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# Chronic Conditions Among Older Americans

Chronic Illness on the Rise

How Much Do We Spend on  
Chronic Conditions?

A Closer Look at Selected Chronic  
Conditions



### CHRONIC CONDITIONS AMONG OLDER AMERICANS

In this chapter, we describe the extent of chronic illness in America and its implications for health care delivery and cost. Tremendous changes in medical science, combined with shifts in lifestyle and demographics, have resulted in a rapid rise in the number and proportion of individuals living with one or more chronic illnesses. Older Americans are especially vulnerable to chronic disease. Today more than 70 million Americans ages 50 and older—four out of five older adults—suffer from at least one chronic condition.

“More than 70 million Americans ages 50 and older—four out of five older adults—suffer from at least one chronic condition.”

The reasons for the rapid rise in chronic illness are varied. They include the aging of the population, longer life expectancies due to improvements in medical care for infectious diseases, and advances in diagnostic technology and treatment options for many chronic diseases. In addition, changes in lifestyle contribute to higher rates of chronic illnesses such as diabetes, high blood pressure, and heart disease.

The health consequences of chronic illness are extensive. People with chronic diseases often have difficulty with basic tasks such as lifting objects or walking up steps, or daily life activities such as bathing, dressing, or eating. They have significantly higher rates of hospitalization and make more emergency room (ER) visits. Their health care spending (shared among patients and payers) is higher than that for people without a chronic disease.

A closer look at particular chronic illnesses shows similar patterns—high spending, above-average use of hospital and ER visits, and presence of multiple, often related conditions. The particular strategies for successful care management of these conditions will vary with the conditions, but we see several common themes from the patterns of care and the research literature that point to the potential benefit from better coordination and support for people with chronic conditions and their caregivers.

In this chapter, we characterize the impact of various chronic conditions on individuals, their families, and their caregivers. More comprehensive studies of all chronic conditions have been undertaken by other authors (see, for example, Anderson, Horvath, Knickman, Colby, Schear, & Jung, 2002; Centers for Disease Control and Prevention [CDC], 2004; Centers for the Evaluative Clinical Sciences and Dartmouth Medical School, 2006; Alliance for Aging Research, no date). Most of the data and statistics on chronic illness presented in this chapter come from analyses using the 2005 Medicare Expenditure Panel Survey (MEPS)<sup>1</sup> and 1997 and 2006 Medicare claims data.<sup>2</sup> These analyses were conducted by researchers at the Johns Hopkins

Bloomberg School of Public Health. All references to the 2005 MEPS or 2006 Medicare data indicate findings derived from those analyses. Other data sources are referenced as appropriate.

### WHAT IS CHRONIC ILLNESS?

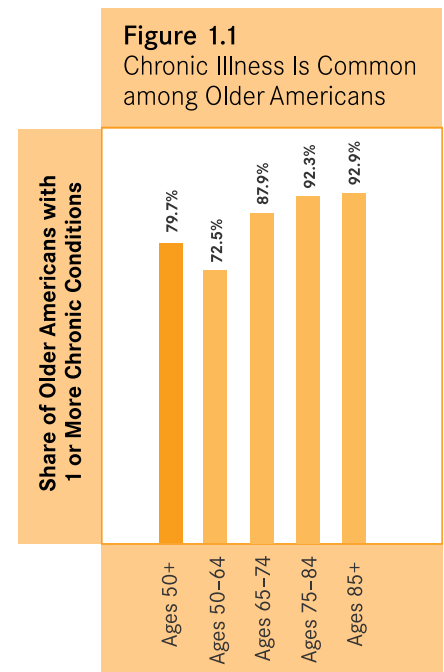
Chronic illnesses are ongoing (usually lasting a year or more), generally incurable illnesses or conditions that require ongoing medical attention and affect a person's daily life (Hwang, Weller, Ireys, & Anderson, 2001; Anderson & Horvath, 2004; National Center for Health Statistics, 2008). Chronic diseases are often preventable. They are managed with good health care from clinicians and care of their own conditions by people, with help from family members and other informal caregivers. Some of the most prevalent and costly chronic diseases include arthritis, asthma, cancer, cardiovascular (heart) disease, depression, and diabetes, though these are only a few of many illnesses that lower the quality of life of Americans.

### CHRONIC ILLNESS ON THE RISE

The latter half of the 20th century was a time of tremendous advances in treating infectious diseases and extending life for all Americans. One side effect of this success is that more Americans ages 50 and older are living with chronic

conditions, often for many years. Changes in the way Americans live, eat, work, and play contribute to increased prevalence of chronic conditions like diabetes, high blood pressure, and heart disease, while improved treatments for such conditions as cancer and congestive heart failure extend life expectancy. A major challenge for our health care system in the 21st century is developing better ways of caring for people with chronic illness.

Today, the statistics on chronic disease are staggering (AHRQ, 2005) (Figures 1.1 and 1.2):



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.

**Note:** Data do not include people who live in institutions.

- More than 70 million Americans ages 50 and older—four out of five older adults—suffer from at least one chronic condition.
- More than half of older adults have more than one chronic condition, and 11 million live with five or more chronic conditions.
- Over 40 percent of all older Americans have high blood pressure, and more than one in four has high cholesterol.
- Almost 20 percent of older Americans suffer from some sort of mental illness.
- Almost 15 percent have diabetes.

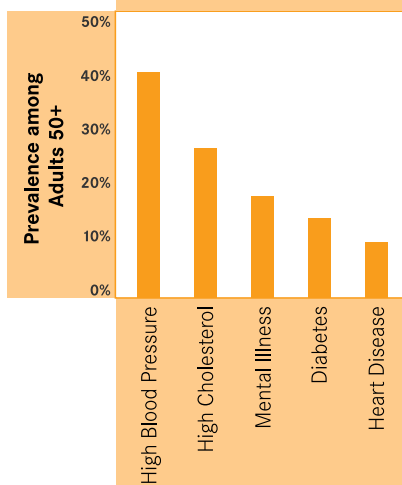
Chronic disease is an increasing burden for older Americans (Figure 1.3):

- The prevalence of diabetes among adults ages 65 and older increased by more than 50 percent between 1997 and 2006 (CMS, 1997, 2006).
- The prevalence of mental illness increased almost 70 percent.<sup>3</sup>
- All told, the share of Medicare beneficiaries with five or more conditions increased from about 30 percent in 1987 to more than 50 percent in 2002 (Thorpe & Howard, 2006).

## WHY ARE CHRONIC CONDITIONS A GROWING PROBLEM?

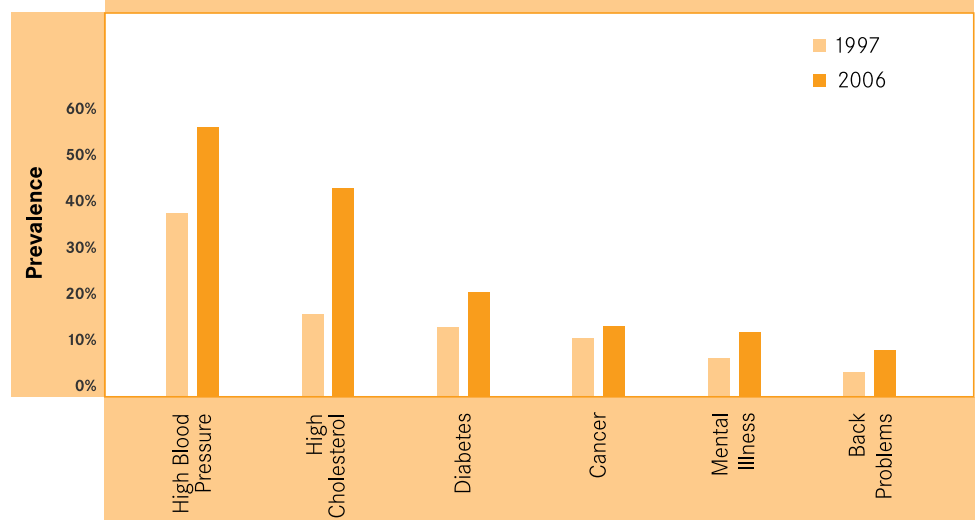
What explains the growing prevalence of many chronic diseases? Several factors are at work. Longer life expectancy is one key factor. The aging of the population also contributes to higher rates of chronic disease. Advances in treatment for chronic illness lead to more people being screened and diagnosed with disease, while changes in clinical practice have broadened the definitions for many chronic conditions. Finally, lifestyle factors, including smoking, changes in exercise habits, and the growing

**Figure 1.2**  
Some Conditions Are Very Common among Older Americans



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.  
**Note:** Data do not include people who live in institutions.

**Figure 1.3**  
Many Chronic Conditions Are on the Rise among Medicare Beneficiaries 65+



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.

**Note:** Prevalence figures shown here are based on Medicare claims data and vary significantly from prevalence data drawn from MEPS data. Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

prevalence of obesity contribute to higher rates of chronic illness.

Longer life expectancy is one important reason why more Americans are developing chronic illness. Improved health care for many acute illnesses and diseases helps to keep people alive longer, thereby raising the chance for them to develop a chronic disease while allowing them to live longer when they do. In the early 1900s the leading causes of death included infectious diseases such as tuberculosis, diphtheria, nephritis, and bronchitis. Today, these diseases have been largely eradicated or are easily treated. Noncommunicable diseases (including many chronic diseases), which accounted for less than 20 percent of deaths in 1900, now

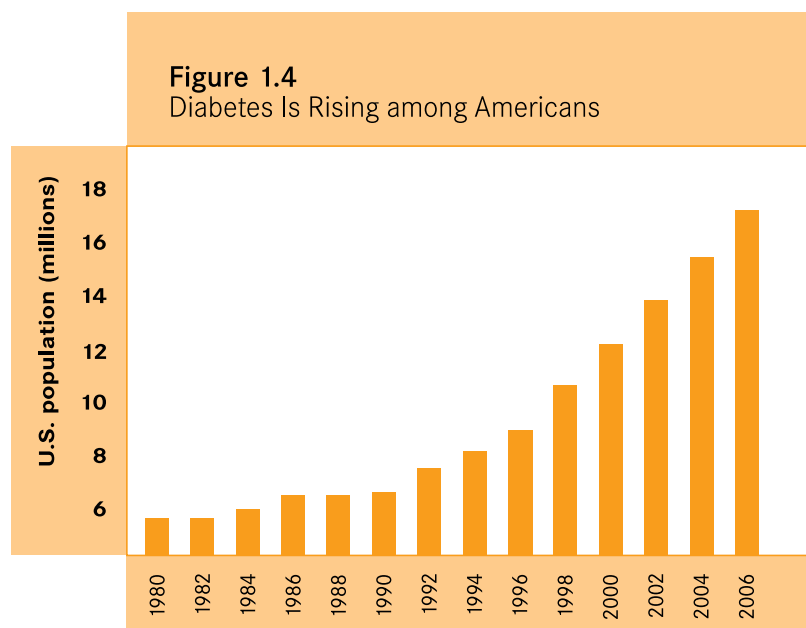
account for more than 80 percent of deaths (Steinbrook, 2004).

As the population ages, we see higher rates of chronic illnesses that appear later in life.

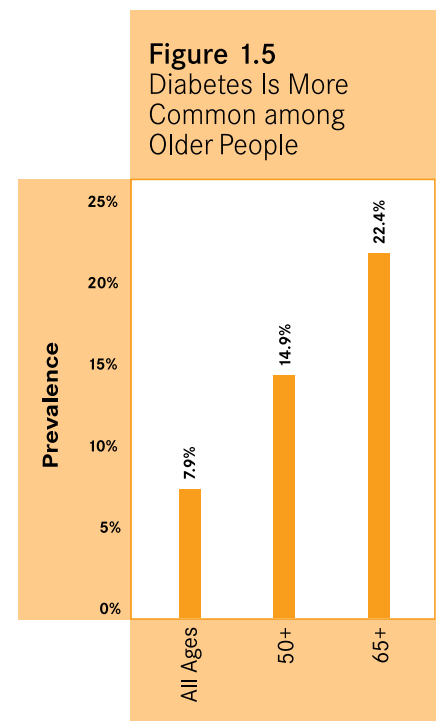
An example of a condition more likely to affect older individuals is diabetes, particularly type 2 diabetes, which typically begins in adulthood and is often associated with obesity. Diabetes, especially type 2, disproportionately affects people over 50 with a prevalence of almost 15 percent in 2005 (Figure 1.4; AHRQ, 2005). Diabetes prevalence (a measure of how common a disease is among the population) rises with age and has increased over time (Figure 1.5). Among Medicare beneficiaries over 65 in the traditional fee-for-

service program, the prevalence was over 22 percent in 2006, up from 14.9 percent in 1997, an increase of over 50 percent. Similarly, the prevalence rate for hypertension also increases with age (CDC, National Center for Health Statistics, 2007). Middle-age Americans (ages 55–65) face a lifetime risk of 90 percent of developing hypertension at some time during the rest of their lives (Vasan et al., 2002).

Another factor contributing to the rise of chronic disease is greater



**Source:** CDC Diabetes Surveillance System.  
**Note:** Includes all forms of diagnosed diabetes.



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data, 2006, and Medical Expenditure Panel Survey, 2005.

**Note:** Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

awareness by both providers and the public, coupled with advances that make treating the diseases easier. Treatment advances allow providers to diagnose illness and identify people who might be helped by medications or therapies, while public awareness of chronic conditions leads to more people requesting testing and treatment. For instance, public awareness of hypertension has increased from about 50 percent of the population in 1976 to 70 percent in 2000 (National Institutes of Health, National Heart, Lung, and Blood Institute, 2003). Increasing awareness has encouraged greater diagnosis and treatment of hypertension.

Other factors have also expanded the percentage of the population who are either potentially or actually under treatment for hypertension and influenced the age at which hypertension may first be detected. Changes in clinical practice have contributed to an increase in the reported prevalence of hypertension (Joint National Committee, 2003). Guidelines for diagnosing hypertension have been changing, leading prescribers to treat less severe forms of the condition (Ostchega et al., 2007). Although anti-hypertensive drugs have been available for years, newer medications for high blood pressure have become available and they have fewer side effects and greater convenience (Staessen, Wang, & Lutgarde, 2001). As a result, from 1997 to 2006, the percentage of Medicare beneficiaries over 65 who have been diagnosed with hypertension has increased by almost 50 percent (39.5 percent vs. 58.1 percent).

High cholesterol presents a similar case. The advent of statins in the early 1990s offered more effective treatments for high cholesterol with fewer side effects.<sup>4</sup> As the benefits of statins became better proven, they became more widely known. Public awareness of high cholesterol increased from less than 40 percent of the population before 1988 to more than 60 percent by 2004 (Hyre et al., 2007). Greater awareness among providers and the public encouraged more diagnosis and treatment of high cholesterol. In addition, changing treatment guidelines (e.g., lower target levels for low density lipoproteins, or LDL cholesterol), clinical practice patterns (e.g., more intensive management of high-risk patients), and the availability of generic versions of these medications accelerated these trends (National Cholesterol Education Program Expert Panel, 2001). As a result, from 1997 to 2006, the percentage of Medicare beneficiaries over 65 who have been diagnosed with high cholesterol has increased by more than 150 percent (17.7 percent vs. 44.9 percent).

Finally, high rates of smoking, obesity, and unhealthy behaviors contribute to increased rates of several chronic illnesses, including COPD,<sup>5</sup> diabetes, and cancer. Researchers estimate that obese people have 67 percent more chronic conditions than normal-weight individuals, while smoking increases chronic illness by 25 percent (RAND Health, 2002). With obesity rates growing rapidly (by more than 60 percent between 1991 and 2000), the prevalence of chronic illness will continue to rise.

People with chronic illness today report being in better health than people 20 years ago. In part due to early diagnosis, people on Medicare who are treated for five or more conditions reported being in good or excellent health in nearly 60 percent of cases in 2002, almost double the 33 percent of cases reporting similar health status in 1987 (Thorpe & Howard, 2006).

Not all chronic illnesses are on the rise. The prevalence (unadjusted for age or sex) of some chronic conditions has not changed substantially or has even decreased over the past decade. Some conditions that are becoming less prevalent include congestive heart failure (down 4.4 percent between 1997 and 2006), dementia (down 10.0 percent), hip fracture (down 0.9 percent), and kidney disease excluding end-stage renal disease (ESRD) (down 4.9 percent) (CMS, 1997, 2006).

### WHO IS MOST LIKELY TO HAVE CHRONIC DISEASE?

Chronic illness affects everyone, but some demographic groups are especially vulnerable. Older Americans are more likely to suffer from certain chronic illnesses, while minorities are at greater risk for conditions like diabetes, stroke, and high blood pressure. Many 50+ Americans with chronic diseases are low-income older adults.

It is not surprising that the burden of chronic illness grows as a person ages. While just under half of Americans ages 50–64 have a chronic condition, nine out of 10 Americans ages 75 and older have at least one, and more than 20 percent suffer from five or more chronic illnesses. The rates of heart disease, high blood pressure, cancer, and mental illness are all higher in older age cohorts. The risk of heart disease is three times higher in someone 75+ than in a person ages 50–64. Similarly, the risk of high blood pressure is 66 percent higher for those 75 to 84 years old than for those 50 to 64 years old.

Interestingly, the “oldest old,” those ages 85 and above, are not significantly sicker than those ages 75–84, a finding that other researchers have attributed to survival of the healthiest individuals. Dementia

is an important exception to this pattern: the risk of dementia rises steadily with age, from a prevalence of less than 1 percent in adults ages 50–64 to 16 percent in those ages 85 and above (AHRQ, 2005).

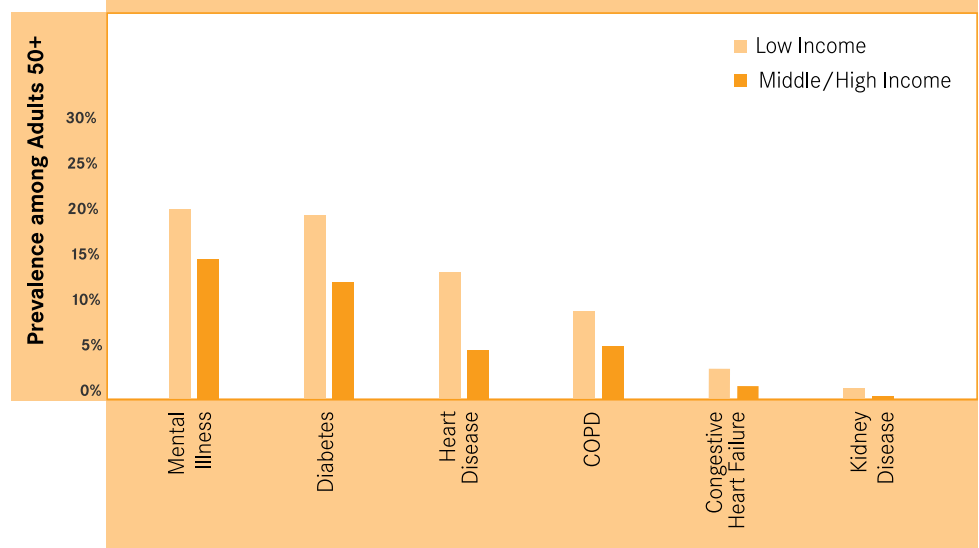
Not all chronic illnesses are so closely associated with increased age. Kidney disease, rheumatoid arthritis, and COPD are examples of chronic conditions that often afflict individuals younger than 50 and do not become significantly more prevalent with age.

The burden of chronic disease is greater for low-income older adults who have higher rates of many conditions, including kidney disease, congestive heart failure,

heart disease, mental illness, and diabetes, than for middle- or upper-income older adults (Figure 1.6).

Minorities also bear a disproportionate burden of certain chronic diseases, including high blood pressure, diabetes, and stroke. These conditions are associated with a number of complications that can impact physiological, functional, and cognitive well-being. In 2005, African Americans over age 50 were about twice as likely as whites to have diabetes, while older Hispanics had a 78 percent higher prevalence of the disease than whites. Diabetes-related mortality rates for African Americans,

**Figure 1.6**  
Many Chronic Diseases Are More Common among Low-Income Seniors



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.

**Note:** Data do not include people who live in institutions.



Hispanic Americans, and American Indians are higher than those for non-Hispanic whites.

Minorities are also more likely to suffer from diabetes-related complications such as kidney disease, lower limb amputation, and retinopathy.<sup>6</sup> These are the very outcomes that better care coordination and preventive services are designed to reduce or eliminate.

For example, Mexican Americans are 4.5 to 6.6 times and non-Hispanic blacks are 2.6 to 5.6 times more likely to experience diabetes-related end-stage renal disease than their white counterparts (American Diabetes Association, no date). The same two groups are also 1.8 times (Mexican Americans) and 2.7 times (non-Hispanic blacks) more likely to experience diabetes-related amputations (American Diabetes Association, no date). Mexican Americans are almost twice and non-Hispanic blacks are almost 50 percent more likely to develop vision problems related to diabetes as non-Hispanic whites (American Diabetes Association, no date).

Stroke is another condition that disproportionately affects African Americans. The prevalence of stroke is almost double for older African Americans (4.6 percent) compared with whites (2.4 percent). Older Hispanics have a lower rate of stroke (1.9 percent) than other

ethnic groups. The death rate from stroke per 100,000 is 48.1 for white males, 47.2 for white females, 74.9 for black males, and 65.5 for black females (Rosamond et al., 2008).

### WHAT DO CHRONIC CONDITIONS DO TO HEALTH?

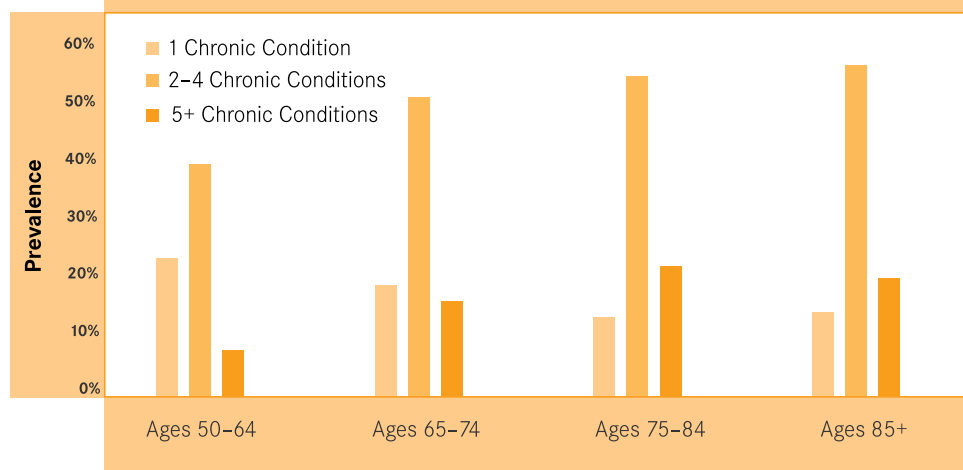
What does it mean to have a chronic condition? The consequences of chronic disease include increased health risks, reduced quality of life, and greater financial costs for people and those who help pay bills (Medicare, Medicaid, insurance companies, and employers).

Chronic illness is rarely confined to a single disease. About 20 percent of the 50+ population has just one chronic condition, while about

32 percent of the 50+ population has between two and four chronic illnesses. Almost 7 percent of older Americans suffer from five or more chronic conditions. The risk of having multiple conditions increases with age. While the risk of having any chronic conditions increases from 70 percent to 92 percent between ages 50 and 85+, the risk of having five or more chronic conditions almost triples, from 8 percent for those ages 50–64 to 21 percent for those ages 85+ (Figure 1.7).

In addition, some chronic illnesses carry a higher risk of co-morbidity than other conditions. People with congestive heart failure, kidney disease, and stroke are much more likely to have five or more other

**Figure 1.7**  
Many Older Americans Have Multiple Chronic Conditions



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.

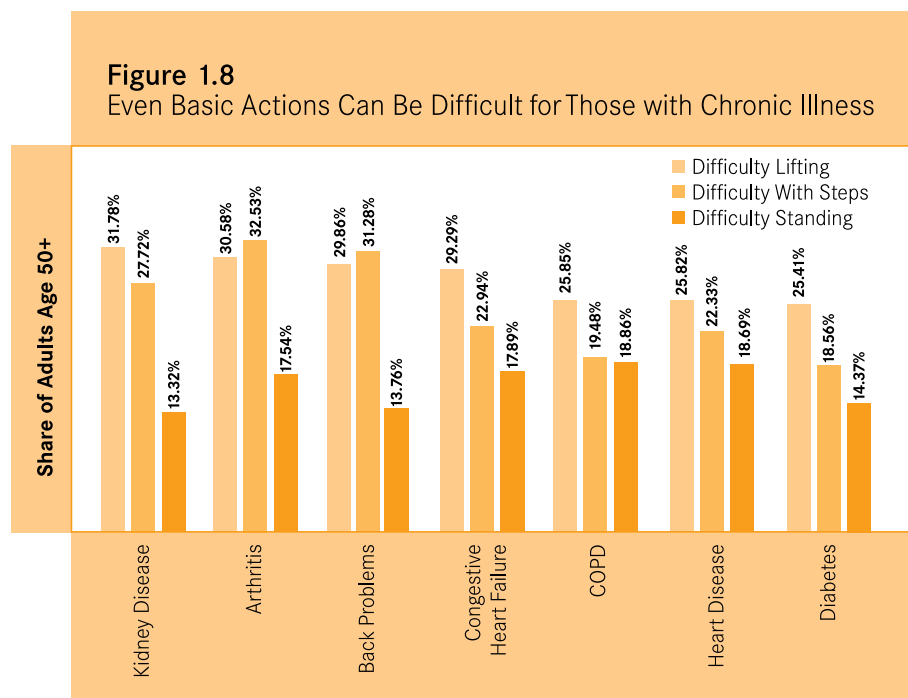
**Note:** Data do not include people who live in institutions.



chronic conditions than people with arthritis, mental illness, or cancer.

Chronic illness takes a toll on many of the core functions and activities of daily life. People with chronic illness often need help performing basic activities of daily living, or ADLs, like bathing, eating, dressing, toileting, or getting out of bed or a chair. One-third of people with kidney disease require assistance with at least one of these ADLs. Other tasks, such as standing for extended periods, lifting, or going up steps, also become more difficult for those with chronic conditions. More than half of people with congestive heart failure, dementia, arthritis, kidney disease, or back problems have difficulty with at least one core function (Figure 1.8; AHRQ, 2005).

Older Americans with a chronic condition are far more likely to be hospitalized than the average population ages 50+. Overall, only about one in 10 older Americans has a hospital stay in a given year. In contrast, about half of those with kidney disease have a hospitalization, and more than 40 percent of those with congestive heart failure are hospitalized annually. Even high blood pressure, back problems, and high cholesterol increase the risk of hospitalization. Not surprisingly, most at risk are those with multiple chronic conditions. For a person



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.

**Note:** Data do not include people who live in institutions.

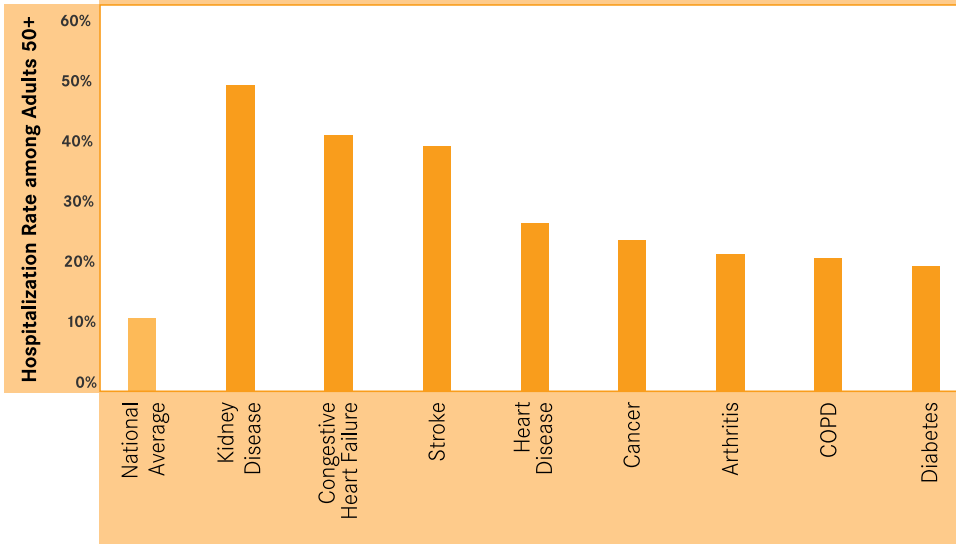
with COPD, for example, the likelihood of being hospitalized during the year is about seven times greater for a patient with five or more conditions than for a patient who has only COPD. A diabetic with five or more chronic conditions is twice as likely as a diabetic with only one or two conditions to be hospitalized (Figure 1.9; (AHRQ, 2005).

In addition to raising the risk of hospitalization, chronic illness leads to higher rates of home health care use, clinician visits, and medication use. While only about 6 percent of older Americans use home health care during a year on average, about a quarter

of people with congestive heart failure or kidney disease use home health, and more than 10 percent of people with COPD, diabetes, stroke, mental illness, cancer, heart disease, or arthritis require such care in a year (AHRQ, 2005).

Ultimately the health consequences of chronic disease add up to lower life expectancy. A person who reaches age 65 without a chronic condition can expect to live another 22 years—to about age 88. In contrast, a person who reaches age 65 with one or two chronic conditions can expect to live another 20 years, while a person with three or more chronic conditions can expect to live

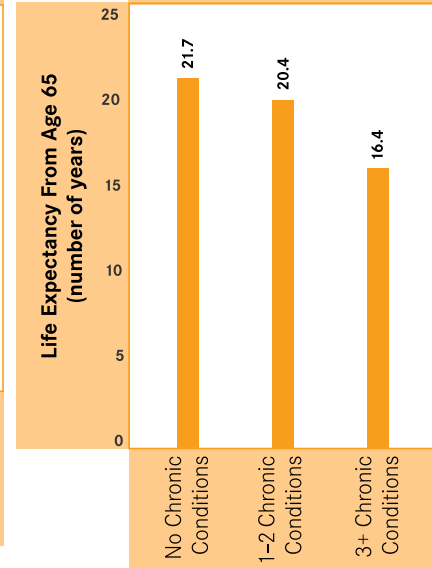
**Figure 1.9**  
Chronic Conditions Lead to Higher Risk of Being Hospitalized



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.

**Note:** Data do not include people who live in institutions.

**Figure 1.10**  
Chronic Illness Reduces Life Expectancy



**Source:** Joyce, Keeler, Shang, & Goldman, 2005.

another 16 years, to about age 81 (Figure 1.10; Joyce, Keeler, Shang, & Goldman, 2005).

#### HOW MUCH DO WE SPEND ON CHRONIC CONDITIONS?

Chronic conditions are costly for patients, payers, and public programs. Average health care spending for Americans 50+ was about \$6,400 in 2005. Spending for those who had no chronic illnesses averaged \$1,425, while spending on people with five or more conditions averaged almost \$16,000 (Figure 1.11; AHRQ, 2005).<sup>7</sup> For older Americans with kidney disease, average spending was more than \$37,000, almost six times the overall average for Americans

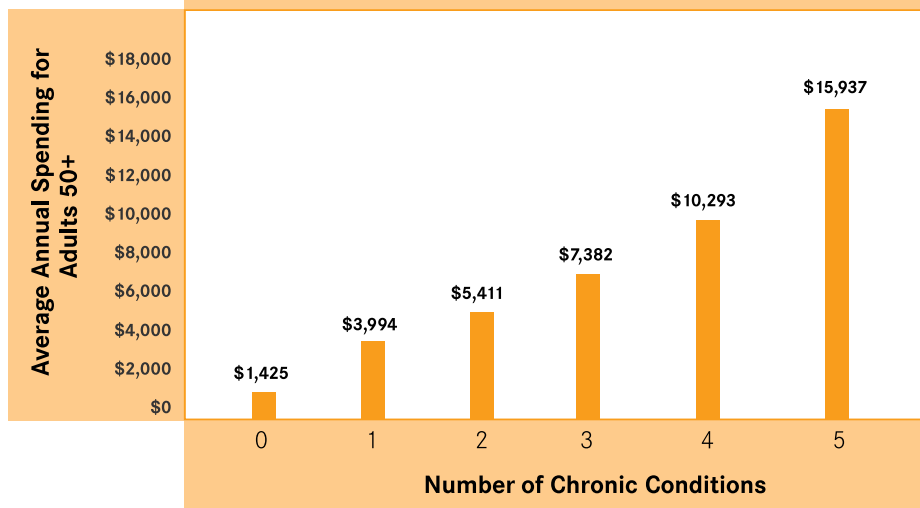
ages 50+. Even people with high cholesterol and high blood pressure have spending that is 30 percent or more above the national average. Nine of the top 10 highest-cost health conditions in the United States are chronic,<sup>8</sup> and 85 percent of all health care spending in 2004 was for people with chronic conditions (Figure 1.12).

Following trends in utilization, spending is closely associated with the number of chronic conditions a person has. With the exception of cancer, average annual spending among people with four or more other conditions is far higher than average spending for those with no other conditions. Among

people who have suffered a stroke, more than 60 percent of annual group spending is concentrated in those who have five or more other conditions that compound the difficulties of stroke recovery. Spending for congestive heart failure, kidney disease, back problems, and COPD is also highly concentrated on those people who have multiple chronic conditions. An exception to the general rule of more conditions leading to higher spending is cancer, where average spending is fairly equal across all people, regardless of the total number of chronic conditions. This may be due to the high cost of cancer treatments

**Figure 1.11**

Health Spending Increases with the Number of Chronic Illnesses

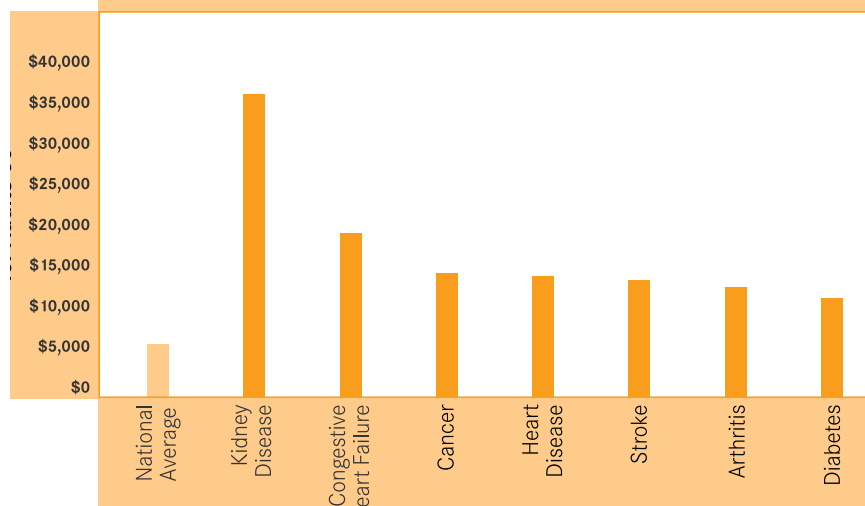


**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.

**Note:** Data do not include people who live in institutions.

**Figure 1.12**

Health Care Spending for Older Americans with Selected Chronic Conditions Is Higher Than Average



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medical Expenditure Panel Survey, 2005.

**Note:** Data do not include people who live in institutions.

such as chemotherapy, radiation, and pharmaceuticals.

These costs add up quickly. Total health care spending for a person with one or two chronic conditions at age 65 is about \$14,500 (in 2005 dollars) more than a person who has no chronic conditions at age 65. Total spending for someone with three or more chronic conditions at age 65 will be more than \$41,000 more, even after accounting for the shorter life expectancy associated with having multiple chronic conditions. How much a particular condition adds to total spending depends both on the cost of treatment and the impact that disease has on life expectancy. Over a lifetime, diabetes is more costly than cancer (\$15,052 in additional spending vs. \$13,503), and high blood pressure is more expensive than stroke (\$11,143 vs. \$4,397) (Figure 1.13) (Joyce, Keeler, Shang, & Goldman, 2005).

In the Medicare program, treatment for hypertension cost \$163 billion in 2006.<sup>9</sup> Per-patient spending for the most costly conditions has increased by between 20 percent and 36 percent over the last decade, and total program spending for these conditions has increased by between 32 percent and 81 percent (Table 1).

## A CLOSER LOOK AT SELECTED CHRONIC CONDITIONS

Researchers have observed that people with multiple chronic conditions are high users of health care services and account for a disproportionate share of health care spending (Wolff, Starfield, & Anderson, 2002). But these high figures mask different patterns in spending and health care needs that follow from different clinical needs for different illnesses, severity of illness, and stage of illness. Nonclinical factors, such as functional ability, family support, informal caregiver availability, financial circumstances, and community support services, also influence people's ability to manage their condition(s).

To explore this variation, we look at patterns of care for specific conditions and groups of related chronic conditions to identify how people with chronic conditions use health care services and where there might be opportunities for improving coordination of services for these people. In Chapter 4, we describe models of care for chronic diseases that attempt to address the issues identified here, and discuss the barriers to more widespread adoption of innovative models of care for chronic illness.

**Table 1. Top Chronic Conditions for Medicare 65+ Based on Aggregate Cost, 2006**

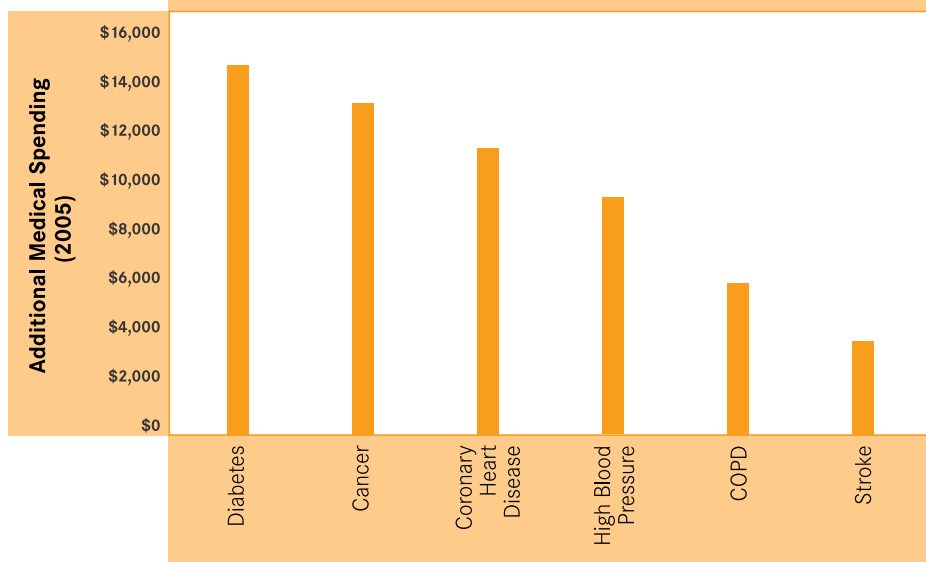
Chronic Condition	Parts A & B Total cost	Change (1997–2006)	Parts A & B Cost/Case	Change (1997–2006)
Hypertension	\$163.2 B	81%	\$10,653	21%
Heart Disease (other)	\$130.4 B	65%	\$15,358	24%
Cholesterol	\$104.3 B	52%	\$ 8,820	36%
Arrhythmias	\$74.9 B	37%	\$19,509	24%
Diabetes	\$74.6 B	37%	\$12,643	20%
CHF	\$72.2 B	36%	\$25,841	31%
Mental Conditions	\$71.3 B	36%	\$19,624	26%
COPD	\$63.9 B	32%	\$18,511	27%

Source: Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.

Note: Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

**Figure 1.13**

Additional Lifetime Medical Spending for Medicare Beneficiaries with Chronic Conditions at Age 65



Source: Joyce, Keeler, Shang, & Goldman, 2005.

Note: Shows the additional spending for that condition compared with no disease.

## CHRONIC BONE CONDITIONS

Many people over 50 have a chronic bone condition such as osteoporosis, back problems, or arthritis. People with a chronic bone condition are often affected by more than one bone condition and may have other chronic conditions as well. The prevalence of chronic bone conditions has increased substantially among Medicare beneficiaries over 65 in

the traditional program from 1997 to 2006 (Figure 1.14).

To some extent, these conditions may be related to each other. For instance, osteoporosis may lead to back problems and can lead to acute and sometimes catastrophic events, like a hip fracture. Arthritis, both osteoarthritis and rheumatoid arthritis,<sup>10</sup> can cause joint pain and stiffness and may limit mobility and function. Without proper medical care, rheumatoid arthritis causes permanent disability in three to five years among 20 percent to 30 percent of people who have the disease and reduces

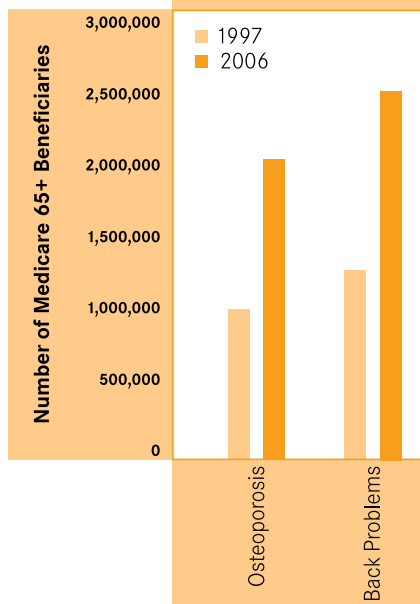
life expectancy by as much as 15 years (*New York Times*, 2008).

Over the long term, in an effort to reduce pain and increase mobility, many people with osteoarthritis and rheumatoid arthritis undergo risky and expensive artificial joint replacements, such as hips and knees.

People with a primary diagnosis of one of these chronic bone conditions use many health services.

As shown in Figure 1.15, more than 40 percent of people with chronic bone conditions tend to have ER visits and hospital admissions,

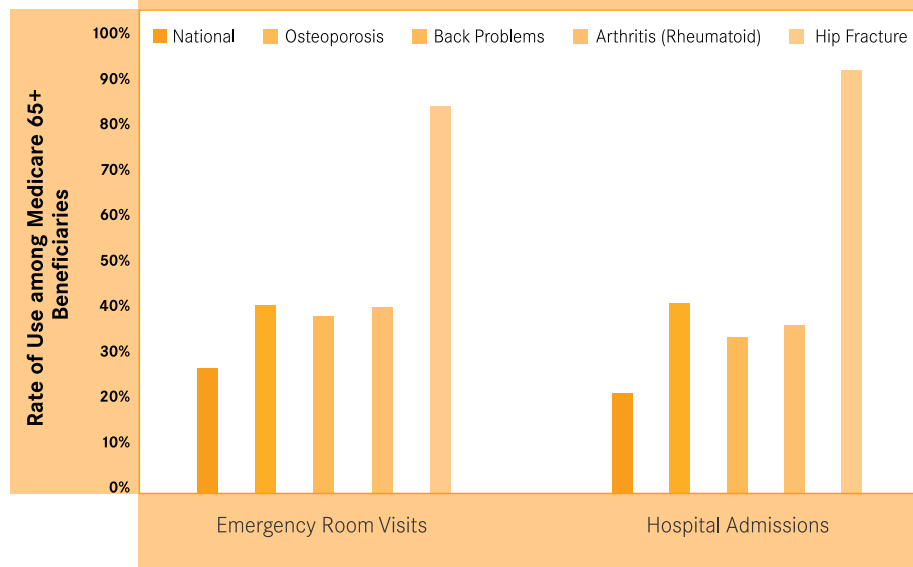
**Figure 1.14**  
Chronic Bone Conditions Becoming More Common among Medicare Beneficiaries 65+



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.

**Note:** Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

**Figure 1.15**  
People with Chronic Bone Conditions Have Higher Than Average ER and Hospital Use



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.

**Note:** Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

compared with fewer than 30 percent for the national average of Medicare beneficiaries over 65 in the traditional program.

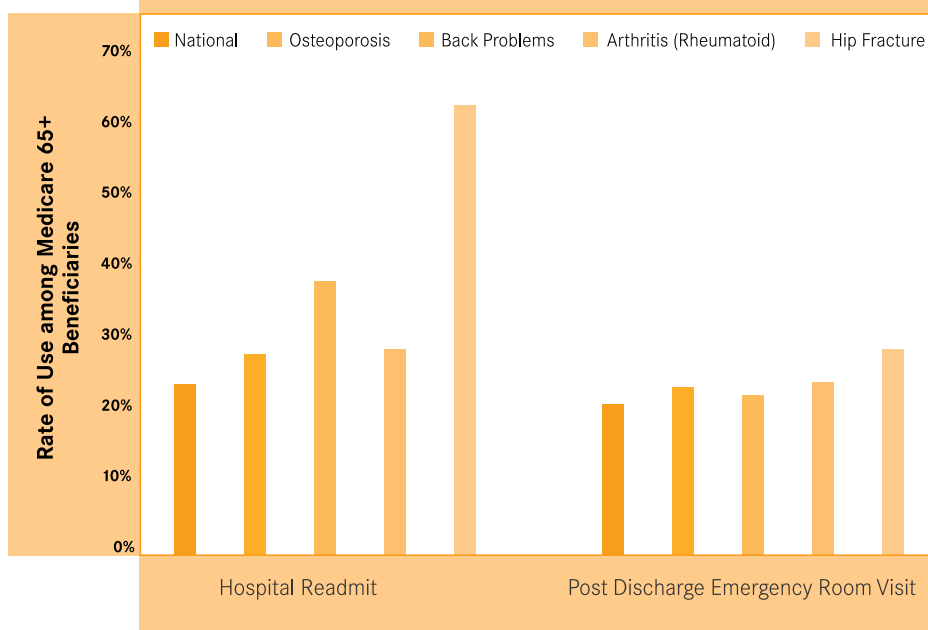
In some cases, appropriate care management and coordination may reduce the need for back surgery, hip fracture repair, and joint replacement. Some encounters with the health care system, such as ER visits soon after discharge and rehospitalizations, could be avoided entirely. Appropriate diagnosis, treatment, and management of osteoporosis and osteoarthritis or rheumatoid arthritis can influence the course of these chronic conditions by slowing or arresting bone deterioration, loss of mobility, and pain associated with these chronic conditions (Arthritis Foundation, [www.arthritis.org](http://www.arthritis.org); National Osteoporosis Foundation, [www.nof.org](http://www.nof.org)). In some cases, it may be possible to reduce serious complications associated with these conditions, such as fractures, through preventive measures, such as fall reduction programs. Falls account for 10 percent of ER visits and 6 percent of hospitalizations among people over 65. A recent study found that a combination of risk assessment, patient education, and adjustments in treatment could substantially reduce the risk of serious falls, fractures, ER visits, and hospitalization (Tinetti et al., 2008).

As indicated in Figure 1.16, 39 percent of Medicare beneficiaries over age 65 with back problems who were hospitalized were readmitted within 30 days, and 23 percent had an ER visit within 30 days of discharge. However, only 70 percent of these people had a clinician visit within 30 days of discharge. These relatively high readmission and return ER visit rates suggest that some of this care could have been provided in more appropriate settings, such as a provider's office or clinic, or avoided entirely.

Targeting people with chronic bone conditions for more intensive clinical management and care coordination may offer opportunities to improve outcomes and find savings. For instance, a study comparing management of care for people with rheumatoid arthritis found that the cost of care delivered by a clinical nurse specialist was lower with the same clinical outcomes for care as that delivered by a multidisciplinary team in an inpatient hospital setting or an outpatient setting (van den Hout et al., 2003).

**Figure 1.16**

People with Chronic Bone Conditions Have Higher Than Average Potentially Avoidable Encounters



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.

**Note:** Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

## OSTEOPOROSIS

Osteoporosis, or “weak bones,” is a chronic condition characterized by low bone mass and structural deterioration of bone tissue leading to bone fragility and increased susceptibility to fractures (National Osteoporosis Foundation, [www.nof.org](http://www.nof.org)). It is estimated that osteoporosis affects about 10 million Americans over age 50, and another 34 million have low bone mass. Osteoporosis is a silent disease until a fracture occurs. About one in two women and one in four men over 50 will have an osteoporosis-related fracture during their remaining lifetimes. Fractures due to osteoporosis are most likely to occur in the hip, spine, and wrist, but any bone can be affected (Office of the Surgeon General, 2004).

Among Medicare beneficiaries over age 65, about 8 percent had a primary diagnosis of osteoporosis in 2006, up from about 4 percent in 1997. It is unclear how much of this increase may have been related to increased incidence of disease and how much may have been related to increased awareness and treatment. In 2006, about 65 percent of people on Medicare with osteoporosis had five or more chronic conditions (including osteoporosis). People with osteoporosis were more commonly affected by other bone-related problems. For example, these beneficiaries were 1.7 times more likely to have osteoarthritis and 1.5 times more likely to have back problems than average (CMS, 2006). People with bone-related problems often have

other conditions, such as COPD, cancer, rheumatoid arthritis, or kidney disease, that may lead to or aggravate osteoporosis by depleting calcium or otherwise upsetting the balance of bone regulatory hormones (Office of the Surgeon General, 2004).

People with osteoporosis use many health services (see Table 2). Experts have suggested that health professionals can take a number of steps to improve bone health, such as identifying and treating people at high risk for bone disorders and educating people about how to prevent and manage bone disease (Office of the Surgeon General, 2004).

**Table 2. Medicare Utilization and Spending for Chronic Conditions, 2006**

	Office Visits (Avg. number)	ER Visits (proportion)	Hospital Admissions (proportion)	Average Length of Stay (days)	Readmissions within 30 days (proportion)	ER Visits within 30 days of Discharge (proportion)	Average Medicare Spending per Case (dollars)	Total Medicare Spending on Condition (dollars)
<b>National Average</b>	17.3	27.5%	22%	2.2	24%	21%	\$7,613	n/a
<b>Osteoporosis</b>	26	41%	38%	4.0	28%	24%	\$12,816	\$27 billion
<b>Hip Fractures</b>	46	85%	93%	18.5	64%	29%	\$45,600	\$558 million
<b>Arrhythmia</b>	34	55%	54%	7.0	31%	29%	\$19,500	\$75 billion
<b>Stroke</b>	32	55%	56%	9.8	35%	29%	\$21,000	\$31 billion
<b>Cancer</b>	29	36%	34%	3.8	27%	24%	\$14,000	\$57 billion

Source: Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.

Note: Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.



## CHRONIC CARDIOVASCULAR CONDITIONS

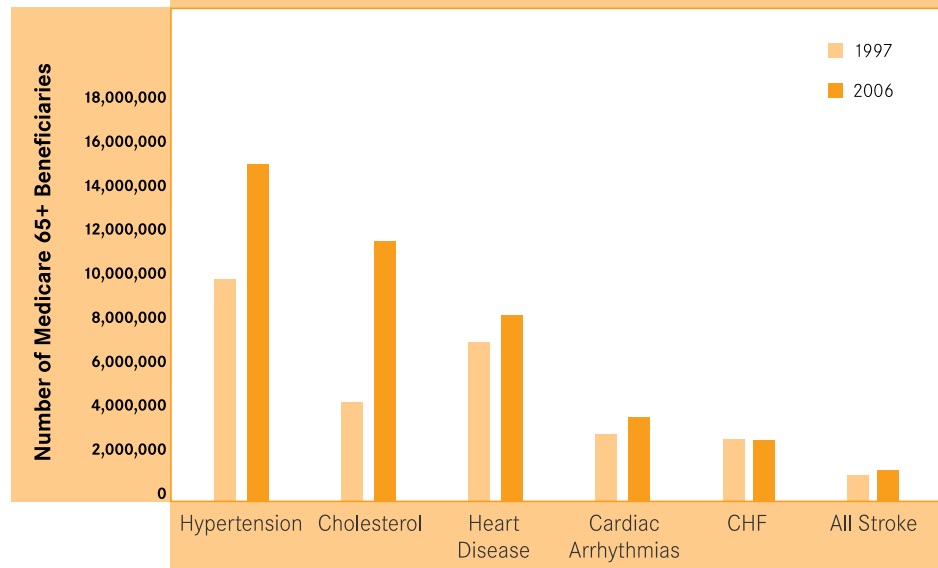
Chronic cardiovascular conditions, such as hypertension, high cholesterol, congestive heart failure, cardiac arrhythmias, other heart disease, and stroke, also affect many people over 50. People are often affected by more than one cardiovascular condition. The number of Medicare beneficiaries over 65 with chronic cardiovascular conditions increased substantially from 1997 to 2006 (Figure 1.17).

These conditions are sometimes related to each other. For instance, hypertension may lead to heart disease, heart attack, and stroke. Cardiac arrhythmias can also lead to stroke, heart failure, and sudden death (National Heart, Lung, and Blood Institute, Diseases and Conditions, [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)).

As shown in Figures 1.18 and 1.19, people with some chronic cardiovascular conditions (i.e., congestive heart failure, arrhythmias, other heart disease, and stroke) are more likely to have ER visits and hospital admissions, compared with the national average of Medicare beneficiaries over 65 in the traditional program.

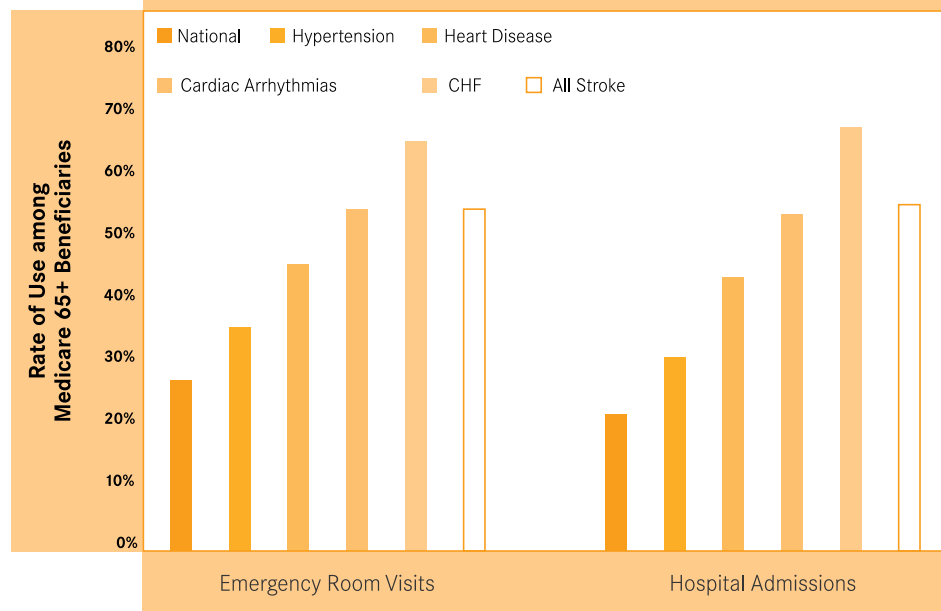
Appropriate diagnosis, treatment, and management of chronic cardiovascular conditions can influence the course of these chronic conditions. As we

**Figure 1.17**  
Chronic Cardiovascular Conditions Are Becoming More Common among Medicare Beneficiaries



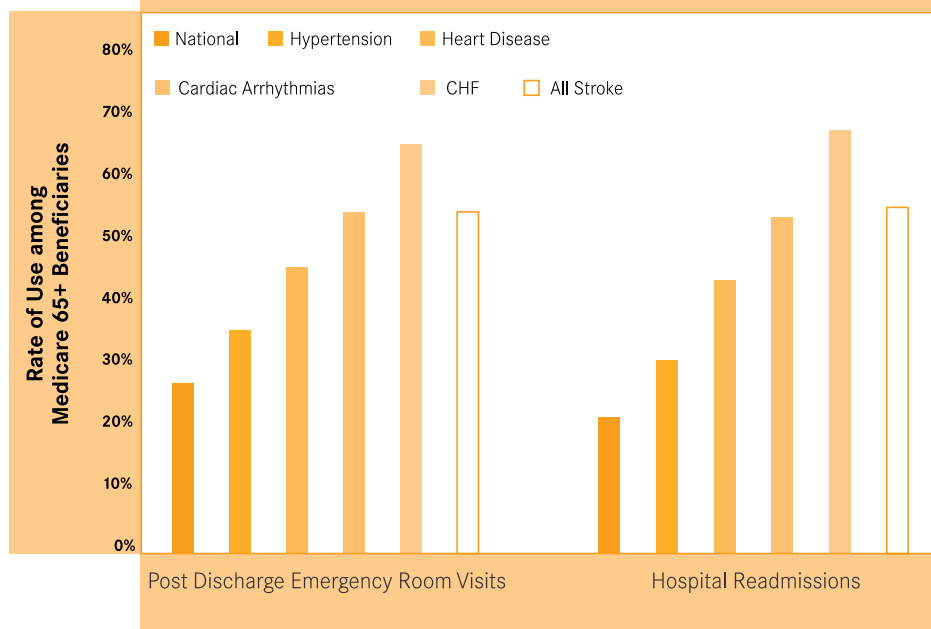
Source: Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.  
Note: Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

**Figure 1.18**  
People with Chronic Cardiovascular Conditions Have Higher Than Average Emergency Room and Hospital Use



Source: Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.  
Note: Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

**Figure 1.19**  
People with Chronic Cardiovascular Conditions Have Higher Than Average Potentially Avoidable Encounters



**Source:** Johns Hopkins Bloomberg School of Public Health analysis of Medicare claims data.

**Note:** Medicare claims data are derived from 5 percent sample of beneficiaries over 65 enrolled in Parts A and B, excluding Part C and ESRD.

describe in the following sections, targeting people with chronic cardiovascular conditions for more intensive clinical management and care coordination may offer opportunities to improve outcomes and find savings.

### ARRHYTHMIAS

Cardiac arrhythmias, problems with the rhythm or rate of heartbeats, constitute a serious chronic condition that may lead to fainting, heart attack, stroke, and sudden death. Arrhythmias are more common among older adults. In 2005, about 4 percent of the U.S.

population over 50 had some type of arrhythmia. Among Medicare beneficiaries over 65 in the traditional program, the prevalence of arrhythmias was more than 14 percent in 2006, up from 12 percent in 1997 (CMS, 1997, 2006).

More than 48 percent of people over 50 with cardiac arrhythmias have four or more additional chronic conditions, and about 31 percent have impairments in three or more daily activities. Among Medicare beneficiaries over 65, more than 74 percent had five or more chronic conditions (including arrhythmia) in 2006.

Other chronic conditions affecting people over 50 with arrhythmias are often cardiovascular in nature, such as hypertension (66 percent) and other heart disease (18 percent). Medicare beneficiaries over 65 with arrhythmia as a primary diagnosis are more commonly affected than average Medicare beneficiaries by co-morbidities, particularly those related to cardiovascular conditions, such as hypertension, congestive heart failure, and other heart disease. In addition, for reasons not well understood, some coexisting chronic conditions such as thyroid conditions may contribute to arrhythmias (National Institutes of Health, National Heart, Lung, and Blood Institute, 2003).

For people with arrhythmias, experts recommend a variety of patient education and self-management approaches to manage this chronic condition and reduce risk of complications, such as keeping a record of changes in pulse rate, keeping all medical appointments, maintaining a list of current medications, reporting symptoms and side effects promptly, and following the provider's advice regarding treatment and healthy lifestyle (National Institutes of Health, National Heart, Lung, and Blood Institute, 2003).

People with arrhythmias have frequent encounters with the

health care system. Many people with arrhythmia undergo procedures related to pacemakers or implantable defibrillators to treat the condition, which frequently require ER visits or hospitalization. People with arrhythmia have above-average rates of potentially avoidable encounters, such as hospital readmission and post-discharge ER visits. Among Medicare beneficiaries over 65 in the traditional program, the average program cost per arrhythmia patient (primary diagnosis) was about \$19,500, which accounted for Medicare spending of almost \$75 billion in 2006.

Programs that improve adherence to evidence-based guidelines for cardiovascular conditions can improve coordination and quality of care and improve clinical outcomes for major cardiovascular diseases (Ellrodt et al., 2007).

### POST-STROKE MANAGEMENT

A stroke, or cerebrovascular accident, is an acute brain injury caused by a clot or bleeding that can lead to serious and lasting impairments, such as paralysis, impaired brain function, and death. Stroke is the third leading cause of death and is the number one cause of serious adult disability in the United States. Nearly three-quarters of all strokes occur in people over age 65, and the risk of having a stroke more than doubles with each decade of life after age 55 (CDC, National Center for Health Statistics, Stroke, [www.CDC.gov](http://www.CDC.gov)).

In 2005, among people over 50, about 457,000 had stroke as a primary diagnosis, and, of these people, about 90 percent were recent strokes (within the last year; AHRQ, 2005). Among Medicare beneficiaries over 65 in the traditional program, the prevalence of stroke was more than 5 percent in 2006, of which almost 60 percent were recent (within the last year). The declining proportion of recent strokes suggests that survival rates are improving, allowing more people who have had a stroke to live longer. Extended survival also means that older stroke patients continue to require treatment for longer periods.

More than 65 percent of people over 50 with stroke have four or more other chronic conditions and many also have functional impairments. Among people over 50 with stroke, about 37 percent have impairments in three or more daily activities. Among Medicare beneficiaries over 65, more than 82 percent had five or more chronic conditions (including stroke) in 2006 and, of these people, about 18 percent died. Stroke is often associated with other chronic conditions, such as hypertension (70 percent), diabetes (22 percent), and heart disease (37 percent). Medicare beneficiaries over 65 who have had a stroke experience above-average prevalence of other chronic conditions, with double the rates of atherosclerosis and congestive heart failure.

Strokes frequently recur, with about 25 percent of stroke patients experiencing another stroke (National Institute of Neurological Disorders and Stroke, [www.ninds.nih.gov](http://www.ninds.nih.gov)). As a result, people with stroke have frequent encounters with the health care system (Table 2 on page 21). Among Medicare beneficiaries over 65 in the traditional program, the average program cost per stroke patient (primary diagnosis) was more than \$21,000, which accounted for Medicare spending of about \$31 billion in 2006.

Stroke is a condition that is suitable for care coordination in all phases (prevention, acute care, rehabilitation, and chronic care) because it is a relatively common condition with serious clinical outcomes and variable practice patterns, and often incurs high cost for care. Core components of an effective stroke program include patient education, risk factor screening, primary care, stroke specialty units, rehab services, home care, community services, support for caregivers, and care coordination (Venketabrusamarian et al., 2002).

Care coordination provided for three months to recovering stroke patients can increase adherence to self-care practices (which patients can do themselves to help their recovery), reduce depression, and improve quality of life (Claiborne, 2006). A comprehensive care coordination program that includes home telehealth could aid stroke patients and their caregivers in managing recovery across the continuum of care at home and in the community (Lutz, Chumbler, & Roland, 2007). During the first three months following a serious disabling stroke, specialized (inpatient) stroke units produced better patient outcomes after one year (e.g., lower mortality and greater functional improvement) than routine inpatient care or home care and, depending on the payment system, could be more cost effective (Kalra et al., 2005).

Family caregivers of stroke patients need support for their role (Lane, McKenna, Ryhan, & Fleming, 2003). However, caregivers encounter important barriers to undertaking and maintaining their caregiver role, such as lack of collaboration from the health care team and lack of community support. Factors that support the caregiver role include coordination of care, a supportive social environment, and mastery of the caregiving role (White et al., 2007).

## CANCER

Cancer, in many forms, has become a serious chronic condition. While the term *cancer* was once commonly equated with “terminal,” five-year survival rates, which oncologists often refer to as a “cure,” exceed 80 percent for many forms of cancer. This means that increasing numbers of people, particularly those over 50, are living with cancer for years. On the other hand, cancer can and does lead to serious complications and death, and collectively it represents one of the most common causes of death in the United States. In 2005, the prevalence of all forms of cancer was more than 6 percent among people over 50 (AHRQ, 2005). Among Medicare beneficiaries over 65 in the traditional program, the prevalence of cancer was about 15 percent in 2006, up from about 12 percent in 1997, in part because more people are living longer with it (CMS, 1997 and 2006).

About 30 percent of people over 50 with cancer have four or more additional chronic conditions, and about 26 percent have impairments in three or more daily activities (AHRQ, 2005). Among Medicare beneficiaries over 65 in the traditional program, about 55 percent had four or more other chronic conditions in 2006 and, of these people, about 12 percent died.

People with cancer have frequent encounters with the health care system. For instance, in 2006, traditional Medicare beneficiaries over 65 had almost 29 doctor visits per capita, almost 36 percent of cancer patients had ER visits, and about 34 percent were hospitalized for an average of about 3.8 days (CMS, 2006). Along with higher health care utilization came higher rates of potentially avoidable encounters, such as hospital readmission (27 percent within 30 days of discharge) and post-discharge ER visits (24 percent within 30 days of discharge).<sup>11</sup>

Among traditional Medicare beneficiaries over 65, the average program cost per cancer patient (primary diagnosis) was more than \$14,000, which accounted for total Medicare spending of almost \$57 billion in 2006.

Although many cancers can often be treated on an outpatient basis, many cancer patients are still hospitalized. Cancer care is poorly coordinated during and after treatment (Ganz, Casillas, & Hahn, 2008). A recurring theme is that patients lack coordination of care and their needs are not being adequately met (Moyez et al., 2008). Obstacles that interfere with delivery of high-quality cancer care include lack of standardized or adherence to

clinical guidelines, insufficient teamwork among multidisciplinary care teams, lack of patient awareness and empowerment, diagnostic delays during provider transitions, and excessive reimbursement for treatment (Aiello Bowles et al., 2008).

Various approaches to cancer care coordination have been tested and appear to improve care on a number of measurement parameters. Implementation of common assessment tools, collaborative care plans, and symptom management guidelines have reduced ER visits and hospital admission for cancer patients by improving care coordination, quality, and integration of palliative care without increasing the intensity of patient symptoms or caregiver burden (Dudgeon et al., 2008). Among cancer patients undergoing chemotherapy, care coordination and telehealth technologies to manage symptoms like emotional distress and pain have reduced unnecessary use of inpatient and outpatient services (Chumbler et al., 2007). Nurse coordinators can improve the quality of care for head and neck cancer patients undergoing a complex treatment regimen by bridging communication gaps between patients and providers and improving care coordination (Wiederholt et al., 2007). Informal caregivers of cancer patients would benefit from structured assessment of their needs related to arranging and coordinating services and increasing their competence as caregivers (Osse et al., 2006).

## ENDNOTES

- <sup>1</sup> The Medical Expenditure Panel Survey Household Component, cosponsored by the Agency for Healthcare Research and Quality (AHRQ) and the National Center for Health Statistics (NCHS), is a nationally representative longitudinal survey that collects detailed information on health care utilization, health insurance, health status, and other social demographic and economic characteristics for the civilian non-institutionalized population in the United States. Clinical conditions were based on physician diagnosed conditions reported by respondents. Clinical conditions were aggregated into clinically meaningful categories using the Clinical Classification System (CCS) developed by AHRQ. Medical conditions were further defined as chronic or non-chronic based on subsets of CCS codes for chronic conditions developed by Wenke Hwang (see Hwang, 2001.) Gerard Anderson, professor of health policy at the Bloomberg School of Public Health and professor of medicine at Johns Hopkins University, supervised the data analysis and worked with analysts at AARP to ensure that data were statistically accurate and reflected the current literature in the field.
- <sup>2</sup> Medicare data for calendar year 1997 and 2006 were derived from a 5 percent sample of patients aged 65 and older who were enrolled in both Parts A and B of the fee-for-service program. Disabled beneficiaries and those enrolled in Medicare Advantage are not included. Costs also exclude Part D, ESRD, and cost-sharing amounts. Clinical conditions were based on International Classification of Disease Version 9 (ICD-9) codes as filed on Medicare claims. Like the MEPS, clinical conditions identified from Medicare claims were aggregated into clinically meaningful categories using AHRQ's CCS and were defined as chronic or non-chronic based on CCS codes developed by Hwang.
- <sup>3</sup> Excluding dementia and senility.
- <sup>4</sup> Statins are drugs that are used to lower cholesterol. They work by blocking a substance the body needs to make cholesterol.
- <sup>5</sup> Chronic obstructive pulmonary disease (COPD) is the overall term for a group of chronic lung conditions that obstruct the airways in the lungs. COPD usually refers to obstruction caused by chronic bronchitis and emphysema, but it can also refer to damage caused by asthmatic bronchitis.
- <sup>6</sup> Diabetic retinopathy is a complication of diabetes that results from damage to the blood vessels of the light-sensitive tissue at the back of the eye (retina).
- <sup>7</sup> Expenditures in MEPS are defined as the sum of direct payments for care provided during the year, including out-of-pocket payments and payments by private insurance, Medicare, Medicaid, and other sources. Payments for over-the-counter drugs and indirect payments not related to specific medical events such as Medicaid Disproportionate Share and Medicare Direct Education subsidies are not included.
- <sup>8</sup> The 10 highest-cost health conditions in 2005 were heart disease, trauma, cancer, mental disorders, pulmonary conditions, hypertension, diabetes, osteoarthritis, back problems, and kidney disease (AHRQ, 2005).
- <sup>9</sup> Costs include Medicare payments under Parts A and B of the fee-for-service program. Costs for disabled beneficiaries and those enrolled in Medicare Advantage are not included. Costs also exclude Part D, ESRD, and cost-sharing amounts.

<sup>10</sup> Osteoarthritis, a degenerative joint disease, is the most common form of arthritis and occurs as cartilage in the joints wears down over time. It occurs most often in older adults. Rheumatoid arthritis is

an inflammatory, autoimmune disorder that causes joint pain and damage and may also affect other organs. It often occurs in women between the ages of 40 and 60 but can occur at any age.

<sup>11</sup> Data reflect all hospital readmissions and emergency room visits within 30 days of discharge.



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