The Nursing Home Population: Different Perspectives and Implications for Policy

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Long-term care institutions are used by residential patients who stay for many years and patients with specific ailments who stay for relatively short periods. The presence of short-stay patients is not adequately recorded by cross-sectional surveys which have been used to measure nursing home use. To obtain a better understanding about the mix of long-stay and short-stay patients, we created a hypothetical population of all users of nursing homes in the United States for a 12-month period. Descriptive statistics are presented on this annual population, which we derived empirically from the 1977 National Nursing Home Survey. We found that an estimated 2.4 million individuals used nursing homes at some time during 1976.

Introduction

Long-term care institutions are often viewed as having two distinct patient populations with different turnover characteristics: resident patients who stay for many years, and patients admitted for specific ailments who stay for relatively short periods (Hing and Zappolo, 1978; Falk, 1971). This phenomenon has been examined by other researchers who pointed out that inadequate information and misapplied statistics have clouded policy deliberations on long-term care (Keeler, et al., 1981). An important aspect of the problem is that efficient approaches for collecting data on long-term care populations represent perspectives that are not ideally suited for important policy or program purposes. Because of the presence of long- and short-stay patients, different perspectives on the same population result in remarkably different statistics. This fact is illustrated by the 1977 National Nursing Home Survey (NNHS), the most current and comprehensive survey on the U.S. nursing home population. The NNHS elicited information on representative samples of 1.) a cross section of current residents in 1977, and 2.) discharged residents in 1976. Each sample presents a different perspective on the national nursing home population. Specifically, persons who are residents in nursing homes in a cross-sectional sample are much more representative of the long-stay group, while short-stay patients who move in and out of nursing homes very quickly are highly represented in the discharged resident sample. As noted by Zappolo (1979), these two samples are comparable to the difference in perspective when one looks into a house first through a side window, then from the back door. Various features are more prominent from one or the other perspective, yet both perspectives are equally real.

Although the current resident survey (CRS) and discharged resident survey (DRS) in the NNHS each serves many analytical purposes, they cannot be used directly to address important policy issues such as the risk of institutionalization by the elderly or the likely duration of stay of an individual admitted to a facility. The data that are available from the NNHS, however, can be applied in various analytical strategies to gain insights on such important issues. In this paper, we present an application of the NNHS which extends the analysis beyond the readily available data in the CRS and DRS. Our objective is to obtain an estimate of the numbers of different people who use nursing homes in a year (12-month period), in order to better understand the dynamics of long- and short-stay patients moving through the nursing home system. Our approach was to create a hypothetical population that represents all users of nursing homes in 1976. Like the CRS, this construct is cross-sectional. However, in contrast to the information from a point prevalence survey, the 12-month interval that our hypothetical population entails captures the flow of short-stay patients while maintaining a view of the long-stay patients.

In the following sections, we first describe how data from the NNHS can be logically intergrated to derive an approximate population of all users of nursing homes in 1976. The essential feature of this approach is the identification of two complementary sets of patients (that is, discharged and retained) that collectively represent all persons spending some time in nursing homes that year. We derived this hypothetical All User population empirically from the cross-sectional and discharged resident samples. To illustrate the differences in use that would be recorded from various perspectives on the 1976 nursing home residents, we compare the number of users and their lengths of stay for the All User, Cross-sectional and Discharged resident populations. Next, we examine the composition of the All User population in terms of patient characteristics. Finally, we discuss some potential policy applications and avenues for further research suggested by the insights on the mix of patients in the nursing home population.

Methods

Data

The 1977 NNHS was designed to produce national estimates of nursing home characteristics, and numbers and characteristics of current and discharged residents and staff through a stratified two-stage probability sample survey. The survey, which covered all types of nursing homes in the coterminous United States as classified by the Master Facility Inventory, was conducted through a combination of personal interviews and self-administered questionnaires. Data were collected for the survey from May through December 1977. A full description of the NNHS is presented by the National Center for Health Statistics (NCHS, 1979).

For this analysis, we employ data only from the surveys on nursing home residents: 1) the survey of current residents in 1977 (CRS) and 2) the survey of discharged residents in 1976 (DRS). These data were abstracted from medical records in the presence of a knowledgeable caregiver. The sample of current residents was derived from the total number of residents on the register of sampled facilities on the evening prior to the day of the Survey, (May 1977 - December 1977). Residents who were physically absent from the facility but had a bed maintained for them were included in the sampling frame. The sampling frame for discharges was the total number of persons discharged alive or dead during the calendar year, 1976.[1] Persons who were discharged more than once during 1976 were listed for each discharge. In light of our interest in obtaining national level estimates, the numbers of cases from both the current resident and discharged resident samples were inflated by the sampling weights used in the NNHS.

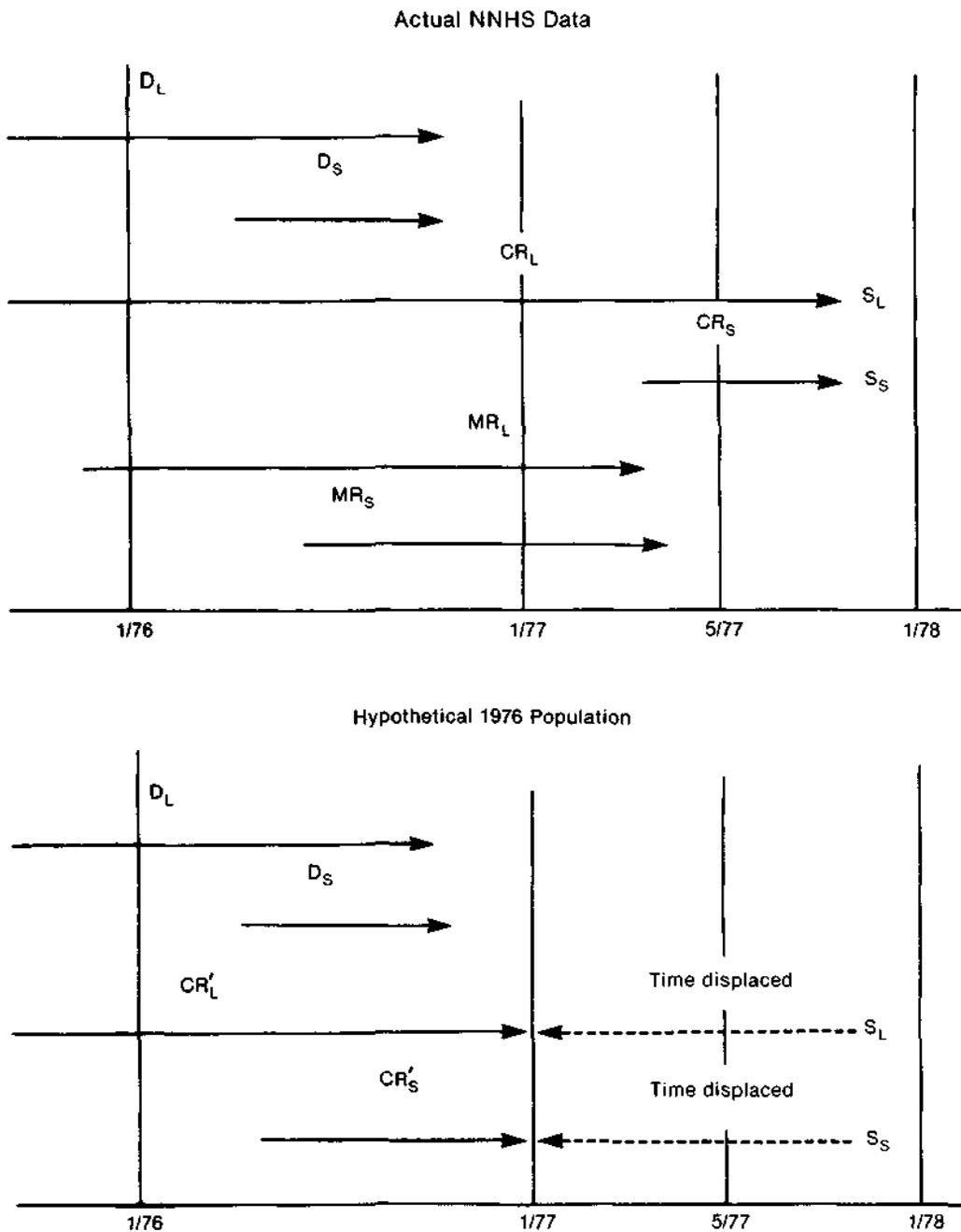## Creation of the Hypothetical Population of All Users

The top panel of Figure 1 pictures the survey data as originally collected in the DRS and the CRS. The DRS sample shared the common characteristic of being discharged sometime between January 1976 and December 1976. However, the discharged residents varied in their length of stay prior to discharge, as portrayed by DL and DS, which represent long- and short-stay residents, respectively. Correspondingly, the CRS sample also contained individuals with long (CRL) and short (CRS) stays; the common characteristic of these residents was that each was an active patient on the date of survey (SL and SS) sometime between May 1977 and December 1977. Between the DRS and the CRS, however, we do not have a representative sample of all users of nursing homes in 1976 (nor in 1977), since persons who were residents in 1976 but were discharged in 1977 prior to the CRS (MRL and MRS) would have been missed by both the CRS and the DRS. Although actual data do not exist on these individuals, we formulated an alternate strategy to obtain a representative sample of all nursing home residents in 1976. The logic of this approach is explained in connection with the bottom panel of Figure 1.

As previously noted, the DRS sample is representative of all discharged residents in 1976. A complementary set of retained (not discharged) residents at the end of 1976 would be needed to comprise the total population in that year, because the two sets are mutually exclusive and collectively exhaustive. One estimate of these retained residents is the CRS sample, since it represents a cross section of individuals who have not been discharged.[2] In fact, if the CRS were conducted on the last day of 1976, a total population of 1976 nursing home users would be readily available. The use of the CRS residents as surrogates for the retained residents on the last day of 1976 is dependent upon the critical assumption that the current residents in this 1977 survey are similar to any cross section of currently registered nursing home residents (within a reasonable time frame), and specifically those present in homes on the last day of 1976.

In terms of Figure 1, we "moved" each individual in the CRS backward in time so that his or her interview data coincided with the last day of 1976. With this displacement in time, the CRS sample became surrogates for retained patients (CRL' and CRS'). Moreover, the distribution of lengths of stay of the surrogates would be identical to that of the CRS sample. As a consequence of this time displacement, we have created a

[1]The sample of discharged residents was obtained from the same facilities as that of the current residents.

[2]It is possible that a current resident was included in the discharge sampling frame if he or she were discharged during 1976. However, data are not available in the NNHS to accurately determine this potential duplication.

FIGURE 1
Creation of 1976 Hypothetical Population from NNHS Data

Actual NNHS Data

D_L

D_S

CR_L

S_L

CR_S

S_S

MR_L

MR_S

1/76   1/77   5/77   1/78

Hypothetical 1976 Population

D_L

D_S

CR'_L

Time displaced

S_L

CR'_S

Time displaced

S_S

1/76   1/77   5/77   1/78

D_L and D_S	are representative lengths of stay of individuals in the Discharged Resident Survey.
CR_L and CR_S	are representative lengths of stay of individuals in the Current Resident Survey.
MR_L and MR_S	are representative lengths of stay of individuals missed by both surveys.
CR'_L and CR'_S	are the same cases as CR_L and CR_S but those lengths of stay were displaced back in time by 6 to 12 months so that end of LOS duration falls on the last day of 1976.
S_L and S_S	are the actual Survey dates for the Current Resident Survey.

hypothetical population for 1976 which accounts for all possible users (that is, discharged residents by DL and DS and retained residents by CRL' and CRS'). In the process, we have theoretically eliminated the need to account for MRL and MRS, the individuals missed by both the CRS and the DRS.

The validity of the assumption that the 1977 current residents are similar to the retained residents on the last day of 1976 is not directly testable with available data. There is likely to be error due to changes in patient characteristics and to changes in the supply and use of nursing home beds over the six to twelve months between the actual survey dates (May 1977 through December 1977) and the last day of 1976.[3]

In the remainder of this paper, we will refer to the individuals in the CRS and the DRS as the Cross-sectional Population and Discharge Population, respectively. While the hypothetical population of all users in 1976 reflects an interval prevalence, and is therefore also cross-sectional, we will refer to it as the All User population.

Length of Stay

The length of stay (LOS) for an individual patient is the duration of time between the date of admission and date of discharge. For the Discharge population, this information for each person is complete. In the Cross-sectional population, the length of stay for each person is "truncated" by the date of survey, because the number of future days is unknown. Since the All User population is a composite of the DRS and the CRS, it will consist of some individuals with a completed LOS and others with a truncated LOS. Both the All User and Cross-sectional populations will therefore have recorded LOS distributions that underestimate the eventual LOS distribution of their respective members.

Of the three perspectives, the Discharge population provides the best approximation of the LOS distribution of an admissions cohort. As noted by Keeler, et al. (1981):

"If each admitted cohort were the same size and had the same distribution of prospective length of stay, the distribution of stay at discharge would be identical to the distribution at admission."

Although empirical findings on nursing home growth over time belie the assumption that this population is stationary, the LOS distribution of the Discharge Population remains a close approximation for that of an admissions cohort. The LOS distribution of the Cross-sectional Population is representative of patients who are in homes at a point in time, and is highly selective of long-stay patients relative to an admissions cohort.

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[3]To obtain an indication of the magnitude of this error, we compared the total resident days in 1976, derived by summarizing the length of stay for that period, with the total recorded days in 1976 reported by another part of the 1977 NNHS. We found that, in 1976, the number of days that the hypothetical population stayed in nursing homes exceeded the recorded days by 3.2 percent.

Because the hypothetical All User population contains people from both the CRS and DRS, its length of stay distribution results from a mix of two distributions. Consequently, any inferences about the All User LOS distribution should be drawn with care. Our purpose in this paper, however, is to determine the number of people who use nursing homes in a given year and to examine their characteristics. To this extent, we are employing the available LOS information in a descriptive fashion to develop insights on the presence of long-and short-stay patients during a 12-month period.

Results

Comparison of LOS and Use Rates

Table 1 presents the LOS distributions for the All User, Cross-sectional and Discharge populations in 1976. As expected, the lengths of stay of the Cross-sectional population are substantially longer than those of the Discharge population. This difference is reflected in the percentage distributions by LOS categories. For example, 31 percent of the residents in the Cross-sectional population had LOS exceeding three years, while only 10 percent of those in the Discharge population fell into this category. This difference is also readily indicated by a comparison of the mean and median LOS for the two groups. Moreover, it should be recalled that the lengths of stay in the former were truncated by the date of survey, and therefore underestimate the eventual LOS distribution of this group. Hence, an even higher proportion of residents viewed from a cross-sectional survey will have an LOS of greater than three years.

Empirically derived from the CRS and DRS, the LOS distribution of the All User population does not display the extreme overrepresentation of long-stay patients found in the CRS. The median LOS for the All User population was approximately 11 months, in contrast to the 20 months and 3 months median lengths of stay recorded for the Cross-sectional and Discharged populations, respectively. While each of the three groups is representative of the 1976 national nursing home population, the statistics on LOS derived from them will vary dramatically, as shown in this comparison.

The All User population, because of the 12-month construct, provides an estimate of the volume of patients that spend some time in the nursing home system during the year. This information would be useful in policy applications which require an estimate of the numbers of different people who will use nursing home care. Table 1 shows that approximately 2,400,000 persons were nursing home patients sometime over the 12-month period. This number is about twice as many as would be estimated with data from only a cross-sectional survey. To illustrate this point, Table 2 presents statistics to highlight nursing home utilization rates among the elderly (those age 65 and over) that would

be estimated from the All User, Cross-sectional, and Discharge populations. For the total 65 and over age group, 4.7 percent would be found in nursing homes if the cross-sectional survey were employed. This point prevalence measure of elderly in nursing homes has often been mistakenly used to estimate the rate of institutionalization. We found, for example, that 8.9 percent of the elderly used nursing homes in 1976 alone, as reflected by the All User population. Table 2 also shows that a major reason for the differential proportions derived from the two perspectives is the phenomenon of short-stay patients. For example, 2.9 percent of the total national elderly population in 1976 used nursing homes and had recorded lengths of stay of less than three months. Among elderly users of nursing homes, 33 percent had recorded lengths of stay of less than three months. In addition, most of the short-stay patients were derived from the DRS, which recorded complete lengths of stay. Hence, a minimum of 2.2 percent of the total elderly population and 25 percent of the elderly who used nursing homes were in facilities for less than three months.

Although the possibility exists for duplication in the counts of individuals recorded by the NNHS, the extent of this duplication is not possible to determine accurately, but it is not expected to be large. We can conclude from Table 2, therefore, that the rate at which elderly individuals are institutionalized in a given year is considerably higher than was once estimated, but that for many of them the period of institutionalization is very short. This result is consistent with findings by other researchers who have viewed the risk of institutionalization from a longitudinal perspective (Kastenbaum and Candy, 1973; Palmore, 1976; Wershow, 1976; Vicente, et al., 1979). These other studies have estimated the lifetime risk of institutionalization for elderly individuals to range from 23 to 38 percent.

TABLE 1

Length of Stay Distribution of All Users, A Cross-Section and Discharges: National Nursing Home Population in 1976

Length of Stay

	Total	<1 Month	1-2 Months	3-5 Months	6-11 Months	1-2 Years	≥ 3 Years	Mean (SD)	Median
All Users									
No. of Persons	2,400,000	440,000	340,000	260,000	280,000	580,000	530,000	677.6	340
% of Total	100%	18.28	13.93	10.65	11.38	24.08	21.69	(962.2)	
Cumulative %	—	18.28	32.21	42.86	54.24	78.32	100.00		
Cross-Section									
No. of Persons	1,300,000	75,000	110,000	120,000	160,000	430,000	410,000	957.9	594
% of Total	100%	5.72	8.55	9.30	12.46	32.67	31.30	(1079.7)	
Cumulative %	—	5.72	14.27	23.57	36.03	68.7	100.00		
Discharges									
No. of Persons	1,100,000	370,000	230,000	140,000	110,000	160,000	120,000	350.7	103
% of Total	100%	32.92	20.20	12.22	10.12	14.06	10.48	(668.9)	
		32.92	53.12	65.34	75.46	89.52	100.00		

TABLE 2

Nursing Home Residents 65+ (in Thousands) as a Percent of the Population 65+: All Residents and Subgroup with Less Than 3 Months LOS, 1976

Age	Population 65+[1]	All Users		Cross-Section		Discharges	
		All Residents	< 3 Months	All Residents	< 3 Months	All Residents	< 3 Months
65-74	14,194,000	3.3% (480)	1.1% (162)	1.8% (260)	0.2% (38)	1.5% (220)	0.8% (124)
75-84	6,775,000	14.3% (970)	4.7% (320)	7.5% (510)	1.1% (75)	6.9% (470)	3.5% (240)
85+	1,906,000	30.5% (600)	10.0% (198)	16.2% (320)	2.4% (149)	14.7% (280)	7.3% (145)
Over 65+	22,835,000	8.9% (2,050)	2.9% (680)	4.7% (1,090)	0.7% (162)	4.2% (970)	2.2% (509)

[1]Source: U.S. Bureau of Census, Current Population Reports: Series p. 25, No. 643.

Statistics on the All User Population

Table 3 presents descriptive statistics on the 2.4 million individuals who used nursing homes in 1976. As expected, most of these individuals were over 75 years of age, female, and not married at the time of survey. The most prevalent primary diagnosis was heart disease, followed by stroke and chronic brain syndrome or other mental illness. Approximately half of all nursing home patients were recorded as having one of these three illnesses.

In the subset of 1976 residents whose recorded LOS was less than three months, we found approximately the same age distribution as in the total population. However, we found lower proportions of females and non-married individuals in this short-stay subset. This result is consistent with the conventional wisdom that such characteristics are associated with the use of nursing nomes for long-term residential purposes. For primary diagnoses, we recorded higher proportions of short-stay patients with cancer, stroke and hip fracture than among all users. Individuals admitted to nursing homes with one of these illnesses would therefore be unlikely to be there for long-term residential care. For example, 63 percent of all patients with a primary diagnosis of cancer had a recorded LOS of less than three months. This finding reflects the relatively short life expectancy after detection of many cancers, particularly by the time a cancer patient is placed in a long-term care institution. The higher proportion of cancer, stroke and hip fracture patients in the short-stay subset was offset by the lower proportion of individuals with a primary diagnosis of mental illness. As noted by others, (for example, Keeler, et al., 1981) this phenomenon might be explained by the deinstitutionalization of mental hospitals and the use of nursing homes as long-term residential facilities for mentally ill patients.

Table 4 presents the distribution of the All User population by primary source of payment. In contrast to health and demographic characteristics, which are expected to be predictors of need for institutional care, admission to nursing homes is often a function of the availability of specific payment sources. In addition, the duration of stay under a specific payment source reflects 1.) funds available by private sources, and 2.) regulations regarding coverage under public programs. For example, Medicare is the primary source of payment for 30 percent of the patients with lengths of stay of less than one month. The proportion then drops dramatically with increasing lengths of stay. This trend is expected since Medicare's coverage of a spell of illness is limited to 100 days. In general, Medicare was designed to provide care for short-stay convalescent patients whose LOS would be short. The proportion of patients with Medicaid as a primary source of payment, on the other hand, increases with LOS. While paying for only 21 percent of the patients in the less than one month group, Medicaid paid for 55 percent of the patients in the longest LOS group. The period of coverage under Medicaid is not limited. The eligibility requirements of Medicaid, which are based on disability or financial need, also encourage the use of nursing homes for long-term residential care. In addition, formerly private paying patients of nursing homes "convert" to Medicaid as the source of payment, once their private resources are depleted (U. S. GAO, 1979). This conversion effect increases the proportion of patients with long lengths of stay with Medicaid as the primary payment source.

TABLE 3
Number and Percent Distribution of the All User Population by Selected Charcteristics

Patient Charcteristic	All Users Number	All Users Percent	<3 Months Number	<3 Months Percent
Age				
<65	360,000	14.9%	105,000	13.3%
65-74	480,000	19.1	162,000	20.6
75-84	970,000	40.2	320,000	40.7
85+	600,000	24.9	198,000	25.2
Sex				
Male	780,000	32.7	290,000	37.6
Female	1,600,000	67.3	480,000	62.3
Marital Status				
Married	410,000	16.9	200,000	26.3
Not Married	2,000,000	81.7	560,000	73.6
Primary Diagnosis				
Heart Disease	640,000	27.6	173,000	23.6
Hypertension	71,000	3.0	16,000	2.1
Stroke	240,000	10.5	96,000	13.1
Chronic Brain Syndrome	150,000	6.4	29,000	3.9
Other Mental Illness	220,000	9.7	35,000	4.7
Arthritis	85,000	3.6	20,000	2.7
Cancer	120,000	5.2	76,000	10.3
Diabetes	120,000	5.0	27,000	3.6
Hip Fracture	110,000	4.8	60,000	8.1
Other	550,000	23.7	200,000	27.3

TABLE 4
Percent Distributions of the All User Population by Primary Source of Payment and Length of Stay

Payment Source	Total	Length of Stay <1 Month	1-2 Months	3-5 Months	6-11 Months	1-2 Years	≥3 Years
Own/Private	38.4 (920,000)	36.9	41.7	42.7	43.3	39.7	31.8
Medicare	9.0 (220,000)	30.4	17.8	4.7	1.2	0.9	0.7
Medicaid SNF	19.3 (460,000)	12.2	14.3	19.6	22.9	22.4	22.7
Medicaid ICF	23.1 (550,000)	9.4	14.9	22.5	23.6	25.7	33.4
Other	10.0 (240,000)	10.6	11.7	10.4	8.8	8.0	11.2
All Sources	100.0 (2,390,000)	100.0	100.0	100.0	100.0	100.0	100.0

Table 4 also shows that approximately one million individuals use their own incomes as the primary source of payment for nursing home care each year, while another million are supported primarily by Medicaid. These two sources are the major contributors to the annual expenditures for nursing home care, estimated to be $11.5 billion in 1976 (Gibson, 1979). Because of the relatively small numbers of individuals whose nursing home care was paid by Medicare, and the relatively short stay of most of these beneficiaries, Medicare's expenditures were correspondingly small relative to Medicaid and personal income expenditures. Overall, Table 4 illustrates the effects on utilization that result from financial and coverage constraints associated with different payment sources.

Discussion

The notion that everyone who enters a nursing home stays for an extended time period has not been supported by empirical studies. In fact, a high proportion of nursing home patients are there for recuperative care and stay for very short periods of time. The presence of long and short-stay patients has produced some misleading conclusions about both the risk of institutionalization, as well as the probable duration of stay.

In this paper, we presented an approach for extending our understanding of the effects of long and short-stay patients in the U.S. nursing home system through the creation of a hypothetical population of all users in 1976. Because of its extended time frame (12 months) relative to the CRS, and the inclusion of all users in 1976 in contrast to the DRS, we were able to estimate the number of different persons who used nursing homes in 1976 and to derive insights on the mix of patients during the year. Knowing how many different types of persons used nursing homes over a 12-month period would appear to be useful in policy-related analyses of annual use of health care by important patient characteristics such as age, sex and diagnosis. These data might also be useful in estimating at least a subset of persons who would be eligible for alternative types of long-term care services. For example, the number of short-stay patients with a primary diagnosis of cancer provides an estimate of the potential target population for hospice care.

In general, efficient data collection approaches do not provide the information required to directly answer many important policy related questions on long-term care. A prospective cohort of admissions followed until discharge will provide the desired data to predict length of stay, but the duration of the effort (possibly 20 years) makes this comprehensive survey impractical. In light of the high proportion of short-stay patients in an admissions cohort, however, a limited duration study of this type with a nationally representative sample might be an important investment in long-term care research. Data from this survey can be employed to predict LOS by patient characteristics at admission, as well as to study important financing issues such as the conversion rate among payment sources over time. Studies of admissions cohorts in small geographic areas over limited time frames have been conducted (Densen, *et al.*, 1976; Spasoff, *et al.*, 1978) and have produced important findings. A complementary approach to the collection of additional data is the statistical modeling of the flow of patients through the nursing home system. Findings from existing studies (Keeler, *et al.*, 1981; Selvin, 1977) suggest that this avenue for further research will provide relevant policy information in an efficient manner.

In conclusion, the presence of long- and short-stay patients in institutions presents an additional dimension for consideration in public policy analysis on long-term care. It is particularly important to recognize which type of nursing home user is likely to be affected by specific policies. For example, widely discussed policies to promote family support are, in fact, addressing the long-stay residential patients, while "vouchers" for health care are most relevant in terms of short-stay patients who use nursing homes for continuing care of an acute episode of illness. Failure to recognize the effects of specific policies on subsets of the nursing home population will result in erroneous projections of policy impact. On the other hand, the financial burden of specific policies may not be as formidable as expected if improved estimates become available on the policies' prospective target populations.

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