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THE CONCENTRATION OF MEDICAL  
SPENDING: AN UPDATE

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The Concentration of Medical Spending: An Update

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### **ABSTRACT**

In the last two decades, Medicare spending has doubled in real terms despite the fact that the health of Medicare beneficiaries improved over this period. The goals of this paper are to document how trends in spending by age have changed among elderly Medicare beneficiaries in the last decade and to reconcile the decline in disability rates with rapid increases in spending among the elderly. First, we conclude that the trend of disproportionate spending growth among the oldest old has continued between 1985 and 1995. Spending among the younger elderly, those 65-69 rose by two percent annually in real per person terms. In contrast, spending for those over age 85 rose by four percent. Second we show that the reasons for the large increase in spending on the oldest elderly relative to the younger elderly is the rapid increase in the use of post-acute services such as home health care and skilled nursing care. Spending on post-acute care for the very old has risen 20 percent per year in the last decade.

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## 1. Introduction

Health care for the elderly in America is at the center of public debate. In the last two decades, the number of Medicare beneficiaries has increased by 50 percent, and Medicare spending per beneficiary has doubled in real terms.<sup>1</sup> Although rapid growth in medical spending affects all age groups, Cutler and Meara (1998) document that spending growth occurred most rapidly among the elderly from the 1950s through the 1980s, and within the population over 65, spending grew fastest among the oldest old.<sup>2</sup>

These findings are difficult to understand, however, in light of changes in the health of the elderly. Manton and co-authors show that disability rates are falling among the elderly by about 1.5 percent per year (Manton et al. 1997). Since the disabled spend much more than the non-disabled on medical care, it seems that in relative, if not absolute terms, spending on the elderly should be falling over time.

The combination of large increases in per person spending and the reduction in disability leads to the paradoxical situation where policy analysts call simultaneously for reforms to control Medicare cost growth (to bring spending growth for the elderly in line with other age groups) and for Medicare to cover currently uncovered services such as prescription drugs (to promote further health improvements).

The goals of this paper are to document how trends in spending by age have changed among elderly Medicare beneficiaries in the last decade and to reconcile the decline in disability

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<sup>1</sup>Based on total Medicare expenditures and total enrollees in 1975 and 1995. See Health United States 1998, p. 367.

<sup>2</sup>Relative spending by age group was fairly flat in 1953. By 1987, spending on the average 85 year old was over 5 times as high as spending on those aged 35-44.

rates with rapid increases in spending among the elderly. The first goal follows from our earlier paper (Cutler and Meara, 1998) where we analyzed medical spending by age from the mid-1950s through 1987. Since the medical world changed dramatically after 1987, we consider what has happened to age-specific spending since then. In the post-1987 period, we cannot look at spending for the elderly in comparison to the non-elderly, but we can look at spending for the younger and older elderly. The second goal is an attempt to reconcile increased spending with sharply declining disability. In particular, we relate medical spending by age to six factors: demographics, disability, time until death, intensity of treatment, prices, and changes in the nature of care.

We reach two central conclusions. First, we find that the trend of disproportionate spending growth among the oldest old has continued during the decade between 1985 and 1995. Between 1985 and 1995, spending for the younger elderly (ages 65-69) rose by 2 percent annually in real, per person terms, while spending for the older elderly (ages 85+) rose by 4 percent. This is similar to the differential increase in spending by age over the 1953-1987 period.

Second, we show that the reason for the large increase in spending on the oldest elderly in comparison to the younger elderly is the rapid increase in use of post-acute services among the oldest old -- home health care and skilled nursing care in particular. People 85 and older used on average \$241 in post-acute services in 1985 and \$1,887 in 1995, a 20 percent annual increase. The younger elderly, in contrast, increased their use of post-acute services from \$49 to \$257, a 15 percent annual increase. Use of acute care services, in contrast, grew relatively evenly by age, 1.2 percent annually for the younger elderly and 0.7 percent annually for the older elderly.

The increase in post-acute service use is the explanation for the discrepancy between

rising medical spending and falling disability. Lower disability by itself contributes to lower spending than we would otherwise observe. But the increase in use of non-traditional services more than offsets the effects of improved health. The increase in post-acute service use is also a major difference between the pre- and post-1987 trends. In our earlier work (Cutler and Meara, 1998), we found that rising expenditures on the older population were a result of increased intensity of acute care services for that age group. In the post-1987 period, intensity changes in acute care treatments do not account for a substantial discrepancy by age.

The increase in post-acute service use may reflect several factors: true increased service use for people who were not receiving care in the past; “gaming” of the Medicare system, where providers now use out-of-hospital services instead of in-hospital services; or outright fraud. We are unable to discriminate among these explanations, although we suspect each is important.

The paper proceeds as follows. In section 2 we describe our data. Section 3 starts the analysis by comparing past and current trends in medical spending by age. Section 4 analyzes how changes in demographics, disability, and death contribute to spending over time. Section 5 examines acute care spending. Section 6 examines post-acute care spending, and 7 concludes.

## **2. Data**

The National Long-term Care Surveys (NLTCs) were conducted in 1982, 84, 89, and 94 to determine the prevalence of disability among the Medicare population. A sample of about 35,000 individuals was drawn from Medicare administrative records and surveyed in 1982. In addition to standard demographic information, the survey collected detailed information on each

individual's instrumental activities of daily living (IADLs, such as managing money, keeping house, etc.) and activities of daily living (ADLs, such as dressing, bathing, etc.). In subsequent surveys, a sub-sample of those initially interviewed were re-screened to determine disability status and additional individuals "aged" into the NLTCs. In total, the NLTCs public use data set provides information on 35,848 individuals. The survey data for these individuals has been linked to all Medicare claims data from 1982 through 1995.

We use the National Long-Term Care Survey from years 1984, 1989, and 1994, matched to Medicare records for 1984-85, 1989-90, and 1994-95.<sup>3</sup> We pooled the Medicare data in two-year increments to increase the precision of our estimates.<sup>4</sup> All numbers reported in the tables are in 1995 dollars adjusted using the CPI-U deflator.

One drawback of the NLTCs for our purpose is that we have no link to other types of medical spending beyond Medicare. Approximately one third of Medicaid's budget pays for nursing home services for elderly recipients. Because such services are disproportionately skewed towards the older elderly population, however, we suspect the omission of Medicaid-covered long-term care understates the growth in spending by the oldest old. Further, non-hospital prescription drugs are not paid for by Medicare, and are thus unrecorded in the survey. We do not know how the omission of this category of care affects our results.

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<sup>3</sup> All calculations use the Center for Demographic Studies "screener cross-sectional weights" to make tabulations representative of the Medicare population in those years.

<sup>4</sup>We inflated expenditure data from 1984, 1989, and 1994 by the one year nominal growth rate in per capita expenditures from 1984-85, 1989-90, and 1994-95 respectively.

### **3. Past and Current Trends in Medical Spending by Age**

During the period from the 1950s through the 1980s, the distribution of medical spending changed dramatically in the U.S. Figure 1 and table 1 reproduce the trend in medical spending documented in Cutler and Meara (1998). The figure shows per capita medical spending relative to per capita spending for 35-44 year olds. In 1953 spending was fairly constant across age groups. Middle aged and elderly individuals spent the same amount on medical care. From the 1950s to the 1980s, medical spending grew dramatically within all age groups, but by 1987, the oldest old (85+) were spending over five times as much as the 35-44 age group.

Figures 2(a) and (b) examine this trend for the NLTCs data between 1985 and 1995 for the population over 65. Over the last decade, spending among the youngest Medicare beneficiaries, those aged 65-69, grew by 2.0 percent annually, from \$2,062 to \$2,519. Among older age groups, and particularly those over 85, per person spending grew at a staggering rate between 1990 and 1995. While the oldest old spent \$3,730 in 1985, they were spending \$5,709 by 1995, a 4.3 percent annual increase.

To see this trend another way, figure 2(b) normalizes spending in each age group and year relative to spending by those aged 65-69 in that year. In 1985, the oldest old were spending about 80 percent more than this reference group. By 1995, the oldest old were spending over twice as much per year as 65-69 year olds.

The trend towards greater spending increases with age is generally true for most of the age groups, with the exception of the 75-79 year old population. These findings represent a continuation of the trend documented from the early 1960s to the 1980s - medical spending is

growing rapidly for all elderly, but particularly among the oldest age groups.

#### **4. Demographics, disability and time until death**

An important component of changes in medical spending is changes in disability status. Two measures of disability have been highlighted in the literature (see Cutler and Sheiner, 1998): functional status; and time until death. Functional status is typically measured with ADL or IADL impairments. People who are functionally impaired spend more on medical care than those who are not impaired. Research also shows that those near death spend much more on medical care than those further away from death (Lubitz and Riley, 1993). About one-third of Medicare spending is in the last year of life.

Table 2 examines how the pattern of age, disability, and death rates influence medical spending. The table shows four models of annual individual Medicare spending in 1989 and 1990. In other words, each observation represents a person-year of spending. Table 2 shows individual spending as a function of basic demographics (age, sex, race and marital status), disability status, and time until death. Column (1) relates Medicare spending to age, sex, race, and marital status alone (the coefficients on race and marital status are not reported). Consistent with earlier work, Medicare spending is highest for the oldest old. Those over 85 spend almost \$2,000 more than those under 70. Women spend \$700 less than men on average; this is also true holding constant functional status and time until death.

Column (2) adds measures of functional status to the regression. The differences in spending by age are much less dramatic when we control for disability status in column (2).



Only those age 75-84 spend more than 65-69 year olds. Essentially all of the additional spending of those aged 85 and older is a result of greater disability.

Column (3) replaces the disability variables with measures of time until death. We include dummies for the quarter of death for those individuals who dies in a given year. The result is similar in column (3) when we control instead for time until death. Time until death also explains a large part of the age effect. Advanced age is associated with only half as big a change when controlling for time until death.

Column (4) includes both functional status and time until death in the regression. Disability and time until death appear to have independent effects on Medicare spending. And together, these two variables explain essentially all of the age effect. The results in table 2 confirm those found in Cutler and Sheiner (1998) using the Medicare Current Beneficiary Survey. Age in itself is not associated with increased levels of Medicare spending; it is the decline in health status associated with advanced ages and the period near death that leads to higher levels of medical spending.

As mortality rates among the elderly decline, fewer people are in the last year of life. Further, disability among the elderly is falling. Table 3, for example, shows rates of hospitalization for common illnesses. Overall hospitalization rates fell from 30 to 22 percent in the decade studied. There were declines in rates of hospitalization for virtually all diseases shown.

Table 4 shows rates of disability and mortality between 1984 and 1995. Overall disability rates fell by about one to two percentage points for those aged 65-79. But, for those over age 80, rates of disability fell dramatically, by about 7 percentage points. Rates of severe disability were

much more constant over this period, falling only slightly. The declines were greater, though, at older ages. These trends are striking in light of the pattern of declining mortality. The share of people who will die in a given year has declined within all age groups over 65. As others have suggested (Manton, 1997), not only are Americans living longer, but they are living with fewer diseases and functional limitations.

The combination of longer life and reduced disability suggests that medical spending for the elderly should be falling, particularly at advanced ages. In table 4 and figure 3, we combine changes in disability and death rates with our estimates of how disability and death impact medical spending to simulate how spending would have changed based solely on changes in disability and death rates. We use the regression coefficients from model 4 in table 1 (excluding race and marital status) to do this prediction.<sup>5</sup> Predicted spending falls slightly, from \$3,324 to \$3,212 over the decade shown in table 4. And the decline is somewhat greater for the older elderly than for the younger elderly (figure 3).

It is apparent that figure 3 and figure 2(b) are in conflict. The changes in disability and death predict that relative spending for the oldest age groups should fall compared with those age 65-69, or at worst stay the same. In fact, medical spending increased twice as rapidly for the oldest elderly in comparison to the younger elderly.

The remainder of the paper aims to explain why spending by age is increasing when the underlying health of the population is improving.

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<sup>5</sup> Our estimates hold constant the 1989-90 age and sex distribution.

## 5. Acute Care Spending

To examine why age patterns in spending have changed, we divide medical spending into two parts: acute care spending and post-acute care spending. Acute care is defined as spending for in-patient and out-patient care in general hospitals and physician offices. Post-acute care spending includes spending on skilled nursing facilities, hospice care, home health, and comprehensive out-patient rehabilitation facilities. This distinction is imperfect. Some rehabilitative care may show up in our measures of acute care spending, since the Medicare claims data do not allow one to perfectly distinguish rehabilitative care from acute care. But the distinction is generally a meaningful one.

The vast majority of spending on acute care is for inpatient hospital care. Inpatient care is reimbursed prospectively based on one of over 400 diagnosis-related groups (DRGs). Each patient is assigned a DRG based on the predominant diagnosis of admission. DRGs are then given relative weights in accordance with the intensity of treatment typically provided for that diagnosis. Payments are formed as the product of the DRG weight and a price:

$$\text{Reimbursement} = \text{DRG weight} * \text{Price.} \quad (1)$$

Over time either weights or price may change. For example, weights for surgical DRGs are generally higher than for medical DRGs, so as more people receive surgery over time, the average DRG weight will increase (Cutler and McClellan, 1998). Changes in intensity of treatment have historically been significant. Cutler and Meara (1998) document that changes in

technology for treatment of major illnesses such as cancers and heart disease coincide with large increases in spending for the elderly.

Medicare also updates the price paid for services over time. The increase in the update factor was designed to keep pace with the growth of input costs for hospitals, although actual update factors have increased less rapidly, as a response to other changes in the health system (Cutler, 1998).

We examine the intensity of treatment by focusing on major diseases of old age where hospital admission is a good indicator of illness. The diseases include: acute myocardial infarctions (heart attacks), other ischemic heart disease, congestive heart failure, stroke and other acute cerebrovascular diseases, cancer, emphysema, chronic obstructive pulmonary disorder, hip fractures, other fractures, depression, schizophrenia, and Alzheimer's. For each individual we construct an intensity measure equal to the sum of DRG weights for all hospital visits in a year.

Table 6 shows the average intensity measure across respondents, and for respondents with each of the diseases listed above. The average intensity measure per Medicare beneficiary has actually declined over time, as hospitalization rates have fallen. Conditional on being admitted to the hospital, however the intensity of treatment has risen over time by about 21 percent. Intensity is rising over time even within a diagnosis. To examine three well-defined acute diagnoses, we constructed several 90-day intensity measures. We summed all DRG weights for services provided within 90 days of an admission for AMI, stroke, or hip fracture. The last three columns of table 6 demonstrate that the intensity of services for these three diagnoses has risen in the last decade. The rise in intensity of services overall implies about a \$1,000 increase in spending. However, the rise in intensity cannot explain the roughly \$5,000 per person increase in

spending for individuals who were hospitalized in a year.

The other component in equation (1) that could lead to increased medical spending is the price paid for medical services. As noted above, however, the update factor has not increased rapidly. Indeed, in real terms between 1985 and 1994, the update factor fell by 7 percent. These cuts in the update factor were a response to gaming in the prospective payment system. Immediately following the implementation of prospective payment in 1982, the average diagnosis became much more serious relative to before prospective payment. The increase in serious diagnoses or “diagnosis creep” reflected provider attempts to increase payment. Medicare officials responded by cutting the increase in the update factor. Further cuts in the update factor were a component of deficit reduction legislation in 1990 and 1993. Price increases, therefore play no role in the rise of Medicare spending.

The net effect on acute care spending is reflected in figures 4a and 4b. Acute care spending rose slightly in all age groups, but the rise was smaller among the older elderly than among the younger elderly. Among the 65-69 age group, spending rose from \$2,000 to about \$2,300, a 1.2 percent annual increase (table 1). Elderly over age 85 witnessed a 0.7 percent annual increase, from \$3,500 to \$3,700. Relative spending on acute care actually fell modestly for the oldest age groups.

Taken together the information on acute care spending suggests that increases in the intensity of treatment offset disability changes slightly, but changes in prices do not. The overall annual change in medical spending for the elderly explained by increased use of acute care services is only 1 percent (compared to an 3 percent average increase for the elderly population), and the increase is greater for the younger elderly than for the older elderly. Other explanations

are clearly more important in explaining the growth in medical costs for the elderly population as a whole, and particularly for the oldest elderly.

## **6. Post-acute care spending**

To complete the picture of changing Medicare spending, we examine the fastest growing portion of Medicare costs, post-acute care services. As noted above, post-acute care spending includes home health, hospice care, comprehensive outpatient rehabilitation care, and skilled nursing care.

Figures 5(a) and (b) demonstrate the striking growth in real spending on these services. Growth in real, per person post-acute services ranged from 15 percent per year for the youngest elderly to 21 percent per year for the oldest elderly (table 1). The numbers are staggering. In 1995, the oldest elderly averaged nearly \$2,000 per person on post-acute services, up from \$240 in 1985. As displayed in figure 5b this contributes significantly to higher relative spending among the over 85 population. Relative post-acute spending for the oldest elderly compared to the younger elderly rose from a factor of 5 to a factor of over 8.

To understand what these services involve, consider the canonical case of an elderly person with a stroke or hip fracture. Such a person needs some acute care services (for example, a hip replacement) and then a period of recovery, involving physical and occupational therapy and perhaps help with routine services the person is not able to perform on their own.

Table 6 shows the steady rise in average annual post-acute care spending for individuals admitted to the hospital with a hip fracture or stroke. Hip fracture patients spent about \$1,600 in

1984-85. But by 1994-95, they spent \$5,200, an increase of over 200 percent. Cost increases were similar for people with a stroke. What is interesting about these conditions is that by most measures, people with a hip fracture or stroke are getting healthier over time (Cutler and Richardson, 1997). Thus, the increase in post-acute service use is unlikely to be just a response to sicker elderly.

Increases in post-acute service use might reflect one of three factors. The first is “gaming”, or changes in the site of care. Care that follows an injury such as hip fracture provides a good example of this. Inpatient care is reimbursed prospectively, so hospitals receive the same payment regardless of whether they provide rehabilitative care in the inpatient setting or not. Post-acute care is reimbursed on a cost basis, however, when services are used. Thus, if hospitals “unbundle” the post-acute care from the inpatient setting, they can collect additional revenues at no extra cost.

In some cases, this unbundling occurs in the hospital itself. Hospitals can set up a wing for rehabilitation or skilled nursing facility care. Using these services many simply involve wheeling the hip fracture patient down the hall, delivering the same services as formerly, and collecting higher reimbursement. In other cases, the home health agency or skilled nursing facility will be a separate provider. This increase in *spending* may be associated with a reduction in *costs*. Outpatient settings are generally cheaper than inpatient settings, so that total costs may fall even as reimbursement is rising.

A second explanation is that increased post-acute spending reflects additional use of services. The rules on when the elderly could use post-acute services were relaxed substantially in the late 1980s, just before the explosion in service use. At least some of the additional service

use may be a result of people having access to services they went without previously, or had a family member provide informally.

The final explanation is that increased post-acute service use represents fraud in the program. Since post-acute services are provided in a person's house, by small agencies that are not easily monitored, the potential for fraud is vast. Recent congressional testimony highlighted frequent instances of fraud in the home health program. The testimony cited one estimate suggesting that as many 40 percent of home health claims should have been denied.<sup>6</sup> This number is sobering given that home health has risen from one percent of Medicare spending in 1970 to over 13 percent in 1995.

We have no way to differentiate among these theories with our data, since the inpatient data do not indicate completely what services are provided. Disentangling the alternative sources of cost growth in post-acute care is a major research topic.

A related topic is the health consequences are of shifting health care delivery towards more post-acute care settings. It may be socially beneficial, if costly, for people to receive care out of a hospital setting. Post-acute providers may have more skill in their jobs than nurses in an inpatient setting have. Patients also like more being at home rather than in a hospital. This too is an important topic for future research.

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<sup>6</sup>See HCFA's website, <http://www.hcfa.gov/testmony/1998/980318.htm>.



## **7. Conclusion**

Over the last decade, medical spending for the oldest old has continued to increase more rapidly than for the youngest old. However, unlike the spending growth in the early 1980s, this growth has little to do with increased intensity of treatment. Over the 1990s, much of the spending growth relates to increased use of post-acute care services. Some of the increased spending on post-acute care likely reflects gaming of Medicare through practices such as unbundling care to maximize reimbursement, some reflects increased service use, and some may be outright fraud.

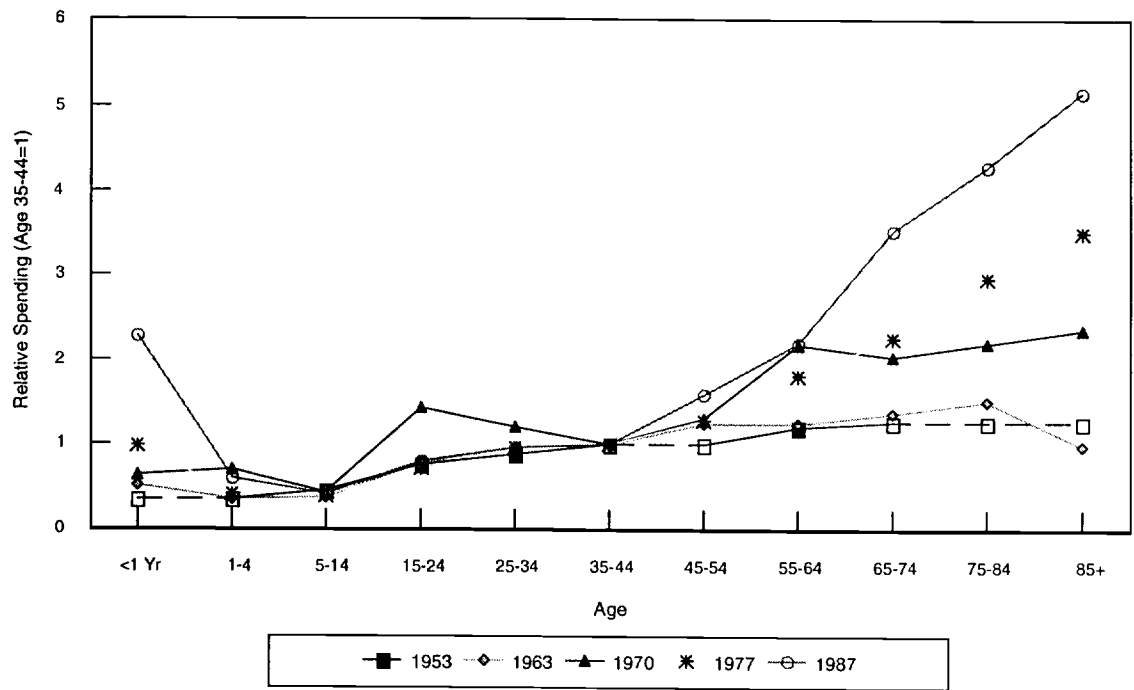
Our results have not addressed the question of what this increased medical spending is buying. This question is central in evaluating the growth of medical costs for the elderly and non-elderly population. Medical spending is valuable if it purchases services worth more than their cost and problematic if the services are worth less than their cost. Additional research on the importance of Medicare in improved health would complement the findings here about the sources of Medicare cost increases.

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Figure 1: The Age Distribution of Medical Spending  
1953-1987



1953 age groups include: 0-5,6-17,18-24,25-34,35-54,55-64, & 65+. Relative spending for 5-24 year olds was constructed assuming a uniform age distribution. Dashed lines in 1953 connect all age groups which were combined when calculating relative spending.

Fig. 2a: Total Medicare Spending Per Person

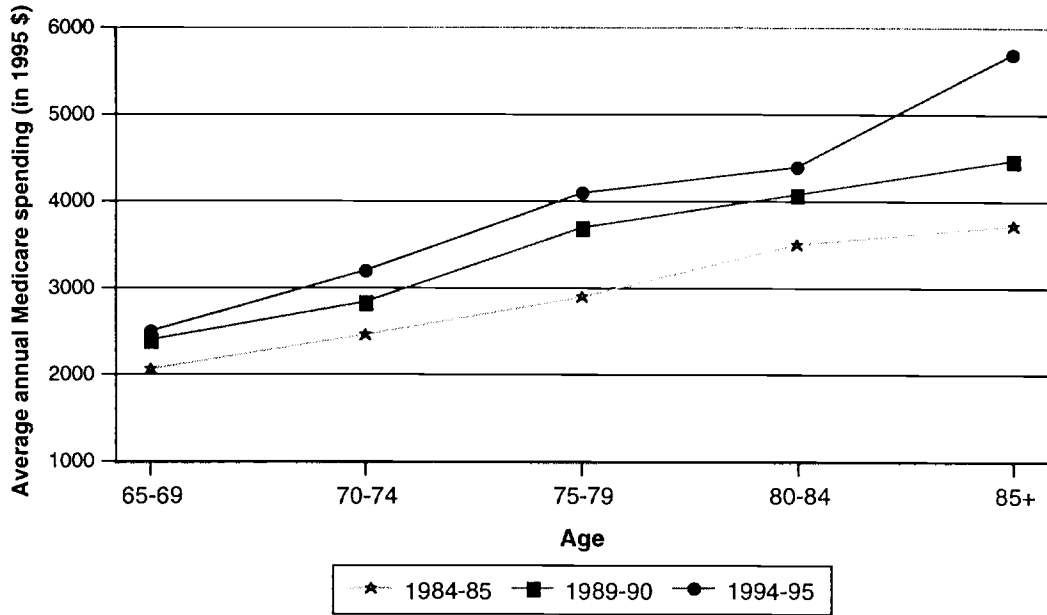


Fig. 2b: Relative Medicare Spending Per Person

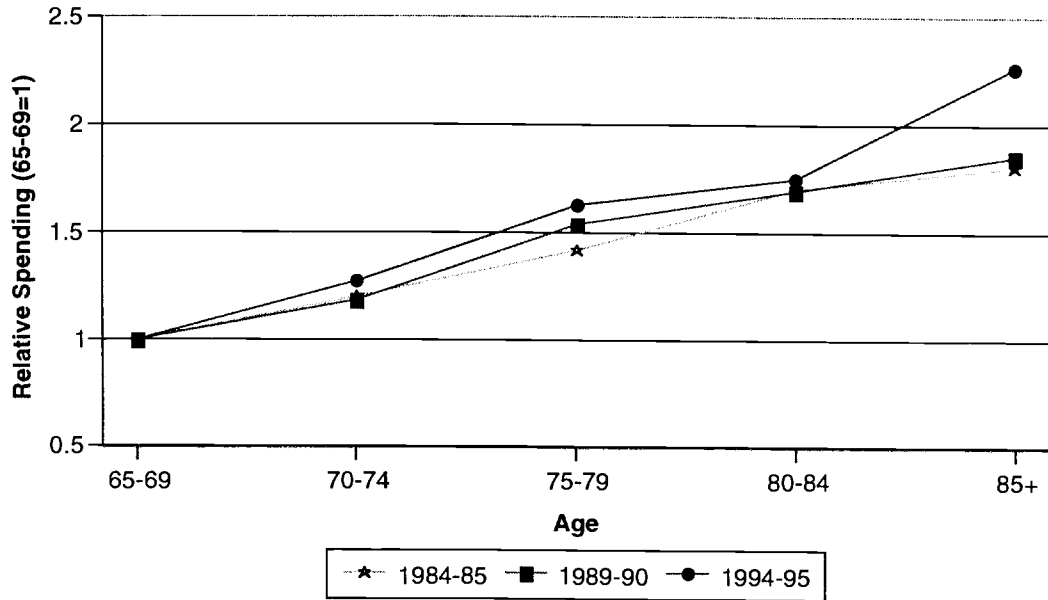


Fig. 3: Projected Spending Based on Disability and Death

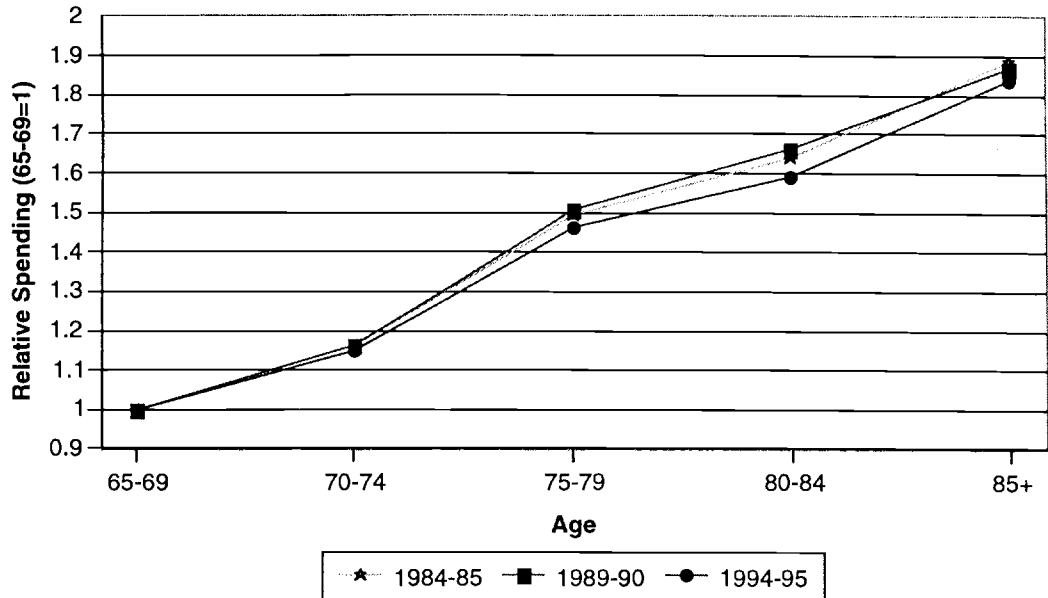
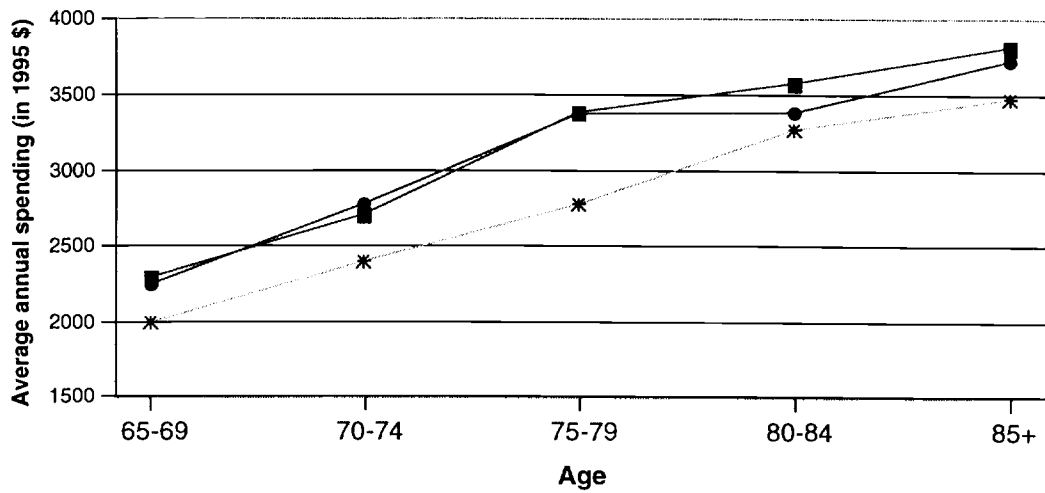


Fig. 4a: Medicare Acute Care Spending Per Person

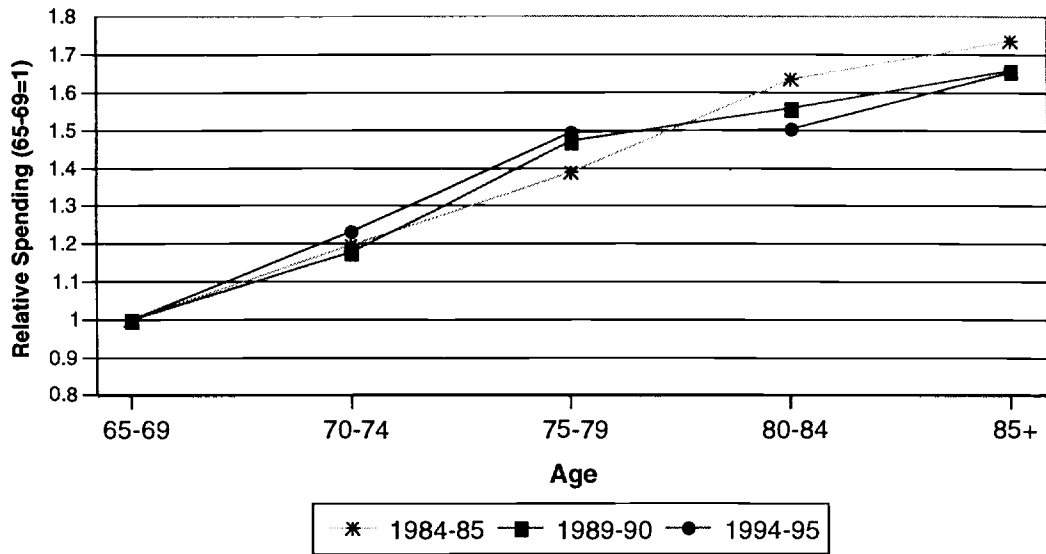


\* 1984-85    ■ 1989-90    ● 1994-95

Note: Acute care includes inpatient and outpatient services delivered in general hospitals, doctors' offices, and other acute care sites.

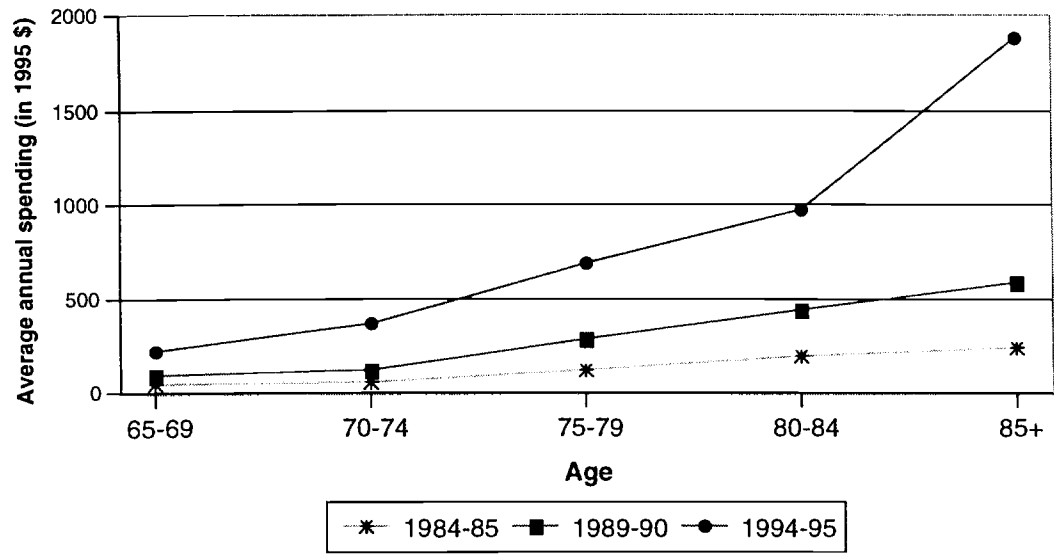


Fig. 4b: Relative Acute Care Spending Per Person



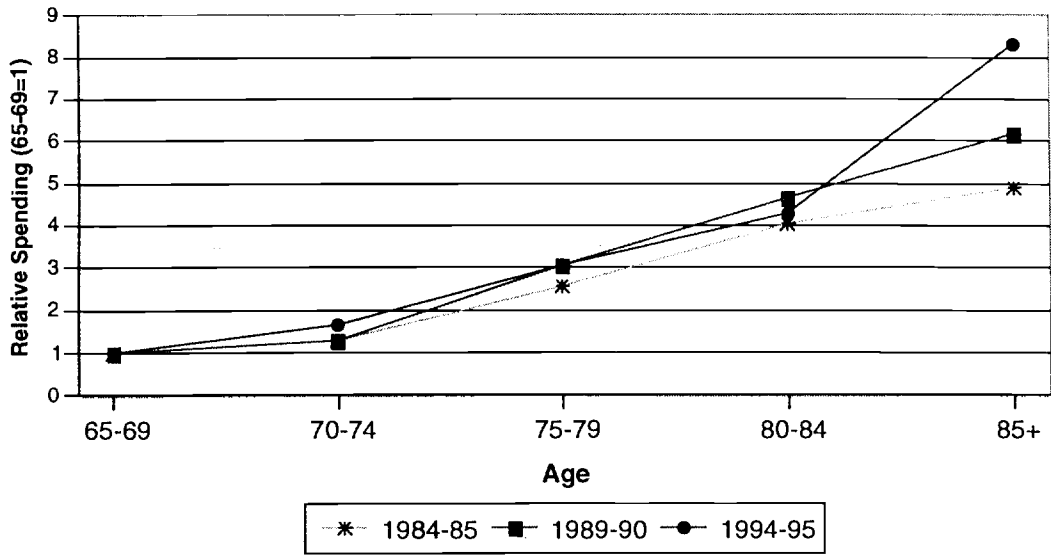
Note: Acute care includes inpatient and outpatient services delivered in general hospitals, doctors' offices, and other acute care sites.

**Fig. 5a: Post-Acute Care Spending**



Note: Post-Acute care includes skilled nursing, home health, hospice care, and Comprehensive Outpatient Rehabilitation Facilities.

Fig. 5b: Relative Post-Acute Care Spending



Note: Post-Acute care includes skilled nursing, home health, hospice care, and Comprehensive Outpatient Rehabilitation Facilities.

Table 1: Medical Spending by Age and Type of Care

	65-69	70-74	75-79	80-84	85+
<b>All medical spending (NMES)</b>					
1963	\$1,102	\$1,178	\$1,417	\$964	\$819
1977	3,205	3,561	4,274	4,607	5,220
1987	3,726	4,063	4,170	5,607	5,650
<b>Total Medicare spending (NLTCs)</b>					
1985	\$2,062	\$2,479	\$2,918	\$3,505	\$3,730
1995	2,519 [2.0%]	3,205 [2.6%]	4,102 [3.4%]	4,400 [2.3%]	5,709 [4.3%]
<b>Acute care Medicare spending</b>					
1985	\$2,002	\$2,397	\$2,782	\$3,276	\$3,482
1995	2,255 [1.2%]	2,782 [1.5%]	3,370 [1.9%]	3,389 [0.3%]	3,734 [0.7%]
<b>Post-acute care Medicare spending</b>					
1985	\$49	\$64	\$126	\$199	\$241
1995	227 [15.3%]	375 [17.7%]	693 [17.0%]	975 [15.9%]	1,887 [20.6%]

Note: Numbers in [.]s are the annual growth rate from the previous year. NMES = National Medical Expenditure Survey, NLTCs = National Long Term Care Survey.

Table 2: Explaining Medicare Reimbursement, 1989-90

Independent Variable	(1)	(2)	(3)	(4)
<i>Demographics</i>				
Age 70-74	369 (151)	251 (148)	289 (149)	201 (147)
Age 75-79	1203 (190)	897 (190)	970 (185)	744 (187)
Age 80-84	1559 (177)	878 (183)	1154 (174)	646 (187)
Age 85+	1990 (197)	398 (233)	1120 (201)	-34 (232)
Female	-696 (127)	-777 (125)	-436 (121)	-526 (119)
<i>Disability</i>				
IADLs only	---	1448 (267)	---	1218 (259)
1-2 ADLs	---	2235 (238)	---	1905 (231)
3-4 ADLs	---	3820 (383)	---	3189 (379)
5+ ADLs	---	6735 (617)	---	5412 (593)
Institutionalized	---	3594 (392)	---	2464 (371)
<i>Time until death</i>				
Died in first quarter	---	---	10,464 (725)	9513 (729)
Died in second quarter	---	---	7,242 (954)	6402 (967)
Died in third quarter	---	---	10,971 (1,910)	10,200 (2896)
Died in fourth quarter	---	---	12,460 (1200)	11,824 (1202)
R <sup>2</sup>	.0106	.0375	.0698	.0862

Note: There are 31,693 observations in each regression. Regressions include controls for race and marital status. Dependent variable is individual annual spending.

Table 3: Changes in Disease Incidence

Condition	Age and sex adjusted rate		
	1984-85	1989-90	1994-95
<i>All Hospitalization</i>	.306	.239	.218
<i>Cardiovascular</i>			
Heart Attack	.012	.010	.010
Stroke	.006	.004	.003
Other ischemic heart disease	.022	.021	.020
Congestive heart failure	.017	.017	.016
Other cerebrovascular	.019	.016	.016
<i>Cancer</i>	.029	.021	.018
<i>Respiratory-</i>			
COPD	.008	.005	.009
Emphysema	.0007	.0004	.0006
<i>Kidney Failure</i>	.0020	.0015	.0018
<i>Musculoskeletal</i>			
Hip fracture	.010	.009	.009
Other fracture	.0086	.0065	.0051
<i>Mental Illness</i>			
Depression	.0004	.0003	2.90e-05
Schizophrenia	.00018	.00014	.0004
<i>Alzheimer's</i>	.0022	.0018	.0018
N	42,986	32,294	33,786

Note: Disease rates are based on the 1990 age-sex distribution. An individual is defined as having a condition when hospitalized with the condition at any time during the year.

Table 4: Disability Rates by Age and Year

Age Group	Any Disability				Severe Disability				Share of People Dying that Year				
	1984	1989	1994	1994	1984	1989	1989	1994	1984	1984	1989	1989	1994
65-69	10.4%	9.2%	9.5%	3.9%	4.0%	3.7%	2.4%	2.1%	2.5%				
70-74	15.4	14.1	12.0	6.1	5.5	4.9	3.4	3.2	2.6				
75-79	23.7	22.3	19.7	10.1	9.9	9.2	5.1	5.2	4.5				
80-84	37.6	35.5	30.6	18.3	18.9	15.8	8.2	7.4	7.6				
85+	63.7	60.4	57.1	39.3	39.5	38.0	14.2	13.1	14.2				

Note: Severe disability is defined as 3 or more ADL restrictions, or institutionalization.

Table 5: Predicted Spending Based on Disability and Death

Year	Predicted Spending	Ratio
1984-85	\$3,324	
1989-90	\$3,333	1.00
1994-95	\$3,212	0.97



Table 6: Changes in Intensity of Treatment

Condition	Annual DRG weight for people admitted to hospital for condition			90-day episode DRG weight for people admitted to hospital for condition		
	'84-'85	'89-'90	'94-'95	'84-'85	'89-'90	'94-'95
<i>All respondents</i>	0.580	0.542	0.507			
<i>All hospitalized respondents</i>	1.89	2.25	2.29			
<i>Cardiovascular</i>						
Heart Attack	2.80	3.53	3.81	2.29	3.22	3.09
Stroke	2.56	3.59	3.07	2.25	1.82	2.33
Other ischemic heart disease	2.87	3.42	3.62			
Congestive heart failure	2.99	3.14	3.34			
Other cerebrovascular	2.17	2.50	2.40			
<i>Cancer</i>	2.99	3.32	2.87			
<i>Respiratory</i>						
COPD	2.70	2.76	2.86			
<i>Musculoskeletal</i>						
Hip fracture	3.03	3.38	3.27	2.70	3.01	2.76
Other fracture	1.64	1.83	2.02			
<i>Alzheimer's</i>	2.37	2.16	2.67			
<i>Kidney Failure</i>	3.92	4.25	4.48			
N (total)	30,011	26,237	28,292			
N (hospitalized)	9,468	6,663	6,713			

Note: DRG weights are those prevailing in 1989.

Table 7: Post-Acute Care Spending for Hip Fracture and Stroke Patients

Condition	1984-85	1989-90	1994-95
Hip Fracture	\$1,567	\$3,207	\$5,220
Stroke	1,488	3,151	4,311

Note: Post-Acute care includes skilled nursing, home health, hospice care, and comprehensive outpatient rehabilitation facilities. Spending is average annual spending for individuals admitted with hip fracture or stroke.