

## STATISTICAL BRIEF #5

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### Hospitalizations for Women with Circulatory Disease, 2003

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#### Introduction

Circulatory diseases—conditions including heart disease and stroke—are the most common reason for admission to the hospital for both men and women, excluding pregnancy and childbirth. These conditions are also the most costly reasons for hospitalization. Although heart disease and stroke are leading causes of death and disability among both women and men, there is continued misunderstanding of the impact of this condition on women.\* Campaigns, such as Heart Truth by the National Heart, Lung, and Blood Institute, have been conducted recently to raise awareness of heart disease among women.†

This Statistical Brief presents data from the Healthcare Cost and Utilization Project (HCUP) on hospital stays for women with circulatory disease in 2003. All differences between estimates noted in the text are statistically significant at the 0.05 level or better.

#### Findings

In 2003, there were about 6.5 million hospital stays in the United States to treat diseases of the circulatory system, with a total hospital bill of \$187 billion. About 48.3 percent of hospital stays for circulatory disease were for women, who accounted for 42.8 percent of the national bill for these conditions.

#### *Specific circulatory diseases among women*

Six specific conditions were responsible for more than 80 percent of circulatory diseases in U.S. hospitals. As shown in table 1, over the seven-year time period from 1997 to 2003, there were no significant shifts in the percentage of women treated in U.S. hospitals for these conditions. Although only 40 percent of hospital stays for myocardial infarction and coronary atherosclerosis were for women, more than half of stays for nonspecific chest pain, congestive heart failure, and stroke were for women. There was no difference between men and women in hospitalizations for cardiac dysrhythmias.

\*American Heart Association. Women, Heart Disease and Stroke. Retrieved May 5, 2006, from the World Wide Web at <http://www.americanheart.org/presenter.jhtml?identifier=4786>.

†National Heart, Lung, and Blood Institute. The Heart Truth, A National Awareness Campaign For Women About Heart Disease. Retrieved May 5, 2006, from the World Wide Web at <http://www.nhlbi.nih.gov/health/hearttruth/>.

#### Highlights

- Diseases of the circulatory system are the most common reason for hospitalization, accounting for approximately 6.5 million hospital stays with a total hospital bill of \$187 billion in 2003. About 48.3 percent of these stays were for women.
- Six conditions comprised 80 percent of all circulatory disease: myocardial infarction (heart attack), coronary atherosclerosis (hardening of the arteries of the heart), nonspecific chest pain, cardiac dysrhythmias (irregular heartbeat), congestive heart failure, and acute cerebrovascular disease (stroke). Women accounted for more than half of all hospital stays for congestive heart failure, nonspecific chest pain, and stroke.
- For myocardial infarction and coronary atherosclerosis, 24–31 percent of hospital stays for 18–44 year olds were for women. This figure increased to more than 60 percent of stays for women 85 years and older.
- In the case of stroke, men and women accounted for about the same number of hospital stays in the youngest age group, 18–44. Among the oldest age group, however, sex differences emerged: women comprised 69.7 percent of hospitalized stroke patients.
- For nonspecific chest pain, women were the majority of inpatients in all three older age groups: 45–64, 65–84, and 85+.
- For most circulatory conditions there were no significant differences in in-hospital mortality between men and women, except for myocardial infarction: 9.3 percent of women died in the hospital compared with 6.2 percent of men.

### *Age-related differences in hospitalization for specific circulatory disorders*

Most hospitalized patients over 65 are women. While the distribution of men and women in the hospital was roughly equal among 45 to 64 year olds (48.9 percent men and 50.9 percent women), this situation changed for older age groups. Specifically, for 65 to 84 year olds, 55 percent of all stays were for women and by age 85 and older, 68.0 percent of all stays were for women.

Table 2 shows that women accounted for less than half of hospital stays for most circulatory conditions in younger age groups, while older women, particularly those 85 years or older, accounted for the majority of hospital stays for each condition. Figure 1 illustrates these findings graphically. The pattern of fewer stays for women in younger age groups and more stays for women among older age groups is most pronounced in two conditions. For myocardial infarction, 28.4 percent of hospital stays for 45 to 64 year olds were for women, but 63.7 percent of stays for those 85 and older were for women. Similarly, for coronary atherosclerosis, 32.7 percent of stays were for women among 45 to 64 year olds; this figure increased to 60.7 percent of stays among those 85 and older.

On the other hand, men and women accounted for roughly the same number of hospital stays for stroke in the 18 to 44 age group. But beyond age 65, women were the majority. For 65 to 84 year olds, 54.5 percent of stroke inpatients were women while among the oldest age group, women constituted 69.7 percent of all stroke patients.

Only for nonspecific chest pain were women more numerous than men among patients younger than 65. About 54.4 percent of hospital stays for nonspecific chest pain were for women age 45 to 64. Women constituted 73.9 percent of nonspecific chest pain stays among patients 85 and older—higher than for any other condition examined.

### *In-hospital mortality among men and women for specific circulatory disorders*

As shown in figure 2, mortality rates for myocardial infarction and stroke were substantially higher than for other circulatory disorders. For most conditions, there were no significant differences between men and women in in-hospital mortality. However, for acute myocardial infarction, one-third more women than men died in the hospital—9.3 percent of women died in the hospital compared with 6.2 percent of men.

## **Data Source**

The estimates in this Statistical Brief are based upon data from the HCUP 2003 Nationwide Inpatient Sample (NIS).

## **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.

### *Region*

- Northeast: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania
- Midwest: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas
- South: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas

– West: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii

### *Diagnoses, ICD-9-CM, and Clinical Classifications Software (CCS)*

The principal diagnosis is that condition established after study to be chiefly responsible for the patient's admission to the hospital. ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are about 12,000 ICD-9-CM diagnosis codes. CCS categorizes ICD-9-CM diagnoses into 260 clinically meaningful categories. This "clinical grouper" makes it easier to quickly understand patterns of diagnoses and procedures.

### **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 it includes all patients from each hospital, regardless of payer. It is drawn from a sampling frame that contains hospitals comprising 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.

### **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.

For more information about HCUP, visit <http://www.hcup-us.ahrq.gov/>.

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

**Arizona** Department of Health Services  
**California** Office of Statewide Health Planning & Development  
**Colorado** Health & Hospital Association  
**Connecticut** Integrated Health Information (Chime, Inc.)  
**Florida** Agency for Health Care Administration  
**Georgia** GHA: An Association of Hospitals & Health Systems  
**Hawaii** Health Information Corporation  
**Illinois** Health Care Cost Containment Council and Department of Public Health  
**Indiana** Hospital & Health Association  
**Iowa** Hospital Association  
**Kansas** Hospital Association  
**Kentucky** Department for Public Health  
**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** Division of Health Care Financing and Policy, Department of Human Resources  
**New Hampshire** Department of Health & Human Services  
**New Jersey** Department of Health & Senior Services  
**New York** State Department of Health  
**North Carolina** Department of Health and Human Services  
**Ohio** Hospital Association

**Oregon** Office for Oregon Health Policy and Research and Oregon Association of Hospitals and Health Systems  
**Pennsylvania** Health Care Cost Containment Council  
**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 & Family Services

For additional HCUP statistics, visit HCUPnet, our interactive query system at [www.hcup.ahrq.gov](http://www.hcup.ahrq.gov).

## References

For a detailed description of HCUP and 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

*Design of the HCUP Nationwide Inpatient Sample, 2003*. Online. June 14, 2005. U.S. Agency for Healthcare Research and Quality. [http://www.hcup-us.ahrq.gov/db/nation/nis/reports/NIS\\_2003\\_Design\\_Report.jsp](http://www.hcup-us.ahrq.gov/db/nation/nis/reports/NIS_2003_Design_Report.jsp)

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>

## Suggested Citation

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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 [hcp@ahrq.gov](mailto:hcp@ahrq.gov) or send a letter to the address below:

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**Table 1. The most common specific reasons for hospitalization for conditions related to the circulatory system, 1997 and 2003**

Principal diagnosis	Number of hospital stays, overall, 2003	Percent women		Significant difference between men and women, 2003
		1997	2003	
All circulatory disease	6,460,800	47.8	48.3	ns
Myocardial infarction (heart attack)	750,700	39.5	40.9	*
Coronary atherosclerosis (hardening of the arteries of the heart)	1,256,500	40.9	39.1	*
Nonspecific chest pain	862,100	54.1	56.2	*
Cardiac dysrhythmias (irregular heartbeat)	708,000	51.9	51.4	ns
Congestive heart failure	1,119,900	54.5	53.8	*
Acute cerebrovascular disease (stroke)	559,700	54.7	54.6	*

\* Test of statistical significance in differences between men and women in 2003,  $p < 0.05$ .

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

**Table 2. Hospital stays for the most common cardiovascular conditions, by age and sex, number of discharges (percent), 2003**

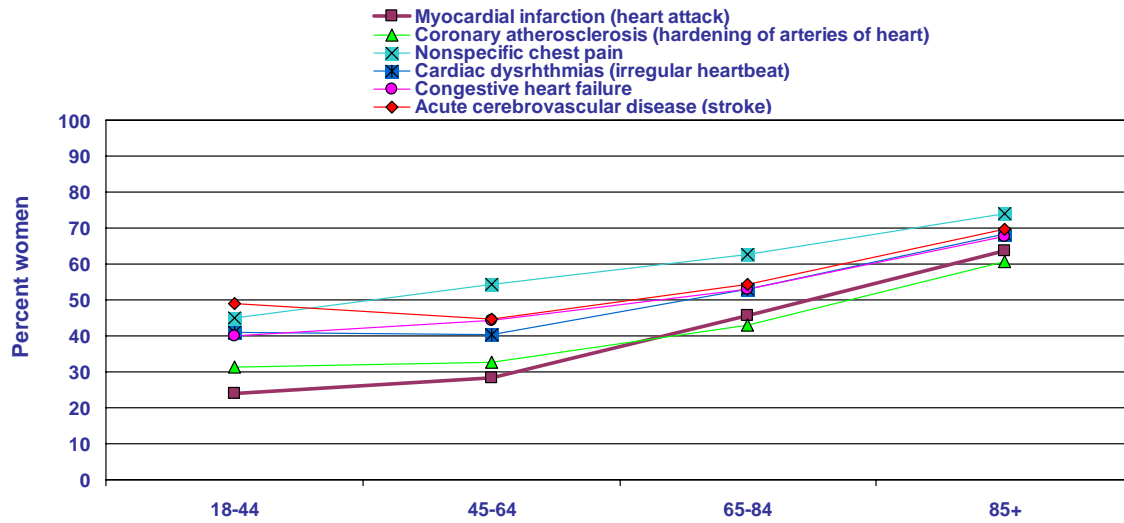
Condition	Age	Men	Women	Statistical significance
Myocardial infarction (heart attack)	18–44	32,444 (75.8)	10,328 (24.1)	*
	45–64	185,132 (71.5)	73,511 (28.4)	*
	65–84	189,701 (54.3)	159,695 (45.7)	ns
	85+	36,079 (36.3)	63,427 (63.7)	*
Coronary atherosclerosis (hardening of the arteries of the heart)	18–44	43,371 (68.6)	19,855 (31.4)	*
	45–64	348,247 (67.3)	168,950 (32.7)	*
	65–84	348,778 (56.8)	264,726 (43.1)	*
	85+	24,414 (39.3)	37,683 (60.7)	*
Nonspecific chest pain	18–44	90,774 (54.7)	74,858 (45.1)	*
	45–64	180,596 (45.4)	216,599 (54.4)	*
	65–84	95,766 (37.2)	161,746 (62.8)	*
	85+	10,134 (26.1)	28,639 (73.9)	*
Cardiac dysrhythmias (irregular heartbeat)	18–44	27,910 (58.5)	19,592 (41.1)	ns
	45–64	102,201 (59.6)	68,824 (40.2)	*
	65–84	180,442 (46.8)	204,810 (53.1)	*
	85+	31,212 (31.6)	67,477 (68.4)	*
Congestive heart failure	18–44	24,768 (60.1)	16,423 (39.8)	ns
	45–64	132,578 (55.7)	105,393 (44.3)	*
	65–84	284,986 (46.9)	322,369 (53.1)	*
	85+	74,870 (32.3)	156,996 (67.7)	*
Acute cerebrovascular disease (stroke)	18–44	14,451 (50.7)	13,979 (49.1)	ns
	45–64	75,416 (55.1)	61,394 (44.8)	ns
	65–84	132,051 (45.5)	158,120 (54.5)	*
	85+	30,761 (30.3)	70,860 (69.7)	*

\*  $p < 0.05$ .

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



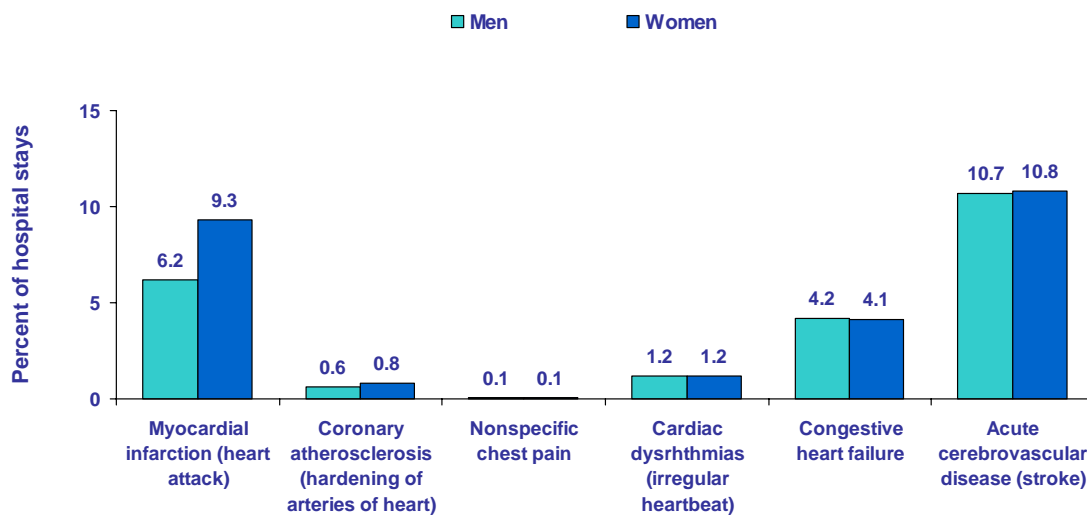
**Figure 1. Hospital stays for the most frequent cardiovascular conditions, by age and sex, 2003**



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



**Figure 2. In-hospital mortality for the most frequent cardiovascular conditions, by sex, 2003**



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