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National Inpatient Hospital Costs: The Most Expensive Conditions by Payer, 2017

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Introduction

Healthcare spending in the United States increased 4.2 percent between 2016 and 2017 to \$3.5 trillion, or \$10,739 per person, and accounted for 17.9 percent of the Gross Domestic Product.¹ Constituting nearly one-third of all healthcare expenditures, hospital spending rose 4.7 percent to \$1.1 trillion during the same time period.² Although this growth represented deceleration compared with the 5.8 percent increase between 2014 and 2015,³ the consistent year-to-year rise in hospital-related expenses remains a central concern among policymakers.

In 2016, there were over 35 million hospital stays, equating to 104.2 stays per 100,000 population.⁴ The average cost per hospital stay was \$11,700, making hospitalization one of the most expensive types of healthcare utilization.⁵ Higher costs are documented for stays among patients with an expected payer of Medicare compared with stays with other expected payers (\$13,600 for Medicare vs. \$9,300–\$12,600 for other payers).⁶

This Statistical Brief presents data from the Healthcare Cost and Utilization Project (HCUP) on costs of hospital inpatient stays in the United States using the 2017 National Inpatient Sample (NIS). It describes the distribution of costs by primary expected payer and illustrates the conditions accounting for the largest percentage of each payer's hospital costs. Hospital charges were converted to costs using HCUP Cost-to-Charge Ratios.⁷ The expected payers examined are Medicare, Medicaid, private insurance, and self-pay/no charge. Because of the large sample size of the NIS data, small differences can be statistically significant. Thus, only differences greater than or equal to 10 percent are noted in the text. Hospital costs in this Statistical Brief

Highlights

- In 2017, aggregate hospital costs for 35.8 million hospital stays totaled \$434.2 billion.
- The five most expensive inpatient conditions were septicemia, osteoarthritis, liveborn (newborn) infants, acute myocardial infarction, and heart failure. The 20 most expensive conditions accounted for slightly less than half of aggregate hospital costs.
- The share of aggregate inpatient hospital costs by primary expected payer was 66 percent for Medicare and Medicaid combined, 27 percent for private insurance, and 3 percent for self-pay/no charge stays.
- Septicemia ranked among the three most costly conditions in the hospital for all four expected payer groups.
- Conditions related to pregnancy and childbirth accounted for 4 of the top 20 most expensive conditions expected to be paid by Medicaid.
- Medicaid was the only expected payer for which 3 of the top 20 most expensive conditions were related to mental and substance use disorders.

¹ Centers for Medicare & Medicaid Services. NHE Fact Sheet. Updated December 5, 2019. www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NHE-Fact-Sheet. Accessed December 7, 2019.

² Ibid.

³ Ibid.

⁴ Freeman WJ, Weiss AJ, Heslin KC. Overview of U.S. Hospital Stays in 2016: Variation by Geographic Region. HCUP Statistical Brief #246. December 2018. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/reports/statbriefs/sb246-Geographic-Variation-Hospital-Stays.pdf. Accessed November 27, 2019.

⁵ Ibid.

⁶ Ibid.

⁷ Agency for Healthcare Research and Quality. HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2001–2017. Agency for Healthcare Research and Quality. Updated December 2019. www.hcup-us.ahrq.gov/db/state/costtcharge.jsp. Accessed February 3, 2020.

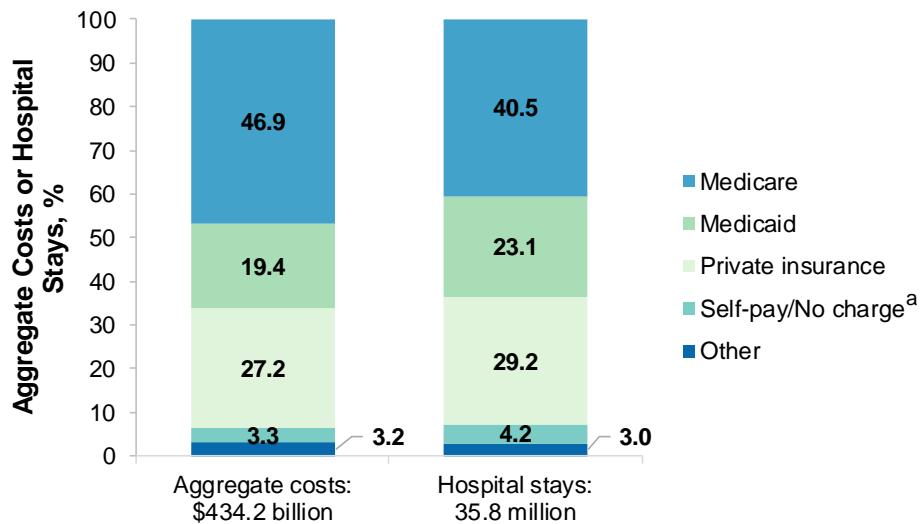
represent the hospital's costs to produce the services—not the amount paid for services by payers—and they do not include separately billed physician fees associated with the hospitalization.

Findings

Aggregate hospital inpatient costs and stays by payer, 2017

Figure 1 presents the distribution by primary expected payer for aggregate hospital costs and total hospital inpatient stays in 2017.

Figure 1. Aggregate hospital costs and hospital stays by primary expected payer, 2017



^a Self-pay/No charge: includes self-pay, no charge, charity, and no expected payment.

Note: Hospital charges were converted to costs using HCUP Cost-to-Charge Ratios. See *Costs and Charges* in the *Definitions* section for additional information.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2017

- In 2017, Medicare and Medicaid combined to account for approximately two-thirds (66.3 percent) of aggregate hospital costs.

Government payers (Medicare and Medicaid combined) accounted for 66.3 percent of all hospital costs in 2017. Stays with an expected payer of Medicare constituted 46.9 percent and those with Medicaid amounted for 19.4 percent of the \$434.2 billion in aggregate hospital costs. Private insurance was the second most common expected payer, representing 27.2 percent of total costs, and hospital stays with an expected payer of self-pay/no charge accounted for 3.3 percent of total hospital costs.

- The percentage of aggregate hospital costs in 2017 for stays with a primary expected payer of Medicare (46.9 percent) was greater than the percentage of hospital stays expected to be covered by Medicare (40.5 percent).

The proportion of aggregate hospital costs (46.9 percent) for stays with an expected payer of Medicare was larger than the proportion of hospital stays (40.5 percent) with an expected payer of Medicare. In contrast, patients with an expected payer of Medicaid accounted for 19.4 percent of hospital costs compared with 23.1 percent of hospital stays.

Most expensive conditions treated in U.S. hospitals, 2017

Table 1 presents the top 20 most expensive conditions treated in U.S. hospitals across all payers in 2017. The conditions are ranked by aggregate hospital costs. Both the dollar amount and percentage of total aggregate costs associated with the condition are shown. The number and percentage of all hospital stays for each condition also are presented.

Table 1. The 20 most expensive conditions treated in U.S. hospitals, all payers, 2017

Rank	Clinical condition grouped by default CCSR category	Aggregate hospital costs, \$, millions	Aggregate hospital costs, %	Number of hospital stays, thousands	Hospital stays, %
1	Septicemia	38,239	8.8	2,086	5.8
2	Osteoarthritis	19,907	4.6	1,249	3.5
3	Liveborn	15,972	3.7	3,693	10.3
4	Acute myocardial infarction	14,342	3.3	662	1.8
5	Heart failure	13,583	3.1	1,091	3.0
6	Spondylopathies/spondyloarthropathy (including infective)	12,305	2.8	532	1.5
7	Respiratory failure; insufficiency; arrest	9,179	2.1	534	1.5
8	Coronary atherosclerosis and other heart disease	8,711	2.0	374	1.0
9	Cerebral infarction	7,402	1.7	525	1.5
10	Diabetes mellitus with complication	7,271	1.7	658	1.8
11	Chronic obstructive pulmonary disease and bronchiectasis	7,013	1.6	761	2.1
12	Cardiac dysrhythmias	6,971	1.6	613	1.7
13	Pneumonia (except that caused by tuberculosis)	6,452	1.5	637	1.8
14	Fracture of the neck of the femur (hip), initial encounter	5,628	1.3	323	0.9
15	Complication of other surgical or medical care, injury, initial encounter	5,608	1.3	325	0.9
16	Nonrheumatic and unspecified valve disorders	5,434	1.3	124	0.3
17	Acute and unspecified renal failure	5,140	1.2	542	1.5
18	Biliary tract disease	4,550	1.0	357	1.0
19	Complication of cardiovascular device, implant or graft, initial encounter	4,455	1.0	170	0.5
20	Fracture of the lower limb (except hip), initial encounter	4,368	1.0	226	0.6
Total for top 20 conditions		202,529	46.6	15,484	43.3
Total for all stays		434,186	100.0	35,798	100.0

Abbreviations: CCSR, Clinical Classifications Software Refined; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Diagnosis groups are defined using the CCSR for ICD-10-CM Diagnoses. Conditions were identified using the CCSR default category assignment(s) for the principal diagnosis code of the hospital stay. The CCSR includes multiple category assignments for some diagnosis codes. The default CCSR category assignments facilitate analyses requiring a mutually exclusive diagnosis categorization scheme by selecting a single CCSR category for each hospital encounter based on clinical coding guidelines, clinical input on the etiology and pathology of diseases, coding input on the use of and ordering of ICD-10-CM codes on a billing record, and standards set by other Federal agencies.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2017

- **The 20 most expensive conditions accounted for slightly less than half (46.6 percent) of aggregate hospital costs in 2017.**

Septicemia was the most expensive condition treated, amounting to \$38.2 billion, or 8.8 percent of aggregate costs for all hospital stays in 2017. Other high-cost hospital stays were for osteoarthritis (\$19.9 billion, or 4.6 percent), liveborn (newborn) infants (\$16.0 billion, or 3.7 percent), acute myocardial infarction (\$14.3 billion, or 3.3 percent), and heart failure (\$13.6 billion, or 3.1 percent).

- **The 20 most expensive conditions constituted 43.3 percent of all hospital stays.**

One out of every 10 hospital stays was for liveborn (newborn) infants (10.3 percent). Among the 20 most expensive conditions, septicemia was the second most common reason for hospitalization, representing 5.8 percent of all hospital stays, followed by osteoarthritis and heart failure (3.5 and 3.0 percent, respectively).

Most expensive conditions by primary expected payer, 2017

Tables 2 through 5 list the 20 most expensive conditions in 2017 for stays expected to be paid by Medicare, Medicaid, or private insurance, or that were expected to be self-pay/no charge.

In summary, similarities across the expected payer categories are described below:

■ **Five conditions were among the 20 most expensive conditions for all four expected payer groups.**

There were some commonalities across payers in the conditions that generated high aggregate hospital costs. For all four expected payer groups, septicemia was among the top three most expensive conditions.

The following five conditions were among the 20 most expensive conditions for all four expected payer groups, ordered by aggregate cost among all payers:

- Septicemia
- Acute myocardial infarction
- Heart failure
- Respiratory failure; insufficiency; arrest
- Diabetes mellitus with complications

■ **Several other conditions were ranked among those with the highest aggregate hospital costs across three of the four expected payer groups.**

- Complication of other surgical or medical care, injury, initial encounter; osteoarthritis; and spondylopathies/spondyloarthropathy (including infective) were among the 20 most expensive conditions for stays with an expected payer of Medicare, Medicaid, and private insurance.
- Cerebral infarction and coronary atherosclerosis and other heart disease were among the 20 most expensive conditions for stays with an expected payer of Medicare, private insurance, and self-pay/no charge.
- The diagnosis of liveborn (newborn) infants was among the four most expensive hospital stays with an expected payer of Medicaid, private insurance, and self-pay/no charge.
- Chronic obstructive pulmonary disease and bronchiectasis and pneumonia (except that caused by tuberculosis) were among the 20 most expensive conditions for stays with an expected payer of Medicare, Medicaid, and self-pay/no charge.

Table 2. The 20 most expensive conditions with an expected payer of Medicare, 2017

Rank	Clinical condition grouped by default CCSR category	Aggregate hospital costs, \$, millions	Aggregate hospital costs, %	Number of hospital stays, thousands	Hospital stays, %
1	Septicemia	22,795	11.2	1,291	8.9
2	Osteoarthritis	11,290	5.5	713	4.9
3	Heart failure	9,397	4.6	806	5.6
4	Acute myocardial infarction	8,007	3.9	381	2.6
5	Spondylopathies/spondyloarthropathy (including infective)	5,791	2.8	250	1.7
6	Respiratory failure; insufficiency; arrest	5,182	2.5	334	2.3
7	Coronary atherosclerosis and other heart disease	5,066	2.5	217	1.5
8	Chronic obstructive pulmonary disease and bronchiectasis	4,981	2.4	537	3.7
9	Cardiac dysrhythmias	4,764	2.3	417	2.9
10	Cerebral infarction	4,607	2.3	344	2.4
11	Fracture of the neck of the femur (hip), initial encounter	4,530	2.2	267	1.8
12	Nonrheumatic and unspecified valve disorders	4,017	2.0	92	0.6
13	Pneumonia (except that caused by tuberculosis)	3,922	1.9	383	2.6
14	Diabetes mellitus with complication	3,637	1.8	280	1.9
15	Acute and unspecified renal failure	3,480	1.7	373	2.6
16	Complication of cardiovascular device, implant or graft, initial encounter	2,774	1.4	111	0.8
17	Complication of other surgical or medical care, injury, initial encounter	2,658	1.3	151	1.0
18	Urinary tract infections	2,560	1.3	345	2.4
19	Gastrointestinal hemorrhage	2,477	1.2	230	1.6
20	Complication of internal orthopedic device or implant, initial encounter	2,369	1.2	111	0.8
Total for top 20 conditions		114,305	56.2	7,632	52.6
Total for all stays		203,533	100.0	14,514	100.0

Abbreviations: CCSR, Clinical Classifications Software Refined; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Diagnosis groups are defined using the CCSR for ICD-10-CM Diagnoses. Conditions were identified using the CCSR default category assignment(s) for the principal diagnosis code of the hospital stay. The CCSR includes multiple category assignments for some diagnosis codes. The default CCSR category assignments facilitate analyses requiring a mutually exclusive diagnosis categorization scheme by selecting a single CCSR category for each hospital encounter based on clinical coding guidelines, clinical input on the etiology and pathology of diseases, coding input on the use of and ordering of ICD-10-CM codes on a billing record, and standards set by other Federal agencies.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2017

- **Seven of the 20 most expensive conditions for hospital stays with an expected payer of Medicare did not appear in the top 20 conditions for other payers.**

The following conditions were among the 20 most expensive conditions for Medicare stays (but not for other payers, as shown in Tables 2–5), ordered by aggregate cost:

- Fracture of the neck of the femur (hip), initial encounter
- Nonrheumatic and unspecified valve disorders
- Acute and unspecified renal failure
- Complication of cardiovascular device, implant or graft, initial encounter
- Urinary tract infections
- Gastrointestinal hemorrhage
- Complication of internal orthopedic device or implant, initial encounter

- **Circulatory, injury, and respiratory conditions represented nearly two-thirds of the 20 most expensive conditions for stays with an expected payer of Medicare.**

Six of the 20 most expensive conditions during hospital stays with an expected payer of Medicare were related to the circulatory system, ordered by aggregate cost:

- Heart failure
- Acute myocardial infarction
- Coronary atherosclerosis and other heart disease
- Cardiac dysrhythmias
- Cerebral infarction
- Nonrheumatic and unspecified valve disorders

Four of the 20 most expensive conditions during hospital stays with an expected payer of Medicare were related to injuries and complications:

- Fracture of the neck of the femur (hip), initial encounter
- Complication of cardiovascular device, implant or graft, initial encounter
- Complication of other surgical or medical care, injury, initial encounter
- Complication of internal orthopedic device or implant, initial encounter

Three of the 20 most expensive conditions during hospital stays with an expected payer of Medicare were related to the respiratory system:

- Respiratory failure; insufficiency; arrest
- Chronic obstructive pulmonary disease and bronchiectasis
- Pneumonia (except that caused by tuberculosis)

Table 3. The 20 most expensive conditions with an expected payer of Medicaid, 2017

Rank	Clinical condition grouped by default CCSR category	Aggregate hospital costs, \$, millions	Aggregate hospital costs, %	Number of hospital stays, thousands	Hospital stays, %
1	Liveborn	8,177	9.7	1,704	20.6
2	Septicemia	6,687	7.9	303	3.7
3	Respiratory failure; insufficiency; arrest	1,977	2.3	89	1.1
4	Complications specified during childbirth	1,627	1.9	350	4.2
5	Diabetes mellitus with complication	1,620	1.9	166	2.0
6	Heart failure	1,613	1.9	112	1.4
7	Schizophrenia spectrum and other psychotic disorders	1,489	1.8	165	2.0
8	Acute myocardial infarction	1,435	1.7	62	0.8
9	Previous C-section	1,218	1.4	211	2.6
10	Cardiac and circulatory congenital anomalies	1,141	1.4	14	0.2
11	Complication of other surgical or medical care, injury, initial encounter	1,113	1.3	59	0.7
12	Pneumonia (except that caused by tuberculosis)	1,042	1.2	102	1.2
13	Spondylopathies/spondyloarthropathy (including infective)	1,018	1.2	48	0.6
14	Skin and subcutaneous tissue infections	1,000	1.2	134	1.6
15	Depressive disorders	975	1.2	187	2.3
16	Hypertension and hypertensive-related conditions complicating pregnancy; childbirth; and the puerperium	951	1.1	144	1.7
17	Traumatic brain injury (TBI); concussion, initial encounter	944	1.1	29	0.3
18	Chronic obstructive pulmonary disease and bronchiectasis	943	1.1	103	1.2
19	Osteoarthritis	940	1.1	55	0.7
20	Alcohol-related disorders	901	1.1	121	1.5
Total for top 20 conditions		36,809	43.6	4,157	50.3
Total for all stays		84,441	100.0	8,271	100.0

Abbreviations: CCSR, Clinical Classifications Software Refined; C-section, caesarean section; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Diagnosis groups are defined using the CCSR for ICD-10-CM Diagnoses. Conditions were identified using the CCSR default category assignment(s) for the principal diagnosis code of the hospital stay. The CCSR includes multiple category assignments for some diagnosis codes. The default CCSR category assignments facilitate analyses requiring a mutually exclusive diagnosis categorization scheme by selecting a single CCSR category for each hospital encounter based on clinical coding guidelines, clinical input on the etiology and pathology of diseases, coding input on the use of and ordering of ICD-10-CM codes on a billing record, and standards set by other Federal agencies.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2017

- **Two of the 20 most expensive conditions for hospital stays with an expected payer of Medicaid did not appear in the top 20 conditions for other payers.**

The following conditions were in the 20 most expensive conditions for Medicaid stays (but not for other payers, as shown in Tables 2–5), ordered by aggregate cost:

- Schizophrenia spectrum and other psychotic disorders
- Hypertension and hypertensive-related conditions complicating pregnancy; childbirth; and the puerperium
- **Conditions involving pregnancy and childbirth, the respiratory system, the circulatory system, and mental and substance use disorders represented nearly two-thirds of the 20 most expensive conditions for stays with an expected payer of Medicaid.**

Four of the 20 most expensive conditions during hospital stays with an expected payer of Medicaid were related to pregnancy and childbirth, ordered by aggregate cost:

- Liveborn
- Complications specified during childbirth
- Previous C-section
- Hypertension and hypertensive-related conditions complicating pregnancy; childbirth; and the puerperium

Three of the 20 most expensive conditions during hospital stays with an expected payer of Medicaid were related to the respiratory system:

- Respiratory failure; insufficiency; arrest
- Pneumonia (except that caused by tuberculosis)
- Chronic obstructive pulmonary disease and bronchiectasis

Three of the 20 most expensive conditions during hospital stays with an expected payer of Medicaid were related to the circulatory system:

- Heart failure
- Acute myocardial infarction
- Cardiac and circulatory congenital anomalies

Three of the 20 most expensive conditions during hospital stays with an expected payer of Medicaid were related to mental and substance use disorders:

- Schizophrenia spectrum and other psychotic disorders
- Depressive disorders
- Alcohol-related disorders

Table 4. The 20 most expensive conditions with an expected payer of private insurance, 2017

Rank	Clinical condition grouped by default CCSR category	Aggregate hospital costs, \$, millions	Aggregate hospital costs, %	Number of hospital stays, thousands	Hospital stays, %
1	Osteoarthritis	6,962	5.9	437	4.2
2	Liveborn	6,747	5.7	1,702	16.3
3	Septicemia	6,644	5.6	364	3.5
4	Spondylopathies/spondyloarthropathy (including infective)	4,491	3.8	190	1.8
5	Acute myocardial infarction	3,774	3.2	167	1.6
6	Coronary atherosclerosis and other heart disease	2,348	2.0	95	0.9
7	Heart failure	1,941	1.6	121	1.2
8	Complications specified during childbirth	1,640	1.4	347	3.3
9	Benign neoplasms	1,575	1.3	108	1.0
10	Respiratory failure; insufficiency; arrest	1,531	1.3	81	0.8
11	Complication of other surgical or medical care, injury, initial encounter	1,510	1.3	95	0.9
12	Diabetes mellitus with complication	1,432	1.2	143	1.4
13	Cerebral infarction	1,428	1.2	98	0.9
14	Fracture of the lower limb (except hip), initial encounter	1,419	1.2	68	0.7
15	Cardiac dysrhythmias	1,393	1.2	125	1.2
16	Obesity	1,374	1.2	115	1.1
17	Biliary tract disease	1,346	1.1	113	1.1
18	Previous C-section	1,314	1.1	227	2.2
19	Encounter for antineoplastic therapies	1,209	1.0	66	0.6
20	Cardiac and circulatory congenital anomalies	1,201	1.0	20	0.2
Total for top 20 conditions		51,280	43.4	4,682	44.8
Total for all stays		118,026	100.0	10,448	100.0

Abbreviations: CCSR, Clinical Classifications Software Refined; C-section, caesarean section; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Diagnosis groups are defined using the CCSR for ICD-10-CM Diagnoses. Conditions were identified using the CCSR default category assignment(s) for the principal diagnosis code of the hospital stay. The CCSR includes multiple category assignments for some diagnosis codes. The default CCSR category assignments facilitate analyses requiring a mutually exclusive diagnosis categorization scheme by selecting a single CCSR category for each hospital encounter based on clinical coding guidelines, clinical input on the etiology and pathology of diseases, coding input on the use of and ordering of ICD-10-CM codes on a billing record, and standards set by other Federal agencies.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2017

Three of the 20 most expensive conditions for hospital stays with an expected payer of private insurance did not appear in the top 20 conditions for other payers.

The following conditions were in the 20 most expensive conditions for private insurance stays (but not for other payers, as shown in Tables 2–5), ordered by aggregate cost:

- Benign neoplasms
- Obesity
- Encounter for antineoplastic therapies

- **Circulatory system conditions and conditions involving pregnancy and childbirth represented nearly half of the 20 most expensive conditions for stays with an expected payer of private insurance.**

Six of the 20 most expensive conditions during hospital stays with an expected payer of private insurance were related to the circulatory system, ordered by aggregate cost:

- Acute myocardial infarction
- Coronary atherosclerosis and other heart disease
- Heart failure
- Cerebral infarction
- Cardiac dysrhythmias
- Cardiac and circulatory congenital anomalies

Three of the 20 most expensive conditions during hospital stays with an expected payer of private insurance were related to pregnancy and childbirth:

- Liveborn
- Complications specified during childbirth
- Previous C-section

Table 5. The 20 most expensive conditions with an expected payer of self-pay/no charge^a, 2017

Rank	Clinical condition grouped by default CCSR category	Aggregate hospital costs, \$, millions	Aggregate hospital costs, %	Number of hospital stays, thousands	Hospital stays, %
1	Septicemia	1,265	8.9	81	5.4
2	Acute myocardial infarction	677	4.8	32	2.1
3	Diabetes mellitus with complication	403	2.8	52	3.4
4	Liveborn	381	2.7	179	11.9
5	Heart failure	338	2.4	32	2.1
6	Cerebral infarction	307	2.2	22	1.4
7	Fracture of the lower limb (except hip), initial encounter	293	2.1	15	1.0
8	Skin and subcutaneous tissue infections	291	2.0	47	3.1
9	Biliary tract disease	286	2.0	26	1.8
10	Traumatic brain injury (TBI); concussion, initial encounter	248	1.7	12	0.8
11	Pancreatic disorders (excluding diabetes)	243	1.7	30	2.0
12	Alcohol-related disorders	237	1.7	42	2.8
13	Coronary atherosclerosis and other heart disease	234	1.6	12	0.8
14	Respiratory failure; insufficiency; arrest	228	1.6	15	1.0
15	Acute hemorrhagic cerebrovascular disease	216	1.5	7	0.4
16	Internal organ injury, initial encounter	210	1.5	9	0.6
17	Pneumonia (except that caused by tuberculosis)	173	1.2	20	1.3
18	Depressive disorders	153	1.1	42	2.8
19	Appendicitis and other appendiceal conditions	153	1.1	15	1.0
20	Chronic obstructive pulmonary disease and bronchiectasis	147	1.0	20	1.3
Total for top 20 conditions		6,483	45.6	711	47.3
Total for all stays		14,214	100.0	1,503	100.0

Abbreviations: CCSR, Clinical Classifications Software Refined; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Diagnosis groups are defined using the CCSR for ICD-10-CM Diagnoses. Conditions were identified using the CCSR default category assignment(s) for the principal diagnosis code of the hospital stay. The CCSR includes multiple category assignments for some diagnosis codes. The default CCSR category assignments facilitate analyses requiring a mutually exclusive diagnosis categorization scheme by selecting a single CCSR category for each hospital encounter based on clinical coding guidelines, clinical input on the etiology and pathology of diseases, coding input on the use of and ordering of ICD-10-CM codes on a billing record, and standards set by other Federal agencies.

^a Self-pay/No charge: includes self-pay, no charge, charity, and no expected payment.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2017

- **Four of the 20 most expensive conditions for self-pay/no charge stays did not appear in the top 20 for any other payer category.**

The following conditions were in the 20 most expensive conditions for self-pay/no charge stays (but not for other payers, as shown in Tables 2–5), ordered by aggregate cost:

- Pancreatic disorders (excluding diabetes)
- Acute hemorrhagic cerebrovascular disease
- Internal organ injury, initial encounter
- Appendicitis and other appendiceal conditions

- **Circulatory, respiratory, digestive, and injury conditions represented over two-thirds of the 20 most expensive conditions for self-pay/no charge stays.**

Five of the 20 most expensive conditions during self-pay/no charge hospital stays were related to the circulatory system, ordered by aggregate cost:

- Acute myocardial infarction
- Heart failure
- Cerebral infarction
- Coronary atherosclerosis and other heart disease
- Acute hemorrhagic cerebrovascular disease

Three of the 20 most expensive conditions during self-pay/no charge hospital stays were related to injury:

- Fracture of the lower limb (except hip), initial encounter
- Traumatic brain injury (TBI); concussion, initial encounter
- Internal organ injury, initial encounter

Three of the 20 most expensive conditions during self-pay/no charge hospital stays were related to the digestive system:

- Biliary tract disease
- Pancreatic disorders (excluding diabetes)
- Appendicitis and other appendiceal conditions

Three of the 20 most expensive conditions during self-pay/no charge hospital stays were related to the respiratory system:

- Respiratory failure; insufficiency; arrest
- Pneumonia (except that caused by tuberculosis)
- Chronic obstructive pulmonary disease and bronchiectasis

About Statistical Briefs

Healthcare Cost and Utilization Project (HCUP) Statistical Briefs provide basic descriptive statistics on a variety of topics using HCUP administrative healthcare data. Topics include hospital inpatient, ambulatory surgery, and emergency department use and costs, quality of care, access to care, medical conditions, procedures, and patient populations, among other topics. The reports are intended to generate hypotheses that can be further explored in other research; the reports are not designed to answer in-depth research questions using multivariate methods.

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP 2017 National Inpatient Sample (NIS).

Definitions

Diagnoses, ICD-10-CM, Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses
The *principal diagnosis* is that condition established after study to be chiefly responsible for the patient's admission to the hospital.

ICD-10-CM is the International Classification of Diseases, Tenth Revision, Clinical Modification. In October 2015, ICD-10-CM replaced the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis coding system with the ICD-10-CM diagnosis coding system for most inpatient and outpatient medical encounters. There are over 70,000 ICD-10-CM diagnosis codes.

The CCSR aggregates ICD-10-CM diagnosis codes into a manageable number of clinically meaningful categories.⁸ The CCSR is intended to be used analytically to examine patterns of healthcare in terms of cost, utilization, and outcomes; rank utilization by diagnoses; and risk-adjust by clinical condition. The CCSR capitalizes on the specificity of the ICD-10-CM coding scheme and allows ICD-10-CM codes to be classified in more than one category. Approximately 10 percent of diagnosis codes are associated with more than one CCSR category because the diagnosis code documents either multiple conditions or a condition along with a common symptom or manifestation. For this Statistical Brief, the principal diagnosis code is assigned to a single default CCSR based on clinical coding guidelines, etiology and pathology of diseases, and standards set by other Federal agencies. The assignment of the default CCSR for the principal diagnosis is available starting with version v2020.2 of the software tool. ICD-10-CM coding definitions for each CCSR category presented in this Statistical Brief can be found in the *CCSR reference file*, available at www.hcup-us.ahrq.gov/toolssoftware/ccs_refined.jsp#user.

Types of hospitals included in the HCUP National (Nationwide) Inpatient Sample

The National (Nationwide) Inpatient Sample (NIS) 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). The NIS includes obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical center hospitals. Excluded are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Beginning in 2012, long-term acute care hospitals are also excluded. However, if a patient received long-term care, rehabilitation, or treatment for a psychiatric or chemical dependency condition in a community hospital, the discharge record for that stay will be included in the NIS.

Unit of analysis

The unit of analysis is the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is admitted to the hospital multiple times in 1 year will be counted each time as a separate discharge from the hospital.

⁸ Agency for Healthcare Research and Quality. HCUP Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. Healthcare Cost and Utilization Project (HCUP). Agency for Healthcare Research and Quality. Updated January 2020. www.hcup-us.ahrq.gov/toolssoftware/ccs_refined.jsp. Accessed February 27, 2020.

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).⁹ 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.¹⁰ 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 American Hospital Association Annual Survey, 2017 outpatient gross revenues (or charges) were about 49 percent of total hospital gross revenues.¹¹

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 includes profit for for-profit hospitals or surpluses for nonprofit hospitals.

Expected payer

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

- Medicare: includes fee-for-service and managed care Medicare
- Medicaid: includes fee-for-service and managed care Medicaid
- Private insurance: includes commercial nongovernmental payers, regardless of the type of plan (e.g., private health maintenance organizations [HMOs], preferred provider organizations [PPOs])
- Self-pay/No charge: includes self-pay, no charge, charity, and no expected payment
- Other payers: includes other Federal and local government programs (e.g., TRICARE, CHAMPVA, Indian Health Service, Black Lung, Title V) and Workers' Compensation

Hospital stays that were expected to be billed to the State Children's Health Insurance Program (SCHIP) are included under Medicaid.

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of healthcare databases and related software tools and products developed through a Federal-State-Industry

⁹ Agency for Healthcare Research and Quality. HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2001–2017. Agency for Healthcare Research and Quality. Updated December 2019. www.hcup-us.ahrq.gov/db/state/costtcharge.jsp. Accessed February 3, 2020.

¹⁰ For additional information about the NHEA, see Centers for Medicare & Medicaid Services (CMS). National Health Expenditure Data. CMS website. Updated December 17, 2019. www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/index.html?redirec=/NationalHealthExpendData/. Accessed February 3, 2020.

¹¹ American Hospital Association. TrendWatch Chartbook, 2019. Table 4.2. Distribution of Inpatient vs. Outpatient Revenues, 1995–2017. www.aha.org/system/files/media/file/2019/11/TrendwatchChartbook-2019-Appendices.pdf. Accessed March 19, 2020.

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 healthcare 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 healthcare 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 Department of Health and Social Services
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
Delaware Division of Public Health
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii University of Hawaii, Hilo, Center for Rural Health
Hawaii Laulima Data Alliance
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
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 State Department of Health
Missouri Hospital Industry Data Institute
Montana Hospital Association
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 Department of Health and Human Resources, West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About the NIS

The HCUP National (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 includes all payers. It is drawn from a sampling frame that contains hospitals comprising more than 95 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use. Over time, the sampling frame for the NIS has changed; thus, the number of States contributing to the NIS varies from year to year. The NIS is intended for national estimates only; no State-level estimates can be produced. The unweighted sample size for the 2017 NIS is 7,159,694 (weighted, this represents 35,798,453 inpatient stays).

For More Information

For other information on costs and charges of hospital stays in the United States, refer to the HCUP Statistical Briefs located at www.hcup-us.ahrq.gov/reports/statbriefs/sb_costs.jsp.

For additional HCUP statistics, visit:

- HCUP Fast Stats at www.hcup-us.ahrq.gov/faststats/landing.jsp for easy access to the latest HCUP-based statistics for healthcare information topics
- HCUPnet, HCUP's interactive query system, at www.hcupnet.ahrq.gov/

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

For a detailed description of HCUP and more information on the design of the National Inpatient Sample (NIS), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the National (Nationwide) Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated December 2019. www.hcup-us.ahrq.gov/nisoverview.jsp. Accessed February 3, 2020.

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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 healthcare 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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