HEALTHCARE COST AND UTILIZATION PROJECT

Agency for Healthcare Research and Quality

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Costs for Hospital Stays in the United States, 2011

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Introduction

Health care expenditures in the United States account for nearly 18 percent of the Gross Domestic Product (GDP).[1] Importantly, inpatient hospital costs account for nearly one-third of all health care expenses for the civilian noninstitutionalized population in the United States.[2] The Agency for Healthcare Research and Quality provides an annual overview of national statistics on inpatient hospital stays, including their associated costs, using data from the Healthcare Cost and Utilization Project (HCUP). This Statistical Brief provides the most current data on costs for stays in community hospitals in the United States using data from 2011 and compares the results to data from 1997.

The analysis of 2010 data on costs for hospital stays was published in Statistical Brief #146, *Costs for Hospital Stays in the United States, 2010.*[3] Earlier results from 2005 through 2009 are presented in a series of HCUP Facts and Figures reports.[4]

Statistics on costs are included for stays by age, primary payer, major diagnostic category, and principal diagnosis. All differences between estimates noted in the text are statistically significant at the .001 level or better.

Highlights

- In 2011, the aggregate cost for all hospital stays was $387.3 billion—a mean of $10,000 per stay.
- Together, adults aged 45–64 years and 65–84 years accounted for nearly two-thirds of aggregate hospital costs and had the highest mean costs per stay in 2011 ($12,500 and $12,600, respectively).
- Stays billed to Medicare and Medicaid together accounted for 63 percent of aggregate hospital costs in 2011.
- Circulatory conditions accounted for the largest share (18 percent) of hospital costs in 2011.
- Stays with septicemia had the highest aggregate hospital costs in 2011 ($20.3 billion), which more than quadrupled since 1997 with an 11.5 percent annual increase.
- The aggregate cost for stays with acute and unspecified renal failure increased in rank from 54th in 1997 to 20th in 2011, as costs for stays with renal failure more than quadrupled since 1997.
- Aggregate inflation-adjusted costs for hospital stays increased 3.6 percent annually between 1997 and 2011, with 2.8 percent annual growth in the intensity of services (cost per stay) and 1.0 percent annual growth in the population.

[1] National Health Expenditures 2011 Highlights. Centers for Medicare & Medicaid Services. http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/highlights.pdf, Accessed November 12, 2013.

[2] Carper, K, Machlin, SR. National Health Care Expenses in the U.S. Civilian Noninstitutionalized Population, 2010. Statistical Brief #396. January 2013. Agency for Healthcare Research and Quality, Rockville, MD. http://meps.ahrq.gov/mepsweb/data_files/publications/st396/stat396.shtml. Accessed November 12, 2013.

[3] Pfuntner, A (Truven Health Analytics), Wier, LM (Truven Health Analytics), Steiner, C (AHRQ). Costs for Hospital Stays in the United States, 2010. HCUP Statistical Brief #146. January 2013. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb146.pdf. Accessed November 12, 2013.

[4] HCUP Facts and Figures. Healthcare Cost and Utilization Project (HCUP). June 2013. Agency for Healthcare Research and Quality, Rockville, MD. https://www.hcup-us.ahrq.gov/reports/factsandfigures.jsp. Accessed November 12, 2013.

Findings

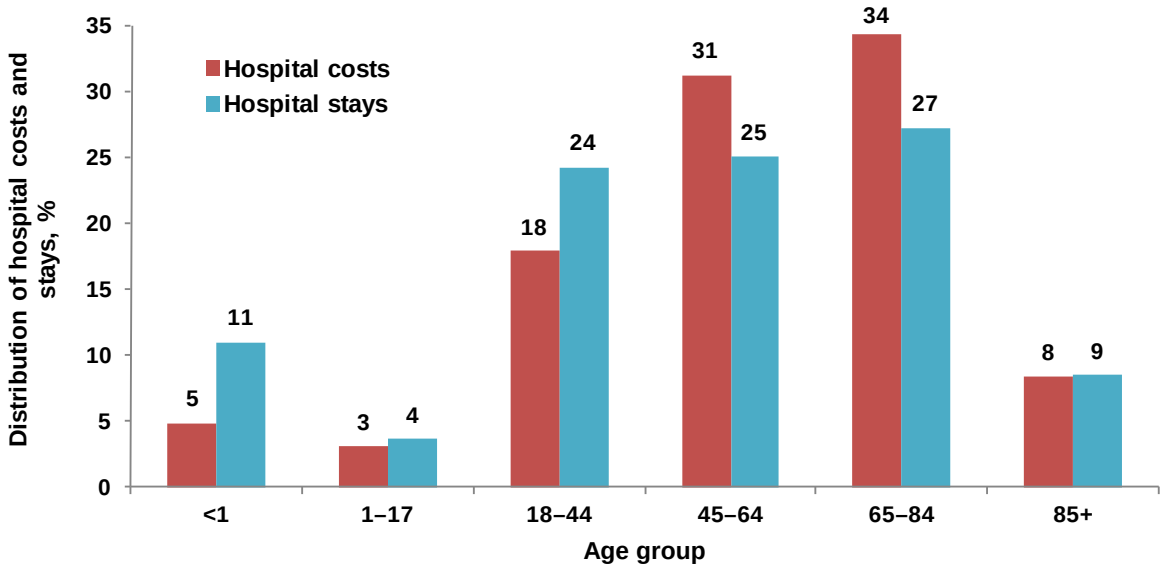
Hospital costs by age, 2011
In 2011, the aggregate cost for all hospital stays was $387.3 billion—an average of $10,000 per stay. Figure 1 shows the distribution of aggregate hospital costs and stays by age for 2011, and Figure 2 displays the mean cost per hospital stay by age.

Together, adults aged 45–64 years and 65–84 years accounted for nearly two-thirds of aggregate hospital costs and over half of hospital stays in 2011. Adults aged 45–64 years and 65–84 years also had the highest mean costs per stay ($12,500 and $12,600, respectively), which exceeded the average cost for all hospital stays.

Adults aged 18–44 years accounted for 18 percent of aggregate hospital costs and nearly one-quarter of hospital stays. The mean cost per stay for these patients ($7,400) was 35 percent lower than the average cost for all stays.

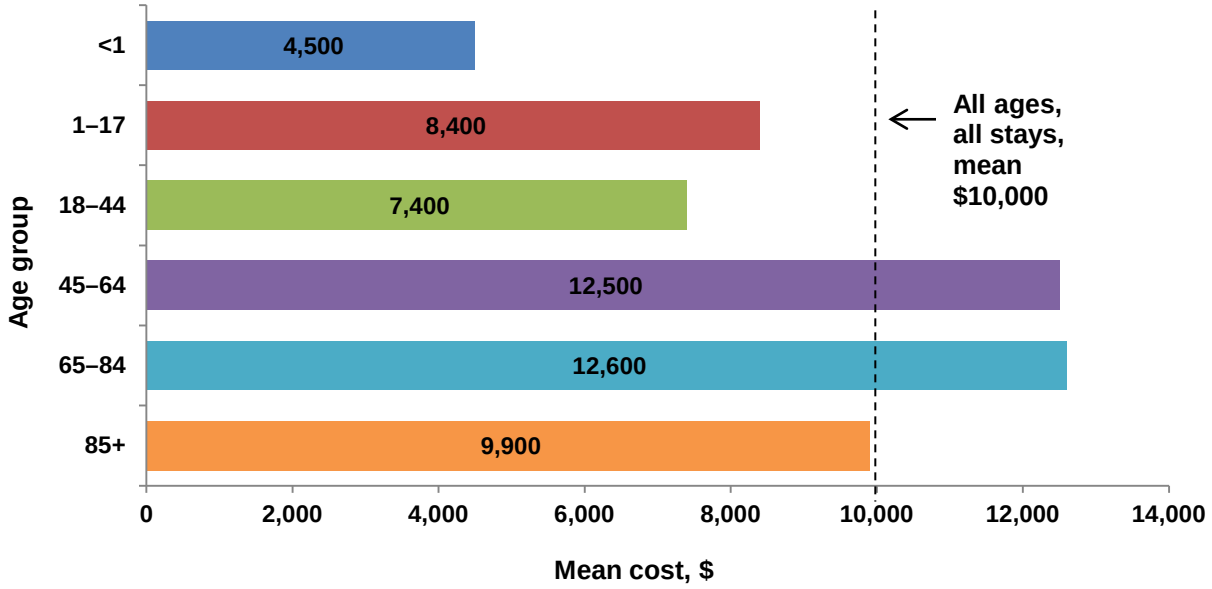
Infants younger than 1 year accounted for 5 percent of aggregate hospital costs and 11 percent of hospitalizations. The mean cost per stay for infants ($4,500) was less than half of the average for all stays. The mean cost per stay for children aged 1–17 years ($8,400) and adults aged 85 years and older ($9,900) was similar to the overall average cost per stay.

Figure 1. Distribution of aggregate hospital costs and stays by age, 2011



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

Figure 2. Mean hospital cost per stay by age, 2011



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

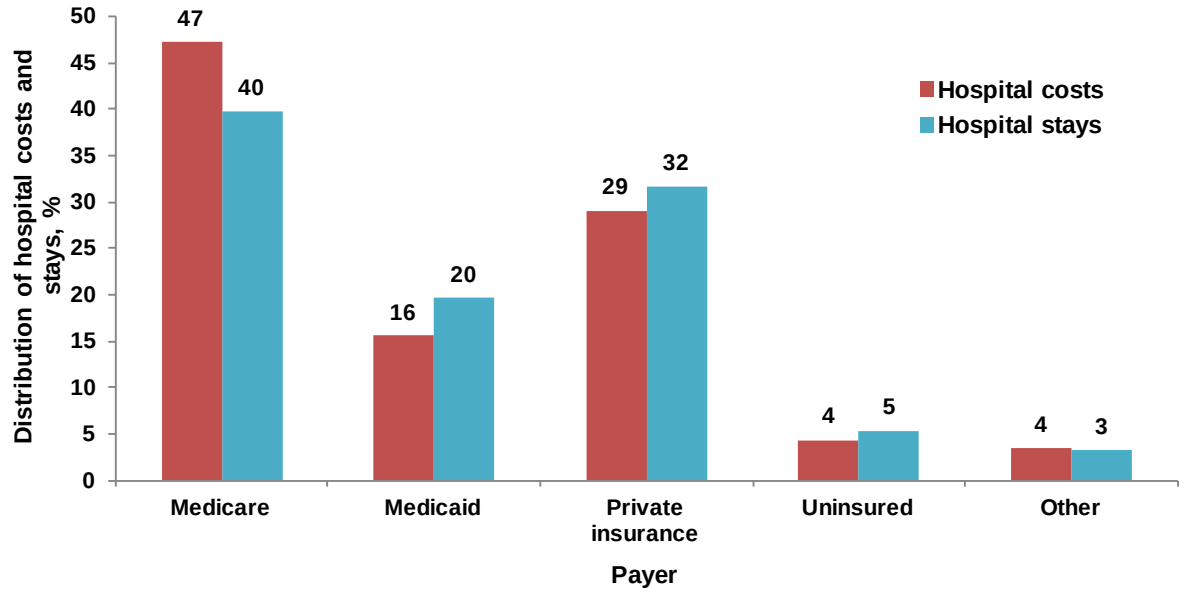
Hospital costs by expected primary payer, 2011

Figures 3 and 4 highlight the distribution of aggregate hospital costs and stays by payer and the mean hospital cost per stay by payer in 2011, respectively.

Stays billed to Medicare and Medicaid together accounted for 63 percent of aggregate hospital costs and 60 percent of hospital stays in 2011. Forty-seven percent of aggregate costs were billed to Medicare, and the mean cost for stays billed to Medicare ($11,900) was nearly $2,000 higher than the overall average cost per stay. At $8,000, the mean cost per stay billed to Medicaid was $2,000 less than the average cost for all stays.

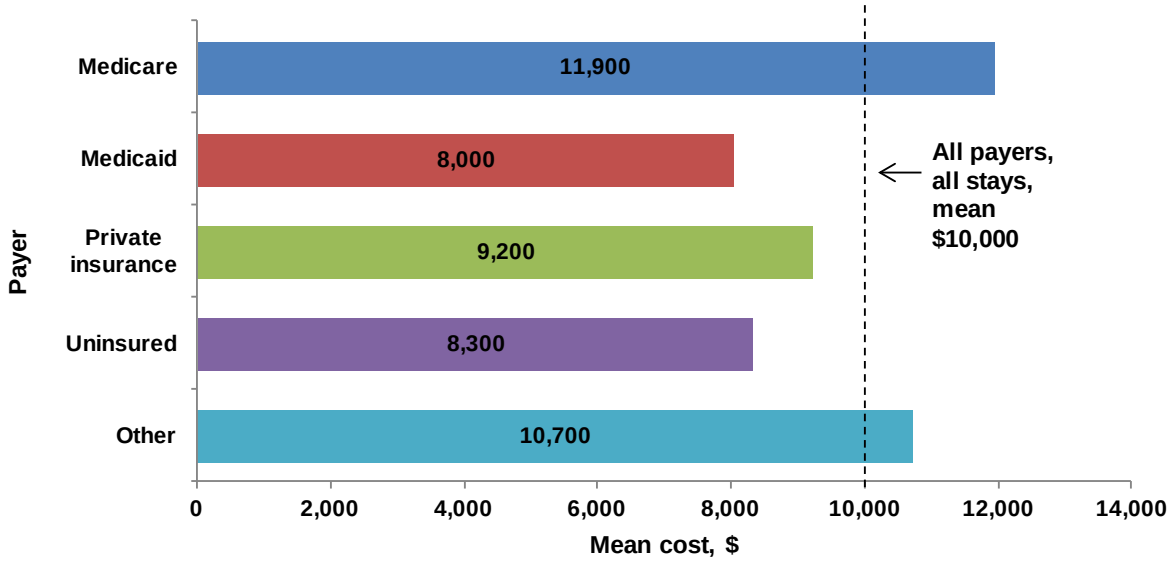
Private insurance was the expected primary payer for nearly one-third of aggregate hospital costs and hospital stays in 2011. The mean cost per stay billed to private insurance ($9,200) was similar to that for all stays. Stays billed to the uninsured and other payers each accounted for 4 percent of aggregate hospital costs. The mean cost per stay for stays billed to the uninsured ($8,300) was lower than the overall average cost, and the mean cost for stays billed to other payers ($10,700) was similar to that for all stays.

Figure 3. Distribution of aggregate hospital costs and stays by payer, 2011



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

Figure 4. Mean hospital cost per stay by payer, 2011

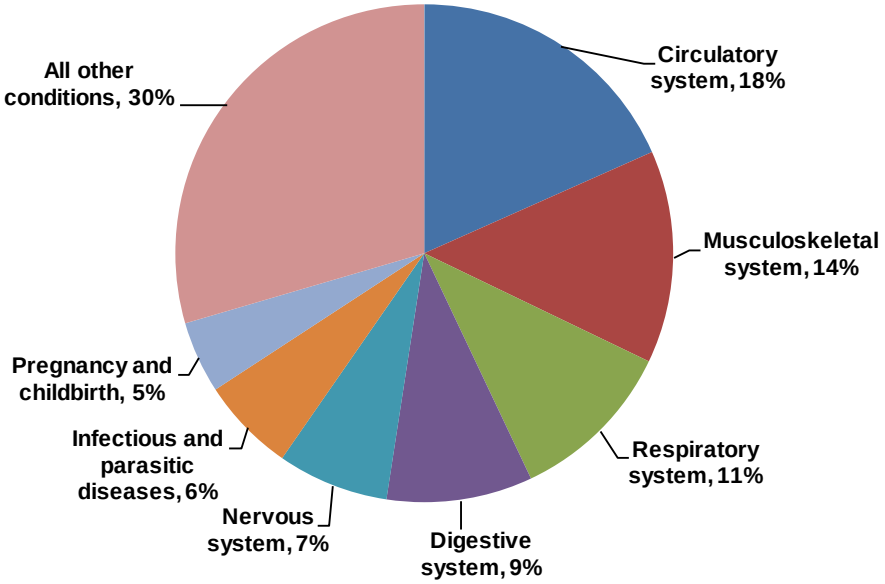


Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS), 2011

Hospital costs by diagnostic category, 2011

In 2011, 70 percent of aggregate hospital costs were attributable to seven major diagnostic categories (Figure 5). Circulatory conditions accounted for the largest share (18 percent) of hospital costs. Musculoskeletal conditions (14 percent) and respiratory conditions (11 percent) also accounted for large shares of hospital costs. Digestive conditions, nervous system conditions, infectious and parasitic diseases, and pregnancy and childbirth-related conditions each accounted for between 5 and 9 percent of aggregate costs.

Figure 5. Distribution of aggregate hospital costs by diagnostic category,* 2011



* Based on principal diagnosis, which was defined by major diagnostic category

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

Hospital costs by diagnosis, 2011

Table 1 shows the 20 specific principal diagnoses for stays with the highest aggregate hospital costs in 2011. Hospital costs for all diagnoses increased 63 percent between 1997 and 2011 from $237.2 billion to $387.3 billion, an annual increase of 3.6 percent. During this period, overall prices as measured by the Gross Domestic Product price index increased 34 percent, or 2.1 percent annually.[5]

Stays with septicemia had the highest aggregate hospital costs in 2011 ($20.3 billion), which more than quadrupled since 1997 (an 11.5 percent annual increase). Costs for stays with septicemia were ranked 9th in 1997, fell to 13th in 2000, moved to 8th in 2004, 3rd by 2007, and have been ranked as the most expensive condition since 2008 (data for intermediate years not shown).

Cardiovascular conditions accounted for five of the specific diagnoses for stays with the highest aggregate costs: acute myocardial infarction, congestive heart failure, coronary atherosclerosis, acute cerebrovascular disease, and cardiac dysrhythmias. When combined, costs for stays with these five cardiovascular conditions accounted for 13 percent of aggregate costs in 2011. The aggregate cost for stays with coronary atherosclerosis decreased 34 percent between 1997 and 2011 (3 percent annually), but the cost per stay increased 52 percent during this time period.

The mean cost for stays with eight principal diagnoses was more than 50 percent higher than the overall mean cost for stays in 2011 ($10,000): septicemia ($18,600), osteoarthritis ($15,400), complication of device ($18,500), acute myocardial infarction ($18,900), spondylosis ($16,800), coronary atherosclerosis ($17,200), respiratory failure ($21,700), and hip fracture ($15,400).

The aggregate cost for stays with acute and unspecified renal failure more than quadrupled from $1.0 billion in 1997 to $4.7 billion in 2011 (an 11.4 percent average annual increase). During this period, the change in rank for costs for stays with renal failure was gradual: these costs ranked 54th in 1997, 43rd by 2002, jumped to 34th in 2003, were 19th by 2007, fell to 23rd in 2010, and then rose to 20th in 2011 (data for intermediate years not shown).

[5] Bureau of Economic Analysis. National Data. Section 1, Domestic Product and Income. Table 1.1.4, Price Indexes for Gross Domestic Product. https://www.bea.gov/iTable/iTable.cfm?ReqID=9&step=1. Accessed November 12, 2013.

Hospital stays with complications of device and complications of surgical procedures or medical care as principal diagnoses accounted for $19.7 billion in aggregate costs. These principal diagnoses ranked as the 3rd and 13th most expensive conditions, and aggregate costs increased about 6 percent annually.

Table 1. Aggregate costs for hospital stays by principal diagnosis, 1997 and 2011

Principal Clinical Classifications Software (CCS) diagnosis	Aggregate inflation-adjusted hospital costs in billions, 2011 dollars		Mean cost per stay, inflation-adjusted 2011 dollars		Average annual change in aggregate costs, %
	1997	2011	1997	2011	1997–2011
All diagnoses	237.2	387.3	6,800	10,000	3.6
Septicemia (except in labor)	4.4	20.3	10,600	18,600	11.5
Osteoarthritis	5.1	14.8	12,200	15,400	7.9
Complication of device, implant or graft	6.0	12.9	12,200	18,500	5.6
Liveborn (newborn infant)	8.6	12.4	2,300	3,300	2.6
Acute myocardial infarction	9.9	11.5	13,500	18,900	1.1
Spondylosis, intervertebral disc disorders, other back problems	3.7	11.2	6,900	16,800	8.2
Pneumonia (except that caused by tuberculosis and sexually transmitted diseases)	9.7	10.6	7,800	9,500	0.7
Congestive heart failure, nonhypertensive	7.2	10.5	7,300	10,900	2.7
Coronary atherosclerosis	15.9	10.4	11,300	17,200	–3.0
Respiratory failure, insufficiency, arrest (adult)	3.6	8.7	18,000	21,700	6.6
Acute cerebrovascular disease	5.9	8.4	9,500	14,000	2.6
Cardiac dysrhythmias	3.8	7.6	6,700	9,600	5.0
Complications of surgical procedures or medical care	3.1	6.8	8,900	13,000	5.8
Chronic obstructive pulmonary disease and bronchiectasis	3.6	5.7	6,500	7,800	3.4
Rehabilitation care, fitting of prostheses, and adjustment of devices	4.1	5.5	10,400	13,100	2.2
Diabetes mellitus with complications	3.0	5.4	7,300	9,600	4.3
Biliary tract disease	3.6	5.1	7,900	11,000	2.6
Fracture of neck of femur (hip)	3.5	4.9	10,400	15,400	2.5
Mood disorders	3.4	4.8	5,200	5,400	2.6
Acute and unspecified renal failure	1.0	4.7	10,500	9,400	11.4

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 and 2011

Cost factors accounting for change in hospital costs by diagnosis, 1997–2011
Figure 6 shows the average annual percentage change in aggregate hospital costs between 1997 and 2011 for the 20 principal diagnoses with the highest aggregate costs in 2011.

Aggregate inflation-adjusted costs for all hospital stays increased 3.6 percent annually between 1997 and 2011. Across all diagnoses, *intensity of services* provided during the hospital stay (cost per stay) increased 2.8 percent annually, *population* grew 1.0 percent annually, and the *number of stays per 10,000 population* remained stable.

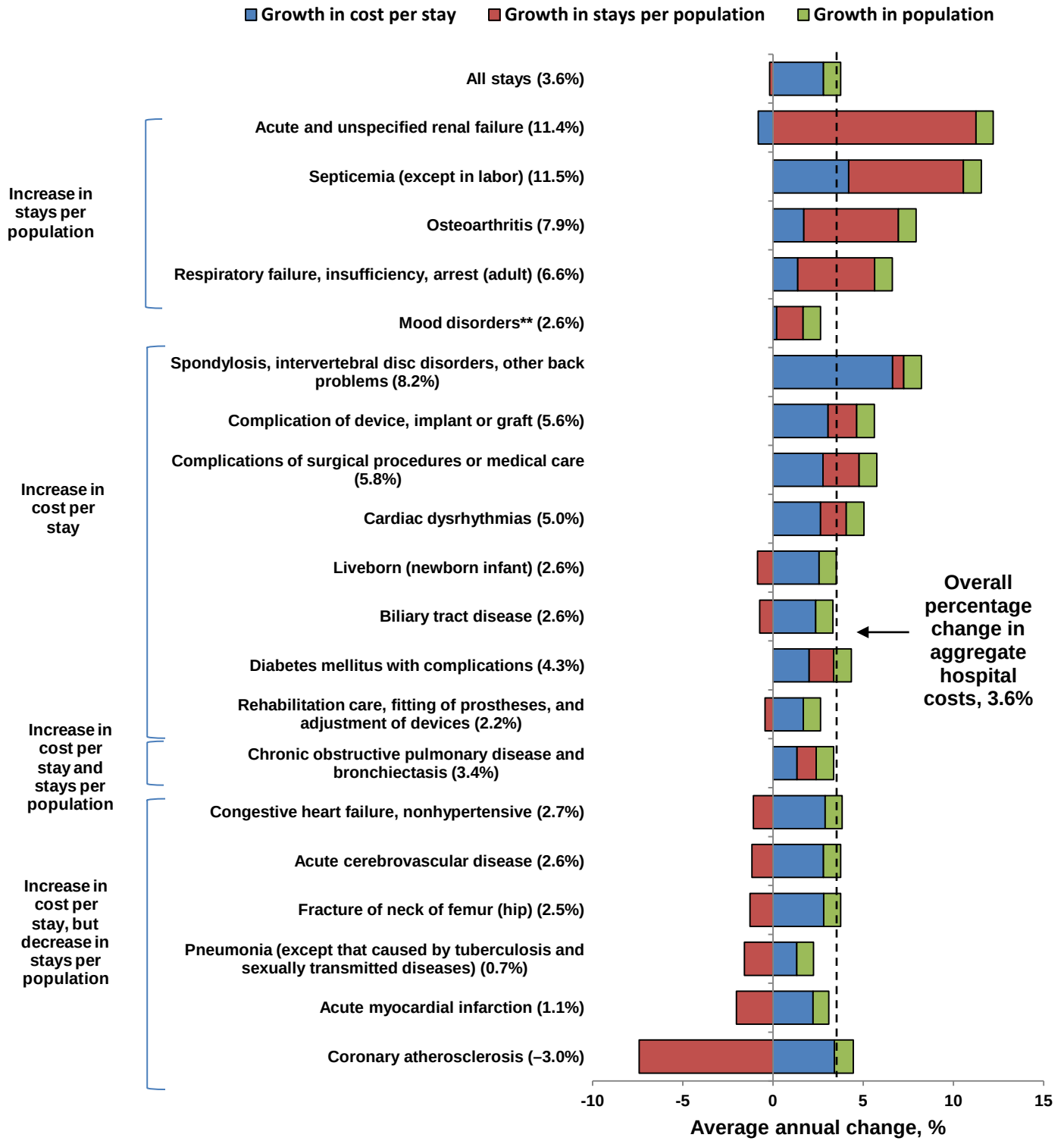
The *hospitalization rate* (stays per population) was the most important factor in cost growth for 4 of the 20 diagnoses that ranked among the most costly stays: acute and unspecified renal failure, septicemia, osteoarthritis, and adult respiratory failure.

Higher intensity of services (increased cost per stay) accounted for a large portion of growth in hospital costs for stays with eight principal diagnoses: back problems, both complication diagnoses, cardiac dysrhythmias, newborns, biliary tract disease, diabetes, and rehabilitation care.

For stays with a principal diagnosis of chronic obstructive pulmonary disease, growth in the hospitalization rate and intensity of services contributed equally to average annual aggregate cost growth.

For six diagnoses, growth in cost per stay was offset by a decline in the hospitalization rate. This included four of the five cardiovascular conditions that were among the most expensive stays in 2011 as well as hip fracture and pneumonia.

Figure 6. Average annual percentage change* and components of change in inflation-adjusted aggregate hospital costs by principal diagnosis, 1997–2011



* Bar segments depict the portion of change attributable to each of the factors listed in the key. The net average annual percentage change is noted in the axis label.

** The change in cost per stay and stays per population for mood disorders was not statistically significant between 1997 and 2011.

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 and 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 Nationwide Inpatient Sample (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. Data on average costs per stay and total aggregate costs were not available in HCUPnet for 1997–2006; these statistics were separately calculated using the HCUP 1997–2006 NIS. Supplemental sources included population denominator data for use with HCUP databases.[6]

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

Average Annual Percentage Change
Average annual percentage change is calculated using the following formula:

$$\text{Average annual percentage change} = \left[\left(\frac{\text{End value}}{\text{Beginning value}}\right)^{\frac{1}{\text{change in years}}} - 1\right] \times 100$$

In this Statistical Brief, 1997 and 2011 were the base years used to calculate the average annual percentage change in aggregate hospital costs, cost per stay, population, and stays per 10,000 population. Average annual percentage change was calculated over 14 years:

$$\text{Average annual percentage change} = \left[\left(\frac{\text{2011 value}}{\text{1997 value}}\right)^{\frac{1}{14}} - 1\right] \times 100$$

Diagnoses, ICD-9-CM Clinical Classifications Software (CCS), Diagnosis-Related Groups (DRGs), and Major Diagnostic Categories (MDCs)
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 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 approximately 14,000 ICD-9-CM diagnosis codes.

CCS categorizes ICD-9-CM diagnoses into a manageable number of clinically meaningful categories.[7] This "clinical grouper" makes it easier to quickly understand patterns of diagnoses. CCS categories identified as "Other" typically are not reported; these categories include miscellaneous, otherwise unclassifiable diagnoses that may be difficult to interpret as a group.

DRGs constitute a patient classification system that categorizes patients into groups that are clinically coherent and homogeneous with respect to resource use. DRGs group patients according to diagnosis, type of treatment (procedures), age, and other relevant criteria.

[6] 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. Online. March 8, 2013. U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/methods/2013_01.pdf. Accessed November 12, 2013.
[7] HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). U.S. Agency for Healthcare Research and Quality, Rockville, MD. Updated November 2013. http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed November 12, 2013.

MDCs are broad groups of DRGs that relate to an organ or a system and not to an etiology (for example, MDC 06, Diseases and Disorders of the Digestive System). Each hospital stay has one DRG and one MDC assigned to it.

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 Nationwide Inpatient Sample (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).[8] *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 are reported to the nearest hundred.

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."

Encounters 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.

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.

[8] HCUP Cost-to-Charge Ratio Files (CCR). Healthcare Cost and Utilization Project (HCUP). 2001–2009. U.S. Agency for Healthcare Research and Quality, Rockville, MD. Updated August 2013. http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed November 12, 2013.

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 constituting 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 November 12, 2013.

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. Accessed November 12, 2013.

Houchens RL, Elixhauser A. Using the HCUP Nationwide Inpatient Sample to Estimate Trends. (Updated for 1988–2004). HCUP Methods Series Report #2006–05. Online. August 18, 2006. U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/methods/2006_05_NISTrendsReport_1988-2004.pdf. Accessed November 12, 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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