HEALTHCARE COST AND UTILIZATION PROJECT

Agency for Healthcare Research and Quality

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Circumcisions Performed in U.S. Community Hospitals, 2009

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Introduction

Circumcision is the most commonly performed surgical procedure in newborns.[1] Although circumcisions may be performed for cultural or religious reasons, there has been debate over the ethics and medical necessity of this procedure.[1,2] As recently reported by the CDC, the percent of male newborn circumcisions declined over the past decade.[3]

In 1999, the American Academy of Pediatrics (AAP) issued a policy position stating that the evidence of medical benefits from circumcisions was not compelling enough to warrant routine newborn circumcision.[4] In recent years however, evidence has been accumulating on the potential health benefits associated with circumcisions, including reductions in infant urinary tract infections and rates of penile cancer.[5] In heterosexual men, circumcision has been linked to decreased acquisition and transmission of sexually transmitted infections such as syphilis, human immunodeficiency virus (HIV) and herpes simplex virus type 2. Since 2005, three randomized controlled studies have been published indicating benefits from circumcision in reducing HIV acquisition in heterosexual males in Africa.[6,7,8] These findings have renewed the debate over AAP's current position that there is insufficient evidence to issue recommendations for routine neonatal circumcisions.[4]

Highlights

- There were an estimated 1.2 million circumcisions performed in U.S. hospitals in 2009.
- Between 1993 and 1999, the rate of male newborn circumcisions increased by 13 percent, from 55.3 to 62.7 percent of male newborn hospital stays. However, between 1999 and 2004, the rate of male newborn circumcisions decreased by 12 percent, from 62.7 to 54.9 percent of male newborn hospital stays. From 2004 to 2009, the rate of male newborn circumcisions remained relatively stable in the range of 55 to 56 percent of male newborns in the hospital.
- The average length of a hospital stay during which circumcision was performed was 3.2 days in 2009, which was similar to 2005. This compares to an average length of a hospital stay of 3.8 for male newborn stays without circumcision in 2009.
- The lowest rate of male newborn circumcisions in 2009 occurred in the West (24.6 percent in 2009) compared to 75.2 percent in the Midwest, 67.0 percent in the Northeast, and 55.7 percent in the South.
- Circumcision rates were higher in the top income quartiles. In 2005, the circumcision rate for the highest income areas (66.1 percent) was 38 percent higher than the lowest income areas (47.8 percent). However, in 2009, the circumcision rate was only 17 percent higher in the highest income areas compared to the lowest (60.4 percent compared to 51.5 percent).
- Circumcision rates were lowest in large central metropolitan areas (41.2 percent). The highest rate was in rural areas (66.9 percent).
- Among privately insured male newborns, 66.6 percent received a circumcision in 2009. This was 55 percent higher than for male newborns covered by Medicaid (42.9 percent received a circumcision) and 67 higher than for uninsured male newborns (39.8 percent received a circumcision). There were no significant changes since 2005.

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[1]Pieretti, R. V. et al. 2010. Late complications of newborn circumcision. *Pediatric Surgery International*. 26(5): 515–518.
[2]Xu, F., et al. 2007. Prevalence of circumcision and herpes simplex virus type 2 infection in men in the United States: The National Health and Nutrition Examination Survey (NHANES), 1999–2004. *Sexually Transmitted Diseases*. 34(7):479–484.
[3] Zhang et al. (2011). Trends in in-hospital male circumcision—United States—1999–2010. *Morbidity and Mortality Weekly Report*. 60(34): 1167–1168.
[4]American Academy of Pediatrics. 1999. Circumcision policy statement. Task Force on Circumcision. 103(3):686–693.
[5]Tobian, A.A.R., et al. 2010. Male circumcision for the prevention of acquisition and transmission of sexually transmitted infections: the case for neonatal circumcision. *Archives of Pediatrics & Adolescent Medicine*. 164(1):78–84.
[6]Gray, R.H., et al. 2007. Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. *Lancet*. 369(9562):657–666.
[7]Bailey, R.C., et al. 2007. Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomized controlled trial. *Lancet*. 369(9562):643–656.
[8]Auvert, B., et al. 2005. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 trial. *PLoS Medicine*. 2(11):e298.

This Statistical Brief presents data from the Healthcare Cost and Utilization Project (HCUP) on hospitalizations[9] involving circumcision procedures in male newborns, updating previously published information from 2005.[10] It provides details on characteristics of infants receiving circumcisions, complementing recently published data on trends in circumcision in the U.S.[11] This Brief provides information on circumcision rates in hospitals across regions of the country by median income, by patient residence, and by payer. Findings by payer are of particular interest because it was recently reported that circumcision rates were 24 percent higher in hospitals located in states where Medicaid pays for circumcisions than in states where Medicaid does not pay for the procedure.[12]

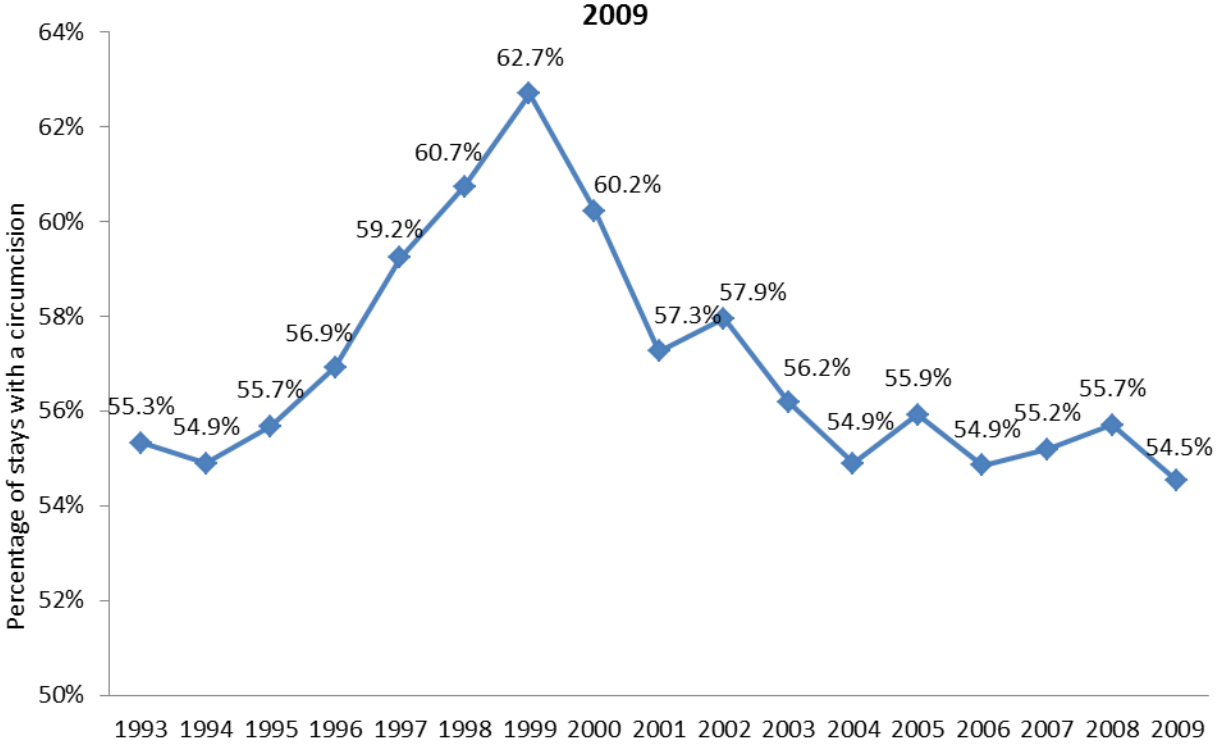
All differences between estimates noted in the text are statistically significant at the 0.05 level or better.

Findings

Trends in male newborn circumcisions in U.S. hospitals

Between 1993 and 1999, the rate of male newborn circumcisions performed in the hospital increased by 13 percent, from 55.3 to 62.7 percent of male newborn hospital stays (figure 1). However, between 1999 and 2004, the rate of male newborn circumcisions decreased by 12 percent, from 62.7 to 54.9 percent of male newborn hospital stays. This coincides with the American Academy of Pediatrics policy statement on circumcision published in 1999.[4] From 2004 to 2009, the rate of male newborn circumcisions remained relatively stable in the range of 55 to 56 percent of male newborns in the hospital.

Figure 1. Percentage of Circumcisions per 1,000 Male Newborns, 1993-2009



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1993-2009

[9] Based on select HCUP State Inpatient Databases (SID) and State Ambulatory Surgery Databases (SASD), an additional 6 percent of circumcisions are performed in ambulatory surgery facilities in 2005 (excluding physician offices).

[10] Merrill, C.T. (Thomson Healthcare), Nagamine, M. (Thomson Healthcare), and Steiner, C. (AHRQ). *Circumcisions Performed in U.S. Community Hospitals, 2005*. HCUP Statistical Brief #45. January 2008. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb45.pdf

[11] Zhang et al. (2011). Trends in in-hospital male circumcision—United States—1999–2010. *Morbidity and Mortality Weekly Report*. 60(34): 1167–1168.

[12] Leibowitz, A. et al. 2009. Determinants and policy implications of male circumcision in the United States. *American Journal of Public Health*. 99(1): 138–145.

Characteristics of male newborn stays with circumcision

As shown in table 1, there were an estimated 1.2 million circumcisions performed in U.S. hospitals in both 2005 and 2009, accounting for about 55 percent of the male newborn population born in the hospital. The average length of a hospital stay during which circumcision was performed was just over three days. The average cost of a newborn hospital stay involving a circumcision in 2009 was $2,310, similar to the $2,220 average cost in 2005. The total aggregate cost of newborn hospital stays involving a circumcision was $2.7 billion for both years, though the majority of these costs were attributable to the hospital stay during which the infant was born rather than the circumcision itself. There were no significant differences between 2005 and 2009 (table 1).

In 2009, male newborns without a circumcision had an average length of stay that was about a half day longer than male newborns with a circumcision. The average cost of a hospital stay for male newborns without a circumcision was about $1,500 higher than male newborns with a circumcision. This difference is likely attributable to avoiding this elective procedure among infants with complicating conditions.

Table 1. Characteristics of male newborn stays involving a circumcision, U.S. hospitals, 2005 and 2009

	Male newborn stays with a circumcision		Male newborn stays without a circumcision, 2009
	2005	2009	
Number of hospital stays	1,208,070	1,157,510	965,280
Mean length of hospital stay, days	3.1	3.2	3.8
Average total cost per hospital stay*	$2,220	$2,310	$3,760
Aggregate total hospital cost* (billions)	$2.7	$2.7	$3.6

*2005 costs have been inflation-adjusted to 2009 dollars. Costs include the costs for the entire hospital stay, including room and board, laboratory tests, procedures, and all other services.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2005 and 2009

Region, income, and patient location characteristics

Circumcision rates varied by region and the trends across regions were consistent from 2005 to 2009 (table 2). The lowest rate of male newborn circumcisions occurred in the West for both years—in 2005, 31.1 percent of male newborns in the hospital received circumcisions and 24.6 percent in 2009. The rate of male newborn circumcisions was about twice as high in the Northeast (64.5 percent in 2005 and 67.0 percent in 2009). The Midwest had the highest rate of male newborn circumcisions across both years—roughly 75 percent of male newborns received circumcisions in both 2005 and 2009.

Table 2. Percentage of male newborn stays involving a circumcision by region, U.S. hospitals, 2005 and 2009

	2005	2009
All male newborn hospitals stays	55.9	54.5
Region		
Northeast	64.5*	67.0§
Midwest	74.9*	75.2§
South	56.3*	55.7§
West	31.1*	24.6§

*The proportion of males with a circumcision in this region is significantly different from that in all other regions at $p<0.05$ in 2005.

§ The proportion of male newborns with a circumcision in this region is significantly different from that in all other regions at $p<0.05$ in 2009.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2005 and 2009

Circumcision rates were generally higher for the top income quartiles (the median household income of the patient's ZIP Code of residence) as shown in table 3. In 2005, the circumcision rate in the highest income areas (66.1 percent) was 38 percent higher than in the lowest income areas (47.8 percent). However, in 2009, this difference decreased—the circumcision rate was only 17 percent higher in the highest income areas compared to the lowest (60.4 percent compared to 51.5 percent).

Table 3. Percentage of male newborn stays involving a circumcision by income, U.S. hospitals, 2005 and 2009

	2005	2009
All male newborn hospitals stays	55.9	54.5
Median household income for patient's ZIP Code of residence		
Quartile 1 (lowest income)	47.8*	51.5 a
Quartile 2	53.7*	53.6 b
Quartile 3	58.2*	54.6 c
Quartile 4 (highest income) †	66.1*	60.4 a, b, c

†Differences between 2005 and 2009 are statistically significant at p<0.05.

* The proportion of male newborns with a circumcision in this income quartile is significantly different from that in all other income quartiles at p<0.05 in 2005.

The following comparisons of the proportion of male newborns with a circumcision are significantly different at p<0.05 in 2009: a = Quartile 1 and Quartile 4, b = Quartile 2 and Quartile 4, and c = Quartile 3 and Quartile 4.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2005 and 2009

Circumcision rates also varied by patient residence (table 4). In both 2005 and 2009, circumcision rates were lowest in large central metropolitan areas (the most urban areas) with 43.0 percent and 41.2 percent circumcised in 2005 and 2009. The highest circumcision rate in 2005 was large fringe metropolitan areas (suburbs)—68.8 percent—but this rate declined by 2009 to 62.3 percent. In 2009, the highest circumcision rate was in rural areas (66.9 percent).

Table 4. Percentage of male newborn stays involving a circumcision by location of patient residence, 2005 and 2009

	2005	2009
All male newborn hospitals stays	55.9	54.5
Location of patient residence		
Large central metro	43.0*	41.2 [a, b, c]
Large fringe metro (suburbs)[†]	68.8*	62.3 [a]
Medium and small metro	57.2*	55.9 [b, d]
Micropolitan and noncore (rural)	64.6*	66.9 [c, d]

[†]Differences between 2005 and 2009 are statistically significant at $p<0.05$.

* The proportion of male newborns with a circumcision in this location of patient residence is significantly different from that in all other locations at $p<0.05$ in 2005.

The following comparisons of the proportion of male newborns with a circumcision are significantly different at $p<0.05$ in 2009: a = large central metro and large fringe metro, b = large central metro and medium-small metro, c = large central metro and micropolitan-noncore, d = medium-small metro and micropolitan-noncore.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2005 and 2009

Expected primary payer

As shown in table 5, private insurance was the primary payer for the majority of hospital stays during which circumcisions were performed (about 60.5 percent of male new born stays in 2005 and 57.4 percent in 2009). Medicaid covered just about one third of all male newborn circumcisions in the hospital. Approximately 3 percent of stays were uninsured.

Table 5. Number and percentage of male newborn hospital stays with circumcision, by primary payer, 2005 and 2009

	Number and percentage* of circumcisions covered by each payer	
Primary payer	**2005**	**2009**
Medicaid	396,580 (32.8%)	409,130 (35.3%)
Private insurance	730,480 (60.5%)	664,300 (57.4%)
Uninsured	33,140 (2.7%)	34,350 (3.0%)
Other insurance†	43,030 (3.6%)	43,970 (3.8%)

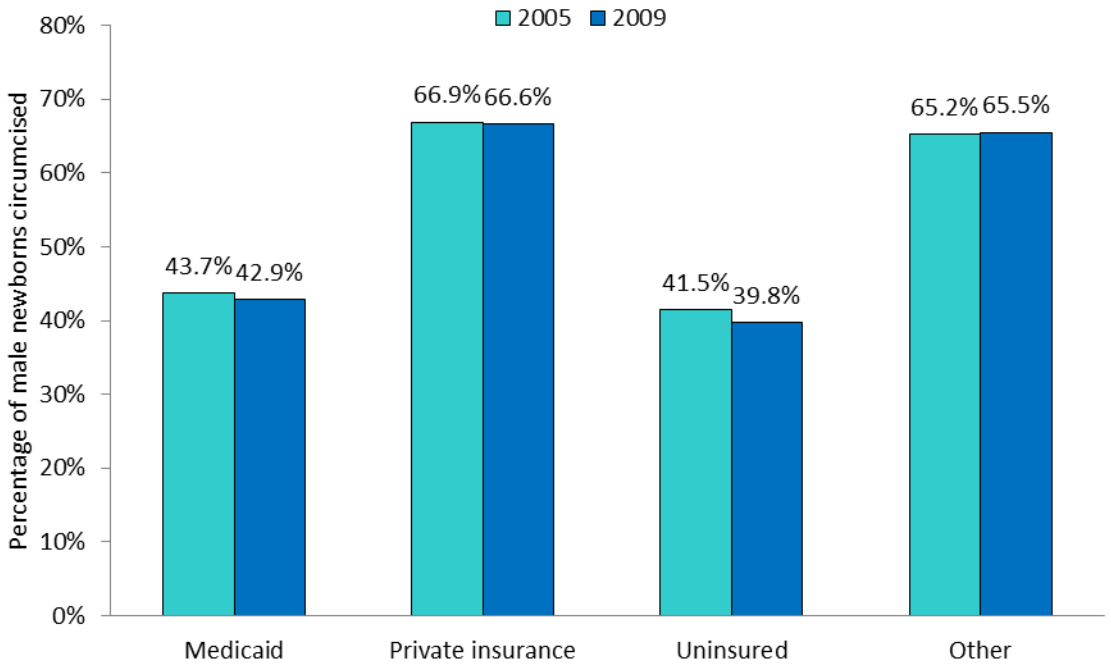
* Percentages do not sum to 100 percent because 3,900 cases were missing information on primary payer.

† Other insurance includes TRICARE/CHAMPUS, Title V, and other government programs.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2005 and 2009

Figure 2 provides information on the percentage of male newborns within each payer group who received circumcisions. Of all male newborns with private insurance, nearly 67 percent were circumcised in 2005 and 2009. In contrast, only about 40 to 44 percent of male newborn stays covered by Medicaid or without any insurance were circumcised in both years. Thus, privately insured newborns were 55 percent more likely to receive circumcisions than newborns covered by Medicaid and 67 percent more likely than uninsured infants. There was no change between 2005 and 2009.

Figure 2. Percentage of male newborns receiving a circumcision within each payer group, 2005 and 2009



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2005 and 2009

Data Source

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.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are about 13,600 ICD-9-CM diagnosis codes.
CCS categorizes ICD-9-CM diagnoses into a manageable number of clinically meaningful categories. This "clinical grouper" makes it easier to quickly understand patterns of diagnoses and procedures.

Procedures and Clinical Classifications Software (CCS)
The principal procedure is the procedure that was performed for definitive treatment rather than performed for diagnostic or exploratory purposes (i.e., the procedure that was necessary to take care of a complication).

CCS categorizes procedure codes into clinically meaningful categories.[13] This "clinical grouper" makes it easier to quickly understand patterns of procedure use.

[13] HCUP CCS. Healthcare Cost and Utilization Project (HCUP). December 2009. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp

Case definition

For this report, all-listed circumcisions were defined as ICD-9-CM procedure:

64.0 – circumcision

For this report, newborns were defined as ICD-9-CM principal diagnosis codes:

765.20 – unspecified weeks of gestation
765.29 – 37 or more weeks of gestation
V30.0 – single liveborn in hospital
V30.00 – single liveborn in hospital without complications
V30.01 – single liveborn in hospital with complications
V30.1 – single liveborn before admission
V30.2 – single liveborn non-hospital
V31.0 – twin-mate liveborn in hospital
V31.00 – twin-mate liveborn in hospital without complications
V31.01 – twin-mate liveborn in hospital with complications
V31.1 – twin-mate liveborn before admission
V31.2 – twin-mate liveborn non-hospital
V32.0 – twin-mate liveborn stillborn in hospital
V32.00 – twin-mate stillborn in hospital without complications
V32.01 – twin-mate stillborn in hospital with complications
V32.1 – twin-mate stillborn before admission
V32.2 – twin-mate stillborn non-hospital
V33.0 – twin not otherwise specified in hospital
V33.00 – twin not otherwise specified without complications
V33.01 – twin not otherwise specified with complications
V33.1 – twin not otherwise specified before admission
V33.2 – twin not otherwise specified non-hospital
V34.0 – other multiple newborn in hospital
V34.00 – other multiple newborn in hospital without complications
V34.01 – other multiple newborn in hospital with complications
V34.1 – other multiple newborn before admission
V34.2- other multiple newborn non-hospital
V35.0 – other multiple stillborn in hospital
V35.00 – other multiple stillborn in hospital with complications
V35.01 – other multiple stillborn in hospital without complications
V35.1 – other multiple stillborn before admission
V35.2 – other multiple stillborn non-hospital
V36.0 – multiple newborn/stillborn in hospital
V36.00 – multiple newborn/stillborn in hospital without complications
V36.01 – multiple newborn/stillborn in hospital with complications
V36.1 – multiple newborn/stillborn before admission
V36.2 – multiple newborn/stillborn non-hospital
V37.0 – multiple birth not otherwise specified in hospital
V37.00 – multiple birth not otherwise specified in hospital without complications
V37.01– multiple birth not otherwise specified in hospital with complications
V37.1 – multiple birth not otherwise specified before admission
V37.2 – multiple birth not otherwise specified non-hospital
V39.0 – liveborn not otherwise specified in hospital
V39.00 – liveborn not otherwise specified in hospital without complications
V39.01 – liveborn not otherwise specified in hospital with complications
V39.1 – liveborn not otherwise specified before admission
V39.2 – liveborn not otherwise specified non-hospital

The estimates of circumcision rates are based just on newborns in the hospital, thus it excludes circumcisions performed outside the hospital as well as births occurring outside the hospital.

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. Excluded are long-term care, rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. However, if a patient received long-term care, rehabilitation, or treatment for psychiatric or chemical dependency conditions in a community hospital, the discharge record for that stay will be included in the NIS.

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 HCUP Cost-to-Charge Ratios based on hospital accounting reports from the Centers for Medicare and Medicaid Services (CMS).[14] Costs will reflect the actual expenses incurred in the production of hospital services, such as wages, supplies, and utility costs, while charges represent the amount a hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used. Hospital charges reflect the amount the hospital billed for the entire hospital stay and do not include professional (physician) fees. For the purposes of this Statistical Brief, costs are reported to the nearest hundred.

Urban-rural location
Urban-rural location is one of six categories as defined by the National Center for Health Statistics:

- *Large Central Metropolitan*: Central counties of metropolitan areas with a population of 1 million or greater
- *Large Fringe Metropolitan*: Fringe counties of counties of metropolitan areas with a population of 1 million or greater
- *Medium Metropolitan*: Counties in metro area of 250,000–999,999 population
- *Small Metropolitan*: Counties in metro areas of 50,000–249,999 population
- *Micropolitan*: Micropolitan counties, i.e. a non-metropolitan county with an area of 10,000 or more population
- *Non-core*: Non-metropolitan and non-micropolitan counties

Median community-level income
Median community-level income is the median household income of the patient's ZIP Code of residence. The cut-offs for the quartile designation are determined using ZIP Code demographic data obtained from Claritas. The income quartile is missing for homeless and foreign patients.

Payer
Payer is the expected primary payer for the hospital stay. To make coding uniform across all HCUP data sources, payer combines detailed categories into more general groups:

- *Medicaid* includes fee-for-service and managed care Medicaid patients. Patients covered by the State Children's Health Insurance Program (SCHIP) may be included here. Because most state data do not identify SCHIP patients specifically, it is not possible to present this information separately.
- *Private insurance* includes Blue Cross, commercial carriers, and private HMOs and PPOs.
- *Other* includes TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs.
- *Uninsured* includes an insurance status of "self-pay" and "no charge".

When more than one payer is listed for a hospital discharge, the first-listed payer is used.

[14] HCUP Cost-to-Charge Ratio Files (CCR). Healthcare Cost and Utilization Project (HCUP). 2001–2008. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/db/state/costtocharge.jsp

Region
Region is one of the four regions defined by the U.S. Census Bureau:

- *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

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:

Alaska State Hospital & Nursing Home Association
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
Mississippi Department of Health
Missouri Hospital Industry Data Institute
Montana MHA – An Association of Montana Health Care Providers
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 Mexico Health Policy Commission
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
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 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 95 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 2008*, 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:

Introduction to the HCUP Nationwide Inpatient Sample, 2008. Online. May 2010. U.S. Agency for Healthcare Research and Quality. http://hcup-us.ahrq.gov/db/nation/nis/NIS_2008_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 R. L., 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

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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 hcup@ahrq.gov or send a letter to the address below:

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