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Obese Patients in U.S. Hospitals, 2004

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Introduction

Obesity has become a major public health problem in the United States. About 30 percent of the U.S. population is currently obese (body mass index [BMI] ≥ 30), and an additional 35 percent of the population is overweight (BMI 25–29).¹ An estimated 31.1 percent of adult males and 33.2 percent of adult females are obese. The health impacts of obesity are serious; the condition is linked to increased risk of hypertension, high blood cholesterol, diabetes, coronary heart disease, stroke, gallbladder disease, arthritis, respiratory problems, and some cancers.²

This Statistical Brief presents data from the Healthcare Cost and Utilization Project (HCUP) on obese patients hospitalized during 2004. Characteristics and locations of patients, usage and expense of hospital stays, and associated diagnoses are examined for patients admitted primarily for obesity as well as for those with a secondary diagnosis—or comorbidity—of obesity.

Findings

In 2004, there were nearly 1.7 million hospital stays during which obesity was noted, accounting for about 6 percent of all hospital stays. (Obesity appears to be under coded in hospital data given the much higher prevalence in the general population.) This figure has increased by 112 percent—or more than doubled—since 1996, when there were 797,000 admissions with a mention of obesity. In comparison, during this same time period, the total number of hospitalizations for any condition increased by about 13 percent.

Differences in hospital stays related to obesity

Table 1 compares those patients with a principal diagnosis of obesity with those with obesity as a secondary diagnosis and includes the non-obese population as a comparison (excluding infants and maternal stays).

In 2004, there were 126,240 hospital stays principally for obesity and nearly 1.6 million additional hospital stays with obesity as a secondary diagnosis. Among those with obesity as a principal

Highlights

- In 2004, there were 1.7 million hospital stays during which obesity was noted, accounting for about 6 percent of all hospital stays—an increase of 112 percent since 1996.
- Among those principally hospitalized for obesity, 55.2 percent were age 18–44 and most of the remaining (42.9 percent) were age 45–64; only 1.2 percent were 65 or older. For those with obesity as a secondary diagnosis only, 23.7 percent were age 18–44 and 28.5 percent were 65 or older.
- Although just over 30 percent of both men and women were obese, about 82 percent of those with a principal diagnosis of obesity and 63.5 percent of those with obesity as a coexisting condition were women.
- The mean length of a hospital stay for obesity as a principal diagnosis was 3.1 days, but when obesity was a coexisting condition, the mean length of stay was 4.9 days.
- In the Northeast, 5.8 hospital stays per 10,000 were principally for obesity; in other regions, these stays ranged from 3.8 to 4.0 per 10,000. However, in the Northeast and West, 45 stays per 10,000 listed obesity as a secondary diagnosis, while rates were much higher in the Midwest and South, at 57 and 60 stays per 10,000.
- The most common principal diagnosis associated with obesity was coronary atherosclerosis, accounting for nearly 7 percent of all patients with obesity. This was 75 percent higher than among the non-obese hospitalized population.
- For hospital stays with obesity as a principal diagnosis, the majority involved gastric bypass and volume reduction surgery.

¹<http://www.cdc.gov/nccdphp/dnpa/obesity/faq.htm>

²National Heart, Lung, and Blood Institute. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. http://www.nhlbi.nih.gov/guidelines/obesity/ob_qdlns.htm

diagnosis, nearly all (99.6 percent) had a diagnosis of morbid obesity, which is defined as at least twice a person's ideal weight, 100 pounds overweight, or a body mass index that is greater than 39. Among those with a secondary diagnosis of obesity, only about one-third had a diagnosis of morbid obesity.

Among those principally hospitalized for obesity, most patients (55.2 percent) were 18–44 years old, and most of the remaining patients (42.9 percent) were 45–64 years old. This contrasts with an older age distribution for those with obesity as a secondary diagnosis only—less than 23.7 percent were 18–44 years old.

In the U.S. as a whole, men and women had similar prevalence rates of obesity: 31.1 percent of men and 33.2 percent of women were obese in 2004.³ However, women were more likely to be hospitalized with obesity than men. In the hospital, about 82 percent of patients with a principal diagnosis of obesity were female, and 63.5 percent of those with obesity as a coexisting condition were female. This compares to about 53 percent of all hospital stays for women with no mention of obesity.

The mean length of a hospital stay for which obesity was a principal diagnosis was 3.1 days, and the mean cost was \$11,700. For patients for whom obesity was a coexisting condition, the mean length of stay was 4.9 days and the cost was less than \$9,000.

Regional variation in stays related to obesity

As shown in figure 1, in the northeastern U.S., 5.8 hospital stays per 10,000 were principally for obesity. In the other regions, rates ranged from 3.8 to 4.0 per 10,000. The pattern was remarkably different for hospital stays with obesity as a secondary diagnosis, as shown in figure 2. In the Northeast and West, there were about 45 stays per 10,000, while the rate in the Midwest was about 57 stays per 10,000; and, in the South, there were nearly 60 stays per 10,000, with obesity as a secondary diagnosis.

Conditions related to obesity

Table 2 lists principal diagnoses for those hospital stays where obesity was a secondary diagnosis, or a coexisting condition. These 20 conditions accounted for 60 percent of all hospital stays that included obesity as a secondary diagnosis. The most common principal diagnosis was coronary atherosclerosis, which accounted for nearly 7 percent of all patients with obesity. This was 75 percent higher than among the non-obese hospitalized population. Five of the top 10 conditions were related to the heart, and most were seen at higher rates for the obese population.

Two infections appeared in the top 10 conditions—skin infections and pneumonia. Skin infections were twice as likely to be seen among obese inpatients, but pneumonia was less frequently recorded for obese hospital stays. Three other respiratory conditions were relatively frequent among obese patients—asthma, chronic obstructive pulmonary disease (COPD), and respiratory failure. Osteoarthritis and back pain were also top 10 conditions for patients with obesity as a secondary diagnosis. Osteoarthritis was more than twice as likely among obese inpatients compared with non-obese inpatients, but back pain was only slightly more common.

Two mental health conditions were frequent principal diagnoses with secondary diagnoses of obesity— affective disorders and schizophrenia; both were slightly more common among obese inpatients. Biliary tract disease, diabetes, and abdominal hernia were also top 20 principal conditions for obese patients.

Procedures related to obesity

Table 3 lists the most common procedures for which obesity was either a principal or secondary diagnosis. For hospital stays with obesity as a principal diagnosis, nearly all stays involved gastric bypass and volume reduction surgery (95.1 percent). No other procedure was as common. For example, 14.7 percent received laparoscopy (many of which would be related to the gastric procedure), 13.8 percent received cholecystectomy, and 10.4 percent received upper gastrointestinal endoscopy (UGI).

Among hospital stays during which obesity was noted as a secondary diagnosis, the types of procedures were much more varied. For example, the most common procedure was cardiac catheterization (received by 9.2 percent of stays), 5.6 percent received blood transfusions, and 4.0 percent received percutaneous transluminal coronary angioplasty (PTCA).

³National Center for Health Statistics. "Obesity Still a Major Problem." http://www.cdc.gov/nchs/pressroom/06facts/obesity03_04.htm (Accessed October 2, 2006)

Data Source

The estimates in this Statistical Brief are based on data from the HCUP 2004 Nationwide Inpatient Sample (NIS). Supplemental sources included data from the U.S. Census Bureau, Population Division, Annual Estimates of the Population for the United States, Regions, and Divisions.

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.

Costs and charges

Total hospital charges were converted to costs using cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare and Medicaid Services (CMS).⁴ Costs will tend to reflect the actual costs of production, while charges represent what the hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used because detailed charges are not available across all HCUP States. Hospital charges reflect the amount the hospital charged for the entire hospital stay and does not include professional (physician) fees. For the purposes of this Statistical Brief, costs are reported to the nearest hundreds.

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. Secondary diagnoses are concomitant conditions that coexist at the time of admission or that develop during the stay. All-listed diagnoses include the principal diagnosis plus these additional secondary conditions.

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.⁵ This "clinical grouper" makes it easier to quickly understand patterns of diagnoses and procedures.

The ICD-9-CM codes defining obesity are 278.00 (obesity, unspecified) and 278.01 (morbid obesity). These codes were introduced in 1995.

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 88 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.

⁴HCUP Cost-to-Charge Ratio Files (CCR). Healthcare Cost and Utilization Project (HCUP). 2001–2003. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/db/state/costtocharge.jsp

⁵HCUP CCS. Healthcare Cost and Utilization Project (HCUP). August 2006. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/toolsoftware/ccs/ccs.jsp

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
Arkansas Department of Health & Human 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 Cabinet for Health and Family Services
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
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.

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, 2004. Online. August 8, 2006. U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/db/nation/nis/reports/NIS_2004_Design_Report.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>

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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 or send a letter to the address below:

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Table 1. Differences in hospital stays related to obesity

	Obesity as a principal diagnosis	Obesity as a secondary diagnosis	No mention of obesity
Number of discharges (percent)	126,240 (0.4%)	1,567,170 (5.3%)	27,756,372 (94.3%)
Age distribution			
17 and younger	0.4%	1.6%	7.4%
18-44	55.2%	23.7%	19.1%
45-64	42.9%	46.2%	28.0%
65 and older	1.2%	28.5%	45.4%
Percent female	81.9%	63.5%	53.1%
Mean length of stay, days	3.1	4.9	5.1
Mean costs, dollars	\$11,700	\$8,800	\$9,000

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

Table 2. Principal diagnosis for hospital stays with a secondary diagnosis of obesity

Rank	Principal diagnosis	Number of stays with obesity as a secondary diagnosis	Percent of stays with this principal diagnosis among stays with	
			obesity as a secondary diagnosis	no mention of obesity
1	Coronary atherosclerosis (hardening of the arteries of the heart)	106,000	6.8	3.9*
2	Nonspecific chest pain	91,400	5.8	2.7*
3	Congestive heart failure	87,200	5.6	3.7*
4	Osteoarthritis	69,300	4.4	2.1*
5	Skin and subcutaneous infections	56,200	3.6	1.6*
6	Acute myocardial infarction (heart attack)	48,100	3.1	2.3*
7	Affective disorders (depression and bipolar disorder)	46,400	3.0	2.4*
8	Pneumonia	45,300	2.9	4.2*
9	Intervertebral disc disorders and other back problems	41,600	2.7	2.1*
10	Cardiac dysrhythmias	39,900	2.6	2.4*
11	Asthma	39,500	2.5	1.4*
12	Biliary tract disease	36,800	2.4	1.5*
13	Chronic obstructive pulmonary disease (COPD)	35,000	2.2	1.9*
14	Schizophrenia	33,700	2.2	1.1*
15	Rehabilitation care	33,500	2.1	1.6*
16	Diabetes mellitus	33,000	2.1	1.6*
17	Complications of device, implant, graft	30,700	2.0	2.1
18	Complications of surgical procedures	28,700	1.8	1.5*
19	Respiratory failure	22,000	1.4	0.9*
20	Abdominal hernia	20,500	1.3	0.6*

* Significant difference between stays with obesity and stays with no mention of obesity at $p < 0.001$.

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

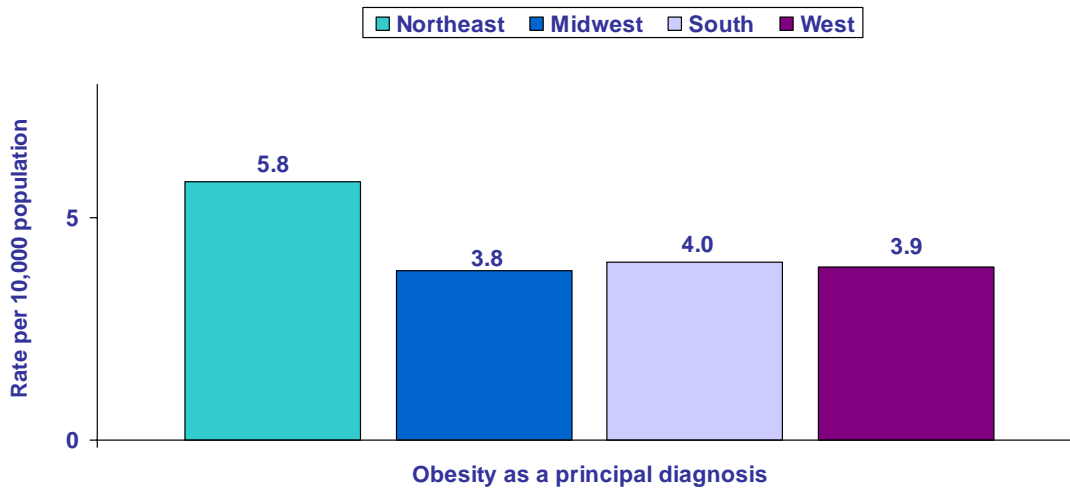
Table 3. Most common all-listed procedures for patients with obesity diagnoses

Obesity as a principal diagnosis			Obesity as a secondary diagnosis		
All-listed procedures	Number of stays	Percent	All-listed procedures	Number of stays	Percent
Gastric bypass and stomach reduction surgery	120,000	95.1	Cardiac catheterization	144,500	9.2
Laparoscopy	18,500	14.7	Blood transfusion	87,100	5.6
Cholecystectomy	17,400	13.8	PTCA	62,800	4.0
UGI endoscopy	13,100	10.4	Mechanical ventilation	60,100	3.8
Liver biopsy	11,000	8.7	Arthroscopy of knee	56,100	3.6

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



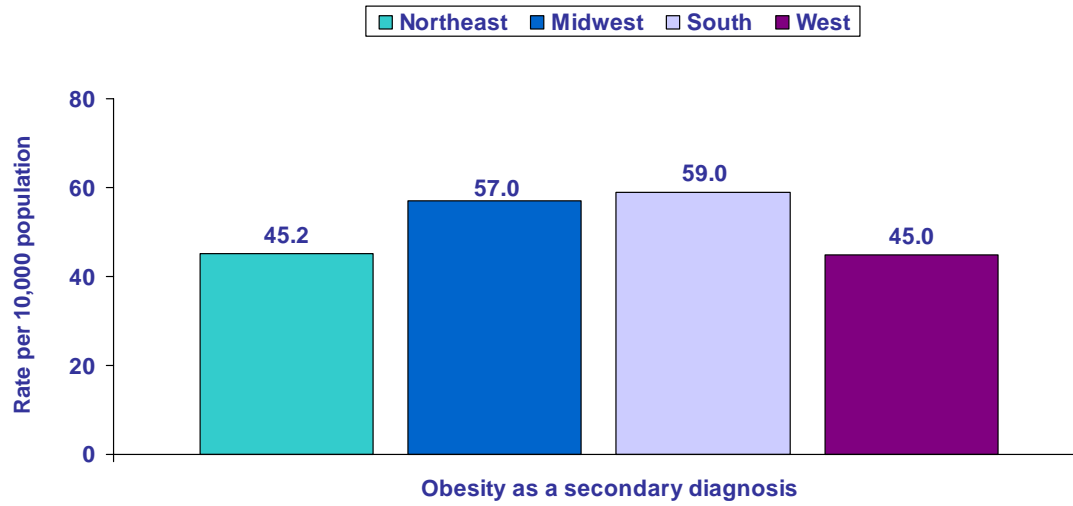
Figure 1. Rate of hospitalization for obesity as a principal diagnosis, by region, 2004



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



Figure 2. Rate of hospital stays with obesity as a secondary diagnosis, by region, 2004



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