# 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-

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[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 offset 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 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

[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

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 |

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

| 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 |

[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

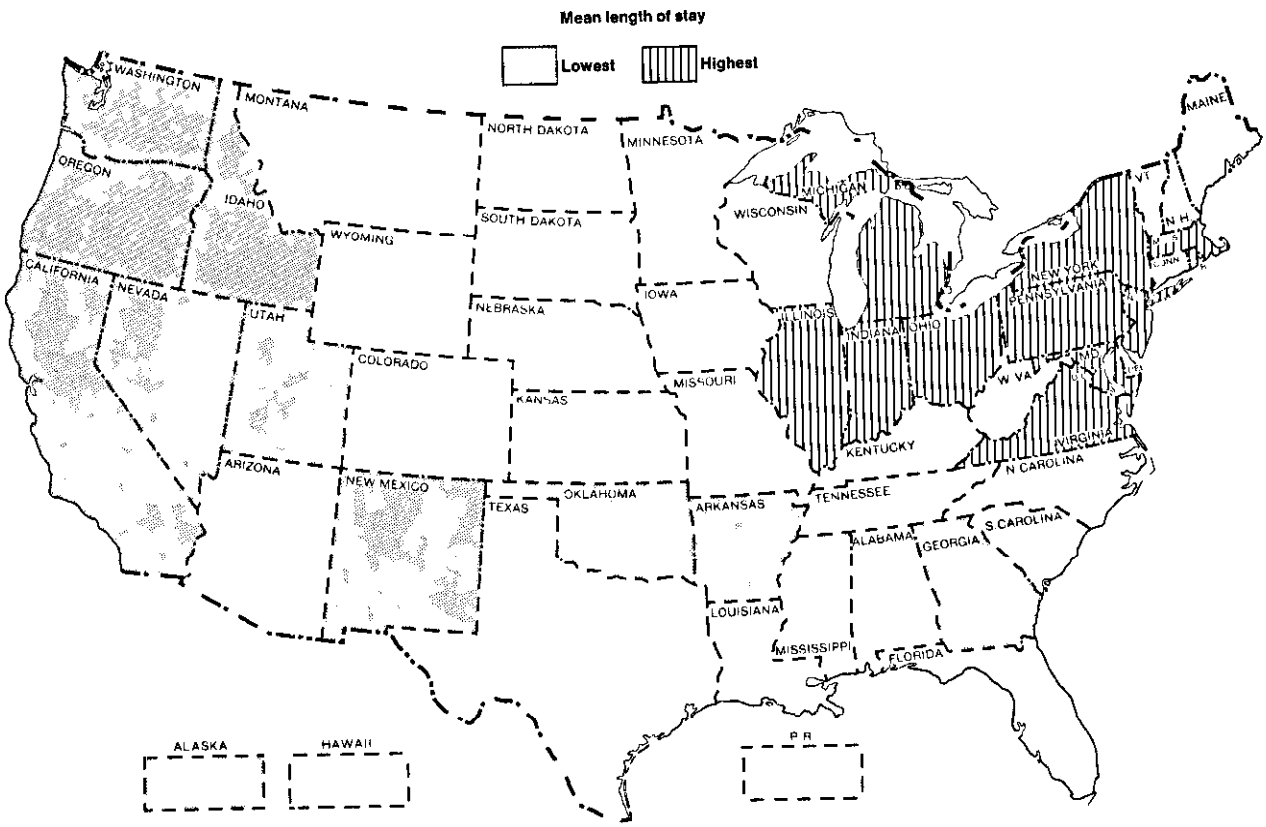
The rank order of the States is similar for both years The highest-ranking States are all in the Northeast and North Central States, as chart 1

[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 |

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



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 7 | 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 |

TABLE 5.—Number of discharges from short-stay hospitals per 1,000 Medicare enrollees aged 65 and over, by patient characteristics, 1967–72

| Patient characteristics | Discharges per 1,000 enrollees | | | | | | |
|---|---|---|---|---|---|---|---|
| | Number | | | | | | Percentage change, 1967–72 |
| | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | |
| All areas | 259 3 | 264 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

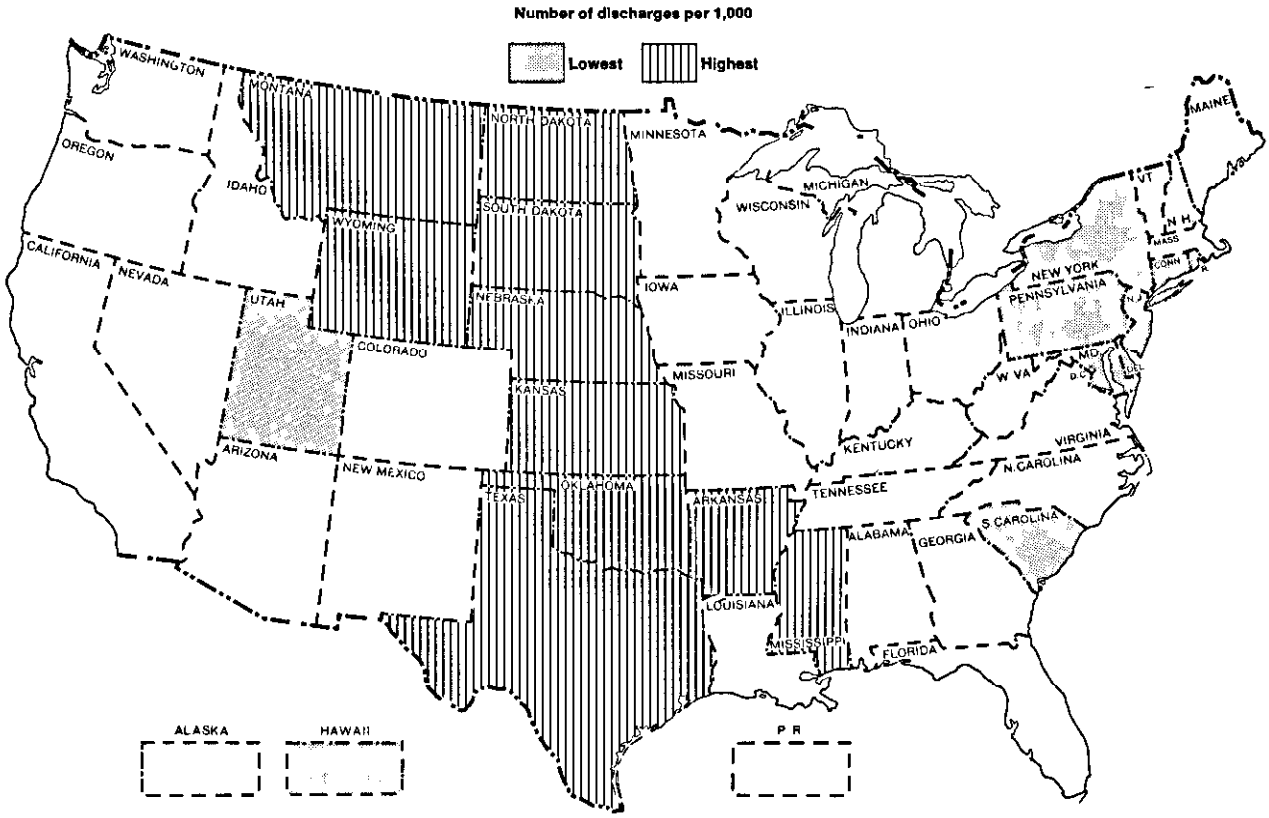
The accessibility of medical care resources to the population—including both distance and travel time—is often suggested as a factor affecting the use of services Chart 2 shows that the highest discharge rates are found in the Mountain, West North Central, and West South Central States where the population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

TABLE 6.—Number of discharges from short-stay hospitals per 1,000 Medicare enrollees aged 65 and over in highest- and lowest-ranking States, 1967 and 1972

| 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

CHART 2.—Number of discharges from short-stay hospitals per 1,000 Medicare enrollees aged 65 and over, in highest- and lowest-ranking States, 1972




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

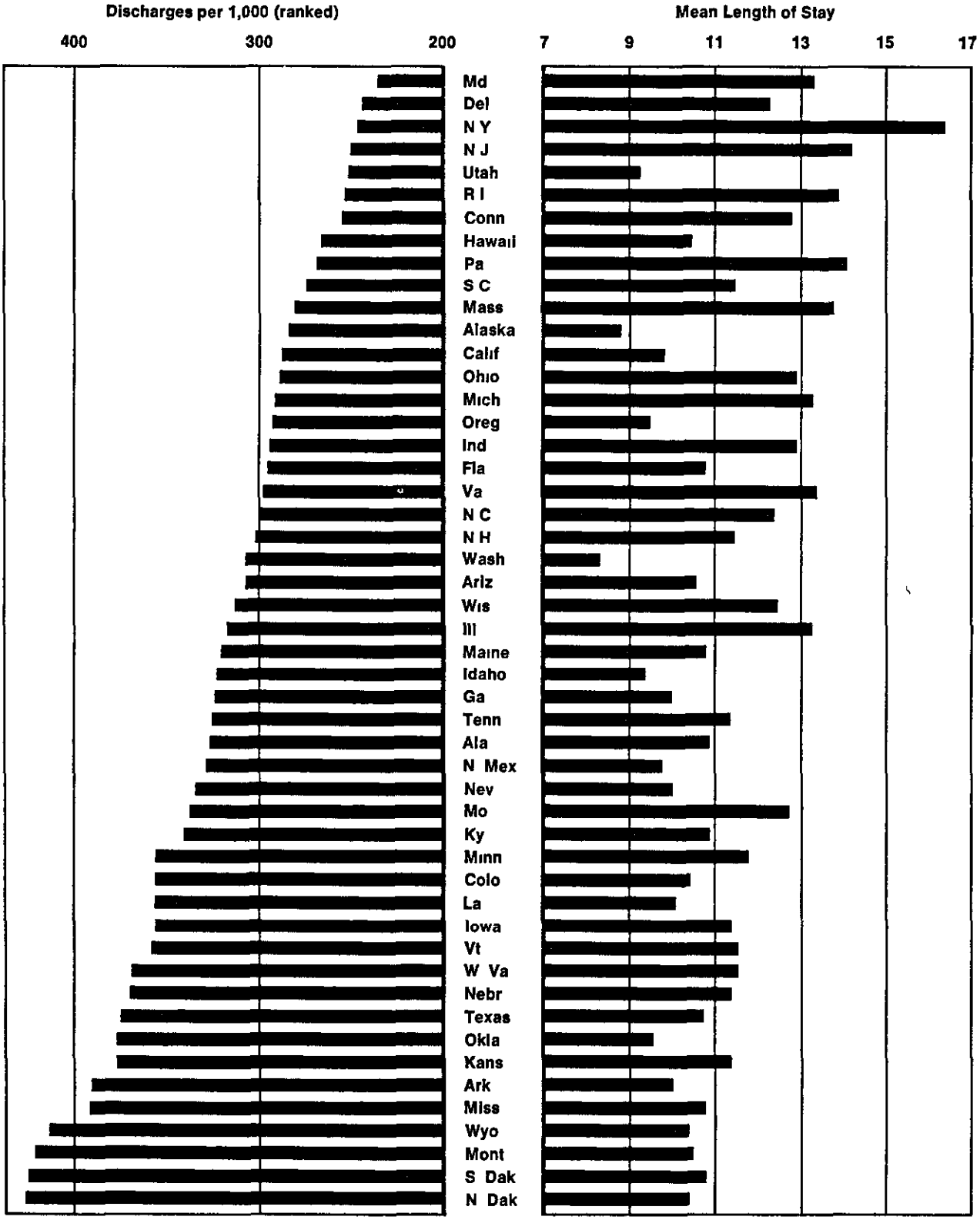
The ranking of an area by rate of hospitalization is often the reverse of its ranking by length of stay In the Northeast States the discharge rate is generally low and mean length of stay is high In much of the South (excluding the Middle Atlantic States) the discharge rate is relatively high and mean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

Comparison of the data in charts 1 and 2 indicates 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



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

[9] Unpublished data of the Division of Health Insurance Studies, Office of Research and Statistics, Social Security Administration Lillian Guralnick designed the tabulations to study multiple hospitalization Medford J Campbell, Jr, produced the computer reports on multiple stays

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 | 306 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 period. These patients accounted for nearly 20 percent of all hospital stays.

| 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 |

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

| 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 |

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 |

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 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 | Northeast | 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 8 | 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 | 94 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 | 116,915 | 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 | 80,520 | 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" 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

[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)

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 (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 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 | 370 | 680 | 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 | 1,550 | 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 | 6,090 | 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 | 10,060 | 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 | *253* | *058* | *071* | *189* | *119* | *059* | *254* | *220* | *382* | *316* |

[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 | | Percentage 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 | 36 | 3 327 | 3 282 | 1 37 |
| Arizona | 37 | 3 299 | 3,593 | −9 30 |
| Connecticut | 38 | 3,251 | 3,181 | 2 20 |
| Georgia | 39 | 3 241 | 3,136 | 3 35 |
| New Mexico | 40 | 3 205 | 3 696 | −13 28 |
| Florida | 41 | 3 200 | 3 210 | 0 |
| South Carolina | 42 | 3,164 | 3,731 | −15 20 |
| Maryland | 43 | 3,144 | 2,980 | 5 50 |
| Idaho | 44 | 3 043 | 3 641 | −16 42 |
| Delaware | 45 | 2 993 | 2 854 | 4 87 |
| Hawaii | 46 | 2,812 | 3,691 | −23 81 |
| California | 47 | 2,802 | 2,904 | −5 47 |
| Oregon | 48 | 2,773 | 2 978 | −6 88 |
| Washington | 49 | 2,553 | 2,561 | − 31 |
| Alaska | 50 | 2 504 | 3,124 | −19 85 |
| Utah | | 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 $(k)^{\frac{1}{2}}$, 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

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 |

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

| Estimated 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 |
|---|---|---|
| United States | 4,989 694 | 6,273,195 |
| Northeast | 1,104,886 | 1,381 420 |
| New England | 303 372 | 365 035 |
| Maine | 34 060 | 39 380 |
| New Hampshire | 20,380 | 25,715 |
| Vermont | 13,669 | 18,180 |
| Massachusetts | 150 767 | 178 825 |
| Rhode Island | 21,326 | 27,145 |
| Connecticut | 63,170 | 75,790 |
| Middle Atlantic | 801,514 | 1 016,385 |
| New York | 390 408 | 487 440 |
| New Jersey | 129,017 | 178,625 |
| Pennsylvania | 282,089 | 350,320 |
| North Central | 1 554,511 | 1,881,735 |
| East North Central | 983 678 | 1,174,140 |
| Ohio | 238,459 | 292 335 |
| Indiana | 118,302 | 148,650 |
| Illinois | 292 325 | 352 155 |
| Michigan | 196,590 | 228 450 |
| Wisconsin | 138,002 | 152,550 |
| West North Central | 570 833 | 707 595 |
| Minnesota | 117,006 | 149,970 |
| Iowa | 101,384 | 127 315 |
| Missouri | 150,527 | 193 030 |
| North Dakota | 27,338 | 29,780 |
| South Dakota | 31,032 | 35 025 |
| Nebraska | 56,999 | 69,230 |
| Kansas | 86,547 | 103,240 |
| South | 1,579 820 | 2,075,560 |
| South Atlantic | 686,161 | 909,405 |
| Delaware | 8 637 | 11,460 |
| Maryland | 54,263 | 72,115 |
| District of Columbia | 13,280 | 14,460 |
| South—*Continued* | | |
| South Atlantic—*Continued* | | |
| Virginia | 87,049 | 113,600 |
| West Virginia | 61,497 | 75,070 |
| North Carolina | 107,809 | 131 595 |
| South Carolina | 48 356 | 56 065 |
| Georgia | 97,768 | 123,995 |
| Florida | 207,502 | 311,045 |
| East South Central | 357,055 | 450 500 |
| Kentucky | 100 741 | 117 320 |
| Tennessee | 105,489 | 130,425 |
| Alabama | 86 269 | 111,365 |
| Mississippi | 64,556 | 91,390 |
| West South Central | 536 604 | 715 655 |
| Arkansas | 72,897 | 96,925 |
| Louisiana | 82,032 | 112,930 |
| Oklahoma | 100 052 | 115 915 |
| Texas | 281,623 | 389,885 |
| West | 774,539 | 972,345 |
| Mountain | 206,913 | 250,460 |
| Montana | 28,366 | 30,050 |
| Idaho | 21,700 | 23 545 |
| Wyoming | 11,394 | 13,205 |
| Colorado | 65,586 | 69 760 |
| New Mexico | 20,365 | 26,055 |
| Arizona | 36,849 | 55 255 |
| Utah | 17,530 | 20,600 |
| Nevada | 5,123 | 11,990 |
| Pacific | 567 626 | 721,885 |
| Washington | 82,801 | 103,195 |
| Oregon | 58,506 | 69 665 |
| California | 414,427 | 533,980 |
| Alaska | 1 302 | 2,015 |
| Hawaii | 10,590 | 13,031 |