New Jersey	44,420	7,205	10,140	10,095	6 685	8,900	2,580	3,445	3,880	3 520
Connecticut	16,145	3,775	3 515	3 740	2 270	3 375	910	1,585	1,635	1,545
Rhode Island	6,095	1,610	1,640	1,485	1,085	1 265	280	520	605	415
New York	105,535	25,230	27,755	26,070	17,625	23,700	7,625	10,050	10,235	8,790
Delaware	2,510	615	805	605	650	660	255	215	270	225
Utah	3,560	1,050	995	1 060	630	1,095	235	335	230	300
Pennsylvania	85 395	18 345	18 320	22,715	10,075	16,785	5 215	6,685	7,115	6 235
Hawaii	1,945	710	740	675	335	430	100	145	215	220
Ohio	64,875	16,490	16,870	17,635	9,120	12,625	6,380	4,965	5,920	5,350
					Ratio of number of multiple to single discharges					
United States	0 276	0 081	0 099	0 233	0 137	0 071	0 253	0 246	0 479	0 370
Highest rank [1]										
North Dakota	314	133	188	294	148	104	211	208	298	383
South Dakota	348	116	123	241	160	085	275	172	435	438
Montana	282	101	099	267	195	138	265	394	514	467
Wyoming	254	080	074	137	279	075	264	211	458	571
Mississippi	319	099	.130	311	190	087	328	333	554	458
Arkansas	403	126	128	296	214	090	302	243	463	409
Texas	287	089	.131	276	180	077	.292	344	554	372
Nebraska	240	088	127	223	144	121	253	323	574	418
Kansas	338	091	107	231	121	059	263	312	557	364
Louisiana	312	114	101	249	214	090	305	220	574	452
Mean	*313*	*101*	*125*	*269*	*184*	*086*	*291*	*309*	*541*	*408*
Lowest rank [1]										
Maryland	213	055	069	121	095	052	104	154	299	221
New Jersey	229	050	060	153	114	051	157	213	369	292
Connecticut	245	059	059	191	141	065	138	224	357	321
Rhode Island	235	042	086	134	160	050	077	143	287	221
New York	215	053	070	194	111	060	246	209	362	332
Delaware	201	060	126	186	130	138	244	103	421	500
Utah	183	088	021	122	135	058	146	175	243	111
Pennsylvania	251	061	076	214	122	057	230	243	422	329
Hawaii	243	076	096	239	218	036	000	611	433	467
Ohio	245	066	076	190	123	063	299	235	416	329
Mean	*233*	*058*	*071*	*189*	*119*	*059*	*234*	*220*	*382*	*315*

[1] For all diagnoses

ductions in length of stay are being offset by the rise in the number admitted for hospital care

Accessibility to health care services appears to be one factor that affects the discharge rate States with the highest rates of hospitalization have low population densities, conversely, States with the lowest rates of hospitalization tend to have high population densities The notable exception is Utah

Multiple hospitalization is a major factor in the number of discharges per 1,000 population Of those persons hospitalized during 1972–73, 36 percent had more than one stay and these patients accounted for more than 61 percent of the discharges

States with high rates of discharges have high percentages of patients with multiple hospitalizations The consistent pattern is worth noting If a State has an overall high percentage of patients with multiple hospitalizations, the per-

TABLE 16—Number of days of care in short-stay hospitals per 1,000 Medicare enrollees aged 65 and over, by State, 1967 and 1972

| State | Rank, 1972 | Days of care per 1,000 enrollees | | |
| | | Number | | Per-centage change |
		1972	1967	
United States		3,678	3,607	1 97
South Dakota	1	4 571	5 057	−9 61
North Dakota	2	4,442	6,015	−26 15
Montana	3	4 405	5,203	−15 34
Kansas	4	4 311	4 718	−8 63
Wyoming	5	4,310	4,890	−11 86
Missouri	6	4,291	3,942	8 85
West Virginia	7	4,270	4 370	−2 29
Illinois	8	4 227	4 258	− 73
Mississippi	9	4,216	3,589	17 47
Nebraska	10	4,206	4 446	−5 40
Minnesota	11	4,189	4,038	3 74
Vermont	12	4 173	4 213	− 95
Iowa	13	4 068	3,957	2 81
New York	14	4,038	3 427	17 83
Texas	15	3,999	3 420	16 93
Virginia	16	3 972	3 674	8 11
Arkansas	17 5	3,909	3,635	7 54
Wisconsin	17 5	3 909	4 262	−8 28
Michigan	19	3 886	3,985	−2 48
Massachusetts	20	3,848	3,760	2 34
Pennsylvania	21	3 790	3,767	61
Indiana	22	3,782	3 606	4 88
Tennessee	23	3 717	3 599	3 28
Colorado	24	3,713	4,477	−17 06
Ohio	25	3 709	3 632	2 12
North Carolina	26	3,700	3 855	−4 02
Kentucky	27	3,694	3,616	2 16
Oklahoma	28	3,618	3,912	−7 52
Louisiana	29	3 590	3 007	19 39
Alabama	30	3 572	3,402	5 00
New Jersey	31	3 549	2 980	19 09
Rhode Island	32	3,525	3 456	2 00
New Hampshire	33	3,488	3,597	−3 03
Maine	34	3 470	3 905	−11 14
Nevada	35	3,346	2 649	26 31
District of Columbia		3 327	3 282	1 37
Arizona	36	3 2o9	3,593	−9 30
Connecticut	37	3,251	3,181	2 20
Georgia	38	3 241	3,136	3 35
New Mexico	39	3 205	3 696	−13 28
Florida	40	3 200	3 210	0
South Carolina	41	3,164	3,731	−15 20
Maryland	42	3,144	2,980	5 50
Idaho	43	3 043	3 641	−16 42
Delaware	44	2 993	2 854	4 87
Hawaii	45	2,812	3,691	−23 81
California	46	2,802	2,9o4	−5 47
Oregon	47	2,773	2 978	−6 88
Washington	48	2,553	2,561	− 31
Alaska	49	2 504	3,124	−19 85
Utah	50	2 325	2,708	−14 14

centage of multiple hospitalization is high no matter what the diagnosis

These findings suggest that options exist for providing medical care services for the same or similar conditions and that geographic patterns are evident in the exercise of those options No doubt the variables that cause, influence, or otherwise affect admissions, readmissions, and length of stay decisions are many and complex It seems evident, also, that the diverse character of this Nation—and especially the differences in population densities—preclude expectation of uniform utilization patterns Yet the continuing escalation

in expenditures for health care services and the mandate for cost control and quality assurance in the provision of federally funded services call for future research to determine the variables that affect utilization and explore ways to change some of the patterns of delivery of health care services

Technical Note*

Data in this report are estimates based on discharges for a 20-percent sample of the population enrolled for hospital insurance and hence are subject to sampling variability 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 population is used Approximate methods were used to calculate standard errors at a reasonable cost for the wide variety of estimates presented in this report Tables I–VII thus should be used only as indicators of the order of magnitude of the standard errors for specific estimates In general, however, few of the estimates in this report are likely to have relative standard errors above 10 percent Only table 11 contains estimates with relative standard errors that may exceed 10 percent

TABLE I —Approximate standard errors of estimated number of discharges

Estimated number	Standard error
1 000	97
10,000	300
100,000	940
1,000,000	3 100
5,000,000	10 000

Estimates of the mean or average length of stay are ratio means and have standard errors inversely related to the size of the base—that is, the fewer the number of discharges in the base, the larger the standard error for a given mean length of stay Thus, table II should be used in conjunc-

*Prepared by James C Beebe, Division of Health Insurance Studies, Office of Research and Statistics

tion with table VIII, which shows the number of discharges by State for 1967 and 1972 Similarly, standard errors for estimated rates per 1,000 enrollees and estimated days of care per 1,000 enrollees are inversely related to the number of enrollees in the base [11]

The standard errors of percentage of patients with multiple stays depend on the size of the percentage and the number of persons in the sample with one or more discharges The standard errors in table IV were calculated by using the number of persons with one or more discharges in Wyoming, the State with the fewest persons in this category in the sample Standard errors for larger States can be approximated by multiplying the standard errors in table IV by $(k)^{1/2}$, where k is the ratio of the number of 1972 discharges in Wyoming to the number of 1972 discharges in the larger State

The standard errors of the percentage distribution of reentries, shown in table V, depend on the size of the percentage and the base with which the percentage is calculated The base can be found by referring to the estimated number of readmissions for 1972–73 in table 11

The standard error of a ratio of multiple discharges to single discharges (table VI) is determined by the size of the ratio and the number of discharges in the denominator These values are shown in tables 12 and 13

[11] For annual enrollment data see *Medicare Health Insurance for the Aged and Disabled, Section 2 Enrollment*, Office of Research and Statistics, Social Security Administration

TABLE II —Approximate standard errors of mean length of stay (in days)

Estimated days	Base of ratios (number of discharges)				
	100	1 000	10 000	100 000	1,000,000
8	2 7	0 9	0 3	0 1	0
12	3 4	1 1	3	1	0
16	4 1	1 3	4	1	0
20	4 8	1 5	5	2	1

TABLE III —Approximate standard errors of estimated number of discharges per 1,000 enrollees

Estimated number	Base of rate (number of enrollees)			
	10,000	100,000	1,000,000	10,000,000
10	3 1	1 0	0 3	0 1
100	9 7	3 0	9	3
300	17	5 2	1 6	7
500	22	6 7	2 1	1 0

TABLE IV —Approximate standard errors of percentage of patients with multiple stays

Percent	Standard error
1	0 2
5	4
10	5
20	7
40	9

TABLE V —Approximate standard errors of percentage of reentries, 1972–73

Percent	Base of percentage (number of reentries)					
	1,000	5,000	10,000	25 000	100 000	500,000
1	1 1	0 5	0 3	0 2	0 1	0
2	1 6	7	4	3	2	1
5	2 7	1 2	8	5	3	1
10	4 0	1 8	1 3	8	4	2
20	6 3	2 8	2 0	1 2	6	3
40	10 0	4 5	3 1	2 0	1 0	4

TABLE VII —Approximate standard errors of estimated number of days of care per 1,000 enrollees

Esti mated days	Base of rate (number of enrollees)						
	10,000	50,000	100,000	500,000	1,000,000	5,000,000	20,000,000
2,000	187	84	60	27	19	9	5
4,000	265	119	84	38	27	13	7
6,000	325	146	104	47	34	16	9
8,000	375	169	120	55	39	19	11

TABLE VI —Approximate standard errors of ratio of multiple to single discharges

Ratio	Base of ratio (number of single discharges)									
	5,000	10,000	15 000	20,000	30,000	50 000	100,000	500,000	1,000,000	5 000,000
0 700	0 066	0 047	0 038	0 033	0 027	0 021	0 014	0 006	0 005	0 003
0 500	052	037	030	026	021	016	011	005	004	002
0 300	037	026	021	018	015	011	008	004	003	001
0 100	018	013	010	009	007	006	004	002	001	001
0 030	009	006	005	004	004	003	002	001	001	000

TABLE VIII —Number of discharges from short-stay hospitals for Medicare patients 'aged 65 and over, by region, division, and State, 1967 and 1972

Region, division, and State	1967	1972	Region, division, and State	1967	1972
United States	4,989 694	6,273,195	South—*Continued*		
Northeast	1,104,886	1,381 420	South Atlantic—*Continued*		
			Virginia	87,049	113,600
New England	303 372	365 035	West Virginia	61,497	75,070
Maine	34 060	39 380	North Carolina	107,809	131 595
New Hampshire	20,380	25,715	South Carolina	48 356	56 065
Vermont	13,669	18,180	Georgia	97,768	123,995
Massachusetts	150 767	178 825	Florida	207,502	311,045
Rhode Island	21,326	27,145			
Connecticut	63,170	75,790	East South Central	357,055	450 500
			Kentucky	100 741	117 320
Middle Atlantic	801,514	1 016,385	Tennessee	105,489	130,425
New York	390 408	487 440	Alabama	86 269	111,365
New Jersey	129,017	178,625	Mississippi	64,556	91,390
Pennsylvania	282,089	350,320			
			West South Central	536 604	715 655
North Central	1 554,511	1,881,735	Arkansas	72,897	96,925
			Louisiana	82,032	112,930
East North Central	983 678	1,174,140	Oklahoma	100 052	115 915
Ohio	238,459	292 335	Texas	281,623	389,885
Indiana	118,302	148,650			
Illinois	292 325	352 155	West	774,539	972,345
Michigan	196,590	228 450			
Wisconsin	138,002	152,550	Mountain	206,913	250,460
			Montana	28,366	30,050
West North Central	570 833	707 595	Idaho	21,700	23 545
Minnesota	117,006	149,970	Wyoming	11,394	13,205
Iowa	101,384	127 315	Colorado	65,586	69 760
Missouri	150,527	193 03o	New Mexico	20,365	26,055
North Dakota	27,338	29,780	Arizona	36,849	55 255
South Dakota	31,032	35 025	Utah	17,530	20,600
Nebraska	56,999	69,230	Nevada	5,123	11,990
Kansas	86,547	103,240			
			Pacific	567 626	721,885
South	1,579 820	2,075,560	Washington	82,801	103,195
			Oregon	58,506	69 665
South Atlantic	686,161	909,405	California	414,427	533,980
Delaware	8 637	11,460	Alaska	1 302	2,015
Maryland	54,263	72,115	Hawaii	10,590	13,031
District of Columbia	13,280	14,460			