HEALTHCARE COST AND UTILIZATION PROJECT

Agency for Healthcare Research and Quality

STATISTICAL BRIEF #166

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Overview of Hospital Stays in the United States, 2011

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Introduction

The Agency for Healthcare Research and Quality has provided an annual overview of national statistics on inpatient hospital stays using data from the Healthcare Cost and Utilization Project (HCUP) since 2005. The results from 2005 through 2009 are presented in a series of *HCUP Facts and Figures* reports.[1]

The overview of 2010 data was published in Statistical Brief #144, *Overview of Hospital Stays in the United States, 2010.*[2] The present Statistical Brief provides 2011 data on characteristics of stays in community hospitals in the United States and compares the results to data from previous years. Statistics also are included for stays by primary payer, age, discharge status, and community income. All differences between estimates noted in the text are statistically significant at the .001 level or better.

Findings

Overall characteristics of stays in U.S. hospitals, 1997–2011
Table 1 shows characteristics of stays in U.S. community hospitals in 1997, 2010, and 2011. There were 38.6 million hospital stays in 2011, which is an 11 percent increase since 1997; however, the hospitalization rate remained stable during this period (about 1,240–1,270 stays per 10,000 population).

The national distribution of stays by hospital location, teaching status, and ownership remained unchanged between 1997 and 2011. In 2011, most stays (87 percent) occurred in metropolitan hospitals, nearly half of stays occurred in teaching hospitals, and about three quarters of stays were in private, not-for-profit hospitals.

The *charge per stay* is the amount that hospitals bill to patients for their rooms, nursing care, diagnostic tests, procedures, and other services. Mean charges per stay more than doubled since 1997 to $35,400 in 2011 (inflation adjusted). The *cost per stay* is the

[1] HCUP Facts and Figures. Healthcare Cost and Utilization Project (HCUP). June 2013. Rockville, MD: Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/factsandfigures.jsp. Accessed November 4, 2013.
[2] Pfuntner A, Wier LM, Elixhauser, A. Overview of Hospital Stays in the United States, 2010. HCUP Statistical Brief #144. December 2012. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb144.pdf. Accessed November 4, 2013.

Highlights

- There were 38.6 million hospital stays in 2011, which is an 11 percent increase since 1997; however, the population also grew during this period, so the hospitalization rate remained stable at about 1,200 stays per 10,000 population.
- Aggregate hospital costs were $387.3 billion in 2011—a 63 percent increase since 1997 (inflation adjusted). Costs per stay increased 47 percent since 1997, averaging $10,000 in 2011.
- In 2011, 60 percent of stays were billed to Medicare and Medicaid—up from 52 percent in 1997. Between 1997 and 2011, the share of stays billed to private insurance fell from 39 percent to 32 percent.
- Patients from the lowest income area had a higher hospitalization rate (1,401 stays per 10,000 population) than patients from all other income areas (1,155 stays per 10,000 population).
- The hospitalization rate was similar for patients living in the Northeast, Midwest, and South (about 1,300 stays per 10,000 population). Patients living in the West had the lowest hospitalization rate, at 1,029 stays per 10,000 population.
- The total number of stays discharged against medical advice increased 41 percent between 1997 and 2011. The share of discharges against medical advice by adults aged 45–64 years increased from 27 percent in 1997 to 41 percent in 2011. From 1997 to 2011, the share of discharges against medical advice increased from 25 percent to 29 percent for Medicare and decreased from 21 percent to 16 percent for private insurance.
- The uninsured accounted for 7 percent of stays for patients from the lowest income communities and 5 percent of stays for patients from all other communities.

amount of the hospital's actual expenses incurred for producing services. Mean costs per stay in 2011 were $10,000, which represents a 47 percent increase since 1997 (inflation adjusted). Aggregate hospital *costs* were $387.3 billion in 2011; this was a 63 percent increase since 1997 (inflation adjusted).

Table 1. Characteristics of U.S. community hospitals, 1997, 2010, and 2011

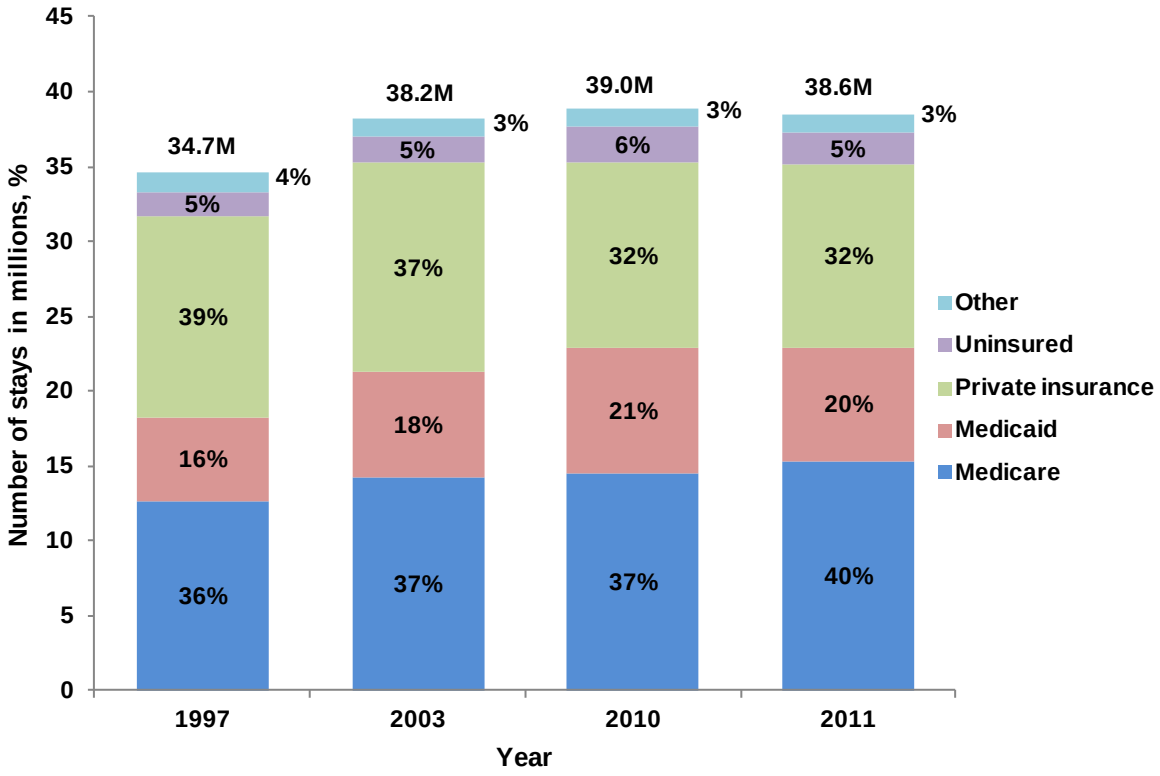
Utilization, charges, and costs	**1997**	**2010**	**2011**
Number of stays			
Total stays in millions	34.7	39.0	38.6
Stays per 10,000 population	1,272	1,261	1,239
Total days of care in millions	168.1	181.7	177.6
Mean length of stay, days	4.8	4.7	4.6
Percentage of discharges in:			
Metropolitan hospitals	84	87	87
Teaching hospitals	47	48	48
Hospital ownership			
Non-Federal government hospitals	14	14	11
Private not-for-profit hospitals	73	72	74
Private for-profit hospitals	13	13	14
Charges and costs,* U.S. $			
Mean charges per stay	15,100	33,800	35,400
Mean costs per stay	6,800	10,300	10,000
Total aggregate costs, in billions	237.2	401.1	387.3

* Charges per stay, costs per stay, and aggregate costs are inflation-adjusted to 2011 dollars.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS), 1997, 2010, and 2011

Hospital stays by expected primary payer, 1997–2011
In 2011, more than half of stays (60 percent) were billed to government payers Medicare and Medicaid (Figure 1). The percentage of stays billed to Medicare and Medicaid increased between 1997 and 2011: from 36 percent to 40 percent for Medicare and from 16 percent to 20 percent for Medicaid. The percentage of stays billed to private insurance, however, decreased during this period from 39 percent to 32 percent. The share of uninsured stays and stays billed to other payers remained stable between 1997 and 2011 at about 5 percent and 3 percent of stays, respectively.

Figure 1. Number and distribution of hospital stays by expected primary payer, 1997–2011



Note: Excludes a small number of stays with missing payer.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS), 1997, 2003, 2010, and 2011

Patient characteristics in U.S. hospitals, 2011
Table 2 shows characteristics of patients who were hospitalized in 2011. With the exception of infants, hospitalization rates increased with age. The high hospitalization rate for infants (10,665 hospital stays per 10,000 population) was largely due to births occurring in the hospital in addition to those infants who required additional hospitalization after birth.

Females accounted for 58 percent of hospital stays in 2011; the hospitalization rate for females was also higher than for males (1,411 versus 1,056 stays per 10,000 population).

About 30 percent of patients in 2011 were from low-income areas. The hospitalization rate for patients from the lowest income area (1,401 stays per 10,000 population) was higher than for patients from higher income areas (1,155 stays per 10,000 population).

Patients residing in large central metropolitan areas accounted for nearly one-third of hospital stays in 2011. Patients from rural areas accounted for the smallest share of stays (18 percent). The hospitalization rate for patients from rural areas was 28 percent higher than for patients living in medium and small metropolitan areas (1,377 stays versus 1,074 stays per 10,000 population).

The hospitalization rate was similar for patients living in the Northeast, Midwest, and South (approximately 1,300 stays per 10,000 population). Patients living in the West had lower hospitalization rates than all other regions, at 1,029 stays per 10,000 population.

Table 2. Number of stays and stays per 10,000 population by age, sex, median community-level income, patient residence, and region for all hospital stays, 2011

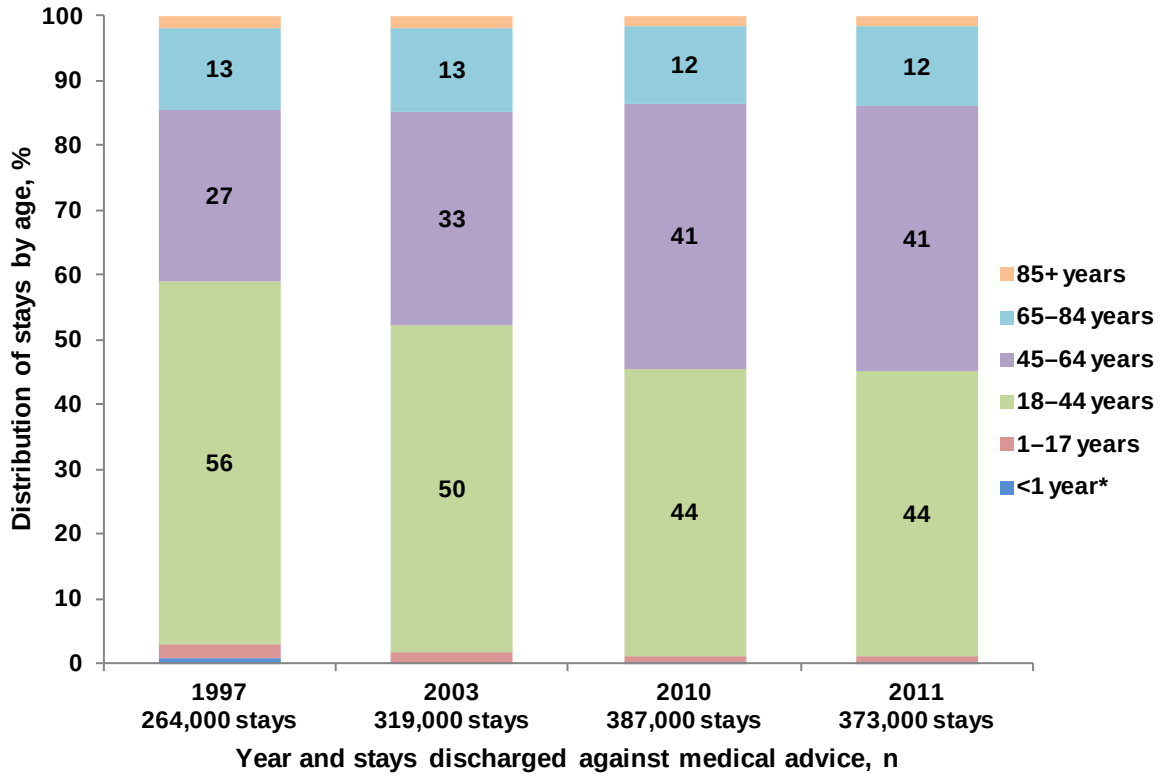
Patient characteristics	Number of stays in thousands	Stays per 10,000 population
All hospital stays	38,591	1,239
Age, years		
<1	4,262	10,665
1–17	1,402	201
18–44	9,385	827
45–64	9,695	1,171
65–84	10,533	2,954
85+	3,283	5,723
Sex		
Male	16,182	1,056
Female	22,334	1,411
Median community-level income for patients' ZIP Code		
Lowest quartile	11,050	1,401
Higher quartiles	26,759	1,155
Patient residence		
Large central metropolitan	11,866	1,288
Large fringe metropolitan (suburbs)	8,954	1,180
Medium and small metropolitan	9,878	1,074
Micropolitan and noncore (rural)	6,975	1,377
Region		
Northeast	7,528	1,354
Midwest	8,769	1,306
South	14,803	1,276
West	7,491	1,029

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS), 2011

Discharges against medical advice by patient age, 1997–2011

The number of hospital stays discharged against medical advice increased 41 percent between 1997 and 2011 (from 264,000 to 373,000 stays) (Figure 2). Adults aged 18–44 years accounted for 56 percent of stays discharged against medical advice in 1997 and 44 percent in 2011. The share of discharges against medical advice for adults aged 45–64 years increased from 27 percent in 1997 to 41 percent in 2011. Adults aged 65–84 years accounted for 12–13 percent of shares in both years. The youngest and oldest age groups—children aged 17 years and younger and adults aged 85 years and older—accounted for 2 percent or less of stays discharged against medical advice in 1997 and 2011.

Figure 2. Distribution of hospital stays discharged against medical advice by patient age, 1997–2011



* Data for children younger than 1 year were suppressed in 2003.

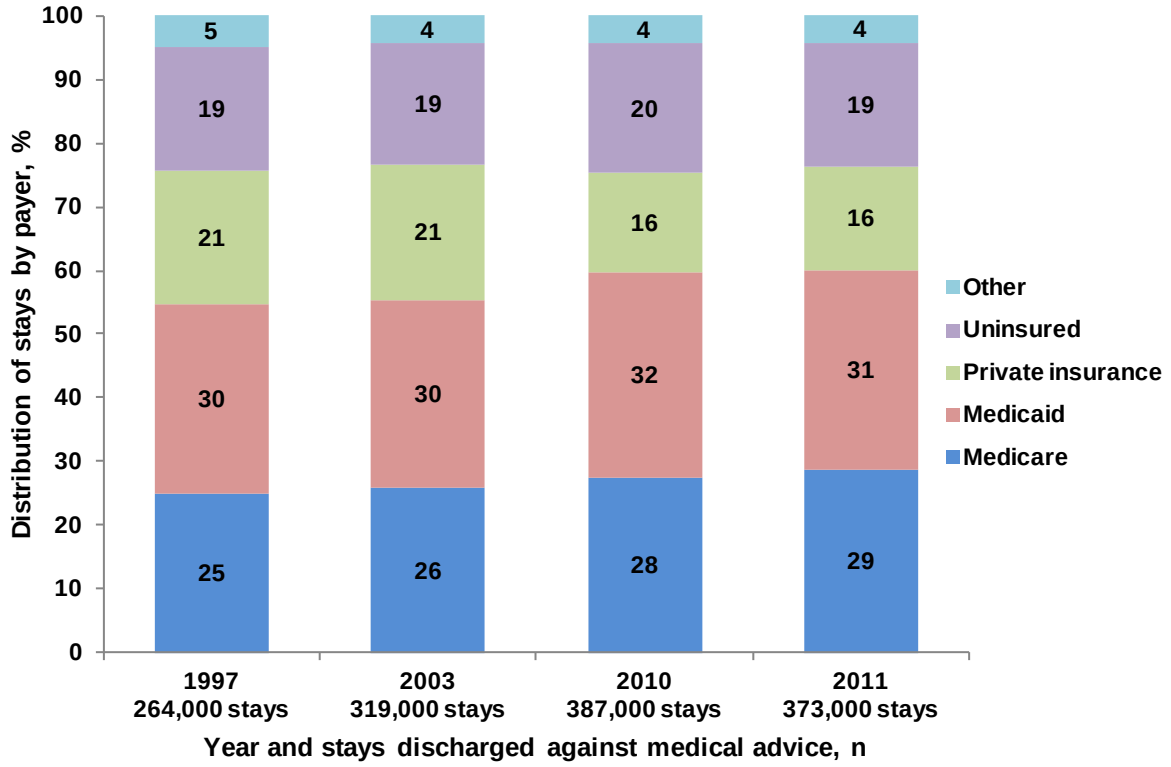
Note: Excludes a small number of stays with missing age.

Note: Bar segments representing 2 percent or less are not labeled.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS), 1997, 2003, 2010, and 2011

Discharges against medical advice by primary payer, 1997–2011
Figure 3 shows the distribution of hospital stays discharged against medical advice by primary payer between 1997 and 2011. From 1997 to 2011, the proportion of discharges against medical advice increased for stays billed to Medicare, from 25 percent to 29 percent, and decreased for stays billed to private insurance, from 21 percent to 16 percent. The share of discharges against medical advice was stable from 1997 to 2011 for stays billed to Medicaid (30–31 percent), the uninsured (19–20 percent), and other payers (4–5 percent).

Figure 3. Distribution of hospital stays discharged against medical advice by primary payer, 1997–2011



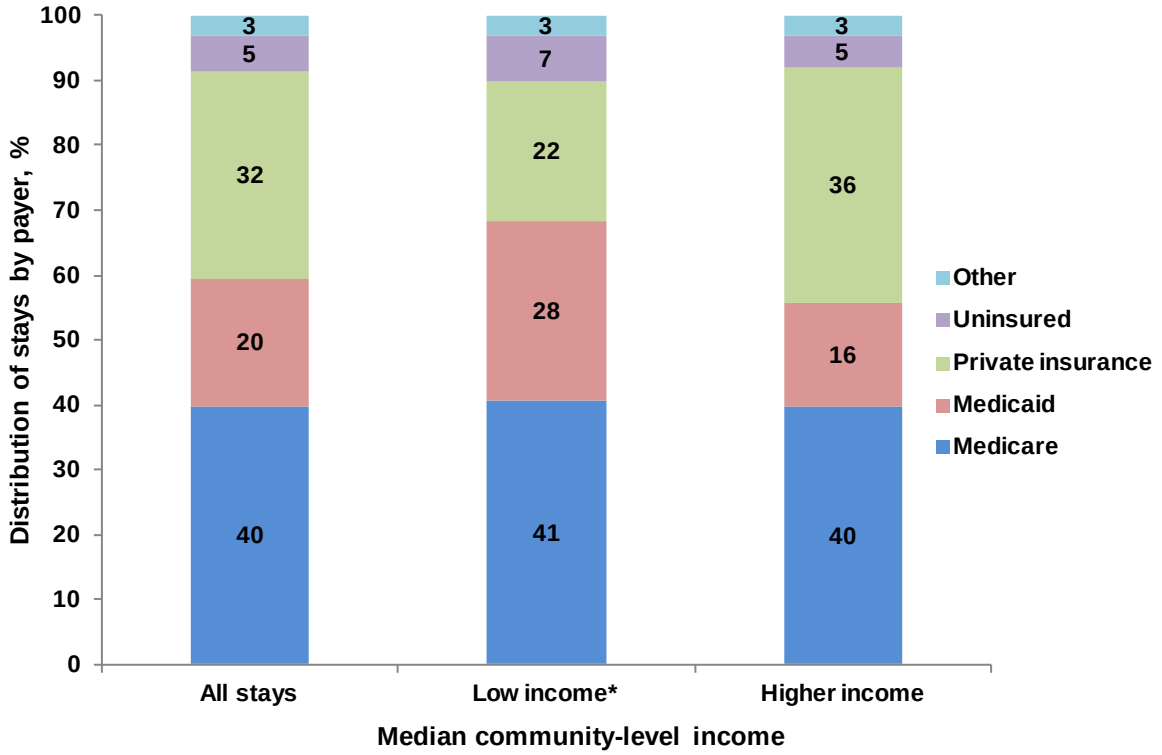
Note: Excludes a small number of stays with missing payer.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS), 1997, 2003, 2010, and 2011

Primary payers by community income level, 2011

Figure 4 shows the distribution of stays by primary payer for patients from all communities (all stays); low-income communities, which were defined as a median household income under $39,000 in 2011; and communities with incomes of $39,000 and higher in 2011. The share of stays was similar for patients across community income levels for Medicare (40–41 percent of stays) and other payers (3 percent of stays). The uninsured accounted for 7 percent of stays for patients from the low-income communities and 5 percent of stays for patients who were from higher income communities. Medicaid, which accounted for 20 percent of all stays, was the primary payer in 28 percent of stays for patients from low-income communities and 16 percent of stays for patients from higher income communities. Private insurance accounted for 22 percent of stays for patients from low-income communities, but it accounted for 32 percent of all stays and 36 percent of stays for patients who were from higher income communities.

Figure 4. Distribution of primary payers for all hospital stays, stays for patients in low-income communities, and stays for patients in all other communities, 2011



* Low-income communities are ZIP Codes with a median household income between $1 and $38,999 in 2011.

Note: Excludes a small number of stays with missing payer or income.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS), 2011

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2011 Nationwide Inpatient Sample (NIS). Historical data were drawn from the 1997, 2003, and 2010 NIS. The statistics were generated from HCUPnet, a free, online query system that provides users with *immediate access* to the largest set of publicly available, all-payer national, regional, and State-level hospital care databases from HCUP.[3] Average costs per stays and total aggregate costs were not available in HCUPnet for 1997; these statistics were separately calculated using the HCUP 1997 NIS. Supplemental data sources included population denominator data for use with HCUP databases.[4]

Many hypothesis tests were conducted for this Statistical Brief. Thus, to decrease the number of false-positive results, we reduced the significance level to .001 for individual tests.

Definitions

Types of hospitals included in HCUP
HCUP is based on data from community hospitals, which are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). HCUP data include obstetrics and gynecology, otolaryngology, 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 & Medicaid Services (CMS).[5] *Costs* will reflect the actual expenses incurred in the production of hospital services, such as wages, supplies, and utility costs; *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 and charges are reported to the nearest hundred.

Hospital location
The classification of whether a hospital is in a metropolitan area ("urban") or nonmetropolitan area ("rural") is defined from the American Hospital Association (AHA) Annual Survey, using the 1993 U.S. Office of Management and Budget definition.

Location of patients' residence
Place of residence is based on the urban-rural classification scheme for U.S. counties developed by the National Center for Health Statistics (NCHS):

- Large Central Metropolitan: Central counties of metropolitan areas with 1 million or more residents
- Large Fringe Metropolitan: Fringe counties of counties of metropolitan areas with 1 million or more residents
- Medium Metropolitan: Counties in metropolitan areas of 250,000–999,999 residents

[3] Agency for Healthcare Research and Quality. HCUPnet web site. http://hcupnet.ahrq.gov/. Accessed November 4, 2013.
[4] Barrett M, Lopez-Gonzalez L, Coffey R, Levit K. Population Denominator Data for use with the HCUP Databases (Updated with 2012 Population data). HCUP Methods Series Report #2013-01. March 8, 2013. Rockville, MD: U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/methods/2013_01.pdf. Accessed November 4, 2013.
[5] HCUP Cost-to-Charge Ratio Files (CCR). Healthcare Cost and Utilization Project (HCUP). 2001–2009. Rockville, MD: U.S. Agency for Healthcare Research and Quality. Updated August 2013. http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed November 4, 2013.

– Small Metropolitan: Counties in metropolitan areas of 50,000–249,999 residents
– Micropolitan: Nonmetropolitan counties, i.e., a nonmetropolitan county with an area of 10,000 or more residents
– Noncore: Nonmetropolitan and nonmicropolitan 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 the Nielsen Company. The income quartile is missing for homeless and foreign patients. In 2011, low-income communities (the lowest quartile) are defined as having a median household income between $1 and $38,999.

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 general groups:

- Medicare: includes patients covered by fee-for-service and managed care Medicare
- Medicaid: includes patients covered by fee-for-service and managed care Medicaid
- Private Insurance: includes Blue Cross, commercial carriers, and private health maintenance organizations (HMOs) and preferred provider organizations (PPOs)
- Other: includes Worker's Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs
- Uninsured: includes an insurance status of "self-pay" and "no charge."

Hospital stays billed to the State Children's Health Insurance Program (SCHIP) may be classified as Medicaid, Private Insurance, or Other, depending on the structure of the State program. Because most State data do not identify SCHIP patients specifically, it is not possible to present this information separately.

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

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

Discharge status
Discharge status reflects the disposition of the patient at discharge from the hospital and includes the following six categories: routine (to home); transfer to another short-term hospital; other transfers (including skilled nursing facility, intermediate care, and another type of facility such as a nursing home); home health care; against medical advice (AMA); or died in the hospital.

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 and 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 Center for Health Information and Analysis
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
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Health Policy and Research
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina 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, nonrehabilitation 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 more than 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.

About HCUPnet

HCUPnet is an online query system that offers instant access to the largest set of all-payer health care databases publicly available. HCUPnet has an easy step-by-step query system, allowing for tables and graphs to be generated on national and regional statistics as well as trends for community hospitals in the United States. HCUPnet generates statistics using data from HCUP's Nationwide Inpatient Sample (NIS), the Kids' Inpatient Database (KID), the Nationwide Emergency Department Sample (NEDS), the State Inpatient Databases (SID), and the State Emergency Department Databases (SEDD).

For More Information

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

For additional HCUP statistics, visit HCUPnet, our interactive query system, at http://hcupnet.ahrq.gov/.

For information on other hospitalizations in the United States, refer to the following HCUP Statistical Briefs located at http://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp:

- Statistical Brief #144, Overview of Hospital Stays in the United States, 2010
- Statistical Brief #146, Costs for Hospital Stays in the United States, 2010
- Statistical Brief #148, Most Frequent Conditions in U.S. Hospitals, 2010
- Statistical Brief #149, Most Frequent Procedures Performed in U.S. Hospitals, 2010

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

Introduction to the HCUP Nationwide Inpatient Sample, 2011. Online. June 2013. U.S. Agency for Healthcare Research and Quality. https://www.hcup-us.ahrq.gov/db/nation/nis/NIS_Introduction_2011.pdf. Accessed October 16, 2013.

Houchens RL, Elixhauser A. Using the HCUP Nationwide Inpatient Sample to Estimate Trends. (Updated for 1988–2004). HCUP Methods Series Report #2006–05. August 18, 2006. Rockville, MD: U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/methods/2006_05_NISTrendsReport_1988-2004.pdf. Accessed October 16, 2013.

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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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