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Hospital Stays in Medicare Advantage Plans Versus the Traditional Medicare Fee-for-Service Program, 2013

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Introduction

The Centers for Medicare & Medicaid Services (CMS) use two main mechanisms to pay for covered services received by Medicare beneficiaries. The traditional mechanism is fee for service (FFS),¹ by which CMS contractors administer a payment to health care providers based on the specific medical service delivered to the beneficiary. An alternative payment mechanism involves paying a predetermined amount per beneficiary to CMS-approved private insurance companies that deliver covered services doing business as Medicare Advantage (MA) plans.²

The set payment per beneficiary to MA plans is intended to incentivize innovation and efficiency and promote care management. This incentive structure is important because, despite a slowdown in the average spending for Medicare beneficiaries over the past few years, aggregate Medicare spending is projected to increase 5 to 7 percent annually over the next 10 years.³ However, historically, MA plans have received higher per enrollee payments relative to the average spending on care for beneficiaries in Medicare FFS. More recently, under provisions of the Affordable Care Act of 2010, the difference between per enrollee payments to MA plans and those on behalf of beneficiaries in Medicare FFS have become smaller.⁴

MA plan enrollment continues to increase, more than tripling since 2003.⁵ In 2014, 15.8 million Medicare beneficiaries—30 percent of the total—enrolled in MA plans.⁶ Because both overall Medicare spending and beneficiary health care are affected by MA plans, the MA program is a focal point for policymakers. A key issue is how resource use by beneficiaries in MA plans

¹ When used in this brief, *FFS* refers to the traditional Medicare fee-for-service program and not the private fee-for-service plans that are offered under the Medicare Advantage program.

² Medicare Payment Advisory Commission. Report to the Congress: Medicare Payment Policy. Washington, DC: Medicare Payment Advisory Commission; March 2015, 315.
http://www.medpac.gov/documents/reports/mar2015_entirereport_revised.pdf?sfvrsn=0. Accessed May 19, 2015.

³ *Ibid.*, 14.

⁴ *Ibid.*, 330.

⁵ *Ibid.*, 321.

⁶ *Ibid.*, 315.

Highlights

- In 2013, Medicare Advantage was the expected primary payer for 23.3 percent of hospital stays for patients younger than 65 years and 29.6 percent of hospital stays for patients 65 years and older.
- Similarly, in 2013 Medicare Advantage accounted for 21.8 percent of aggregate hospital costs among younger Medicare patients and 28.5 percent of aggregate costs among older Medicare patients.
- In 2013 the average length of Medicare Advantage inpatient stays was shorter than that of Medicare fee-for-service inpatient stays for both age groups.
- Among Medicare inpatient stays in 2013, the proportion of patients younger than 65 years with a mental health stay was smaller (9.6 vs. 13.8 percent) and the length of a mental health stay was shorter (7.5 vs. 9.2 days) when the expected primary payer was Medicare Advantage versus Medicare fee for service. A similar relationship was observed between Medicare Advantage and Medicare fee for service for mental health stays among patients 65 years and older.
- Among Medicare patients younger than 65 years in 2013, average hospital costs for stays covered by Medicare Advantage were lower than for stays covered by Medicare fee for service at small, public, private investor-owned, and independent hospitals.

compares with that by beneficiaries in Medicare FFS. Health care resource use can be measured by the number of hospital stays, length of inpatient stays, and average costs for hospital stays, and health care resource use varies across hospital settings. In addition, health care resource use by Medicare enrollees younger than 65 years who are entitled to coverage on the basis of disability or end-stage renal disease differs in important ways from that by Medicare enrollees 65 years and older; this younger age group accounted for 17 percent of the Medicare population in 2012.⁷ Published studies on the relative use of resources between MA plans and Medicare FFS generally have found lower service use by MA plan enrollees after controlling for demographic characteristics and health status.⁸

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data from the 13 States that provide the distinction between MA plans and Medicare FFS in their information on payment source. Statistics are presented on utilization and costs of hospital inpatient stays for which Medicare is the primary expected payment source. Outcomes are provided by Medicare coverage option—MA plan versus Medicare FFS—and for two Medicare patient age groups (younger than 65 years and 65 years and older). Information is presented for different types of hospital stays and for select hospital characteristics. Only differences in values of 10 percent or greater between MA and FFS are noted in the text.

⁷ Medicare Payment Advisory Commission. Report to Congress: Medicare Payment Policy. Washington, DC: Medicare Payment Advisory Commission; March 2015, 21. http://www.medpac.gov/documents/reports/mar2015_entirereport_revised.pdf?sfvrsn=0. Accessed May 19, 2015.

⁸ Afendulis CC, Chernew ME, Kessler DP. The Effect of Medicare Advantage on Hospital Admissions and Mortality. Working Paper 19101. Cambridge, MA: National Bureau of Economic Research; June 2013.

Findings

Characteristics of Medicare hospital stays, 2013

Table 1 presents characteristics of inpatient hospitalizations in 2013 for which Medicare was the expected primary payer. Statistics are reported separately for stays for which the expected primary payer was an MA plan versus Medicare FFS; these payer groups are further subdivided into patients younger than 65 years versus those 65 years and older.

Table 1. Characteristics of Medicare hospital inpatient stays by patient age and Medicare coverage option, 2013

Characteristics	Younger than 65 years		65 years and older	
	MA	FFS	MA	FFS
Patient characteristics				
Mean age, years	53.4	51.6	77.5	78.4
Female, %	51.2	48.1	55.3	56.6
Chronic conditions				
Mean number	3.4	3.3	4.1	4.1
None, %	6.3	5.7	1.9	1.9
1–4 conditions, %	66.1	68.0	58.5	58.4
5+ conditions, %	27.7	26.3	39.7	39.8
Hospital stay characteristics				
Total hospital stays, n ^a	260,100	857,500	1,390,100	3,307,700
Aggregate costs, billions \$	3.2	11.6	17.9	44.8
Admissions from emergency department, %	68.8	70.0	71.8	70.3
Mean length of stay, days	5.4	6.1	5.2	5.6

Abbreviations: MA, Medicare Advantage; FFS, fee for service

Note: *FFS* refers to the traditional Medicare fee-for-service program and not the private fee-for-service plans that are offered under the Medicare Advantage program.

^a The number of total hospital stays is rounded to the nearest 100.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for 13 States, 2013

- **Characteristics of hospitalized patients in MA plans were similar to those of hospitalized patients with FFS.**

Among inpatient stays for both age groups (younger than 65 years and 65 years and older), hospitalized patients in MA plans were similar to those with FFS in mean age, sex, and number of chronic conditions.

- **MA was the expected primary payer for approximately one-fourth of Medicare inpatient hospital stays and costs among younger and older Medicare patients.**

In 2013, MA was the primary payer for approximately one quarter of stays among patients younger than 65 years (23.3 percent) and patients 65 years and older (29.6 percent). Similarly, MA accounted for 21.8 and 28.5 percent of aggregate costs for hospital inpatient stays among younger and older Medicare patients, respectively.

- **Among patients younger than 65 years, the average length of stay was shorter for MA patients than for FFS patients.**

The average length of stay among Medicare patients younger than 65 years was 12.4 percent shorter for those in MA plans compared with those with FFS (5.4 vs. 6.1 days).

Hospital utilization and costs for Medicare patients, 2013

Table 2 presents utilization and costs for select types of hospital inpatient stays among Medicare patients in 2013. Statistics are reported separately by age (younger than 65 years vs. 65 years and older), and these age groups are subdivided into the Medicare coverage options (MA vs. FFS).

Table 2. Utilization and cost per stay for Medicare hospital inpatient stays by patient age and Medicare coverage option, 2013

Type of stay	Hospital stays, %		Mean length of stay, days		Mean cost per stay, \$ ^a	
	MA	FFS	MA	FFS	MA	FFS
Younger than 65 years						
Type of hospital service						
Medical stays	60.9	62.1	4.7	5.1	9,200	10,500
Surgical stays	23.8	19.7	6.4	7.3	23,300	26,800
Injury-related stays	4.0	3.7	4.8	5.0	13,300	14,800
Mental health stays	9.6	13.8	7.5	9.2	7,300	8,300
Selected types of stays						
Potentially preventable hospitalizations	15.6	14.5	4.7	4.8	9,000	9,800
Resource intensive DRGs	17.3	17.1	4.5	4.9	10,300	11,400
65 years and older						
Type of hospital service						
Medical stays	66.7	69.1	4.7	5.2	9,100	10,000
Surgical stays	25.8	22.8	6.0	6.3	22,600	24,400
Injury-related stays	5.7	5.9	5.1	5.1	13,900	14,300
Mental health stays	1.7	2.2	8.1	9.6	8,700	9,600
Selected types of stays						
Potentially preventable hospitalizations	16.9	17.5	4.7	4.8	8,600	9,100
Resource intensive DRGs	21.8	21.8	4.8	5.2	10,700	11,400

Abbreviations: DRG, diagnosis-related group; MA, Medicare Advantage; FFS, fee for service

Note: FFS refers to the traditional Medicare fee-for-service program and not the private fee-for-service plans that are offered under the Medicare Advantage program.

^a The mean cost per stay is rounded to the nearest 100.

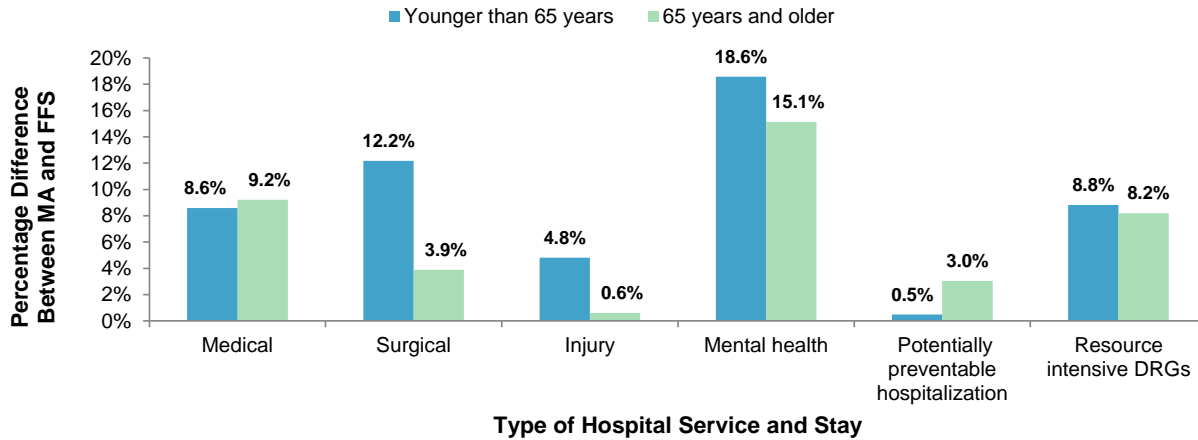
Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for 13 States, 2013

- **MA patients had a higher proportion of surgical stays and a lower proportion of mental health stays than did FFS patients.**

In 2013, a higher proportion of hospital stays were for surgery among both younger and older patients in MA plans compared with those with FFS (younger than 65 years: 23.8 vs. 19.7 percent; 65 years and older: 25.8 vs. 22.8 percent). In contrast, a lower proportion of MA stays were for mental health compared with FFS (younger than 65 years: 9.6 vs. 13.8 percent; 65 years and older: 1.7 vs. 2.2 percent).

Figure 1 illustrates the percentage by which the average length of stay is lower for patients in MA plans than for those with Medicare FFS.

Figure 1. Percentage by which mean length of stay is lower for patients in MA plans versus those with Medicare FFS, by patient age and type of stay, 2013



Abbreviations: DRG, diagnosis-related group; MA, Medicare Advantage; FFS, fee for service

Notes: *FFS* refers to the traditional Medicare fee-for-service program and not the private fee-for-service plans that are offered under the Medicare Advantage program. Percentage differences were calculated from values that were not rounded.

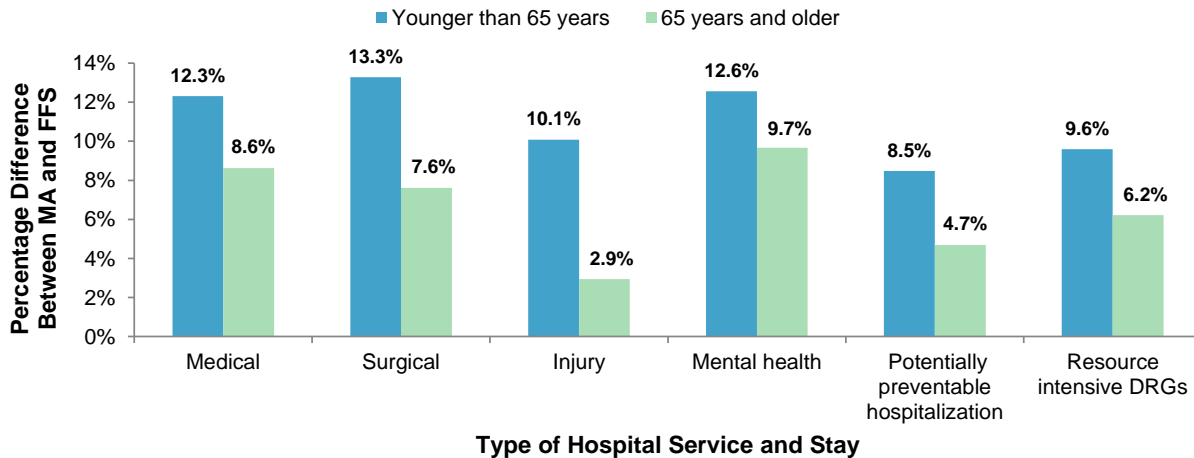
Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for 13 States, 2013

- **For both younger and older Medicare patients, mental health stays were shorter on average for patients in MA plans than for FFS patients.**

The average length of stay for mental health among those younger than 65 years was 18.6 percent shorter for Medicare patients in MA plans compared with those with FFS (7.5 vs. 9.2 days). Similarly, among Medicare patients 65 years and older, the average length of stay for mental health was 15.1 percent shorter for those in MA plans versus those with FFS (8.1 vs. 9.6 days). In addition, among Medicare patients younger than 65 years, the average length of stay for surgical stays was 12.2 percent shorter for patients in MA plans compared with those with FFS (6.4 vs. 7.3 days).

Figure 2 illustrates the percentage by which mean hospital cost per stay is lower for patients in MA plans than for those with Medicare FFS.

Figure 2. Percentage by which mean hospital costs are lower for patients in MA plans versus with Medicare FFS, by patient age and type of stay, 2013



Abbreviations: DRG, diagnosis-related group; MA, Medicare Advantage; FFS, fee-for-service

Notes: *FFS* refers to the traditional Medicare fee-for-service program and not the private fee-for-service plans that are offered under the Medicare Advantage program. Percentage differences were calculated from values that were not rounded.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for 13 States, 2013

- **Patients younger than 65 years in MA plans had lower mean hospital costs than those with FFS for four types of stays.**

Among younger patients, those in MA plans had lower costs for four types of hospital stays when compared with FFS: 12.3 percent lower for medical stays (\$9,200 vs. \$10,500), 13.3 percent lower for surgical stays (\$23,300 vs. \$26,800), 10.1 percent lower for injury-related stays (\$13,300 vs. \$14,800), and 12.6 percent lower for mental health stays (\$7,300 vs. \$8,300).

Hospital utilization and costs for Medicare patients by select hospital characteristics, 2013

Table 3 presents utilization and costs for hospital inpatient stays in 2013 among Medicare patients by select hospital characteristics. Statistics are reported separately by Medicare patient age group (younger than 65 years vs. 65 years and older) and Medicare coverage option (MA vs. FFS).

Table 3. Utilization and cost of Medicare hospital inpatient stays for select hospital characteristics by patient age and Medicare coverage option, 2013

Hospital characteristics	Hospital stays, %		Mean length of stay, days		Mean cost per stay, \$ ^a	
	MA	FFS	MA	FFS	MA	FFS
Younger than 65 years						
Teaching hospitals	55.3	50.4	5.8	6.5	14,000	15,300
Small hospitals (<100 beds)	5.9	8.9	4.9	6.4	10,800	12,600
Ownership						
Public hospitals	8.7	11.8	5.8	6.8	13,100	15,000
Private, not-for-profit hospitals	73.2	71.3	5.4	5.9	13,100	13,800
Private, investor-owned hospitals	18.1	16.9	4.8	6.5	9,600	11,100
Hospital system						
Centralized	24.9	20.5	5.6	6.0	13,600	14,300
Moderately centralized	10.3	14.8	5.5	6.1	15,500	15,600
Decentralized	35.7	26.6	4.9	5.6	10,300	11,000
Independent	5.5	7.9	6.2	8.1	13,600	15,500
65 years and older						
Teaching hospitals	50.8	44.1	5.5	5.8	14,300	15,100
Small hospitals (<100 beds)	5.8	10.2	5.0	5.7	11,300	12,300
Ownership						
Public hospitals	7.7	9.9	5.4	5.7	13,600	14,400
Private, not-for-profit hospitals	76.3	73.9	5.2	5.5	13,400	13,900
Private, investor-owned hospitals	16.0	16.3	4.8	5.9	10,200	11,600
Hospital system ^b						
Centralized	24.2	20.5	5.5	5.5	13,800	14,100
Moderately centralized	10.5	14.1	5.4	5.5	14,900	15,300
Decentralized	37.1	27.9	4.7	5.1	11,000	11,500
Independent	5.3	6.8	5.7	7.3	13,800	15,400

Abbreviations: DRG, diagnosis-related group; MA, Medicare Advantage; FFS, fee for service

Note: FFS refers to the traditional Medicare fee-for-service program and not the private fee-for-service plans that are offered under the Medicare Advantage program.

^a The mean cost per stay is rounded to the nearest 100.

^b In 2013, 28.4 percent of community, nonrehabilitation hospitals in the included States did not report to the American Hospital Association on type of hospital system.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for 13 States, 2013

- **Compared with FFS, MA was the expected primary payer for a higher proportion of stays at centralized and decentralized hospitals and for a lower proportion of stays at small, public, moderately centralized, and independent hospitals.**

Among Medicare patients in both age groups, the proportion of inpatient stays at centralized and decentralized hospitals was higher for those in MA plans than for those with FFS. For example, the share of stays at decentralized hospitals for patients in MA plans and with FFS was 35.7 versus 26.6 percent for those younger than 65 years and was 37.1 versus 27.9 percent for patients 65 years and older. For both younger and older Medicare patients, a lower proportion of MA inpatient stays were at small, public, moderately centralized, and independent hospitals compared with FFS.

Among hospital stays by patients 65 years and older, the proportion of inpatient stays also was higher at teaching hospitals when the expected primary payer was MA than when it was FFS (50.8 vs. 44.1 percent).

- **The average length of stay for both age groups in MA plans was shorter than for those with FFS, and average length of stay varied across hospital characteristics.**

MA patients had shorter stays when compared with FFS patients at small; private, investor-owned; and independent hospitals in both age groups. For example, at private, investor-owned hospitals, the average length of stay for patients 65 years and older in MA plans was 4.8 days compared with 5.9 days for FFS. Among patients younger than 65 years, inpatient stays for those in MA plans were also shorter at teaching (5.8 vs. 6.5 days), public (5.8 vs. 6.8 days), moderately centralized (5.5 vs. 6.1 days), and decentralized (4.9 vs. 5.6 days) hospitals.

- **For a variety of hospital characteristics for stays by Medicare patients in both age groups, average hospital costs were lower for hospitalizations covered by MA than for those covered by FFS.**

Among patients younger than 65 years, hospital stays for which MA was the expected primary payer had lower average costs than those for which FFS was the expected primary payer at hospitals categorized as small (\$10,800 vs. \$12,600); public (\$13,100 vs. \$15,000); private, investor-owned (\$9,600 vs. \$11,100); and independent (\$13,600 vs. \$15,500). Among patients 65 years and older, the average cost per stay covered by MA was lower than for FFS for private, investor-owned hospitals (\$10,200 vs. \$11,600) and independent hospitals (\$13,800 vs. \$15,400).

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2013 State Inpatient Databases (SID) for 13 States: California, Connecticut, Florida, Georgia, Iowa, Kentucky, Maryland, New York, Oregon, Pennsylvania, Rhode Island, Tennessee, and West Virginia. These States provided enough detail on patients' source of payment to distinguish Medicare Advantage (MA) from fee for service (FFS). Data from the American Hospital Association (AHA) Annual Survey of Hospitals were used to obtain the hospital characteristics in the 13 States.

Definitions

Case definition

The inclusion of a State in this analysis was based on three criteria:

1. Payer codes that identified Medicare managed care (MA) separately from other Medicare (FFS) were present.
2. The Medicare managed care proportion was at least 5 percent.
3. The difference between the percentage of Medicare managed care enrollment as reported by CMS and the percentage of claims with Medicare managed care as the expected primary payer reported in HCUP data did not exceed 30 percent.

For the selected States, ratios of the CMS Medicare enrollment percentage to the HCUP Medicare claims percentage ranged from 0.87 to 1.26 (i.e., the difference between sources ranged from 13 to 26 percent). The selected States accounted for 41 percent of all Medicare beneficiaries and 50 percent of all MA enrollees in 2011.

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 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.⁹ 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. DRGs are sensitive to whether the stay involved complications or comorbidities.

Coding criteria for the four hospital service lines are provided in Table 4 and are based on ICD-9-CM codes, CCS categories, and DRGs. Each discharge was assigned to a single hospital service line hierarchically, based on the following order: maternal/neonatal, mental health, injury, surgical, and medical.

⁹ Agency for Healthcare Research and Quality. HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2014. <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>. Accessed January 7, 2015.

Table 4. Coding criteria for the four hospital service lines analyzed in this research

Mental health service line
Mental health visits are defined using the following CCS <u>principal</u> diagnosis categories:
<i>Starting in 2007</i>
<ul style="list-style-type: none">• 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 diagnosed 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
<i>2003 through 2006</i>
<ul style="list-style-type: none">• 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). Diagnosis codes in the 800–999 range used to identify injuries are listed below:

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/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 also are 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 to 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.

Abbreviations: CCS, Clinical Classifications Software; DRG, diagnosis-related group; NEC, not elsewhere classified

Types of hospitals included in HCUP State Inpatient Databases

This analysis used State Inpatient Databases (SID) limited to 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). Community hospitals include obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Excluded for this analysis are long-term care facilities such as 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 was included in the analysis.

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 1 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).¹⁰ *Costs* 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.

How HCUP estimates of costs differ from National Health Expenditure Accounts

There are a number of differences between the costs cited in this Statistical Brief and spending as measured in the National Health Expenditure Accounts (NHEA), which are produced annually by CMS.¹¹ The largest source of difference comes from the HCUP coverage of inpatient treatment only in contrast to the NHEA inclusion of outpatient costs associated with emergency departments and other hospital-based outpatient clinics and departments as well. The outpatient portion of hospitals' activities has been growing steadily and may exceed half of all hospital revenue in recent years. On the basis of the AHA Annual Survey, 2012 outpatient gross revenues (or charges) were about 44 percent of total hospital gross revenues.¹²

Smaller sources of differences come from the inclusion in the NHEA of hospitals that are excluded from HCUP. These include Federal hospitals (Department of Defense, Veterans Administration, Indian Health Services, and Department of Justice [prison] hospitals) as well as psychiatric, substance abuse, and long-term care hospitals. A third source of difference lies in the HCUP reliance on billed charges from hospitals to payers, adjusted to provide estimates of costs using hospital-wide cost-to-charge ratios, in contrast to the NHEA measurement of spending or revenue. HCUP costs estimate the amount of money required to produce hospital services, including expenses for wages, salaries, and benefits paid to staff as well as utilities, maintenance, and other similar expenses required to run a hospital. NHEA spending or revenue measures the amount of income received by the hospital for treatment and other services provided, including payments by insurers, patients, or government programs. The difference between revenues and costs include profit for for-profit hospitals or surpluses for nonprofit hospitals.

Payer

Payer is the expected 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)
- Uninsured: includes an insurance status of *self-pay* and *no charge*

¹⁰ Agency for Healthcare Research and Quality. HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2001–2012. Rockville, MD: Agency for Healthcare Research and Quality. Updated December 2014. <https://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp>. Accessed January 7, 2015.

¹¹ For additional information about the NHEA, see Centers for Medicare & Medicaid Services (CMS). National Health Expenditure Data. CMS Web site May 2014. <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/index.html?redirect=/NationalHealthExpendData/>. Accessed January 7, 2015.

¹² American Hospital Association. TrendWatch Chartbook, 2014. Table 4.2. Distribution of Inpatient vs. Outpatient Revenues, 1992–2012. <http://www.aha.org/research/reports/tw/chartbook/2014/table4-2.pdf>. Accessed January 7, 2015.

- Other: includes Worker's Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs.

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 patients in SCHIP specifically, it is not possible to present this information separately.

For this Statistical Brief, hospital stays were limited to those with an expected primary payer of Medicare. Discharges were identified as MA or Medicare FFS based on the expected primary payer as received from the State data source. The coding of managed care in HCUP data varies by State. Discharges with expected primary payer descriptions of *Medicare HMO*, *Medicare PPO*, *Medicare POS*, *Medicare managed care*, or *Medicare Advantage* were categorized as MA. All other Medicare discharges were categorized as Medicare FFS.

Potentially preventable hospitalizations

The Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators (PQIs) were used to develop estimates of the number of potentially preventable hospitalizations. The PQIs (version 4.5), a component of the AHRQ Quality Indicators (QIs), are a set of measures that can be used with hospital inpatient discharge data to identify access to and quality of care for "ambulatory care-sensitive conditions." These are conditions for which good outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. Conditions included in the overall potentially preventable hospitalizations indicator (PQI #90) reported in this Statistical Brief are dehydration, bacterial pneumonia, urinary tract infection, diabetes with short-term complications, diabetes with long-term complications, uncontrolled diabetes without complications, diabetes with lower extremity amputation, chronic obstructive pulmonary disease, asthma, hypertension, heart failure, and angina without a cardiac procedure. PQI rates also can be affected by other factors such as disease prevalence. The PQIs are adjusted for age and sex.

Further information on the AHRQ QIs, including documentation and free software downloads, is available at <http://www.qualityindicators.ahrq.gov/>. Additional information on how the QI software was applied to the HCUP data for the statistics reported in this Statistical Brief is available in Coffey et al., 2012.¹³

Resource intensive diagnosis-related groups (DRGs)

In this Statistical Brief, resource intensive DRGs are defined as the 18 MS-DRG conditions and procedures with the highest proportion of intensive care unit (ICU) utilization based on a previous analysis of HCUP SID for 29 states in 2011.¹⁴ These MS-DRGs are presented in Table 5.

¹³ Coffey R, Barrett M, Houchens R, Moy E, Andrews R, Coenen N. Methods Applying AHRQ Quality Indicators to Healthcare Cost and Utilization Project (HCUP) Data for the Eleventh (2013) National Healthcare Quality Report (NHQR) and National Healthcare Disparities Report (NHDR). HCUP Methods Series Report #2012-03. Online. November 12, 2012. U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/methods/2012_03.pdf. Accessed January 7, 2015.

¹⁴ Barrett ML, Smith MW, Elixhauser A, Honigman LS, Pines JM. Utilization of Intensive Care Services, 2011. HCUP Statistical Brief #185. December 2014. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb185-Hospital-Intensive-Care-Units-2011.pdf>. Accessed May 16, 2015.

Table 5. MS-DRG conditions and procedures with the highest proportion of ICU utilization

MS-DRG condition or procedure
64 Intracranial hemorrhage or cerebral infarction with MCC
65 Intracranial hemorrhage or cerebral infarction with CC
189 Pulmonary edema and respiratory failure
193 Simple pneumonia and pleurisy with MCC
208 Respiratory system diagnosis with ventilator support less than 96 hours
247 Percutaneous cardiovascular procedure with drug-eluting stent without MCC
280 Acute myocardial infarction, discharged alive with MCC
287 Circulatory disorders except AMI, with cardiac catheterization without MCC
291 Heart failure and shock with MCC
292 Heart failure and shock with CC
309 Cardiac arrhythmia and conduction disorders with CC
310 Cardiac arrhythmia and conduction disorders without CC/MCC
313 Chest pain
378 Gastrointestinal hemorrhage with CC
638 Diabetes with CC
682 Renal failure with MCC
871 Septicemia or severe sepsis without mechanical ventilation 96+ hours with MCC
918 Poisoning and toxic effects of drugs without MCC

Abbreviations: AMI, acute myocardial infarction; CC, chronic condition; MCC, multiple chronic conditions

Hospital characteristics

Hospital characteristics obtained from the AHA Annual Survey of Hospitals data were status as a teaching hospital, bed size, ownership, and type of hospital system.

A *teaching hospital* is defined as having a residency program approved by the American Medical Association, being a member of the Council of Teaching Hospitals, or having a ratio of full-time equivalent interns and residents to beds of 0.25 or higher.

Type of hospital system is based on responses to AHA Annual Survey of Hospitals questions related to health system membership and degree of centralization in hospital services, physician arrangements, and insurance product development. The AHA derives type of hospital system from a binary variable for system membership and the AHA system cluster variable shown in Table 6, which uses multiple AHA survey responses and factor analysis to classify hospitals into one of six categories on the basis of differentiation, centralization, and integration.¹⁵ *System* is defined by AHA as either a multihospital or a diversified single hospital system. A multihospital system is two or more hospitals owned, leased, sponsored, or contract managed by a central organization. Single, freestanding hospitals may be categorized as a system by bringing into membership three or more, and at least 25 percent, of their owned or leased nonhospital preacute or postacute health care organizations. For this Statistical Brief, the AHA cluster values 1 and 2 are collapsed into one group and called centralized systems.

¹⁵ Bazzoli GJ, Shortell SM, Dubbs N, Chan C, Kralovec P. A taxonomy of health networks and systems: bringing order out of chaos. *Health Services Research*. 1999;33(6):1683–717.

Table 6. American Hospital Association health system cluster descriptions¹⁶

Cluster code	Label	Description
1	Centralized health system	A delivery system in which the system centrally organizes individual hospital service delivery, physician arrangements, and insurance product development. The number of different products/services that are offered across the system is moderate.
2	Centralized physician/insurance health system	A delivery system with highly centralized physician arrangements and insurance product development. Within this group, hospital services are relatively decentralized, with individual hospitals having discretion over the array of services they offer. The number of different products/services that are offered across the system is moderate.
3	Moderately centralized health system	A delivery system that is distinguished by the presence of both centralized and decentralized activity for hospital services, physician arrangements, and insurance product development. For example, a system within this group may have centralized care of expensive, high-technology services, such as open heart surgery, but allow individual hospitals to provide an array of other health services based on local needs. The number of different products and services that are offered across the system is moderate.
4	Decentralized health system	A delivery system with a high degree of decentralization of hospital services, physician arrangements, and insurance product development. Within this group, systems may lack an overarching structure for coordination. Service and product differentiation is high, which may explain why centralization is hard to achieve. In this group, the system may simply serve a role in sharing information and providing administrative support to highly developed local delivery systems centered around hospitals.
5	Independent hospital system	A delivery system with limited differentiation of hospital services, physician arrangements, and insurance product development. These systems are largely horizontal affiliations of autonomous hospitals.
6 or blank	Blank	Sufficient data from the FY 2012 Annual Survey were not available to determine a cluster assignment.

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, and private data organizations (HCUP Partners) and the Federal government to create a national information resource of encounter-level health care data. 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.

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

¹⁶ American Hospital Association. AHA Annual Survey Database Fiscal Year 2012. <http://www.ahadataviewer.com/book-cd-products/AHA-Survey/>. Accessed August 31, 2015.

Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
District of Columbia 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 Office of Health Analytics
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

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. 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 #180, Overview of Hospital Stays in the United States, 2012
- Statistical Brief #181, Costs for Hospital Stays in the United States, 2012
- Statistical Brief #186, Most Frequent Operating Room Procedures Performed in U.S. Hospitals, 2003–2012
- Statistical Brief #162, Most Frequent Conditions in U.S. Hospitals, 2011

For a detailed description of HCUP and more information on the design of the State Inpatient Databases (SID), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2014. <http://www.hcup-us.ahrq.gov/sidoverview.jsp>. Accessed January 7, 2015.

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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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