HEALTHCARE COST AND UTILIZATION PROJECT

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Trends and Projections in U.S. Hospital Costs by Patient Age, 2003–2013

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Highlights

- Between 2003 and 2011, aggregate inflation-adjusted hospital costs grew for all age groups, with 2.1 percent average annual growth overall. Costs are projected to continue to increase through 2013, but at a slower rate. Overall, this cost growth is driven by growth in the average cost per discharge, with virtually no growth in the number of discharges.
- Among patients aged 0–17 years, inflation-adjusted aggregate hospital costs from 2003–2011 increased substantially for surgeries but decreased for injury hospitalizations. These aggregate costs are projected to increase for all types of hospitalizations through 2013, driven primarily by increases in the costs per discharge.
- For all types of hospitalizations, adults aged 18–64 years experienced increases in aggregate hospital costs from 2003–2011 and for projected costs through 2013. This growth was highest for mental health, which had growth in the number of discharges and the costs per discharge.
- Among adults aged 65 years and older, aggregate hospital costs increased for all types of hospitalizations from 2003–2011, with injury showing the most rapid growth. Growth in aggregate costs was driven largely by growth in costs per discharge and only slightly by growth in discharges. Surgery was a notable exception, where discharges fell slightly.

Introduction

Hospital costs continue to increase rapidly, with aggregate inflation-adjusted costs growing by 3.6 percent annually between 1997 and 2011.[1] Hospital costs vary substantially by medical condition and by the age of the patient.[2] For example, in 2011, adults between the ages of 45 and 84 accounted for almost two-thirds of aggregate hospital costs and had the highest mean cost per hospital stay.[3]

Timely information on trends in costs for various types of hospitalizations provides health care payers and policymakers with baseline information that can be used to help evaluate the impact of health care improvement efforts. A novel initiative from the Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project (HCUP) is used in this Statistical Brief to produce timely, current inpatient statistics on the cost and utilization of hospital care by patient age for specific types of conditions (e.g., medical, surgical).[4]

In this Statistical Brief, we use historical HCUP inpatient data from 2003 through 2011 along with early 2012 data from nine HCUP States to develop national quarterly projections of 2012 and 2013 aggregate hospital costs, average hospital costs, and total number of discharges. Data are presented for maternal patients, neonatal patients, and patients in three nonmaternal and non-neonatal age groups: 0–17 years, 18–64 years, and 65 years and older. Growth in actual and projected hospital costs and utilization is provided by age group for four nonmaternal and non-neonatal types of hospitalizations: medical, surgical, injury, and mental health. Differences greater than 10 percent between annual weighted estimates are noted in the text. Because analyses in this Statistical Brief are based on all discharges from

[1] Pfuntner A, Wier LM, Steiner C. Costs for hospital stays in the United States, 2011. HCUP Statistical Brief #168. December 2013. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb168-Hospital-Costs-United-States-2011.pdf. Accessed January 28, 2014.
[2] Ibid.
[3] Ibid.
[4] Complete and detailed description, methodology, data, and projections are provided in the following report: Steiner C, Andrews R, Barrett M, Weiss A. HCUP Projections: Cost of Inpatient Discharges 2012 to 2013. HCUP Projections Report #2013-01. December 11, 2013. U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/projections/2013-01.pdf. Accessed January 31, 2014.

all States weighted to a national level, the values may differ slightly from results reported from the HCUP Nationwide Inpatient Sample (NIS).

Findings

Overall hospital costs and utilization by patient age, 2003–2013

Table 1 presents aggregate hospital costs, average hospital costs, and total discharges for all inpatient hospitalizations by patient age group in 2003 and 2011 (actual values adjusted for inflation) and for 2013 (projected values adjusted for inflation). The average annual percentage change from 2003 to 2011 (actual change) and from 2011 to 2013 (projected change) is provided. Changes in aggregate hospital costs are influenced by changes in average hospital costs (costs per discharge) and total number of discharges.

Table 1. Aggregate hospital costs (inflation-adjusted), average hospital costs (inflation-adjusted), and total discharges by patient age group, 2003–2013

Outcome by age group	2003 (actual)	2011 (actual)	Average annual percentage change from 2003 to 2011	2013 (projected)	Average annual percentage change from 2011 to projected 2013
Aggregate hospital costs, in millions, $ (inflation-adjusted)					
All ages	338,700	401,000	2.1	411,800	1.3
Nonmaternal and non-neonatal					
0–17 years	16,400	19,600	2.3	21,000	3.3
18–64 years	143,400	177,000	2.7	182,800	1.6
65+ years	147,200	169,000	1.7	173,200	1.2
Maternal and neonatal					
Neonate	13,600	16,600	2.5	17,300	2.3
Maternal	17,400	19,000	1.1	19,500	1.3
Average hospital costs, $ (inflation-adjusted)					
All ages	9,100	10,600	2.0	11,000	1.9
Nonmaternal and non-neonatal					
0–17 years	7,700	10,600	4.1	11,400	3.8
18–64 years	10,500	12,200	2.0	12,600	1.5
65+ years	11,600	13,000	1.4	13,300	1.5
Maternal and Neonatal					
Neonate	3,200	4,100	3.1	4,300	2.3
Maternal	3,800	4,400	2.0	4,600	2.4
Total discharges, thousands					
All ages	37,400	37,700	0.1	37,300	–0.5
Nonmaternal and non-neonatal					
0–17 years	2,100	1,900	–1.7	1,800	–0.5
18–64 years	13,700	14,500	0.7	14,500	0.1
65+ years	12,600	13,000	0.4	13,000	–0.2
Maternal and Neonatal					
Neonate	4,200	4,000	–0.6	4,000	0.0
Maternal	4,600	4,300	–0.9	4,200	–1.1

Note: Inflation-adjusted costs are presented in 2013 dollars.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2003–2011, and early State discharge data, 2012

- **Aggregate hospital costs are projected to increase at a lower rate between 2011 and 2013 than in previous years.**

  Aggregate hospital costs adjusted for inflation increased by an average of 2.1 percent per year between 2003 and 2011. These costs are projected to continue to increase through 2013, but at a somewhat lower rate (1.3 percent per year). In 2003, aggregate hospital costs (in 2013 dollars) were $338.7 million, and they are projected to reach $411.8 million in 2013.

  Overall, the growth in actual and projected aggregate hospital costs is driven by growth in the average cost per discharge (2.0 percent actual average annual growth from 2003–2011 and 1.9 percent projected annual growth through 2013) with virtually no growth in the number of discharges (0.1 percent average annual change from 2003–2011 and –0.5 percent average annual change through 2013).

  Between 2003 and 2011, aggregate hospital costs grew for all patient age groups, exceeding 2 percent average annual growth for patients aged 0–17 years (2.3 percent), neonates (2.5 percent), and patients aged 18–64 years (2.7 percent). Aggregate hospital costs are projected to continue to increase by more than 2 percent annually through 2013 for neonates and patients aged 0–17 years (2.3 percent and 3.3 percent, respectively), but they are only projected to increase by 1.6 percent for patients aged 18–64 years.

- **Average hospital costs increased by 2 percent per year between 2003 and 2011, and they are projected to continue to increase at about this same rate through 2013.**

  Average hospital costs (costs per discharge) adjusted for inflation increased by an average of 2.0 percent per year between 2003 and 2011. These costs are projected to continue to increase at about this same rate per year (1.9 percent) through 2013. In 2003, average hospital costs (in 2013 dollars) were $9,100, and they are projected to reach $11,000 in 2013.

  Between 2003 and 2011, average hospital costs grew by more than 2 percent for all patient age groups except adults aged 65 years and older (1.4 percent growth per year). Average hospital costs are projected to continue to increase by more than 2 percent annually through 2013 for neonates (2.3 percent), maternal patients (2.4 percent), and patients aged 0–17 years (3.8 percent).

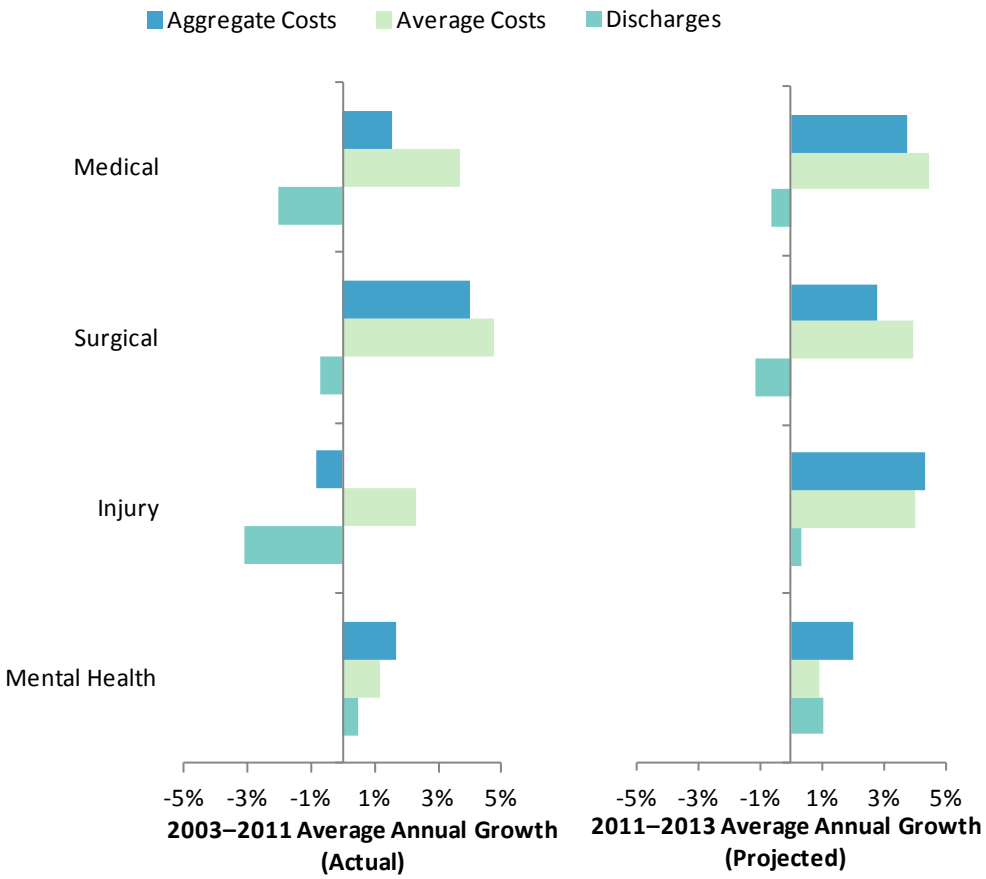
- **Total hospital discharges remained relatively stable between 2003 and 2011 and are projected to decrease slightly through 2013.**

  The overall number of hospital discharges changed minimally at 0.1 percent average annual growth between 2003 and 2011. Discharges are projected to decrease by an average of 0.5 percent per year from 2011 through 2013. There were 37.4 million total hospital discharges in 2003, and this number is projected to be virtually unchanged in 2013 at 37.3 million discharges.

  There was modest change (less than 1 percent) in the number of hospital discharges between 2003 and 2011 for four of the five patient age groups, ranging from –0.9 percent average change per year for maternal patients to 0.7 percent average change per year for adults aged 18–64 years. The only exception was for patients aged 0–17 years. This group had a noteworthy change in the number of hospital discharges, decreasing at an average rate of –1.7 percent per year from 2003 to 2011; this rate is projected to slow to –0.5 percent change per year through 2013. Finally, maternal patients are projected to experience a change of –1.1 percent per year through 2013.

Growth in hospital costs and utilization by patient age group and hospital service line, 2003–2013
Figures 1–3 show the average annual growth rate between 2003 and 2011 (actual) and between 2011 and 2013 (projected) in aggregate hospital costs (inflation-adjusted), average hospital costs (inflation-adjusted), and total discharges by hospital service line for nonmaternal and non-neonatal patients aged 0–17 years (Figure 1), 18–64 years (Figure 2), and 65 years and older (Figure 3).

Figure 1. Growth in aggregate hospital costs (inflation-adjusted), average hospital costs (inflation-adjusted), and total number of discharges, patients aged 0–17 years, 2003–2013



Note: Inflation-adjusted costs are presented in 2013 dollars.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2003–2011, and early State discharge data, 2012

- **Among patients aged 0–17 years, aggregate hospital costs from 2003–2011 grew most rapidly for surgical hospitalizations but decreased for injury hospitalizations. Costs are projected to grow substantially for most hospital service lines through 2013.**

  Between 2003 and 2011, aggregate hospital costs for patients aged 0–17 years in the surgical service line increased by an average of 4.0 percent per year. Increased surgical costs were driven by an increase in the average costs (4.8 percent), as the number of discharges declined (–0.7 percent). Aggregate hospital costs are projected to grow by at least 2 percent per year through 2013 for all hospital service lines, ranging from 2.0 percent for mental health to 4.4 percent for injury hospitalizations. Except for mental health, this growth is primarily associated with projected growth in the average costs per discharge, with little or negative growth in the number of discharges.

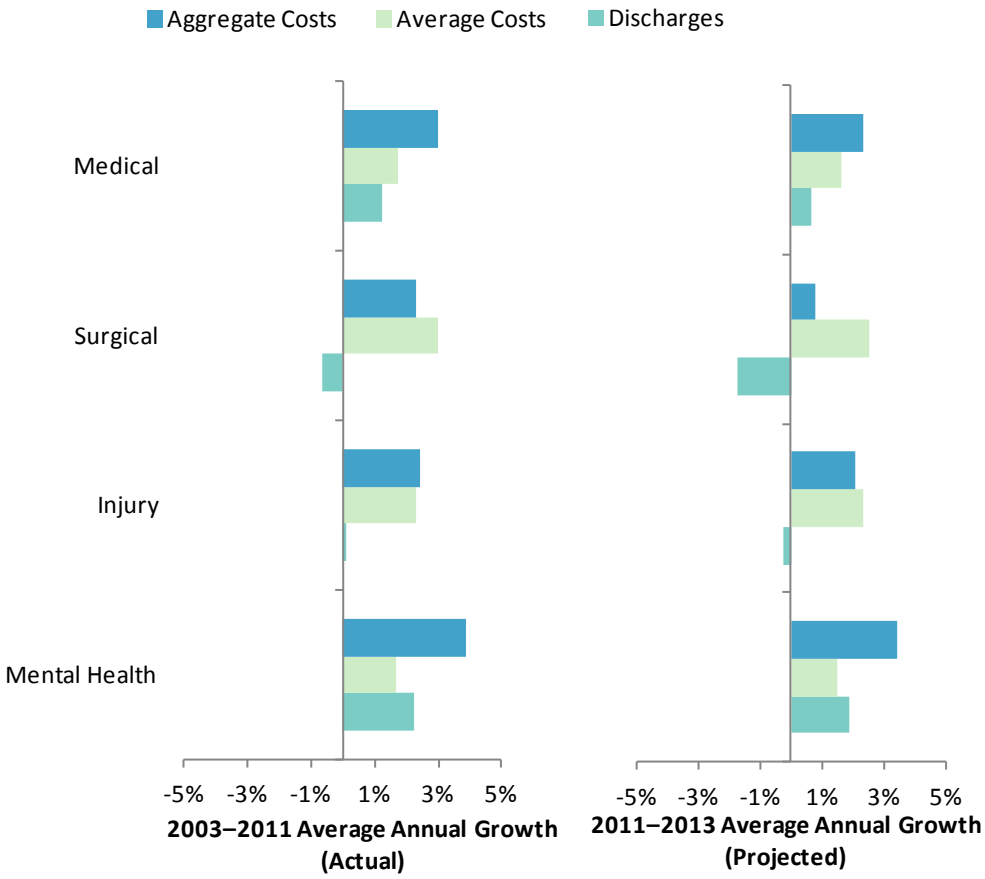
- **Average hospital costs for patients aged 0–17 years grew substantially through 2011 and are projected to continue to increase rapidly through 2013 in all hospital service lines except for mental health.**

  Average hospital costs (costs per discharge) for patients aged 0–17 years increased by an average of at least 2 percent per year from 2003 through 2011 for all types of hospitalizations except mental health (1.2 percent). Average hospital costs are projected to continue to increase at about the same rate through 2013 for mental health hospitalizations (0.9 percent) but to grow by at least 4 percent per year for the other hospital service lines.

- **Patients aged 0–17 years experienced a decrease from 2003–2011 in all types of hospitalizations except for mental health, and these trends are generally projected to continue through 2013.**

  Patients aged 0–17 years experienced a reduction in hospital discharges between 2003 and 2011 for all types of hospitalizations except mental health, which increased slightly at 0.5 percent average annual growth. Growth rates are projected to continue to remain negative or low through 2013 for all types of hospitalizations among this age group.

Figure 2. Growth in aggregate hospital costs (inflation-adjusted), average hospital costs (inflation-adjusted), and total number of discharges, adults aged 18–64 years, 2003–2013



Note: Inflation-adjusted costs are presented in 2013 dollars.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2003–2011, and early State discharge data, 2012

- **Among adults aged 18–64 years, aggregate hospital costs increased most rapidly for mental health hospitalizations.**

  Aggregate hospital costs for adults aged 18–64 years increased for all hospital service lines between 2003 and 2011, with mental health hospitalizations experiencing the most rapid growth (average 3.9 percent per year). This growth is projected to continue through 2013, with costs in the mental health service line projected to increase an average of 3.4 percent per year. Growth in the average costs per discharge contributed to much of the overall cost growth across service lines, with the exception of mental health, which experienced even greater growth in the number of total discharges.

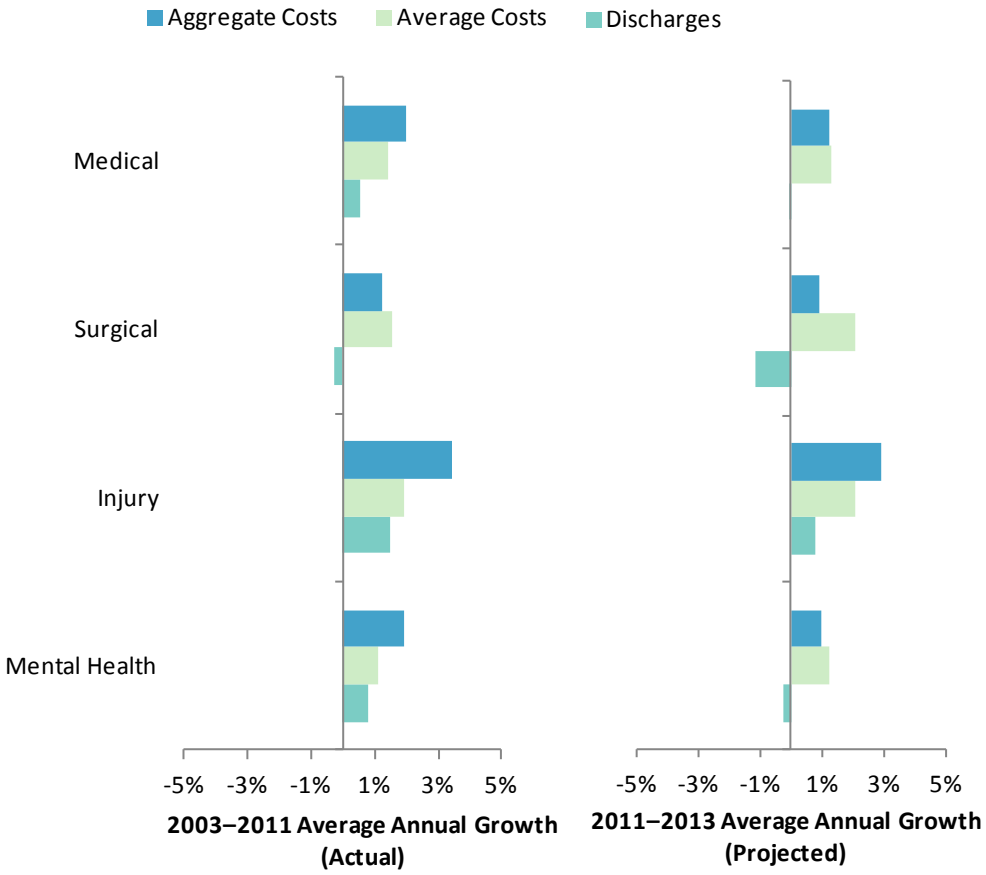
- **Average hospital costs increased for all types of hospitalizations among adults aged 18–64 years.**

  Average hospital costs for adults aged 18–64 years increased between 2003 and 2011 for all hospital service lines, ranging from 1.7 percent average growth per year (mental health and medical) to 3.0 percent (surgical). These growth rates are projected to continue through 2013 with average hospital cost annual growth rates ranging from 1.5 percent (mental health) to 2.5 percent (surgical).

- **Among adults aged 18–64 years, hospitalizations for mental health had the most growth.**

  Among adults aged 18–64 years, mental health hospitalizations grew most rapidly between 2003 and 2011 at 2.2 percent average growth per year. This trend is projected to continue through 2013, with 1.9 percent average annual growth in mental health discharges. The other service lines experienced slower growth, with surgical hospitalizations projected to decrease (–1.7 percent) from 2011 through 2013.

Figure 3. Growth in aggregate hospital costs (inflation-adjusted), average hospital costs (inflation-adjusted), and total number of discharges, adults aged 65 years and older, 2003–2013



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2003–2011, and early State discharge data, 2012

- **Among adults aged 65 years and older, aggregate hospital costs increased most rapidly for injury hospitalizations.**

  Aggregate hospital costs for adults aged 65 years and older increased for all hospital service lines between 2003 and 2011, with injury hospitalizations experiencing the most rapid growth (3.4 percent per year). This growth is projected to continue through 2013, with aggregate hospital costs in the injury service line projected to increase an average of 2.9 percent per year. For most of the service

lines, the growth in aggregate costs was associated primarily with growth in average costs per discharge and only slightly with growth in the number of discharges. Surgery was a notable exception, where discharges fell slightly.

- **Average hospital costs among adults aged 65 years and older grew between 1 and 2 percent per year.**

  Average hospital costs among adults aged 65 years and older experienced relatively moderate average annual growth between 2003 and 2011 for all types of hospitalizations, ranging from 1.1 percent (mental health) to 1.9 percent (injury). Average hospital costs are projected to continue to grow at a similar annual rate through 2013, ranging from 1.3 percent (mental health and medical) to 2.1 percent (surgical and injury).

- **There was little growth in the number of hospitalizations for adults aged 65 years and older.**

  The total number of discharges changed relatively little between 2003 and 2011 for adults in this age group, ranging from –0.3 percent average change per year for surgical hospitalizations to 1.5 percent average change per year for injury hospitalizations. The minimal growth across all types of hospitalizations for these adults is projected to continue through 2013.

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for 2003 through 2011. The SID from 2003 through 2011 include about 305 million inpatient discharges from 47 States. At the time these statistics were generated, we had early quarterly data for nine States for 2012. The 2012 projections incorporated observed rates for these nine States and estimated rates from time-series models for the remaining States. For 2013, the projections were entirely based on rates estimated from time-series models.

National quarterly projections for 2012 and 2013 were generated using the SAS Time Series Forecasting System™ (Version 9.2).[5] Projections were calculated first by State and then weighted proportionally to the nine Census divisions and the nation. For each State, the software automatically selected from among 40 different time-series models the model with the lowest mean absolute percentage error (MAPE) for that State. National quarterly trends were calculated as a weighted average of the State-level quarterly trends within each division. Each State's weight was proportional to its total number of discharges (excluding newborns), as reported in the American Hospital Association (AHA) Annual Survey of Hospitals. These AHA-based weights were used throughout the period, 2003–2012.

Definitions

Case definition
Coding criteria for the five hospital service lines are provided in Table 2 and are based on International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes, Clinical Classifications Software (CCS) categories, and diagnosis-related groups (DRGs) (see definitions below). Each discharge was assigned to a single hospital service line hierarchically, based on the following order: maternal and neonatal, mental health, injury, surgical, and medical.

Diagnoses, ICD-9-CM Clinical Classifications Software (CCS), and Diagnosis-Related Groups (DRGs)
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 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.[6] 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 comprise 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. Each hospital stay has one assigned DRG.

[5] SAS Institute. Large-Scale Automatic Forecasting Using Inputs and Calendar Events. White Paper, SAS Institute Inc., 2009.
[6] HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). U.S. Agency for Healthcare Research and Quality, Rockville, MD. Updated April 2014. http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed April 14, 2013.

Table 2. Coding criteria for five hospital service lines analyzed in this research

Maternal and neonatal service line
Maternal and neonatal stays are defined using the following CCS principal diagnosis categories: *Maternal* • 176: Contraceptive and procreative management • 177: Spontaneous abortion • 178: Induced abortion • 179: Postabortion complications • 180: Ectopic pregnancy • 181: Other complications of pregnancy • 182: Hemorrhage during pregnancy; abruptio placenta; placenta previa • 183: Hypertension complicating pregnancy; childbirth and the puerperium • 184: Early or threatened labor • 185: Prolonged pregnancy • 186: Diabetes or abnormal glucose tolerance complicating pregnancy; childbirth; or the puerperium • 187: Malposition; malpresentation • 188: Fetopelvic disproportion; obstruction • 189: Previous C-section • 190: Fetal distress and abnormal forces of labor • 191: Polyhydramnios and other problems of amniotic cavity • 192: Umbilical cord complication • 193: OB-related trauma to perineum and vulva • 194: Forceps delivery • 195: Other complications of birth; puerperium affecting management of mother • 196: Normal pregnancy and/or delivery *Neonatal* • 218: Liveborn • 219: Short gestation; low birth weight; and fetal growth retardation • 220: Intrauterine hypoxia and birth asphyxia • 221: Respiratory distress syndrome • 222: Hemolytic jaundice and perinatal jaundice • 223: Birth trauma • 224: Other perinatal conditions

Mental health service line

Mental health visits are defined using the following CCS principal diagnosis categories:

Starting in 2007

- 650: Adjustment disorders
- 651: Anxiety disorders
- 652: Attention-deficit, conduct, and disruptive behavior disorders
- 653: Delirium, dementia, and amnestic and other cognitive disorders
- 654: Developmental disorders
- 655: Disorders usually diagnoses in infancy, childhood, or adolescence
- 656: Impulse control disorders, NEC
- 657: Mood disorders
- 658: Personality disorders
- 659: Schizophrenia and other psychotic disorders
- 660: Alcohol-related disorders
- 661: Substance-related disorders
- 662: Suicide and intentional self-inflicted injury
- 663: Screening and history of mental health and substance abuse codes
- 670: Miscellaneous disorders

2003 through 2006

- 65: Mental retardation
- 66: Alcohol-related mental disorders
- 67: Substance-related mental disorders
- 68: Senility and organic mental disorders
- 69: Affective disorders
- 70: Schizophrenia and related disorders
- 71: Other psychoses
- 72: Anxiety; somatoform; dissociative; and personality disorders
- 73: Preadult disorders
- 74: Other mental conditions
- 75: Personal history of mental disorder; mental and behavioral problems; observation and screening for mental condition

Injury service line

Injuries are identified using the principal diagnosis and a scheme recommended by Safe States Alliance, which was previously known as the *State and Territorial Injury Prevention Directors Association (STIPDA)*. The table below lists the diagnosis codes in the range 800–999 used to identify injuries.

Included

- **800–909.2, 909.4, 909.9**: Fractures; dislocations; sprains and strains; intracranial injury; internal injury of thorax, abdomen, and pelvis; open wound of the head, neck, trunk, upper limb, and lower limb; injury to blood vessels; late effects of injury, poisoning, toxic effects, and other external causes, excluding those of complications of surgical and medical care and drugs, medicinal, or biological substances.
- **910–994.9**: Superficial injury; contusion; crushing injury; effects of foreign body entering through orifice; burns; injury to nerves and spinal cord; traumatic complications and unspecified injuries; poisoning and toxic effects of substances; other and unspecified effects of external causes.
- **995.5–995.59**: Child maltreatment syndrome.
- **995.80–995.85**: Adult maltreatment, unspecified; adult physical abuse; adult emotional or psychological abuse; adult sexual abuse; adult neglect (nutritional); other adult abuse and neglect.

Excluded

- **909.3, 909.5**: Late effect of complications of surgical and medical care and late effects of adverse effects of drug, medicinal, or biological substance.
- **995.0–995.4, 995.6–995.7, 995.86, 995.89**: Other anaphylactic shock; angioneurotic edema; unspecified adverse effect of drug, medicinal and biological substance; allergy, unspecified; shock due to anesthesia; anaphylactic shock due to adverse food reaction; malignant hyperpyrexia or hypothermia due to anesthesia.
- **996–999**: Complications of surgical and medical care, not elsewhere classified.

It should be noted that the above definition of injury includes five diagnosis codes that are also included under two CCS diagnosis categories used for the definition of the mental health service line:

- CCS = 660 (alcohol-related disorders): diagnosis 9800 (toxic effect of ethyl alcohol)
- CCS = 661 (substance-related disorders): diagnoses 96500 (poisoning by opium), 96501 (poisoning by heroin), 96502 (poisoning by methadone), 96509 (poisoning by other opiate).

Because of the hierarchical ordering used to assign discharges to service lines, discharges with one of these five principal diagnosis codes were assigned to the mental health service line and not the injury service line.

Surgical service line

Surgical stays are identified by a surgical DRG. The DRG grouper first assigns the discharge to a major diagnostic category (MDC) based on the principal diagnosis. For each MDC, there is a list of procedure codes that qualify as operating room procedures. If the discharge involves an operating room procedure, it is assigned to one of the surgical DRGs within the MDC category; otherwise it is assigned to a medical DRG.

Medical service line

Medical stays are identified by a medical DRG. The DRG grouper first assigns the discharge to an MDC based on the principal diagnosis. For each MDC, there is a list of procedure codes that qualify as operating room procedures. If the discharge involves an operating room procedure, it is assigned to one of the surgical DRGs within the MDC category; otherwise it is assigned to a medical DRG.

Average annual percentage change
Average annual percentage change is calculated using the following formula:

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

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 State Inpatient Databases (SID).

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).[7] *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. The CCRs are at the hospital level and are not sensitive to possible differences by hospital service line. 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.

Quarterly cost data from the HCUP Projections[8] were weighted to produce annual costs. Annual costs were inflation adjusted using the Gross Domestic Product (GDP) from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA), with 2013 as the index base.[9] That is, all costs are expressed in 2013 dollars.

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government to create a national information resource of encounter-level health care data (HCUP Partners). HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels.

[7] HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2001–2011. U.S. Agency for Healthcare Research and Quality, Rockville, MD. Updated August 2013. http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed December 13, 2013.
[8] Steiner C, Andrews R, Barrett M, Weiss A. HCUP Projections: Cost of Inpatient Discharges 2012 to 2013. HCUP Projections Report #2013-01. December 11, 2013. U.S. Agency for Healthcare Research and Quality. Rockville, MD. http://www.hcup-us.ahrq.gov/reports/projections/2013-01.pdf. Accessed January 31, 2014.
[9] U.S. Bureau of Economic Analysis. National Income and Product Account Tables, Table 1.1.4 Price Indexes for Gross Domestic Product. http://www.bea.gov/iTable/iTable.cfm?RegID=9&step=1#reqid=9&step=1&isuri=1. Accessed March 20, 2014.

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 Revenue and Fiscal Affairs Office
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

* HCUP Partners designated with an asterisk participated in AHRQ's quarterly data initiative contributing quarterly data in 2012.

About Statistical Briefs

HCUP Statistical Briefs are descriptive summary reports presenting statistics on hospital inpatient and emergency department use and costs, quality of care, access to care, medical conditions, procedures, patient populations, and other topics. The reports use HCUP administrative health care data.

About the SID

The HCUP State Inpatient Databases (SID) are hospital inpatient databases from data organizations participating in HCUP. The SID contain the universe of the inpatient discharge abstracts in the participating HCUP States, translated into a uniform format to facilitate multistate comparisons and analyses. Together, the SID encompass more than 95 percent of all U.S. community hospital discharges in 2009. The SID can be used to investigate questions unique to one State, to compare data from two or more States, to conduct market-area variation analyses, and to identify State-specific trends in inpatient care utilization, access, charges, and outcomes.

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 #166, Overview of Hospital Stays in the United States, 2011
- Statistical Brief #168, Costs for Hospital Stays in the United States, 2011
- Statistical Brief #162, Most Frequent Conditions in U.S. Hospitals, 2011
- Statistical Brief #165, Most Frequent Procedures Performed in U.S. Hospitals, 2011

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 State Inpatient Databases. Online. August 2013. U.S. Agency for Healthcare Research and Quality. http://hcup-us.ahrq.gov/db/state/siddist/Introduction_to_SID.pdf. Accessed July 8, 2014.

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/methods/CalculatingNISVariances200106092005.pdf. Accessed December 13, 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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