

STATISTICAL BRIEF #83

December 2009

Potentially Preventable Hospitalization Rates Declined for Older Adults, 2003–2007

Elizabeth Stranges, M.S. and Bernard Friedman, Ph.D.

Introduction

In 2007, adults aged 65 and over accounted for one third of all hospitalizations in the U.S.; the majority of these stays were paid for by Medicare.¹ As the U.S. population ages, older adults will put increasing demands on health care providers and payers; older adults are at higher risk for a variety of diseases than younger adults and these diseases will occur with greater frequency among an older population than among a younger population.

Improving the quality and effectiveness of outpatient services and disease management may reduce the demand placed on the system by the aging population by reducing potentially preventable hospitalizations. For example, drug therapy is an outpatient service which can be used to treat and manage both acute and chronic conditions. However, because out-of-pocket costs for drugs can be high, especially if a person has multiple chronic conditions or does not have health insurance coverage for drugs, individuals may make choices that put their health at risk and result in hospitalizations. In 2003 Congress enacted Medicare Part D to cover drug costs, and at the start of 2006 this coverage was open to choice by Medicare beneficiaries. Making drug therapy more accessible by reducing the out-of-pocket cost of drugs for the elderly may help maintain the health of the elderly and avoid hospitalizations.

This Statistical Brief presents data from the Healthcare Cost and Utilization Project (HCUP) on rates of potentially preventable hospitalizations among adults ages 18–64 (younger adults) and adults aged 65 and

Highlights

- In 2007, rates of potentially preventable hospitalizations for diabetes, chronic respiratory conditions, chronic cardiac conditions, and acute conditions were consistently higher for adults aged 65 and over than for younger adults.
- Between 2003 and 2007, rates of potentially preventable hospitalizations declined faster among older adults (age 65 and over) than among younger adults (ages 18–64).
- Among older adults, the rate of hospital stays for angina without procedure fell by almost half (from 13.4 to 7.6 discharges per 10,000 population) and the rate of stay for congestive heart failure fell by about one quarter (from 222.4 to 190.5 discharges per 10,000 population).
- The rate of hospital stays for diabetes decreased by 8 percent among older adults between 2003 and 2007 (from 54.5 to 49.9 discharges per 10,000 population). In contrast, the rate of these stays among younger adults increased from 18.2 discharges to 19.4 discharges per 10,000 population.
- In nine of eleven categories of potentially preventable hospitalizations, hospitalization rates declined more rapidly or rose less rapidly for older adults than for younger adults between 2005 and 2007.

¹ Levit K, Wier L, Stranges E, Ryan K, Elixhauser A. *HCUP Facts and Figures: Statistics on Hospital-based Care in the United States, 2007*. Rockville, MD: Agency for Healthcare Research and Quality, 2009 (<http://www.hcup-us.ahrq.gov/reports.jsp>).

over (older adults), and the change in those rates over time. The Agency for Healthcare Research and Quality (AHRQ)'s Prevention Quality Indicators (PQIs) were used to develop hospitalization rates for selected chronic and acute conditions in adults for 2003, 2005, and 2007.

Findings

Rates of potentially preventable hospitalizations by age, 2007

In 2007, rates of potentially preventable hospitalizations for diabetes, chronic respiratory conditions, chronic cardiac conditions, and acute conditions were consistently higher for adults aged 65 and over than for younger adults (table 1).

Overall, potentially preventable diabetes-related hospitalizations occurred 2.6 times more often among older adults than among younger adults (49.9 versus 19.4 discharges per 10,000 population). Table 1 shows that long-term diabetes complications were the most frequent reason for diabetes stays among both groups, and occurred 3.7 times more often among older adults than younger adults (32.8 versus 8.8 discharges per 10,000 population). In contrast, short-term diabetes complications occurred twice as often among younger adults than among older adults (6.5 discharges per 10,000 younger adults versus 3.3 discharges per 10,000 older adults).

Potentially preventable stays for chronic respiratory conditions were 5.4 times more common among older adults as they were among younger adults (99.9 versus 18.5 discharges per 10,000 population). There were 78.4 stays for chronic obstructive pulmonary disease (COPD) and 21.6 stays for asthma for every 10,000 older adults. In contrast, there were 8.4 stays for COPD and 10.1 stays for asthma for every 10,000 younger adults.

Hospital stays for chronic cardiac conditions which may have been prevented occurred over 10 times more often among older adults than among those ages 18–64 (214.7 versus 20.8 discharges per 10,000 population). Congestive heart failure was the most common chronic cardiac condition leading to preventable hospital stays among both younger and older adults (14.3 and 190.5 discharges per 10,000 population). The rates of potentially preventable hospital stays were much lower for hypertension (4.3 discharges per 10,000 younger adults and 16.6 discharges per 10,000 older adults) and angina without procedure (2.2 discharges per 10,000 younger adults and 7.6 discharges per 10,000 older adults).

Potentially preventable hospital stays for acute conditions occurred almost 10 times as frequently among older adults as they did among younger adults (269.4 versus 29.2 discharges per 10,000 population). Bacterial pneumonia was the acute condition with the highest rate of hospitalizations among both younger and older adults (16.9 and 149.8 discharges per 10,000 population); stays for urinary tract infections and dehydration were not as common as those for bacterial pneumonia.

Share of potentially preventable hospitalizations by age, 2007

While rates of hospitalization for many of these preventable conditions were substantially higher among older adults than among younger adults, the number of hospital stays for which each age group accounted was not as disparate because the younger population (189 million people) is much larger than the older adult population (38 million people). Figure 1 shows that younger adults accounted for 66 percent of 55,600 potentially preventable diabetes-related stays in 2007; older adults accounted for 34 percent. Also, although the rates of hospitalizations for acute conditions and for chronic cardiac conditions were about 10 times higher among older adults than among younger adults, older adults accounted for only about two-thirds of the total hospitalizations for these conditions.

Change in rates of potentially preventable hospitalizations by age, 2003–2007

Between 2003 and 2007, rates of potentially preventable hospitalizations declined among older adults; for some types of conditions, they declined faster among older adults than they did among younger adults (figure 2).

The rate of hospital stays for diabetes decreased by 8 percent among older adults between 2003 and 2007 (from 54.5 to 49.9 discharges per 10,000 population). In contrast, the rate of these stays among younger adults rose from 18.2 discharges to 19.4 discharges per 10,000 population, an increase of 6 percent. For older adults, the majority of the decrease in the rates of diabetes-related hospitalizations occurred between 2003 and 2005; the changes between 2005 and 2007 were less dramatic (table 2).

Potentially preventable stays for cardiac conditions among older adults occurred 14 percent less frequently in 2007 (214.7 discharges per 10,000 population) than they did in 2003 (249.3 discharges per 10,000 population); the rate of hospitalizations for these conditions declined by 8 percent among younger adults during the same period. Among older adults, the rate of stay for angina without procedure fell almost by half (from 13.4 to 7.6 discharges per 10,000 population), and the rate of stay for congestive heart failure fell by 14 percent (from 222.4 to 190.5 discharges per 10,000 population) (table 2). Of the three types of potentially preventable hospitalizations for chronic cardiac conditions, hypertension was the only one for which the rate of hospitalizations for older adults increased between 2003 and 2007; in fact, the hospitalization rate for hypertension fell by 9 percent between 2003 and 2005 and then rose by 35 percent between 2005 and 2007.

Among older adults, the rate of hospitalizations for acute conditions declined by 10 percent between 2003 and 2007, from 299.4 to 269.4 discharges per 10,000 population. The rate of stays for bacterial pneumonia contributed in large part to this change, dropping from 179.2 discharges per population to 149.8 discharges per population, while the rate of stays for urinary tract infections actually increased (from 66.4 to 76.4 discharges per 10,000 population) (table 2). Hospitalization rates for acute conditions among younger adults also decreased, but more modestly (from 31.4 to 29.2 discharges per 10,000 population, a change of 7 percent). For older and younger adults, the majority of the decrease in the rates of hospitalizations for these conditions overall occurred between 2005 and 2007.

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP Nationwide Inpatient Sample, 2003, 2005 and 2007. Supplemental source included data on regional population estimates from Table 8: Annual Estimates of the Population for the United States, Regions, and Divisions: April 1, 2000 to July 1, 2008 (NST-EST2008-01), Population Division, U.S. Census Bureau, Release date: December 22, 2008 (<http://www.census.gov/popest/states/NST-ann-est.html>).

Definitions

Types of hospitals included in HCUP

HCUP is based on data from community hospitals, defined as short-term, non-Federal, general and other hospitals, excluding hospital units of other institutions (e.g., prisons). HCUP data include OB-GYN, ENT, orthopedic, cancer, pediatric, public, and academic medical hospitals. They exclude long-term care, rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals, but these types of discharges are included if they are from community hospitals.

Unit of analysis

The unit of analysis is the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is admitted to the hospital multiple times in one year will be counted each time as a separate "discharge" from the hospital.

Prevention Quality Indicators

The Prevention Quality Indicators (PQIs) are part of a set of AHRQ Quality Indicators (QIs) developed initially by investigators at Stanford University and the University of California under a contract with AHRQ. The PQIs are a set of measures that can be used with hospital inpatient discharge data to identify quality of care for “ambulatory care-sensitive conditions.” These are conditions for which good outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. PQI rates can also be affected by other factors, such as disease prevalence. In this report, only observed rates are used, not the risk-adjusted rates (i.e., for age and gender) which are used for area comparisons. The PQIs have been approved by the National Quality Forum and are maintained and updated by Batelle, Inc. under contract to AHRQ.

Further information on the AHRQ QIs, including documentation and free software downloads, is available at <http://www.qualityindicators.ahrq.gov/index.htm>. This website includes information on the new version of the PQIs, Version 3.2. It also includes information on the new Pediatric Quality Indicators (PedQIs, formerly referred to as PDIs), which include the hospital admission rate measures for pediatric asthma and pediatric gastroenteritis.

About HCUP

HCUP is a family of powerful health care databases, software tools, and products for advancing research. Sponsored by the Agency for Healthcare Research and Quality (AHRQ), HCUP includes the largest all-payer encounter-level collection of longitudinal health care data (inpatient, ambulatory surgery, and emergency department) in the United States, beginning in 1988. HCUP is a Federal-State-Industry Partnership that brings together the data collection efforts of many organizations—such as State data organizations, hospital associations, private data organizations, and the Federal government—to create a national information resource.

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health and Hospitals
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Division of Health Care Finance and Policy
Michigan Health & Hospital Association
Minnesota Hospital Association
Missouri Hospital Industry Data Institute
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health and Senior Services
New York State Department of Health
North Carolina Department of Health and Human Services
Ohio Hospital Association

Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Rhode Island Department of Health
South Carolina State Budget & Control Board
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About the NIS

The HCUP Nationwide Inpatient Sample (NIS) is a nationwide database of hospital inpatient stays. The NIS is nationally representative of all community hospitals (i.e., short-term, non-Federal, non-rehabilitation hospitals). The NIS is a sample of hospitals and includes all patients from each hospital, regardless of payer. It is drawn from a sampling frame that contains hospitals comprising about 90 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at both the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use.

For More Information

For more information about HCUP, visit www.hcup-us.ahrq.gov.

For additional HCUP statistics, visit HCUPnet, our interactive query system, at www.hcup.ahrq.gov.

For information on other hospitalizations in the U.S., download *HCUP Facts and Figures: Statistics on Hospital-based Care in the United States in 2007*, located at <http://www.hcup-us.ahrq.gov/reports.jsp>.

For a detailed description of HCUP, more information on the design of the NIS, and methods to calculate estimates, please refer to the following publications:

Steiner, C., Elixhauser, A., Schnaier, J. The Healthcare Cost and Utilization Project: An Overview. *Effective Clinical Practice* 5(3): 143–51, 2002.

Introduction to the HCUP Nationwide Inpatient Sample, 2007. Online. June 16, 2009. U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/db/nation/nis/NIS_2007_INTRODUCTION.pdf.

Houchens, R., Elixhauser, A. *Final Report on Calculating Nationwide Inpatient Sample (NIS) Variances, 2001*. HCUP Methods Series Report #2003-2. Online. June 2005 (revised June 6, 2005). U.S. Agency for Healthcare Research and Quality. <http://www.hcup-us.ahrq.gov/reports/CalculatingNISVariances200106092005.pdf>

Houchens RL, Elixhauser A. *Using the HCUP Nationwide Inpatient Sample to Estimate Trends. (Updated for 1988–2004)*. HCUP Methods Series Report #2006-05 Online. August 18, 2006. U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/2006_05_NISTrendsReport_1988-2004.pdf

Suggested Citation

Stranges, E., Friedman, B. *Trends in Potentially Preventable Hospitalization Rates Declined for Older Adults, 2003–2007*. HCUP Statistical Brief #83. December 2009. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb83.pdf>

* * *

AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of health care in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please e-mail us at hcup@ahrq.gov or send a letter to the address below:

Irene Fraser, Ph.D., Director
Center for Delivery, Organization, and Markets
Agency for Healthcare Research and Quality
540 Gaither Road
Rockville, MD 20850

Table 1. Hospitalization rates for potentially preventable conditions by age, 2003, 2005, 2007.

	Age 18–64			Age 65 and Over		
	2003	2005	2007	2003	2005	2007
	Number of discharges per 10,000 population					
Diabetes						
Short Term Diabetes Complications (PQI 1)	5.9	6.0	6.5	4.1	3.7	3.3
Long Term Diabetes Complications (PQI 3)	8.1	8.6	8.8	33.5	32.7	32.8
Uncontrolled Diabetes (PQI 14)	1.9	1.7	1.8	4.9	3.8	3.9
Lower-Extremity Amputation (PQI 16)	2.3	2.3	2.3	12.0	10.4	9.9
Chronic Cardiac Conditions						
Hypertension (PQI 7)	3.4	3.2	4.3	13.5	12.4	16.6
Congestive Heart Failure (PQI 8)	15.7	14.5	14.3	222.4	210.7	190.5
Angina without Procedure (PQI 13)	3.5	2.6	2.2	13.4	9.7	7.6
Chronic Respiratory Conditions						
Chronic Obstructive Pulmonary Disease (PQI 5)	*	8.8	8.4	*	88.3	78.4
Adult Asthma (PQI 15)	11.8	10.6	10.1	23.1	24.5	21.6
Acute Conditions						
Dehydration (PQI 10)	5.5	5.0	4.6	53.8	48.0	43.2
Bacterial Pneumonia (PQI 11)	18.3	18.2	16.9	179.2	184.0	149.8
Urinary Tract Infection (PQI 12)	7.6	7.6	7.7	66.4	72.6	76.4

*Due to ICD-9-CM coding changes, comparable rates of these hospitalizations are not available for 2003.

Source: AHRQ, Center for Delivery, Organization, and Markets. Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2003, 2005, and 2007.

Table 2. Percentage change in hospitalization rates for potentially preventable conditions by age, 2003–2007.

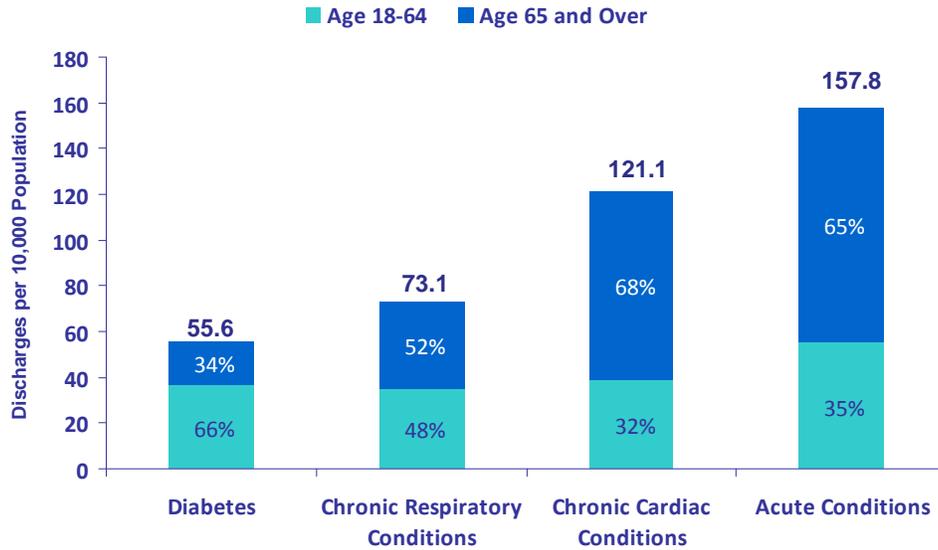
	2003–2005		2005–2007		2003–2007	
	Age 18–64	Age 65 and over	Age 18–64	Age 65 and over	Age 18–64	Age 65 and over
Diabetes						
Short Term Diabetes Complications (PQI 1)	2%	-10%	8%	-10%	10%	-19%
Long Term Diabetes Complications (PQI 3)	6%	-2%	3%	0%	9%	-2%
Uncontrolled Diabetes (PQI 14)	-9%	-22%	5%	1%	-5%	-21%
Lower-Extremity Amputation (PQI 16)	-3%	-13%	0%	-5%	-3%	-17%
Chronic Cardiac Conditions						
Hypertension (PQI 7)	-6%	-9%	33%	35%	25%	23%
Congestive Heart Failure (PQI 8)	-8%	-5%	-1%	-10%	-9%	-14%
Angina without Procedure (PQI 13)	-27%	-27%	-16%	-22%	-39%	-43%
Chronic Respiratory Conditions						
Chronic Obstructive Pulmonary Disease (PQI 5)	*	*	-4%	-11%	*	*
Adult Asthma (PQI 15)	-11%	6%	-5%	-12%	-15%	-7%
Acute Conditions						
Dehydration (PQI 10)	-9%	-11%	-8%	-10%	-16%	-20%
Bacterial Pneumonia (PQI 11)	-1%	3%	-7%	-19%	-8%	-16%
Urinary Tract Infection (PQI 12)	0%	9%	1%	5%	1%	15%

*Due to ICD-9-CM coding changes, rates of potentially preventable hospitalizations are not available for 2003 and percent change involving this year cannot be calculated.

Source: AHRQ, Center for Delivery, Organization, and Markets. Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2003, 2005, and 2007.



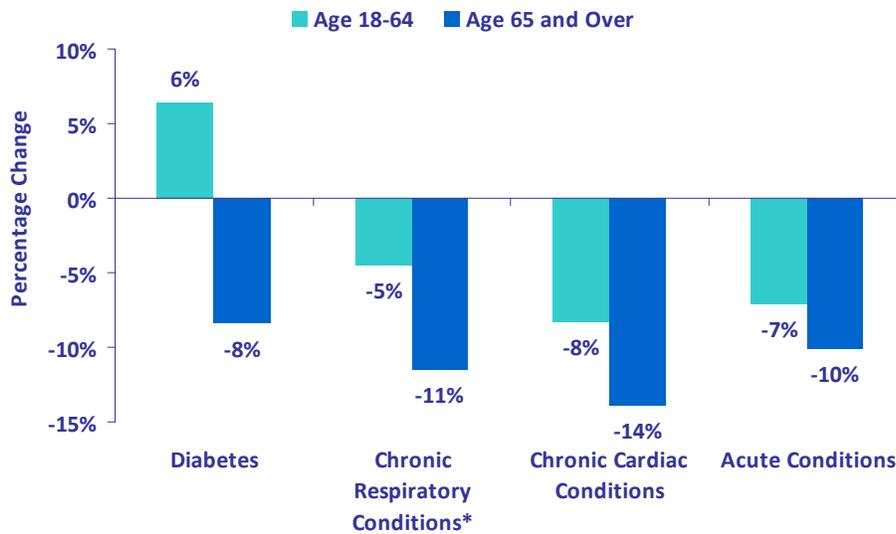
Figure 1. Older adults accounted for the majority of potentially preventable hospital stays for chronic respiratory, chronic cardiac and acute conditions in 2007



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample (NIS), 2004 and 2007.



Figure 2. Rates of potentially preventable hospitalizations declined faster among older adults than among working age adults between 2003 and 2007



*Due to ICD-9-CM coding changes, the rates of potentially preventable hospitalizations for COPD are not available for 2003. The change in the rates shown here is from 2005-2007.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample (NIS), 2004 and 2007.