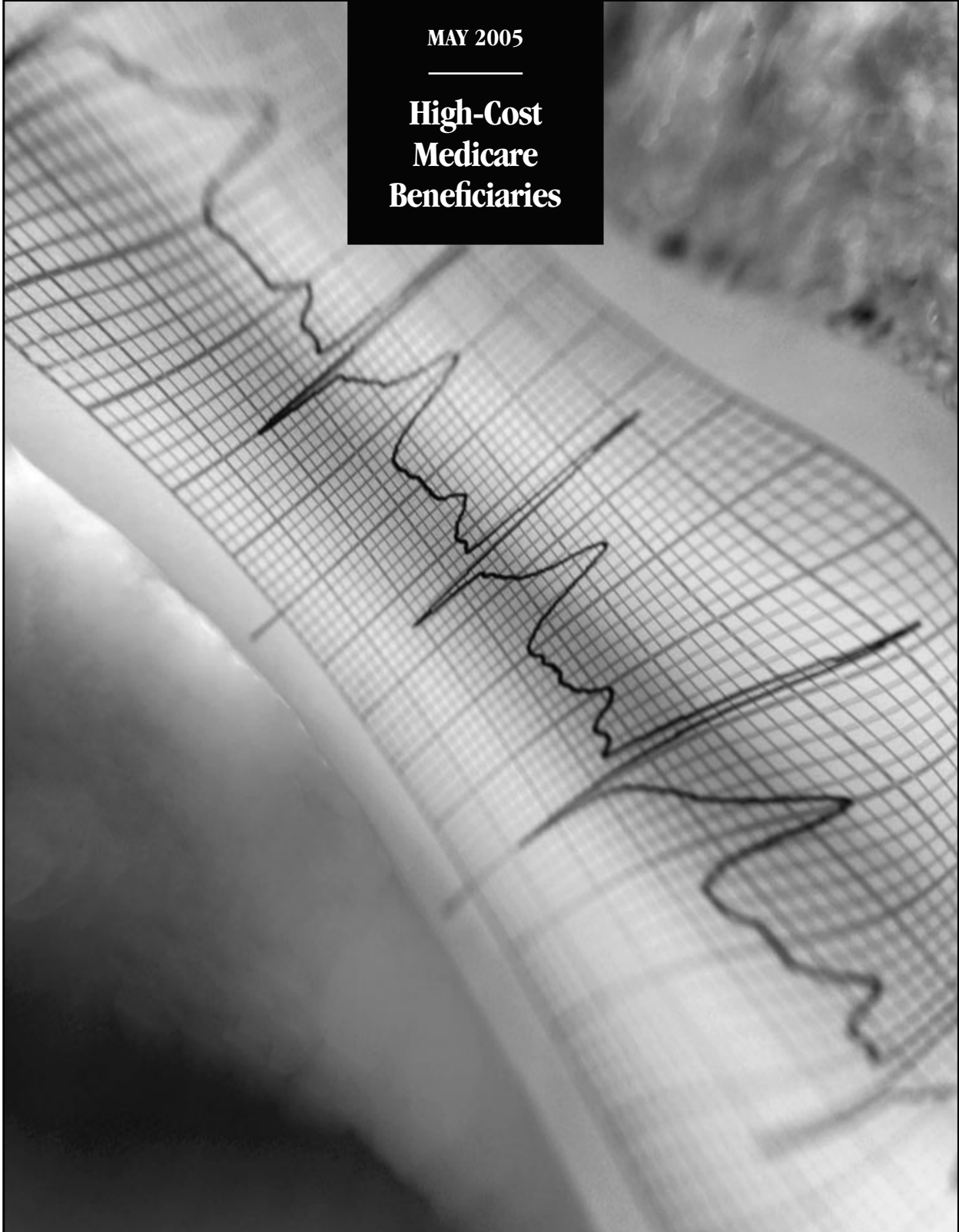


CONGRESS OF THE UNITED STATES  
CONGRESSIONAL BUDGET OFFICE

A  
**CBO**  
PAPER

MAY 2005

**High-Cost  
Medicare  
Beneficiaries**







# **High-Cost Medicare Beneficiaries**

May 2005

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## Notes

All years referred to in this paper are calendar years.

Numbers in the text and tables may not add up to totals because of rounding.

All dollar amounts are expressed in 2005 dollars (having been converted using the GDP price deflator).

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## Preface

**T**otal Medicare spending exceeded \$300 billion in 2004 and is expected to grow significantly in the coming decades. In response to those financial pressures, policymakers have considered a number of strategies for slowing the growth of Medicare spending, including increasing the share of spending paid by beneficiaries and enhancing competition in the provision of services.

This Congressional Budget Office (CBO) paper, prepared at the request of the Senate Majority Leader, explores an additional approach: focusing on the small group of beneficiaries that accounts for a large share of the program's spending. Possible intervention strategies would aim to reduce that spending. The paper analyzes the concentration of Medicare spending in a given year and over time using data from Medicare claims and considers illustrative methods for identifying beneficiaries who are likely to incur high future costs. In keeping with CBO's mandate to provide objective, nonpartisan analysis, this paper makes no recommendations.

Julie Lee and Todd Anderson of CBO's Health and Human Resources Division prepared the paper under the supervision of Bruce Vavrichek, James Baumgardner, Steve Lieberman, and Mark Miller. (Todd Anderson, Steve Lieberman, and Mark Miller have since left CBO). Susan Labovich provided computer programming support and coordinated CBO's access to the data used in this analysis. Tom Bradley, Philip Ellis, and Allison Percy, also of CBO, provided thoughtful comments on drafts, as did Amber Barnato of the University of Pittsburgh and Jeffrey Kelman of the Centers for Medicare and Medicaid Services. (The assistance of external reviewers implies no responsibility for the final product, which rests solely with CBO.) Dr. Barnato and Jennifer Bowman, formerly of CBO, helped to draft portions of an earlier version of the paper.

Christine Bogusz edited the paper, and Loretta Lettner proofread it. Maureen Costantino prepared the paper for publication and designed the cover. Lenny Skutnik printed copies of the paper, and Annette Kalicki produced the electronic version for CBO's Web site ([www.cbo.gov](http://www.cbo.gov)).

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**CONTENTS**

**Summary and Introduction** *1*

**The Concentration of Medicare Expenditures** *2*

Factors Affecting the Degree of Concentration *3*

Characteristics of High-Cost Medicare

Beneficiaries *4*

**The Persistence of Medicare Expenditures** *5*

Expenditure Patterns Over Time *6*

The Concentration of Spending Over a Five-Year

Period *8*

**Prospectively Identifying Future High-Cost Beneficiaries** *8*

Illustrative Strategies for Identifying High-Cost  
Beneficiaries *9*

Approaches to Managing Care for High-Cost

Beneficiaries *10*

**Tables**

1.	Expenditure Levels and Thresholds for Medicare Beneficiaries, by Spending Group, 2001 and 1991	4
2.	Concentration of Expenditures Among Subgroups of Medicare Beneficiaries, by Spending Group, 2001	5
3.	Characteristics of Medicare Beneficiaries in High- and Low-Cost Spending Groups, 2001	6
4.	Use of Medicare Services by High- and Low-Cost Spending Groups, 2001	7
5.	Transition of Medicare Beneficiaries Between High- and Low-Cost Spending Groups, 1997 to 1998	8
6.	Percentage and Number of Medicare Beneficiaries in High- and Low-Cost Spending Groups with Selected Chronic Conditions, 2001	12
7.	Illustrative Criteria for Targeting Future Medicare Beneficiaries in High-Cost Spending Groups	12

**Figures**

1.	Concentration of Total Annual Medicare Expenditures Among Beneficiaries, 2001	2
2.	Expenditure History of Medicare Beneficiaries Who Constituted the Top 25 Percent in 1997	9
3.	Concentration of Total Cumulative Medicare Expenditures Among Beneficiaries, 1997 to 2001	10
4.	Distribution of High-Cost Months Over the 1997-2001 Period	11

**Box**

1.	Methodology of This Analysis	3
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# High-Cost Medicare Beneficiaries

## Summary and Introduction

Medicare's rising demand for budgetary resources has been well documented, with spending for the program projected to grow significantly in the coming decades.<sup>1</sup> In response, policymakers are exploring ways to reduce that potential growth in spending, perhaps by increasing beneficiaries' cost sharing or promoting competition among service providers. Options that would constrain the program's costs without reducing the quality or availability of care, however, are limited.

One potential avenue for reducing Medicare spending stems from the observation that a small fraction of Medicare beneficiaries accounts for a large share of the program's spending in a given year. That concentration of expenditures is characteristic of insurance programs in general. However, it also suggests the possibility of a policy alternative: identify the relatively small group of potentially high-cost beneficiaries and find effective intervention strategies to reduce their spending. If that approach was successful, even a small percentage reduction in the spending of that group of beneficiaries could lead to large savings for the Medicare program.

The feasibility of using such a strategy depends on the answers to three key questions. First, how concentrated is health care spending among Medicare beneficiaries? Second, can individuals who will have high costs be identified before those costs are incurred (or at least before a large enough share of those costs has been incurred to still warrant targeting the remaining spending)? And third, as-

suming that future high-cost beneficiaries can be identified, can effective strategies be devised to avert the anticipated high costs?

This paper explores the first two questions in order to gauge the potential effectiveness of focusing on high-cost Medicare beneficiaries as a way to reduce the program's costs. To begin with, it documents the extent to which Medicare expenditures are concentrated among relatively few beneficiaries. Analysts observe a significant degree of concentration in the spending of Medicare beneficiaries, both in a given year and over time. For example, high-cost beneficiaries (those in the top 25 percent in terms of their spending) accounted for 85 percent of annual expenditures in 2001 and for 68 percent of five-year cumulative expenditures from 1997 to 2001. In addition, those high-cost beneficiaries, compared with beneficiaries in the bottom 75 percent in terms of their spending, were slightly older, more likely to suffer from chronic conditions, such as coronary artery disease and diabetes, and more likely to die in a given year.

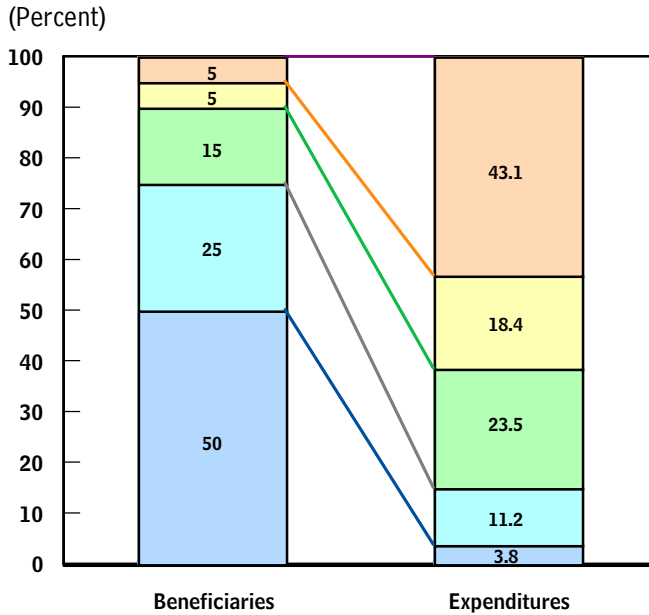
Finally, to determine whether beneficiaries with high future costs can be identified before those costs are incurred, the paper explores three simple observational methods for prospectively identifying beneficiaries who will incur extended periods of expensive medical care. The methods look at beneficiaries who were high cost in a certain year (in this case, 1997), who were admitted to a hospital that year, or who had multiple chronic conditions that year. The costs for all three groups are compared with those for a random sample of Medicare beneficiaries.

Spending in 1997 for all three groups was more than twice as high as spending for the reference group, and it was four times as high for the group with a hospital admission. The next year, however, the previously hospitalized group had the largest decline in its share of spending, whereas the share of spending by beneficiaries with multiple chronic conditions barely fell at all. Over the next

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1. See Congressional Budget Office, *The Long-Term Budget Outlook* (December 2003). CBO projects that, under current law, Medicare spending will increase from 2.6 percent of gross domestic product (GDP) in 2004 to 8.3 percent or more in 2050. See also *The 2005 Annual Report of the Board of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds* (March 2005). The Medicare trustees estimate that Medicare spending will equal 9.3 percent of GDP in 2050 and 13.6 percent in 2079.

**Figure 1.**  
**Concentration of Total Annual Medicare Expenditures Among Beneficiaries, 2001**



Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

four years (through 2001), all three groups spent nearly twice as much on Medicare-covered services as beneficiaries in the reference group.

Those methods are highly stylized and conceptual illustrations. In practice, which groups to identify and which methods to use would depend on the actual intervention strategies that might be implemented. Moreover, the extent to which those targeted beneficiaries reduced their spending would ultimately rest on the ability to devise and implement effective intervention strategies, clinical or otherwise, to change beneficiaries’ use of medical services.

### The Concentration of Medicare Expenditures

Medicare spending is highly concentrated, with a small number of beneficiaries accounting for a large proportion of the program’s annual expenditures. In 2001, the costliest 5 percent of beneficiaries enrolled in Medicare’s fee-

for-service (FFS) sector accounted for 43 percent of total spending, while the costliest 25 percent (defined as the high-cost group in this paper) accounted for fully 85 percent of spending (see Figure 1). In this context, spending includes expenditures paid for by all parties—including the Medicare program itself, beneficiaries, and third-party payers such as medigap insurers—for all services covered by the Medicare program.<sup>2</sup> (For a description and discussion of the Medicare data used in this analysis, see Box 1.) Real (inflation-adjusted) spending among the most expensive 5 percent of beneficiaries averaged about \$63,000 per person in 2001, with the least expensive person in that group spending more than \$35,400 (see Table 1). Among the most expensive 25 percent of beneficiaries, spending averaged about \$24,800, with the least expensive beneficiary in that group spending over \$6,200 in 2001. By contrast, the least expensive 50 percent of Medicare beneficiaries accounted for only 4 percent of total spending, with costs in 2001 averaging about \$550 per person.

The concentration of Medicare spending has lessened slightly since the early 1990s. From 1991 to 2001, there was a large increase in the level of Medicare spending, with total annual Medicare expenditures per FFS beneficiary growing by more than 40 percent in inflation-adjusted terms, from \$5,080 to \$7,310.<sup>3</sup> However, the rate of increase in spending was larger among low-cost beneficiaries than among high-cost ones. On average, real per capita spending among the bottom 75 percent of beneficiaries grew at 6.8 percent per year over that 10-year period, whereas spending among the top 25 percent

- Spending by the Medicare program itself is more concentrated. For example, the most expensive 5 percent of Medicare FFS beneficiaries accounted for 48 percent of annual Medicare FFS spending in 2002, and the most expensive 25 percent accounted for 88 percent. See Medicare Payment Advisory Commission, *Report to the Congress: New Approaches in Medicare* (June 2004), Figure 2-1.
- The increase in national health expenditures during that period was even larger, with an average annual growth rate of inflation-adjusted spending per person of over 5 percent between 1990 and 2001. See [www.cms.hhs.gov/statistics/nhe/historical/t1.asp](http://www.cms.hhs.gov/statistics/nhe/historical/t1.asp). Part of the difference in the rates of spending growth is attributable to the fact that Medicare did not cover outpatient prescription drugs—a fast-growing component of national health expenditures—during that period. In addition, the Balanced Budget Act of 1997 reduced payments for various Medicare-covered services.

**Box 1.****Methodology of This Analysis**

The Congressional Budget Office's (CBO's) analysis of Medicare expenditures presented in this paper is based on longitudinal data of Medicare claims from 1989 through 2001 for a 5 percent sample of Medicare beneficiaries enrolled in the fee-for-service sector of the Medicare program. The sample was derived from claims records maintained by the Centers for Medicare and Medicaid Services.

The data contain information on the enrollment and entitlement status of each beneficiary, his or her demographic characteristics, and monthly expenditures for all Medicare-covered services (short-term hospital, other hospital, skilled nursing facility, outpatient, physician, home health, hospice, and durable medical equipment). In this paper, total expenditures for Medicare-covered services include third-party payments and beneficiaries' share of payments through deductibles and copayments, as well as the amounts paid by the Medicare program. CBO converted all expenditures into 2005 dollars using the GDP deflator. (Those constant-dollar expenditures can be interpreted as the opportunity cost of health care.) Although the data contain some diagnostic information reported in claims files (such as beneficiaries' diagnosis-related group, or DRG), they generally lack detailed clinical information. Moreover, because outpatient prescription drugs were not covered by Medicare during the years of the sample, the database also does not include spending for prescription drugs.

To be included in a given year of data, a beneficiary had to have at least one month of enrollment in both Part A (Hospital Insurance) and Part B (Supplementary Medical Insurance) of the Medicare program. Beneficiaries enrolled in managed care were excluded from the analysis because their expenditure information was not available. The resulting sample contains approximately 1.6 million beneficiaries per year.

The number of admissions to hospitals and skilled nursing facilities was constructed from inpatient and skilled nursing claims. The number of visits to physicians' offices and emergency departments was constructed from codes (according to the Healthcare Common Procedure Coding System, or HCPCS) reported in physicians' claims.

Seven chronic conditions were considered in the analysis: asthma, chronic obstructive pulmonary disease, chronic renal failure, congestive heart failure, coronary artery disease, diabetes, and senility. A beneficiary was defined as having a chronic condition if he or she had the diagnosis reported in physicians' claims data (as the primary or secondary diagnosis) for at least one month in a given year. Detailed diagnosis codes were grouped into general categories using the Clinical Classification Software developed by the Agency for Healthcare Research and Quality.

of beneficiaries grew at 3.3 percent per year.<sup>4</sup> As a result, the share of Medicare spending by the top one-quarter of beneficiaries decreased from 88.8 percent in 1991 to 85.0 percent in 2001 (see Table 1).

4. Those trends are consistent with the fact that medical spending for physician-provided care (used by both low-cost and high-cost Medicare beneficiaries) grew faster during that period than did spending for hospital-provided care (used largely by high-cost beneficiaries).

**Factors Affecting the Degree of Concentration**

A high degree of concentration of expenditures is not unique to the Medicare population. Health care expenditures in the general population show similar patterns.<sup>5</sup> In fact, they are even more concentrated: in 1996, for example, the costliest 5 percent of the U.S. population accounted for 55 percent of total health care spending.

5. See Marc L. Berk and Alan C. Monheit, "The Concentration of Health Care Expenditures, Revisited," *Health Affairs*, vol. 20, no. 2 (March/April 2001), pp. 9-18.

**Table 1.****Expenditure Levels and Thresholds for Medicare Beneficiaries, by Spending Group, 2001 and 1991**

Spending Group	2001			1991		
	Percentage of Total Spending	Average Spending in Group (Dollars)	Threshold for Group (Dollars)	Percentage of Total Spending	Average Spending in Group (Dollars)	Threshold for Group (Dollars)
Percentage of Beneficiaries						
Top 5 percent	43.1	63,030	35,420	45.8	46,530	25,470
6 percent to 10 percent	18.4	26,900	20,470	19.0	19,260	14,560
11 percent to 25 percent	23.5	11,430	6,210	24.0	8,140	4,240
26 percent to 50 percent	11.2	3,290	1,620	9.1	1,840	760
51 percent to 100 percent	3.8	550	0	2.2	220	0
<b>Memorandum:</b>						
Medicare Expenditures per Beneficiary	n.a.	7,310	n.a.	n.a.	5,080	n.a.

Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

Notes: Spending is reported in 2005 dollars.

n.a. = not applicable.

That skewed distribution of medical spending is rooted in the fundamental reason that people value insurance. Events that people typically insure against, like flood or fire, involve a small probability of a very expensive outcome. Similarly, in health care, although individuals may know about their need for medical services to some degree, their exact amount of spending on medical care is variable and unpredictable. For instance, most people do not know whether they will have a heart attack, even if they are fully aware of their relative risk factors. Health insurance spreads the financial risks of adverse health outcomes across the insured population, so that the small fraction of people who incur very high expenses of severe illness are financially protected. Both the probability of adverse health outcomes and the expense of medical care to treat them affect the degree of concentration of spending.

To the extent that the probability and the nature of ill health vary across subgroups of the Medicare population, one would expect to see varying degrees of concentration in spending across those groups. A striking example is the very small group of beneficiaries with end-stage renal disease (ESRD), who have chronic kidney failure and require dialysis or kidney transplantation.<sup>6</sup> Most people with that condition have very high medical spending. As

a result, that group has a much more even distribution of expenditures across its members than does the larger Medicare population. For example, the most expensive 5 percent of ESRD patients accounted for only 17.4 percent of spending by all ESRD patients in 2001; in comparison, the most expensive 5 percent of all Medicare FFS beneficiaries accounted for 43 percent of spending by all Medicare beneficiaries (see Table 2). Similarly, beneficiaries with chronic medical conditions have high average annual medical spending, but it is also more evenly spread across that group than is spending for the overall Medicare population.<sup>7</sup>

### Characteristics of High-Cost Medicare Beneficiaries

Although high-cost beneficiaries tend to be older than low-cost ones, the two groups are not so distinct in terms of other demographic characteristics (see Table 3). At over 74 years, the average age of high-cost beneficiaries exceeded that of low-cost ones by more than three years

6. People with ESRD, like people receiving Social Security benefits on the basis of a disability, are entitled to Medicare benefits regardless of age.
7. See Box 1 for the definition of chronic conditions used in this paper.

**Table 2.****Concentration of Expenditures Among Subgroups of Medicare Beneficiaries, by Spending Group, 2001**

(Percent)

Spending Group	ESRD Beneficiaries	Elderly Beneficiaries	Beneficiaries with Chronic Conditions	All Beneficiaries
Percentage of Beneficiaries				
Top 5 percent	17.4	41.9	34.2	43.1
6 percent to 10 percent	11.2	18.4	16.9	18.4
11 percent to 25 percent	24.1	23.9	26.9	23.5
26 percent to 50 percent	26.6	11.7	15.7	11.2
51 percent to 100 percent	20.8	4.1	6.3	3.8
Total	100.0	100.0	100.0	100.0
<b>Memorandum:</b>				
Subgroups as a Percentage of All Beneficiaries				
	1	85	48	100
Average Spending per Beneficiary (Dollars)				
	54,370	7,270	12,130	7,310

Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

Notes: Spending is reported in 2005 dollars.

ESRD = end-stage renal disease.

Elderly beneficiaries are defined as those 65 years of age or older. As an example of how to read the information in this table, the top 5 percent of elderly Medicare beneficiaries accounted for 41.9 percent of all spending by elderly beneficiaries.

in 2001. Nearly 20 percent of high-cost beneficiaries were age 85 or older, compared with 10 percent of other beneficiaries, and about 14 percent died during the year. The gender and racial compositions of the two groups were very similar.

The prevalence of chronic conditions, which typically require ongoing care and treatment to maintain health and functional status and to slow the progression of the disease, was also strongly linked to high expenditures and the use of medical resources. More than 75 percent of high-cost beneficiaries were diagnosed with one or more of seven major chronic conditions in 2001. More than 40 percent of high-cost beneficiaries had coronary artery disease, and about 30 percent had each of three other conditions—diabetes, congestive heart failure, and chronic obstructive pulmonary disease. All of those conditions were much less prevalent among low-cost beneficiaries.

In terms of the medical services they received, the high- and low-cost groups were similar in that they both visited physicians regularly (see Table 4). The vast majority of

Medicare beneficiaries in both groups saw a physician in 2001; however, among high-cost beneficiaries who visited a physician, the average number of visits during the year was 11, compared with six visits among low-cost beneficiaries who visited a physician at least once. High-cost beneficiaries were also much more likely to have been admitted to a hospital or a skilled nursing facility than were members of the low-cost group and to have been treated in a hospital emergency room during the year.

### The Persistence of Medicare Expenditures

If the goal of policymakers is to ultimately direct intervention strategies toward high-cost beneficiaries and change their use of Medicare services, it is important to consider patterns in Medicare spending over relatively long periods of time, not just over one year. Do individuals who make heavy demands on the Medicare program one year continue to do so in subsequent years? Or are

**Table 3.****Characteristics of Medicare Beneficiaries in High- and Low-Cost Spending Groups, 2001**

(Percent)

	High Cost (Top 25 Percent)	Low Cost (Bottom 75 Percent)
Demographic Characteristics		
Average age (Years)	74.4	71.1
Under age 65	13	15
Age 85 and over	19	10
Female	57	57
Black	10	9
Mortality	14	2
Presence of Chronic Conditions		
Asthma	8	4
Chronic obstructive pulmonary disease	29	10
Chronic renal failure	9	1
Congestive heart failure	30	5
Coronary artery disease	42	15
Diabetes	30	16
Senility	14	4
Beneficiaries with One or More Chronic Conditions	78	38
Beneficiaries with More than One Chronic Condition	48	12

Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

Note: Beneficiaries under age 65 include those who are entitled to Medicare benefits on the basis of a disability or end-stage renal disease.

the high-cost beneficiaries changing each year? If there is high turnover among high-cost beneficiaries, intervention strategies designed to change their use of Medicare services could be difficult to implement successfully because the time available to affect their spending may be limited.

**Expenditure Patterns Over Time**

The transition of Medicare beneficiaries between high- and low-cost status in two successive years is illustrated in Table 5. For Medicare beneficiaries who were high cost in 1997, nearly half (44 percent) were also in the high-cost category the next year, compared with one in six (17 percent) of low-cost beneficiaries. If the transition between cost categories was purely random, 25 percent of the survivors in each group would have been expected to be high cost in the second year.

A look at the longer expenditure history of high-cost beneficiaries in 1997 provides additional insight into the per-

sistence of their high-cost status (see Figure 2). As discussed above (and indicated by the darkest bars in Figure 2), 44 percent of high-cost beneficiaries in 1997 had large Medicare spending again in 1998. That fraction dropped off in subsequent years, nearly reaching 25 percent four years later, in 2001. A similar spending pattern preceded high-cost beneficiaries' 1997 experience: nearly half of those who would be high cost in 1997 were high cost in 1996, and about one-quarter were high cost four years prior to 1997.

That pattern of spending makes intuitive sense. Although the presence of serious chronic illness is common among high spenders, many types of adverse health shocks that result in very high spending (such as a heart attack and the subsequent bypass operation) are episodic and largely random. It is less likely that a person would have a series

**Table 4.****Use of Medicare Services by High- and Low-Cost Spending Groups, 2001**

Type of Service	High Cost (Top 25 Percent)		Low Cost (Bottom 75 Percent)	
	Percentage with Service Type	Average Use Conditional on Service	Percentage with Service Type	Average Use Conditional on Service
Short-Term Hospital Admission	74.8	1.7	2.4	1.0
Other Hospital Admission	12.1	1.4	0.3	1.1
Skilled Nursing Facility Admission	16.5	1.4	0.1	1.1
Emergency Department Visit	62.6	2.2	14.0	1.4
Physician's Office Visit	86.0	11.3	73.6	6.0

Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

Note: As an example of how to read the information in this table, among the 74.8 percent of high-cost beneficiaries who had a short-term hospital admission, the mean number of admissions was 1.7.

of acute health shocks several years in a row than have an episode or two in a given year and then recover. Therefore, high expenditures in one year are likely to decrease over time as expenditures regress to the mean in subsequent years.

An examination of the spending patterns of Medicare beneficiaries reveals a second pattern: the quantitative importance of the subsequent death of high-cost beneficiaries. About 14 percent of beneficiaries with high Medicare expenses in a given year die during that year (see Figure 2). Within four years, that fraction accumulates to 40 percent.

In general, impending mortality greatly increases the probability of an individual's incurring high costs regardless of his or her prior spending. Studies show that about one-quarter of total Medicare payments are for the typically expensive and intensive treatment received in a patient's last year of life, which often postpones death for only a short time.<sup>8</sup> Indeed, the high mortality rate among high-cost beneficiaries reported in Figure 2 confirms that a sizable fraction of spending by high-cost beneficiaries is for people near death. But not all deaths result in high spending, nor do all high-cost beneficiaries die soon thereafter.<sup>9</sup> Different trajectories of functional decline at

the end of life imply different spending patterns prior to death. Whereas people dying from organ failure experience gradually diminishing functional status with periodic exacerbations of their illness, thus incurring very high spending before death, other people who die suddenly often incur little health care spending in their last year of life.<sup>10</sup>

Although patients who die incur no further medical costs, they also offer little potential for cost savings if they had been targeted for an intervention strategy. Taking subsequent mortality into account, however, strengthens the empirical correlation of high spending over time. For high-cost beneficiaries in 1997 who did not die over the next four years, nearly one-half—instead of one-quarter—were high cost at the end of 2001. In Figure 2, the numbers of living high-cost and low-cost beneficiaries were roughly equal in each year from 1998 through 2001. Had there been no persistence in high medical expenses, only one-quarter of those beneficiaries would have been expected to be high cost during those years.

8. See Christopher Hogan and others, "Medicare Beneficiaries' Costs of Care in the Last Year of Life," *Health Affairs*, vol. 20, no. 4 (July/August 2001), pp. 188-195; and James D. Lubitz and Gerald F. Riley, "Trends in Medicare Payments in the Last Year of Life," *New England Journal of Medicine*, vol. 328, no. 15 (April 15, 1993), pp. 1092-1096.

9. Moreover, because a patient's time of death is unpredictable (except perhaps in cases such as advanced cancer), it is only in hindsight that researchers can estimate which costs were associated with care at the end of the patient's life and which costs were associated with attempts to save the patient's life.

10. See June R. Lunney, Joanne Lynn, and Christopher Hogan, "Profiles of Older Medicare Decedents," *Journal of the American Geriatrics Society*, vol. 50, no. 6 (June 2002), pp. 1108-1112; and June R. Lunney and others, "Patterns of Functional Decline at the End of Life," *Journal of the American Medical Association*, vol. 289, no. 18 (May 14, 2003), pp. 2387-2392.

**Table 5.**

### Transition of Medicare Beneficiaries Between High- and Low-Cost Spending Groups, 1997 to 1998

(Percent)

Cost Status in 1997	Cost Status in 1998	
	High Cost	Low Cost
High Cost	44	56
Low Cost	17	83

Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

Note: The low-cost (or not high-cost) spending group in 1998 also includes beneficiaries who died or became disenrolled between 1997 and 1998.

### The Concentration of Spending Over a Five-Year Period

Given the presence of high end-of-life expenditures and the regression to the mean following a high-cost year, one might expect Medicare expenditures over a longer period to be less concentrated than annual expenditures tend to be. For the entire 1997 cohort of Medicare beneficiaries, that is indeed the case (see Figure 3).<sup>11</sup> Compared with the distribution of annual expenditures reported in Figure 1, that cohort's five-year inflation-adjusted cumulative expenditures are somewhat less concentrated: the top 5 percent of beneficiaries, when ranked by five-year cumulative spending, accounted for 27 percent of total five-year Medicare spending from 1997 to 2001, compared with 43 percent for annual spending. Furthermore, the top 25 percent of beneficiaries accounted for 68 percent of total five-year spending, compared with 85 percent for annual spending.

There is still a great deal of concentration of expenditures over five years, however, in part because a significant group of Medicare beneficiaries incurs high spending over an extended period. For beneficiaries whose cumula-

tive 1997-2001 spending put them in the top 25 percent of all beneficiaries for that 60-month period, Figure 4 displays the distribution of the number of months in which they were in the top 25 percent of beneficiaries in terms of spending in that month. The median number of months is 22. In other words, about half of cumulatively high-cost beneficiaries had high monthly costs during 22 months or more of the 60-month period. That result could indicate that there may be time and opportunity to intervene to affect the use of Medicare services for a significant number of high-cost beneficiaries because they remain persistently high cost over an extended period.

### Prospectively Identifying Future High-Cost Beneficiaries

Whether a strategy of focusing on high-cost beneficiaries could lead to significant reductions in overall Medicare spending would depend on two factors: the ability to identify individuals who will have high costs in the future, and the ability to mitigate those high costs. The existence of Medicare beneficiaries whose high spending persists over an extended period presents potential opportunities for intervention strategies. However, prospectively identifying such individuals could be difficult.

A basic problem is that although researchers can identify characteristics or conditions that are prevalent among high-cost beneficiaries, many low-cost beneficiaries may also share the same characteristics. For instance, a number of chronic conditions were found to be highly prevalent among high-cost beneficiaries, and considerably less prevalent among low-cost beneficiaries. However, because the number of low-cost beneficiaries in this illustration is three times as large as the number of high-cost beneficiaries, the *numbers* of high-cost and low-cost beneficiaries with those conditions are much more similar (see Table 6). So while diabetes is nearly twice as prevalent among high-cost beneficiaries as it is among low-cost ones, the actual number of low-cost beneficiaries with diabetes greatly exceeds the number of high-cost beneficiaries with that condition. Therefore, any intervention strategy that focuses simply on beneficiaries with diabetes will include a large number of people who will not incur significant medical expenditures (at least soon thereafter). Even the most successful strategies for identifying high-cost individuals will probably include some who will not turn out to be expensive.

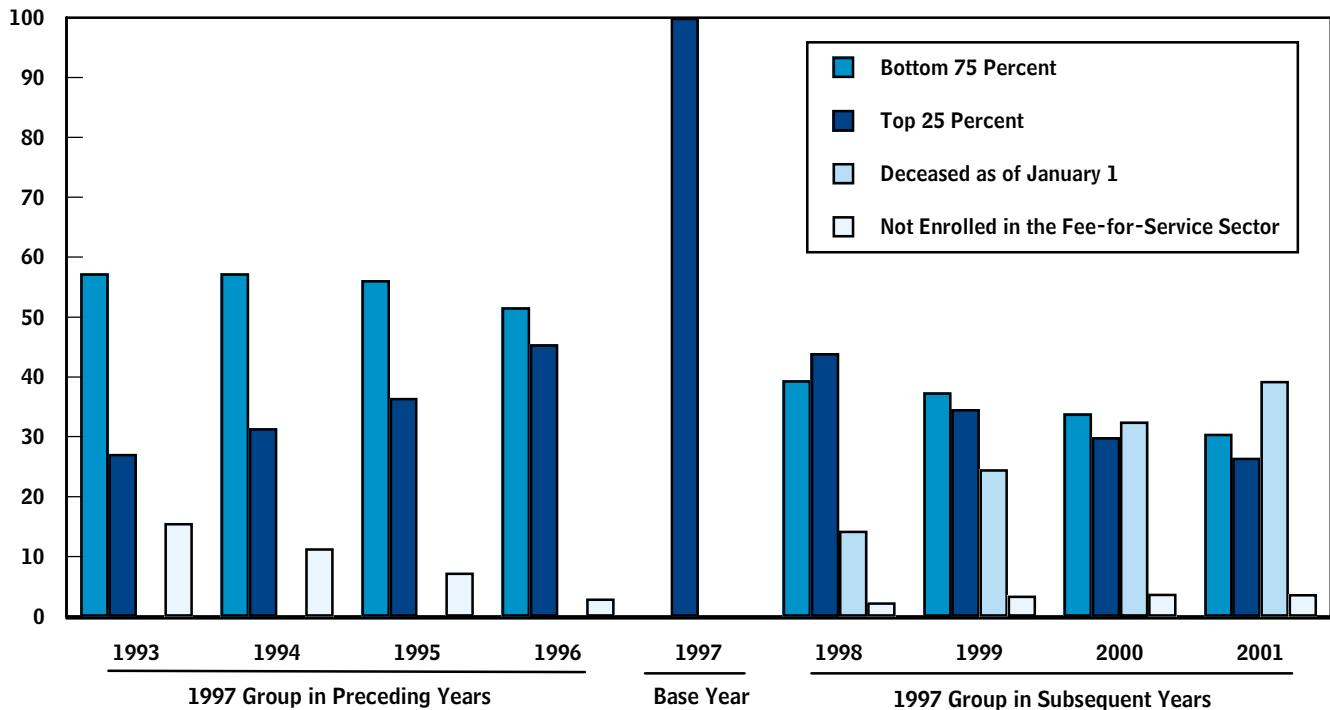
11. That cohort is defined as beneficiaries who enrolled in the Medicare program as of January 1997 and who either remained enrolled for five years (until December 2001) or died. Beneficiaries who subsequently enrolled in a Medicare managed care plan were excluded. There were about 1.4 million beneficiaries in CBO's random sample of that cohort.



**Figure 2.**

## Expenditure History of Medicare Beneficiaries Who Constituted the Top 25 Percent in 1997

(Percentage of beneficiaries)



Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

### Illustrative Strategies for Identifying High-Cost Beneficiaries

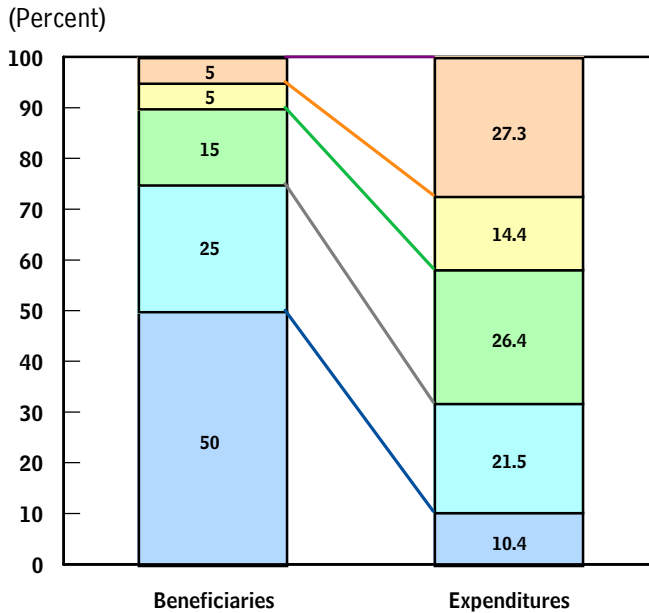
This section briefly considers three simple strategies for prospectively identifying high-cost beneficiaries on the basis of the characteristics of those beneficiaries discussed above. The first strategy is to select beneficiaries who were high cost in the previous year. The spending history shown in Figure 2 demonstrates that expenditures in the previous year are correlated with expenditures in the following year. The second strategy is to select beneficiaries who were hospitalized in the previous year based on the correlation between hospital admission and continued high spending. Both the first and second strategies would delay providing interventions until the disease had progressed and some substantial costs had already been incurred. The third strategy is to select beneficiaries who were diagnosed with two or more of seven chronic conditions: asthma, chronic obstructive pulmonary disease, chronic renal failure, congestive heart failure, coronary artery disease, diabetes, and senility. The resulting samples from the three strategies were compared with a sam-

ple of randomly selected Medicare beneficiaries. (The selection criteria for all of those strategies also required that the beneficiaries still be alive in January 1998.)<sup>12</sup>

How the strategies fared is displayed in Table 7 on page 12. The share of the Medicare population included in each of the three selected groups ranged from 17 percent to 22 percent. To make the subsequent shares of spending by the groups more comparable, CBO adjusted the size of each group (by random assignment) to match the size of the smallest original group, or 17 percent of the overall Medicare FFS population. The group with a hospital admission had the largest average spending in 1997 (at \$24,900), followed by the high-cost group (at \$23,000) and the group with multiple chronic conditions (at \$16,900). The reference group had \$6,200 in average spending. The previously hospitalized group also had the

12. The selection criteria further required that beneficiaries be enrolled in Medicare's fee-for-service sector from 1997 to 2001, enabling analysts to track their spending over the entire five-year period.

**Figure 3.**  
**Concentration of Total Cumulative Medicare Expenditures Among Beneficiaries, 1997 to 2001**



Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

largest decline in spending from 1997 (the year of the hospitalization) to 1998, with its share of total Medicare spending falling by over 20 percentage points, or by more than one-third. In contrast, the share of spending by beneficiaries with chronic conditions, as with those in the reference group, barely fell at all.

In terms of subsequent spending, beneficiaries in each of the three selection groups used more than \$46,000 in Medicare-covered services over the next four years, compared with \$27,000 for beneficiaries in the reference group. The previously high-cost group accounted for 29 percent of total Medicare spending over those four years, compared with 28 percent for beneficiaries with a prior hospitalization and 28 percent for those diagnosed with multiple chronic conditions. Those levels of aggregate spending occurred despite the fact that nearly half of the members in each group died before the end of the four-year period.

**Approaches to Managing Care for High-Cost Beneficiaries**

The three selection strategies considered above are highly stylized and conceptual illustrations, and they do not address the challenges of designing and implementing workable programs to reduce costs. However, they broadly reflect some of the approaches currently being developed and tested by various organizations. For example, the selection strategy focusing on people diagnosed with chronic conditions is similar to the approach taken by some private disease management programs.

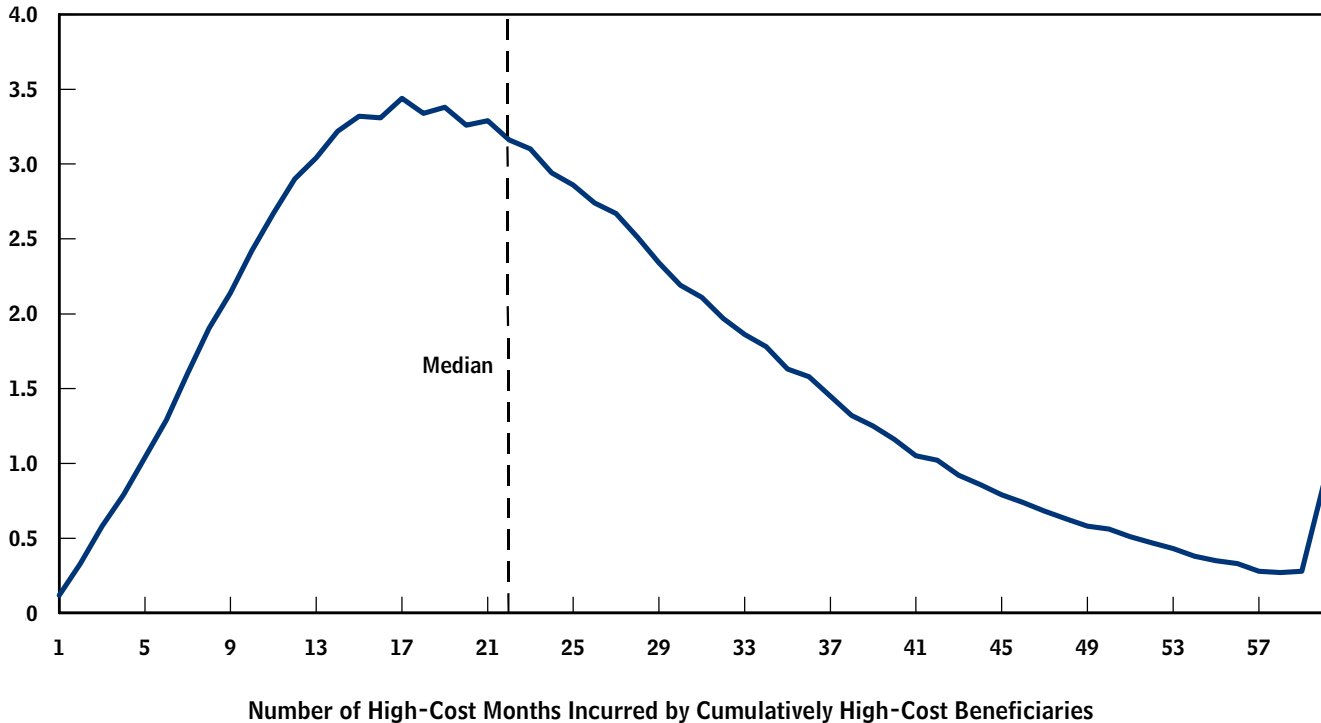
Over the past decade, many private health plans and organizations have begun to offer disease management as a model of care for chronically ill patients, in an attempt both to improve the quality of care that enrollees receive and to slow the growth of their health care costs. Disease management programs vary widely in the specific techniques and tools they use, but they share some common components that are designed to address several perceived shortcomings of current medical practice. One component is to educate patients about their disease and how they can better manage it. The goal is to encourage patients to use medication properly, to understand and monitor their symptoms more effectively, and possibly to change their behavior. A second component is to actively monitor patients' clinical symptoms and treatment plans, following evidence-based guidelines. A third component is to coordinate care among providers, including physicians, hospitals, laboratories, and pharmacies. A disease management program can provide feedback and support to physicians about patients' status between office visits as well as up-to-date information on best practices as they apply to the specific patient. Although disease management is a term sometimes used as a catchall that addresses any and all limitations of fee-for-service care, it does not encompass general care coordination or general preventive services, such as flu shots.<sup>13</sup>

Various demonstration projects and initiatives by the Centers for Medicare and Medicaid Services also focus on strategies to improve care for beneficiaries who account for large amounts of Medicare spending. For example, the Chronic Care Improvement Program was created by the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 to improve clinical care for

13. See Congressional Budget Office, *An Analysis of the Literature on Disease Management Programs* (October 2004).

**Figure 4.****Distribution of High-Cost Months Over the 1997-2001 Period**

(Percentage of beneficiaries in the top 25 percent)



Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

beneficiaries with advanced congestive heart failure and/or diabetes with significant comorbidities.<sup>14</sup> The more recent Care Management for High-Cost Beneficiaries Demonstration is designed to develop and test strategies to improve the coordination of Medicare services for high-cost FFS beneficiaries.

Identifying individuals likely to be responsible for a large share of Medicare spending merely points out the possibility of focusing on high-cost beneficiaries as a way to reduce the program's costs. Realizing those reductions in spending would ultimately rest on the ability to devise

and implement effective intervention strategies, clinical or otherwise, to change beneficiaries' use of medical services.

Initial results from disease management programs and other efforts indicate the difficulty of reducing the use of care. In certain cases, the health conditions underlying high spending may not be amenable to effective interventions. Moreover, although interventions may improve health outcomes for high-cost beneficiaries, they may lead to increases in the use of medical care. It is important to note that improving the care received by high-cost beneficiaries in itself may be a worthwhile objective, even if it fails to reduce costs.

14. Nine sites have been selected for the pilot phase of the program.

**Table 6.**

### Percentage and Number of Medicare Beneficiaries in High- and Low-Cost Spending Groups with Selected Chronic Conditions, 2001

Chronic Condition	High Cost (Top 25 Percent)		Low Cost (Bottom 75 Percent)	
	Percentage	Number (Millions)	Percentage	Number (Millions)
Chronic Obstructive Pulmonary Disease	29	2.3	10	2.4
Chronic Renal Failure	9	0.7	1	0.2
Congestive Heart Failure	30	2.4	5	1.2
Coronary Artery Disease	42	3.4	15	3.6
Diabetes	30	2.4	16	3.9

Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

**Table 7.**

### Illustrative Criteria for Targeting Future Medicare Beneficiaries in High-Cost Spending Groups

	Selection Criteria Based on the 1997 Cohort			Random Sample of Medicare Beneficiaries
	High Cost in 1997	Hospital Admission in 1997	Multiple Chronic Conditions in 1997	
Original Percentage of 1997 Cohort	25	20	19	n.a.
Percentage Alive in January 1998	22	17	17	n.a.
Adjusted Sample Size (Percent)	17	17	17	17
Spending				
Average spending in 1997 (Dollars)	22,990	24,890	16,940	6,180
Share of total 1997 spending	54.1	58.6	39.9	16.7
Share of total 1998 spending	38.1	36.9	36.1	15.9
Share of total 1999 spending	29.6	28.3	29.6	14.9
Share of total 2000 spending	25.1	24.0	25.3	13.9
Share of total 2001 spending	21.7	20.8	21.9	12.9
Average four-year cumulative spending, 1998 to 2001 (Dollars)	48,150	46,180	47,420	27,480
Average share of total Medicare spending, 1998 to 2001	28.6	27.5	28.2	14.4
Percentage of Beneficiaries				
Deceased as of December 2001	46	46	49	23

Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Services.

Notes: A chronic condition is a diagnosis of asthma, chronic obstructive pulmonary disease, chronic renal failure, congestive heart failure, coronary artery disease, diabetes, or senility in at least one month. Multiple chronic conditions comprise two or more of those seven conditions. Spending is reported in 2005 dollars.

n.a. = not applicable.