

**H·CUP**  
HEALTHCARE COST AND UTILIZATION PROJECT

issue **1**

# Highlights

## Economic and Health Costs of Diabetes

**D**iabetes is a chronic condition that affects 18.2 million people—nearly 6 percent of children and adults nationwide. Methods for controlling diabetes and minimizing its impact on health status and health care costs are well documented. The complications associated with this disease can result in significant costs to individuals with diabetes and to the health care system as well.

This Highlight summarizes findings from AHRQ's Healthcare Cost and Utilization Project (HCUP) using hospital care data to examine how diabetes-related complications affect health status, hospitalizations, and economic costs. For example:

- n Cardiovascular disease and lower extremity amputations are significantly more likely to occur in patients with diabetes than those without the condition.
- n Multiple hospitalizations are common among individuals with diabetes and certain vulnerable populations are more likely to experience multiple hospital stays.
- n The complications associated with diabetes result in significant costs to the health care system, particularly for public insurance programs, and are largely preventable.

The HCUP findings discussed below illustrate the severity of diabetes and its complications and suggest important implications for policymakers, program administrators, and providers.

### KEY FACTS ABOUT DIABETES AND ITS COMPLICATIONS:

- ▶ National inpatient hospital costs for diabetes with complications were nearly \$3.8 billion in 2001.
- ▶ The risk of hospitalization from cardiovascular disease is two to four times higher for women with diabetes as compared to women without diabetes.
- ▶ Patients hospitalized with diabetes are 28 times more likely to have an amputation than patients without diabetes.
- ▶ Health care costs are three times higher for diabetes patients with multiple hospitalizations as compared to diabetes patients with a single stay in a given year.
- ▶ Patients with diabetes who are racial/ethnic minorities, enrolled in public insurance programs, or living in low-income communities are more likely to experience multiple hospitalizations and have higher hospital costs than their counterparts.
- ▶ With appropriate primary care for diabetes complications, nearly \$2.5 billion in hospital costs might have been averted, with significant potential savings obtained in Medicare (\$1.3 billion of total costs) and Medicaid (\$386 million of total costs).



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## CARDIOVASCULAR DISEASE IS COMMON AMONG ADULTS WITH DIABETES

A majority of adults with diabetes experience some form of cardiovascular complication, such as heart disease and stroke. In fact, cardiovascular disease is the leading diabetes-related cause of death among individuals with diabetes. Among women, the rate of cardiovascular disease increases with age but is greatest for women diagnosed with diabetes (see Figure 1). The risk of hospitalization with cardiovascular disease is two to four times higher for women with diabetes than for women without diabetes.

## PREVALENCE OF LOWER EXTREMITY AMPUTATIONS IS HIGH

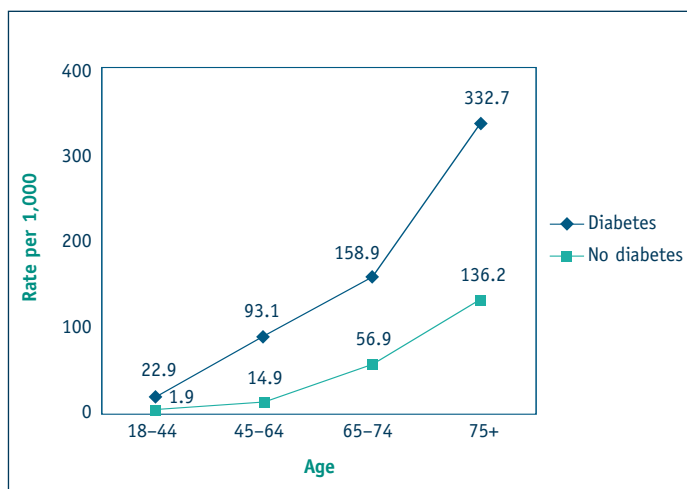
Amputations of the leg, foot, or toe are much more likely to occur in individuals with diabetes. Two-thirds of all lower extremity amputations in the United States were directly linked to diabetes (see Figure 2). In addition, two-thirds of these amputations were paid for by the Medicare program. While the risk of amputation increases with age for all individuals, the rate of amputation is far greater for people with diabetes. Patients hospitalized with diabetes are 28 times more likely to have an amputation than patients without diabetes.

## MULTIPLE HOSPITALIZATIONS ARE LIKELY

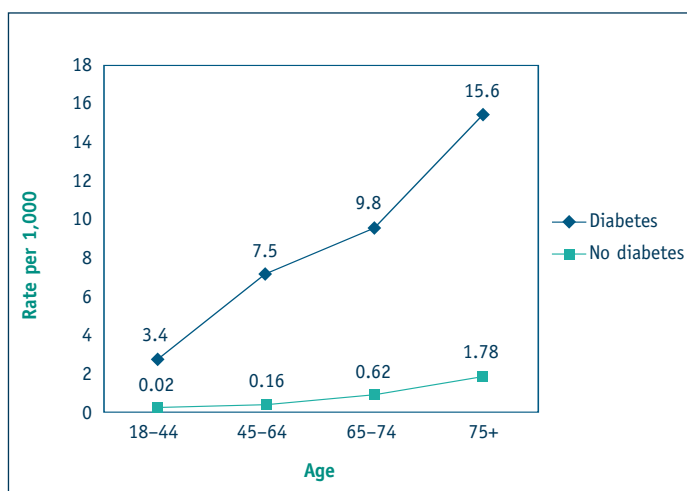
Nearly one-third of patients with diabetes are hospitalized two or more times for a similar problem in the same year due to complications associated with this disease. Multiple hospitalizations for children with diabetes are typically for acute conditions (60 percent of pediatric multiple stays), whereas adult multiple stays are more likely for chronic conditions—most commonly cardiovascular disease and lower extremity disease.

Patients with diabetes who are racial/ethnic minorities, enrolled in public insurance programs such as Medicaid, or living in low-income communities are more likely to experience multiple hospitalizations (see Figure 3) and have higher hospital costs than their counterparts. The number of multiple hospitalizations is 80 percent higher for pediatric patients and 55 percent higher for nonelderly adults enrolled in Medicaid than for their privately insured counterparts. Patients with Medicare coverage are 48 percent more likely to have multiple hospital stays compared to those with private insurance coverage (data not shown).

**FIGURE 1**  
HOSPITAL DISCHARGE RATES FOR WOMEN WITH MAJOR CARDIOVASCULAR DISEASE

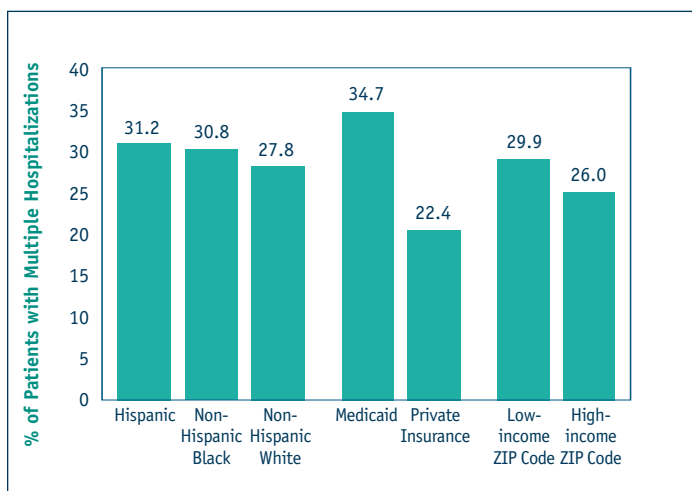


**FIGURE 2**  
HOSPITAL DISCHARGE RATES FOR LOWER EXTREMITY AMPUTATIONS

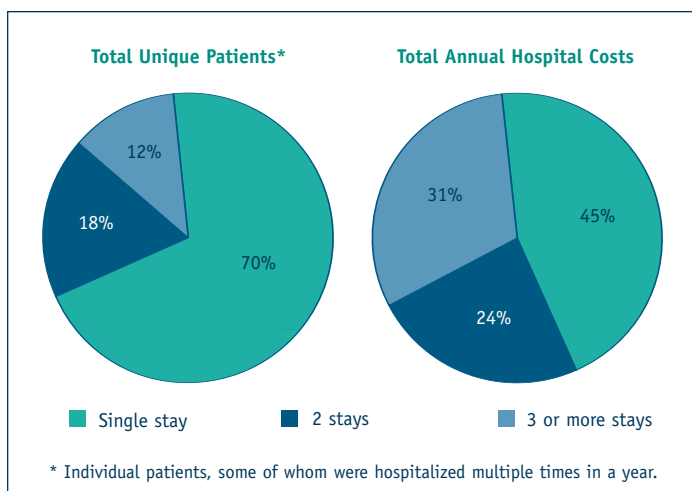


Although only 30 percent of all diabetes patients who are hospitalized are re-hospitalized in a 1-year period, they account for more than half of all diabetes-related hospital costs (see Figure 4) and more than half of all diabetes hospital stays (not shown). Indeed, the total annual hospital cost per patient for all stays is nearly three times as high for patients with multiple hospitalizations as compared to patients with a single stay—\$23,100 vs. \$8,500.

**FIGURE 3**  
ADULT DIABETES PATIENTS (AGES 18–64) WITH MULTIPLE HOSPITALIZATIONS



**FIGURE 4**  
HOSPITALIZATIONS AND ASSOCIATED COSTS FOR PATIENTS WITH DIABETES



**THE ESTIMATES IN THIS HIGHLIGHT ARE BASED ON THE FOLLOWING, MORE DETAILED PUBLICATIONS:**

Jiang HJ, Stryer D, Friedman B, et al. *Multiple Hospitalizations for Patients with Diabetes*. *Diabetes Care* 26(5): May 2003, 1421–1426.

Agency for Healthcare Research and Quality & Centers for Disease Control and Prevention. *Hospital Discharge Rates for Nontraumatic Lower Extremity Amputation by Diabetes Status—United States, 1997*. *Morbidity and Mortality Weekly Report*, 50(43): November 2, 2001, 955–958.

Agency for Healthcare Research and Quality & Centers for Disease Control and Prevention. *Major Cardiovascular Disease (CVD) During 1997–1999 and Major CVD Hospital Discharge Rates in 1997 Among Women with Diabetes—United States*. *Morbidity and Mortality Weekly Report*, 50(43): November 2, 2001, 943–954.

The following States contribute data to HCUP: AZ, CA, CO, CT, FL, GA, HI, IL, IA, KS, KY, MA, MD, ME, MI, MN, MO, NC, NE, NJ, NY, OH, OR, PA, RI, SC, TN, TX, UT, VA, VT, WA, WI, WV.

HCUPnet is available at [www.ahrq.gov/hcupnet](http://www.ahrq.gov/hcupnet)

## PREVENTABLE COMPLICATIONS OF DIABETES ARE COSTLY

Diabetes with complications accounted for 1.2 percent of all inpatient hospital stays in 2001, resulting in national aggregate hospital costs of approximately \$3.8 billion. (Such complications include conditions such as coma, renal failure, and blindness resulting from diabetes, among others.) Up to about \$2.5 billion—roughly two-thirds of the total—might have been averted with appropriate primary care for individuals with diabetes complications. A significant amount of these potential savings might have been obtained from public insurance programs. The Medicare program had the largest share of potentially preventable costs—\$1.3 billion was attributable to diabetes-related hospital costs. Costs to the Medicaid program for potentially preventable hospital stays were \$386 million.

## IMPLICATIONS FOR PUBLIC POLICY

Hospitalizations for diabetes complications are generally considered preventable with high-quality health care and patient adherence to treatment. Clinical studies suggest that prevention activities, quality outpatient care, and greater patient self-management of diabetes may prevent or reduce the prevalence of cardiovascular disease, lower extremity amputations, and multiple hospitalizations associated with diabetes. Patient self-management—taking medications appropriately, controlling blood sugar levels, and managing diet with regular exercise—is an important component of diabetes care.

These HCUP findings suggest goals on which policymakers, program administrators, and providers can focus to minimize diabetes complications, recurrent hospitalizations, and their costs. For example:

- n Offer interventions for cardiovascular disease to patients with diabetes.
- n Carefully monitor people with diabetes who have a prior admission for diabetes to prevent repeat hospitalizations.
- n Consider enhanced interventions for more vulnerable populations with diabetes, particularly racial/ethnic minorities, patients with public insurance coverage, and patients living in low-income areas.

**For more information on diabetes, please visit:**  
<http://www.ahrq.gov/browse/diabetes.htm>

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For more information about HCUP, including detailed descriptions of the HCUP databases, visit the HCUP Web site at:

<http://www.hcup-us.ahrq.gov>



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## ABOUT HCUP

*The Healthcare Cost and Utilization Project (HCUP) is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality. HCUP is based on statewide data collected by HCUP Partners and provided to AHRQ. HCUP would not be possible without statewide data collection projects. HCUP includes the largest collection of longitudinal hospital care data in the United States, encompassing all-payer, discharge-level information.*

*What's Inside—This Highlight summarizes data concerning diabetes and its effect on health and healthcare costs, as derived from the HCUP Nationwide Inpatient Sample (NIS) and HCUPnet, a publicly available Web-based data tool.*

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