The Elderly and the Health Care System: Another Perspective

PAUL M. DENSEN

Harvard University

A NUMBER OF YEARS AGO THE MATHEMATICIAN Norbert Wiener coined the word cybernetics (from the Greek *kubernetes,* to steer, guide, govern) to describe the analysis of the flow of information in electronic, mechanical, and biological systems. The term has come to be applied particularly to feedback mechanisms in which change in one system induces change in another, which in turn brings about change in the first system and sometimes, though not always, results in a dynamic equilibrium.

Cybernetics seems to me to be the perfect word to describe the dynamics of the relation between the statistics that document the changes taking place in the demographic, health, and economic characteristics of the population and the organizational arrangements developed by society to meet the challenges revealed by the data.

The process is especially well illustrated by the relation between the statistical information about the elderly and the various programs which have come into being to meet their needs. In this article I review this relationship and suggest that the time has come to develop a new perspective from which to view the accumulating data on the utilization of the health care system by the elderly.

An Evolving Statistical and Health Care Structure

Today our sources of information about the population's health and its utilization of the various parts of the health care structure are more

The Milbank Quarterly, Vol. 65, No. 4, 1987

numerous and varied than ever before. The demographic changes in the population and in the character of its health problems revealed by this rich data base are familiar to all health workers. The elderly, especially the oldest old, are increasing rapidly both in numbers and in percentage of the total population. Chronic disease and disability are major health problems of our time.

To cope with these changes and with the fact that since 1960 health care costs have risen from 5.3 percent of the gross national product to 10.7 percent in 1985 (U.S. Bureau of the Census 1986, 96) the health care structure itself is continually undergoing change both in the kinds of organizations delivering health care and in the way such care is paid for.

Health maintenance organizations, social/health maintenance organizations, nursing homes, home care programs, retirement communities, and for-profit hospital chains, for example, are all a part of the contemporary scene that either didn't exist or were only a tiny part of the whole only a few decades ago. In an attempt to control hospital costs, prospective payment based on diagnostic-related groups has been introduced and long-term care insurance has made its debut as a means of paying for out-of-hospital, largely nursing home, costs (Meiners 1984).

The introduction of new organizational arrangements for the delivery of health services, the realization of the importance of social support services as well as medical services in contributing to the quality of life, and the struggle to control costs all emphasize the desirability—nay, necessity—of looking at the utilization of the health care system as a whole. Despite our knowledge of the use of various parts of the service network, such information is lacking. It is time to bring together the evolving strands of statistical information about physician utilization, hospital utilization, nursing home utilization, etc., to present a systems perspective of how the population relates to the health care structure in its entirety as well as to its component parts.

Figure 1 represents an attempt to produce such a systems perspective for the elderly. I have chosen the elderly to illustrate the concept because they are one of the fastest growing elements of the population. They are subject to chronic disease, they require a variety of services to meet their needs, the cost of meeting those needs is likely to be high, and the policies to deal with these concerns make their progress through the health care system particularly important to review at

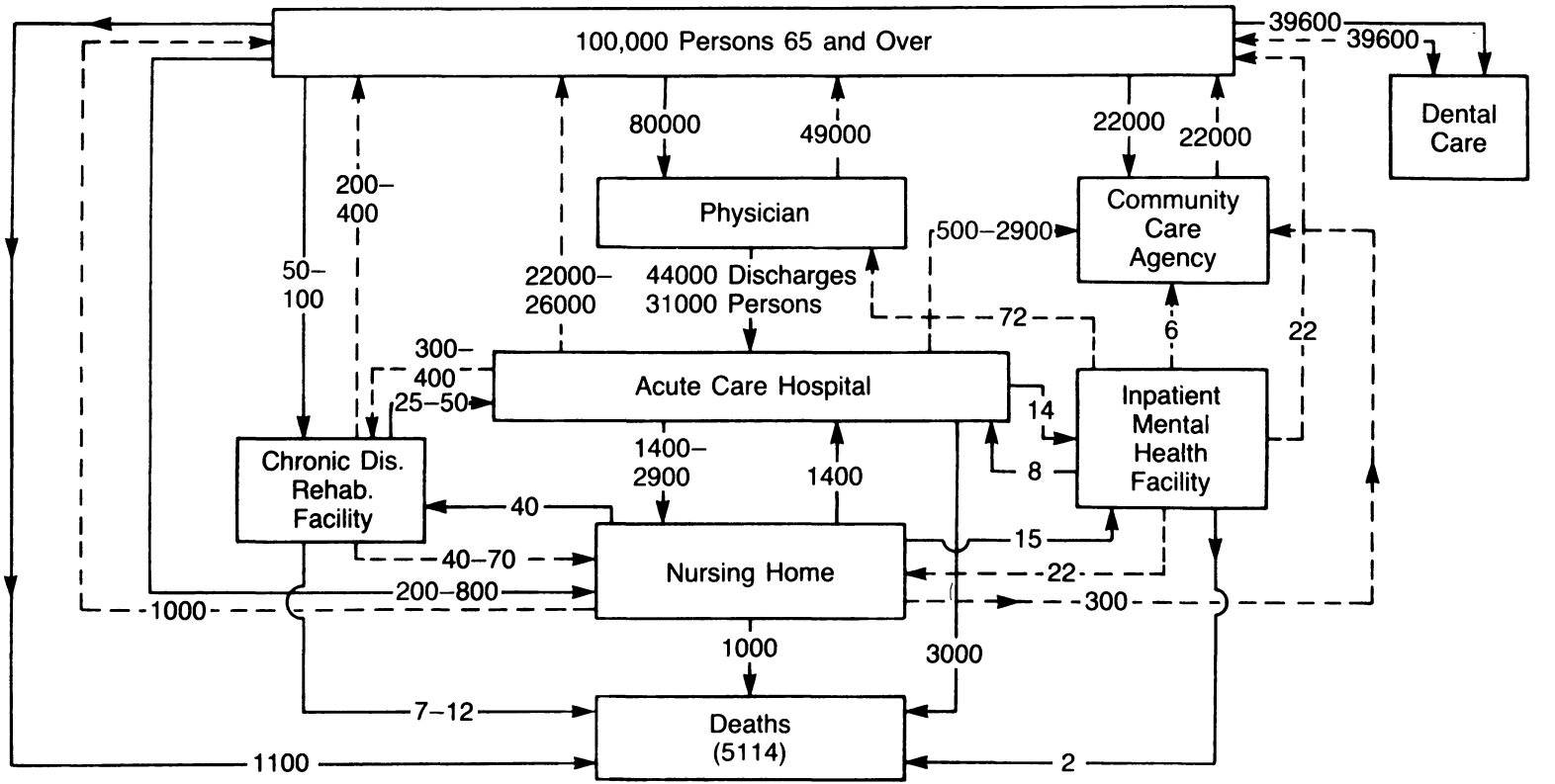

FIG. 1. Annual movement of persons 65 and over through the health care system.

⟶ = movement to more restrictive/intensive care setting; — — → = movement to less restrictive/intensive care setting

fairly frequent intervals. It will readily be recognized that the approach to the construction of such an overview for the elderly can be applied to any other age group.

The Construction of Figure 1

Figure 1 is constructed by piecing together what are essentially a series of cross-sectional observations to produce an integrated picture of the annual progress of the elderly through the health care system. For many parts of the diagram, particularly those concerned with utilization after discharge from the acute-care hospital, no published national data are available. The estimates in these cases are based upon various reports in the literature and on data collected from state reporting systems, such as the hospital discharge data for Maryland and South Carolina or from nongovernmental sources such as the Massachusetts Health Data Consortium. The estimates of admission and discharges from inpatient mental health facilities are derived largely from unpublished data of the National Institute of Mental Health. Appendix tables A through F detail the sources of the estimates and the various assumptions upon which they are based. Except when the numbers are very small, the estimates have been rounded to the nearest 10, 100, or 1,000, as the case may be.

Utilization data are most often reported in terms of admissions and discharges rather than individual persons. Since figure 1 represents an effort to trace *people* through the health care system, it is desirable ideally to have a frequency distribution of persons by number of admissions for each of the settings of figure 1. Fortunately, this information is available for the acute-care hospitals (appendix table A). To keep the concept clear, the percentage distributions of where people go after they leave the hospital are applied to the number of *persons* discharged. This compensates to some degree for the readmissions to the acute-care hospital from nursing homes and vice versa. These *people* are then traced through the rest of the system as described in the appendices. In the case of inpatient mental health facilities, it was possible to calculate a rate of first admission (people) directly (appendix table E).

At several points in figure 1, ranges are indicated, some of which are quite wide. This variability reflects differences in the methods

used to collect and classify the data and, in the absence of nationwide averages, differences between parts of the country in the availability of particular kinds of resources, such as nursing homes or home care programs, as well as possible real differences in utilization patterns.

Wherever possible, national data available from the National Center for Health Statistics or some other agency primarily engaged in data collection are used rather than estimates from a variety of miscellaneous sources. Thus, the estimated number of deaths in each setting is based upon United States mortality statistics by place of death rather than upon the sum of the deaths derived from the data for each setting. Similarly, in the case of discharges of persons from the acute-care hospital to chronic-disease/rehabilitation facilities, the estimate derived from the National Center for Health Statistics (NCHS) hospital discharge survey (300–400) is used rather than that based upon reports of admissions to rehabilitation facilities (200–400).

The Progress of the Elderly through the Health Care System

The system of health care for the elderly is often described as "fractionated," with the various needs of the elderly being viewed as though they were independent of each other. Such a perspective tends to result in administrative structures and financing efforts that contribute to further fractionation of services, duplication of effort, and high costs. Moreover, each part of the system develops its own set of utilization data with few unifying principles governing their collection to produce a coherent picture of how the total care fabric contributes to meet the needs of the elderly.

Figure 1 is a beginning attempt to produce such a coherent picture. It should be viewed with Pareto's comment on Kepler in mind: "Give me a fruitful error any time, full of seeds, bursting with its own corrections. You can keep your sterile truth to yourself" (Gould 1983). The fact that some of the data used in figure 1 are shakier than others should not deter us from making a beginning.

The reports of the National Health Survey (National Center for Health Statistics) tell us that in the course of a year about 80,000 out of every 100,000 elderly persons in the population see a doctor at least once and approximately 22,000 make use of a community

agency, the majority of the latter being seen in community senior centers. About 31,000 elderly are hospitalized in a year, generating about 44,000 discharges.

Where people go when they leave the hospital is not as readily determined. At present, there are no national data published by the National Center for Health Statistics, though the subject is of growing importance. Some state data are available (appendix table B), though there is no common classification of discharge disposition.

When they leave the hospital the majority of the elderly go home—somewhere between 22,000 and 26,000—depending on what source one uses for the estimates. Anywhere between 500 and 2,900 go home with a referral to organized community-support programs such as home care agencies, meals-on-wheels, housekeeping and chore service programs, transportation programs, etc. This is obviously one of the shakier estimates, yet it is an area with growing policy implications.

Between 1,400 and 2,900 individuals are discharged to skilled or intermediate care nursing homes. A small number are discharged to chronic disease/rehabilitation facilities and inpatient mental health facilities.

The popular conception that most people who enter a nursing home remain there until death has been refuted by such studies as that of Liu and Manton (1983). Yet, our knowledge of the disposition of elderly patients upon discharge from the nursing home is even less complete than that on hospital discharges. Using the sources shown in appendix table C, we see that somewhere around 1,000 individuals are discharged back to the community, though how many of these are referred to a community agency is at present not known. About 1,400 individuals reenter the acute-care hospital and another 1,000 die in the nursing home. A small number are discharged to chronic disease/rehabilitation facilities or inpatient mental health facilities.

The overall death rate in 1980 for persons aged 65 and over was 51.1 per thousand, which when applied to the cohort of 100,000 elderly yields an estimate of 5,114 deaths. Using NCHS data, these are distributed as shown in figure 1. The estimate (rounded) obtained by adding up the deaths reported from each of the points in the health care system falls somewhere between a low of 4,000 and a high of 5,000, the latter figure being quite close to the estimate obtained from National Center for Health Statistics data. The difference between the numbers obtained by the two approaches is not surprising,

considering the variety of sources from which the individual estimates spring. It is, however, worth noting because, as our knowledge of how people use the health care system improves, one may expect that the two estimates will draw closer to each other.

Discussion

There are several benefits to be gained through periodic systems analysis of the type represented by figure 1. Perhaps the most important is that it provides a means of visualizing the relations of the various parts of the system to each other and the shifts in the way people use the health care network that may follow upon changes in health policy.

For example, the recent shift in policy from a retrospective to a prospective method of reimbursing acute-care hospitals for inpatient care shows signs of producing ripple effects throughout the entire health care system, some of which may have been unanticipated. Hospitals are debating whether they should own or at least affiliate in some formal sense with particular nursing homes. Similar discussion seems to be taking place with regard to home care programs.

As these rearrangements among hospitals, nursing homes, and community programs occur and as such structures as retirement communities appear on the scene, they will inevitably be reflected in shifts in the patterns of where people go and where they come from at each point in the diagram. The ability to recognize the effects of policy changes at an early stage and to place even tentative estimates on the magnitude of the change should help to guide further policy decisions as well as to aid in making cost estimates of proposed changes nationally and locally.

Changes in health policy are currently being discussed in a number of other areas which, if adopted, are bound to have profound system effects with consequences for resource allocation and costs. Various forms of health insurance are being proposed. Some relate to long-term care insurance in which the term seems to refer to insurance for nursing home care, others are concerned with catastrophic illness, and still others seek to provide coverage for those currently lacking any form of health insurance. It is not my purpose here to discuss the pros and cons of these proposals but to point out that inevitably the adoption of any of these will have system effects that will be reflected

in figure 1. Knowledge of these can serve to modify programs as initially conceived either as regards eligibility, coverage, or method of reimbursement which, in turn, may make the programs more effective in meeting the needs of those they are designed to serve. Thus, figure 1 provides a means of judging the cybernetic effect of legislation or changes in it upon the utilization of the total health care system.

Each of the proposals mentioned above deals with a particular group of the population. Consideration of figure 1 may not only make the dimensions of the problem clearer but perhaps result in the issue being viewed in a wider context. For instance, we now have insurance for hospital care, insurance for medical care, and the beginnings of insurance for long-term care. Dr. Leona Baumgartner, when she was commissioner of health for New York City, used to refer to the various components of the health care system as "a many splintered thing." I cannot help but wonder whether the appellation is equally descriptive of the health insurance field and whether one might reexamine the possibility of broader coverage than that resulting from a consideration of one segment at a time. I say reexamine because the debates on national health insurance some years ago embodied essentially that thought. Indeed, it has been suggested that one might phase in national health insurance, moving from broad coverage for the elderly to cover all children up to a certain age and then later going on to other age groups (Fein 1970). In any case, whatever form of health insurance evolves is bound to have system-wide effects that will manifest themselves in the flow diagram.

A number of areas for research are suggested by figure 1. It would be of great interest if at each way station on the chart the volume of care provided and the dollars expended for that care could be added. To some extent this can be done. Thus, since the average number of physicians' visits per person aged 65 and over per year is 6.4, a cohort of 100,000 elderly will generate 640,000 visits. Similarly, based upon 1983 data from the Massachusetts Health Data Consortium, the 40,000 hospital discharges represent about 492,000 days of care and about $21,160,000 in hospital charges. The findings of the National Medical Care Utilization and Expenditure Survey may contribute to filling in other parts of the diagram.

An obvious line of research suggested by figure 1 is a longitudinal study of a cohort of elderly to obtain information directly on how

people move through the health care system. Such a study, properly designed, would have the advantage of being able to attach both the volume of care and the expenditures associated with that care to each stage of the process. It would also permit examination of the characteristics of individuals who make the greatest demands upon the health care system. For example, though the average annual number of physician visits of the elderly is 6.4, about 7 percent have 13 or more visits per year. In other words, a small proportion of the elderly account for a large proportion of visits. This is a well-known phenomenon and is seen in the utilization of hospitals as well (Zook and Moore 1980; Anderson and Steinberg 1984). What is less well known is whether there are demographic, social, or biological characteristics of this group that distinguish them from the rest of the elderly and whether the same individuals are also high utilizers of the other sectors of the service network. The report of Young and Fisher (1980) represents an early attempt to make use of Medicare data to examine questions of this kind, but much more work is needed.

By its very nature, longitudinal research requires considerable periods of time for completion. Desirable as such research would be, it would not serve the same purpose as figure 1, which is intended to make it possible to assess quickly and at fairly frequent intervals the shifts that take place in response to policy changes in the relations of various parts of the health care system to each other and in the way the elderly make use of the service network. In this sense, figure 1 may be viewed as a barometer of the effects of policy changes upon the health care structure and its operation.

In its present form, figure 1 is primarily an attempt to present a concept. Its utility depends, of course, upon the quality and timeliness of the data. A number of steps can be taken to strengthen the data. Perhaps the most important of these is to recognize that the information called for is not complicated. In its simplest form, all that is required is knowledge of the number of admissions and discharges at each point of the diagram, classified by age, source of admission, and discharge destination. With the possible exception of discharge destination, this is information that almost every service unit obtains for each individual entering its program. The problem then becomes one of systematically organizing and collecting this admission and discharge data from the operating records of each of the components of the health care system.

To move in this direction, the problems of arriving at a common classification for source of admission and discharge disposition and a common definition of first admission and readmission need to be addressed. Past experience with such technical problems has shown that they are solvable. Once solved, their adoption should be encouraged by various federal and state agencies charged with the collection of data on the utilization of the health care system and by the various professional societies.

Given the rapid changes in the demographics of the population and the state of flux of society's arrangements for meeting the needs of the elderly, it is clear that the data base in that part of figure 1 that seeks to describe what takes place once the patient leaves the hospital needs to be strengthened so that we may have a better understanding of the relation between policy and practice.

Though we do not currently have national data on where elderly people go when they enter or leave the various parts of the health care system, the data in the appendices show that several states are already collecting the desired information on an annual basis for hospitals and nursing homes—the two biggest parts of the health care system apart from the physician. It would be desirable to consider the possibility of building on this experience by incorporating in the national data-collection programs that already exist for most of the settings shown in figure 1 information on source of admission and place of disposition.

Society's arrangements for meeting the health care needs of its citizens are continually changing and seemingly at an ever more rapid pace. We can no longer afford to think of the parts of the health care system as discrete entities, but must view the system in its entirety. Our statistical programs must also be prepared to change so as to foster this perspective.

APPENDIX TABLE A
Estimation of Physician and Dentist Utilization and Admissions to and Discharges from Acute-care Hospitals

Component of care and measure of utilization	Calculation (all figures refer to persons aged 65 & over except as otherwise noted)	Estimate (rounded)	Source	Date of data
PHYSICIAN UTILIZATION				
No. seeing physician at least once during year	79.8% saw M.D. at least once in past year. 100,000 × .798 = 79,800	80,000	National Center for Health Statistics 1986	1980–1981
No. returning home after seeing M.D.	Of the 80,000 seeing M.D., 31,000 were hospitalized (see below), leaving 49,000 returning home. This figure does not take into account those hospitalized directly in a chronic disease/rehab. or mental health inpatient facility.	49,000		
COMMUNITY CARE AGENCY UTILIZATION	21.5% of the elderly used community services during the preceding year.	22,000	Stone 1985	Jan–June 1984
DENTIST UTILIZATION	39.6% saw a dentist at least once in past year.	39,600	Jack 1986	1983

HOSPITAL UTILIZATION

No. hospitalized in acute-care hospital

437.2 discharges per 5,000 population. Data on rehospitalization are available from the Health Interview Survey (HIS), the Nat'l Health, Medical Care Utilization and Expenditure Survey (NMCUES), and the South Carolina Physician and Hospital Reimbursement Study (S.C.) They yield the following percentage distributions:

No. of stays	Persons			Discharges		
	HIS	NMCUES	S.C.	HIS	NMCUES	S.C.
1	72.6%	63.0%	70.1%	52.7%	42.0%	47.6%
2	19.4	23.9	19.6	28.3	31.8	26.6
3 or more	8.0	13.1	10.3	19.0	26.2	25.8

Applying these figures to the 43,720 discharges yields the following estimated number of persons:

HIS	NMCUES	S.C.
31,955	29,132	30,386

An unweighted average of these figures gives an estimated 30,504. This figure may be slightly high because the 3 or more stays were assumed to be 3.

44,000 discharges	National Center for Health Statistics 1985	1983
	National Center for Health Statistics 1986b	1981
	Bryant and Biggar 1985	1980
	West et al. 1985	1981
31,000 persons		

Discharge destination of hospitalized persons

(Percentages applied to 31,000 hospitalized persons)

Home	Range of 71.2 to 84.0%	22,000–26,000	See appendix table A-1	See appendix table A-1

Nursing home	Range of 4.5 to 9.4	1,400–2,900	See appendix table A-1	See appendix table A-1
	9	2800	Kane, Matthias, and Sampson 1983	1979, 1980
Community care agency	Range of 1.7 to 9.4	500–2,900	See appendix table A-1	See appendix table A-1
Inpatient mental health facility	Rate of admission to inpatient mental health facility: 387.7 per 100,000 population. Of these, 31.2% are readmissions, giving a rate of first admissions of 121 per 100,000. 11.3% of these are from an acute care hospital.		National Institute of Mental Health 1985	1980
		14	See appendix table E	See appendix table E
Chronic disease/ rehabilitation facility	Range of 1.0 to 1.2	300–400	See appendix table B	See appendix table B

APPENDIX TABLE A-1
Percentage Distribution of Hospital Discharges in Selected Areas by Discharge Destination

Discharge destination	Area		
	Massachusetts	Maryland	South Carolina
Home	71.2%	81.2%	84.0%
Nursing home	9.4	7.1	4.5
Skilled nursing facility	5.3	4.2	
Intermediate care facility	4.1	2.9	
Home health or community program	9.4	1.8	1.7
Other acute-care hospital	1.6	1.2	1.9
Rehabilitation or chronic disease hospital	1.2	0.8	1.0
Inpatient mental health facility	0.1		
Against medical advice		0.3	0.2
Other and unknown		0.2	
Died	7.2	7.3	6.7
Total	100.0	100.0	100.0
Number of discharges	291,196	427,866	100,561
Time period	Oct. 1982–Sept. 1983	1980–1983	1982
Source:	Massachusetts Health Data Consortium	Maryland Information Service Center	South Carolina Cooperative Statistics System

APPENDIX TABLE B
Estimation of Nursing Home Admissions by Source of Admission

Component of care and measure of utilization	Calculation (all figures refer to persons aged 65 & over except as otherwise noted)	Estimate	Source	Date of data
From acute-care hospital	See appendix table A	1,400–2,900	See appendix table A-1	See appendix table A-1
From home	Percentage of admissions (all ages) from acute-care hospitals to skilled and intermediate care nursing homes: 70.4% (Mass.)–74.0% (Calif.) Applying these percentages to nursing home admissions from hospitals yields between 1,892 and 4,119 total admissions to nursing homes. Of these total admissions, between 11.8% (Calif.) and 18.5% (Mass.) are admitted from home.	200–800	Mass. Dept. of Public Health (unpublished); California Center for Health Statistics 1985	1983 1983
From inpatient mental health facility	See appendix table E	22	See appendix table E	1980
From chronic disease/ rehabilitation facilities	See appendix table D	40–70	See appendix table D	1980

APPENDIX TABLE C
Percentage Estimation of Nursing Home Discharges by Discharge Disposition*

Percentage Distribution of Nursing Home Discharges by Discharge Disposition and Source of Information

Discharge Destination	Source of Information					
	Lewis, Cretin, and Kane et al. 1985	Lewis et al. 1985	Van Nostrand 1986	Ozonoff 1986	California Center for Health Statistics 1985	Meiners 1984
Home	30.6%	29.9%	30.6%	6.4%	24.1%	22.2%
Home with home care				10.9		
Residential or group home					7.2	7.0
Community-based program						0.3
Hospital	38.0	29.9	35.4	40.0	44.7	35.1
Chronic disease/rehabilitation facility			2.0	1.0		0.4**
Inpatient mental health facility			0.6	0.3		
Death	31.4	40.2	31.4	41.3	23.9	35.0
Date of data	1980	1980	1976	1983	1983	Feb. 1981–Jan. 1982

* Excluding transfers between nursing homes and unknowns. Column totals may not equal 100 percent because of rounding.
** May include some mental health facilities.

Total nursing home admissions:

Minimum 1,400 + 200 + 40 + 22 = 1,662 Round to 1,700
Maximum 2,900 + 800 + 70 + 22 = 3,792 Round to 3,800

Applying the ranges from the various sources of information and grouping discharges to residential or group homes with discharges to home and discharges to home with home care together with community-based programs we have:

Discharge destination	Percentage range	Minimum	Maximum	Midpoint	Rounded
Home	29.2–37.8%	486–629	1,107–1,433	960	1,000
Community-based program	11.2	186	424	305	300
Hospital	29.9–44.7	479–743	1,134–1,695	1,415	1,400
Chronic disease/rehabilitation facility	0.4– 2.0	7–33	15–76	42	40
Inpatient mental health facility	0.3– 0.6	5–10	11–23	14	15
Death	23.9–41.3	397–689	906–1,566	982	1,000

APPENDIX TABLE D
Estimation of Admissions to and Discharges from Chronic Disease/Rehabilitation Hospitals

ADMISSIONS:

From appendix table A-1, the percentage of total discharges from acute-care hospitals to chronic disease/rehabilitation facilities *and* psychiatric facilities ranges from 0.8% (Md.) to 1.3% (Mass.). Of the Mass. discharges, 1.2% were to chronic disease/rehabilitation facilities and 0.1% to inpatient mental health facilities. Assuming this ratio prevails in Md., we get 0.7% discharged to chronic disease/rehabilitation facilities and 0.1% to inpatient mental health facilities.

Applying these ranges (0.7 to 1.2%) to the 31,000 *persons* admitted to acute-care hospitals, we get the following as admissions to chronic disease/rehabilitation facilities from acute care hospitals:

Minimum: 31,000 × .007 = 217 rounded to 200 Maximum: 31,000 × .012 = 372 rounded to 400

The admissions from acute-care hospitals constitute 70.3% of total admissions after removing intrahospital transfers (Mullner, Nuzum, and Matthews 1983). This yields total admissions to chronic disease/rehabilitation facilities of 309 (rounded to 300) minimum and 529 (rounded to 500) maximum. The distribution by source of admission (Mullner, Nuzum, and Matthews 1983) is:

70.3%	from acute-care hospitals, yielding estimated admissions	217	(200 minimum)	372	(400 maximum)
3.4%	from nursing homes, yielding estimated admissions	11		18	
19.2%	from home, yielding estimated admissions	53	(50 minimum)	91	(100 maximum)
9.0%	other, yielding estimated admissions	28		48	
Total		309		529	

These data refer to all ages. Age-specific data were not given.

DISCHARGES:

The distribution of discharges by place to which discharged (Mullner, Nuzum, and Matthews 1983) is:

76.8%	discharged home, yielding estimated discharges	237	(200 minimum)	406	(400 maximum)
7.7%	to acute-care hospitals	24	(25 minimum)	41	(50 maximum)
13.3%	to nursing home	41	(40 minimum)	70	(70 maximum)
2.2%	other	7		12	

These data refer to all ages. Age-specific data were not given.

APPENDIX TABLE E
Estimation of Admissions to and Discharges from Mental Health Facilities

(A) ADMISSIONS: Inpatient Mental Health Admissions and Rate per 100,000 Population for Persons Aged 65 & Over by Type of Inpatient Facility, 1980

Type of facility	Admissions	Rate per 100,000
State & county mental health institution	20,056	78.0
Private psychiatric hospital	13,916	54.1
V.A. medical center	6,489	25.2
Nonfederal general hospital with separate psychiatric services*	59,254	230.4
Total	99,715	387.7

* Includes nonfederal hospitals with separate psychiatric services, nonpublic nonfederal general hospitals with separate psychiatric services, and multiservice nonfederal general hospitals with separate psychiatric services.

The total admission rate of 387.7 per 100,000 aged 65 & over includes readmissions. First admissions in 1980 were 31.2% of the total (Manderscheid 1986), yielding a first-admission rate of 121 per 100,000 aged 65 & over.
Assuming that the percentage distribution by source of referral is the same for first admissions as for all admissions and subtracting admission from state and county hospitals as interfacility transfers, the following is the estimated number of first admission by source of referral, obtained by applying the percentage distribution of admissions by source of admission to the 121 individuals admitted at least once during the year.

Source of referral	Percentage	Estimated number
Self, family, or friend	33.9%	41
Police, court, or correctional agency	8.6	10
Physician (private psychiatrist, other physician, outpatient psychiatric clinic)	42.8	52
Hospital (other inpatient facility and other)	11.3	14
Community health agency (alcohol treatment facility, CMHC)	3.5	4
Total	100.0	121

(B) DISCHARGES: (a) Distribution of Live Discharges by Type of Inpatient Facility for Persons Aged 65 & Over, and All Ages, 1980 (3-month sample survey)

Type of facility	65 & over	All ages	Percentage of total		65 & over as percentage of all ages
			65 & over	All ages	
State & county hospital	12,298	303,130	13.6%	24.2%	4.06%
Private psychiatric hospital	13,592	134,974	15.0	10.8	10.07
V.A. hospital	5,288	145,802	5.8	11.7	3.63
Nonfederal general hospital*	59,254	666,300	65.5	53.3	8.89
Total	90,432	1,250,206	100.0	100.0	7.23

* It is assumed that all admissions are discharged in 3 months and that there are no deaths (Manderscheid 1986).

For the 3-month period represented by the above table live discharges aged 65 and over from state and county hospitals are 4.06 percent of live discharges all ages. Applying this to the known number of live discontinuations from the annual survey of state and county hospitals (368,348) yields an estimated number of annual live discharges aged 65 and over of 14,955. Based on the sample survey data, this is 13.6% of total live discharges aged 65 and over, which yields 109,963 as the annual figure for total live discharges aged 65 and over. Adding the estimated annual deaths aged 65 and over (see below) of 3,645 gives 113,608 as the total annual discharges aged 65 and over or a rate of 441.7 per 100,000 population. (The denominator here is 25,719,628 derived from the total admission rate.)

Assuming that the ratio of persons discharged to total discharges is the same as the ratio of persons admitted to total admissions (31.2%), this yields a rate of persons discharged at least once of 138 per 100,000 aged 65 and over.

(b) Distribution of Deaths in Mental Health Facilities by Type of Inpatient Facility for Patients Aged 65 & Over and All Ages, 1980

Type of facility	65 & over		All ages		65 & over as percentage of all ages
	Number	Percentage of total	Number	Percentage of total	
State & county hospital	1,086	88.8%	2,283	85.6%	47.6%
Private psychiatric hospital	87	7.1	129	4.8	67.4
V.A. hospital	51	4.1	254	9.5	19.7
Nonfederal general hospital	—	—	—	—	
Total	1,225	100.0	2,663	100.0	

Deaths aged 65 and over in state and county mental health facilities are 47.6% of deaths of all ages. Applying this to the 6,800 annual deaths of all ages in state and county hospitals yields 3,237 annual deaths aged 65 and over in state and county hospitals. These are 88.8 percent of total deaths, yielding 3,645 annual total deaths aged 65 and over. This figure may be low because deaths in nonfederal general hospitals are unknown. They are, however, thought to be low because length of stay in these hospitals is short (Manderscheid 1986).

To obtain the distribution of discharges by discharge destination the following data were used:

Distribution of Discharges from Inpatient Mental Health Facilities by Discharge Destination, 1980

Discharge destination	Percentage of total
Physician	31.4%
Private psychiatrist	
Other M.D.	
Outpatient care	
Partial care, outpatient this hospital, other outpatient psychiatric clinic, alcohol or drug outpatient	30.5

Discharge destination	Percentage of total
Nursing home	16.2
Home	15.6
Acute-care hospital	5.9
Other inpatient care	
Intrahospital transfer	4.9
Other state and county mental health facility	
Other inpatient psychiatric facility	
Other	2.9
Death	1.2
Community care program	1.1
Alcohol or drug detoxification facility	
Court or other legal program	0.3
Total	100.0
Applying these percentages to the 138 annual discharges we have:	
Physician	43
Outpatient care	28
Nursing home	22
Home	22
Acute-care hospital	8
Intrahospital transfer	7
Other	4
Death	2
Community care program	2
Total	138

After the seven intrafacility transfers are subtracted we are left with 131 individuals discharged at least once.

Source: Except as otherwise noted, all data are derived from unpublished tabulations made available by the National Institute of Mental Health.

References

Anderson, G.S., and E.P. Steinberg. 1984. Hospital Readmissions in the Medicare Population. *New England Journal of Medicine* 311(21):1349–53.

Bryant, E.E., and R. Biggar. 1985. Utilization and Expenditures for Ambulatory Medical Care by Persons Hospitalized, U.S., 1980. *National Medical Care Utilization and Expenditures Survey,* series no. 7. Washington.

California Center for Health Statistics. 1985. *Topical Reports: Discharges for Long-term Care Facilities and Other Related Issues, California, 1983.* Sacramento.

Fein, R. 1970. What Direction for National Health Insurance? *Hospital Practice* (August):67–72.

Gould, S.J. 1983. *Hen's Teeth and Horses' Toes.* New York: W.W. Norton.

Jack, S.S. 1986. Use of Dental Services: United States, 1983. *Vital and Health Statistics Advanced Data,* no. 122. Washington.

Kane, R.L., R. Matthias, and S. Sampson. 1983. The Risk of Placement in a Nursing Home after Acute Hospitalization. *Medical Care* 21(11):1055–61.

Lewis, M.A., S. Cretin, and R.L. Kane. 1985. The Natural History of Nursing Home Patients. *Gerontologist* 15(4):382–87.

Lewis, M.A., R.L. Kane, S. Cretin, and V. Clark. 1985. Immediate and Subsequent Outcomes of Nursing Home Care. *American Journal of Public Health* 75(7):758–62.

Liu, K., and K.G. Manton. 1983. The Length of Stay Pattern of Nursing Home Admissions. *Medical Care* 21(12):1211–22.

Meiners, M.R. 1984. The State of the Art in Long-term Care Insurance. In *Long-term Care Financing and Delivery Systems: Exploring Some Alternatives.* Conference proceedings, Health Care Financing Administration (pub. no. 03174). Washington.

Mullner, R., F.J. Nuzum, and D. Matthews. 1983. Inpatient Medical Rehabilitation: Results of the 1981 Survey of Hospitals and Units. *Archives of Physical Medicine and Rehabilitation* 64:354–58.

National Center for Health Statistics. 1985. *Health United States, 1985.* Pub. no. (PHS) 86-1232. Washington.

———. 1986a. Health Characteristics. *Vital and Health Statistics,* series 10, no. 146. Pub. no. (PHS) 86-1581. Washington.

———. 1986b. Current Estimates from the National Health Interview Survey, U.S., 1981. *Vital and Health Statistics,* series 10, no. 141. Washington.

National Institute of Mental Health. 1985. *Mental Health, United States, 1985.* Pub. no. (ADM) 85-1378. Washington.

Stone, R. 1985. Aging in the Eighties, Age 65 Years and Over: Use of Community Services. *Vital and Health Statistics Advanced Data,* no. 124. Washington.

U.S. Bureau of the Census. 1986. *Statistical Abstract of the United States.* Washington.

Van Nostrand, J. 1986. Tabulation of Living Arrangements after Discharge from Nursing Home. Washington: National Center for Health Statistics. (Unpublished.)

West, H., L. Marcus, P. McMenamin, and L. Guralnick. 1985. *South Carolina Physician and Hospital Reimbursement Study: Final Report.* DHHS contract no. 100-83-0026. Vienna, Va.: Mandex, Inc.

Young, K.M., and C.R. Fisher. 1980. Medicare Episodes of Illness: A Study of Hospital, Skilled Nursing Facility, and Home Health Care. *Health Care Financing Review* 2(Fall):1–20.

Zook, C.J., and F.D. Moore. 1980. High-cost Users of Medical Care. *New England Journal of Medicine* 302:996–1002.

Acknowledgments: This article is based on the Lowell Reed Lecture, given at the statistics section of the American Public Health Association, November 20, 1985. I am indebted to many persons who have been most generous in sharing unpublished data. I am particularly grateful to Joel Kleinman of the National Center for Health Statistics for the data in appendix E on deaths by place of death; to Mark Meiners of the National Center for Health Services Research, Victoria Ozonoff of the Massachusetts Department of Public Health, and Joan Van Nostrand of the National Center for Health Statistics for the data in appendix C on nursing home discharges by discharge destination; to Ronald Manderscheid of the National Institute of Mental Health for the material in appendix E and to Elliott Stone of the Massachusetts Health Data Consortium, Pat Goldberg of the Maryland Information Service Center, and Peter Bailey and Dell Kinlaw of the South Carolina Cooperative Health Statistics System for the information in appendix A-1 on the destination of hospital discharges. My thanks to all who have been so cooperative and patient with my demands.

Address correspondence to: Dr. Paul M. Densen, Fremont Road, P.O. Box 405, Sandown, NH 03873.