

# Clinical Conditions With Frequent, Costly Hospital Readmissions by Payer, 2020

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H. Joanna Jiang, Ph.D., and Marguerite L. Barrett, M.S.

## Introduction

Overall hospital utilization decreased substantially during the COVID-19 pandemic because of both patient and system factors. These included delays in seeking care, stay-at-home orders, and a pause in elective admissions.<sup>1,2</sup> Nevertheless, the 30-day all-cause hospital readmission rate remained stable in 2020 compared with the prepandemic period.<sup>3</sup> Therefore, it is important to identify the clinical conditions associated with frequent, costly hospital readmissions during the pandemic year 2020. This would help us determine whether the disruptions of the early pandemic affected the conditions linked to most readmissions before the pandemic.<sup>4</sup>

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents national estimates on clinical conditions with the highest hospital readmission counts, rates, and costs among adults (aged 18 years and older) using the 2020 Nationwide Readmissions Database (NRD). A readmission was defined as a hospital admission for any cause within 30 days of an initial stay (index admission) between January and November 2020. Three readmission metrics are presented by expected payer: (1) conditions with the highest number of readmissions, (2) conditions with the highest readmission rate, and (3) conditions with the highest average readmission cost. Expected payer and condition (principal diagnosis) are based on the index admission. Index admissions for cancer and cancer-related therapies are included in overall readmission statistics but are not reported in condition-specific statistics. Readmissions for cancer and cancer-related treatments are more likely to be planned and expected than are other conditions. Because of the large sample size of the NRD data, small differences can be statistically significant. Thus, only differences greater than or equal to 10 percent are discussed in this Statistical Brief.

## Highlights

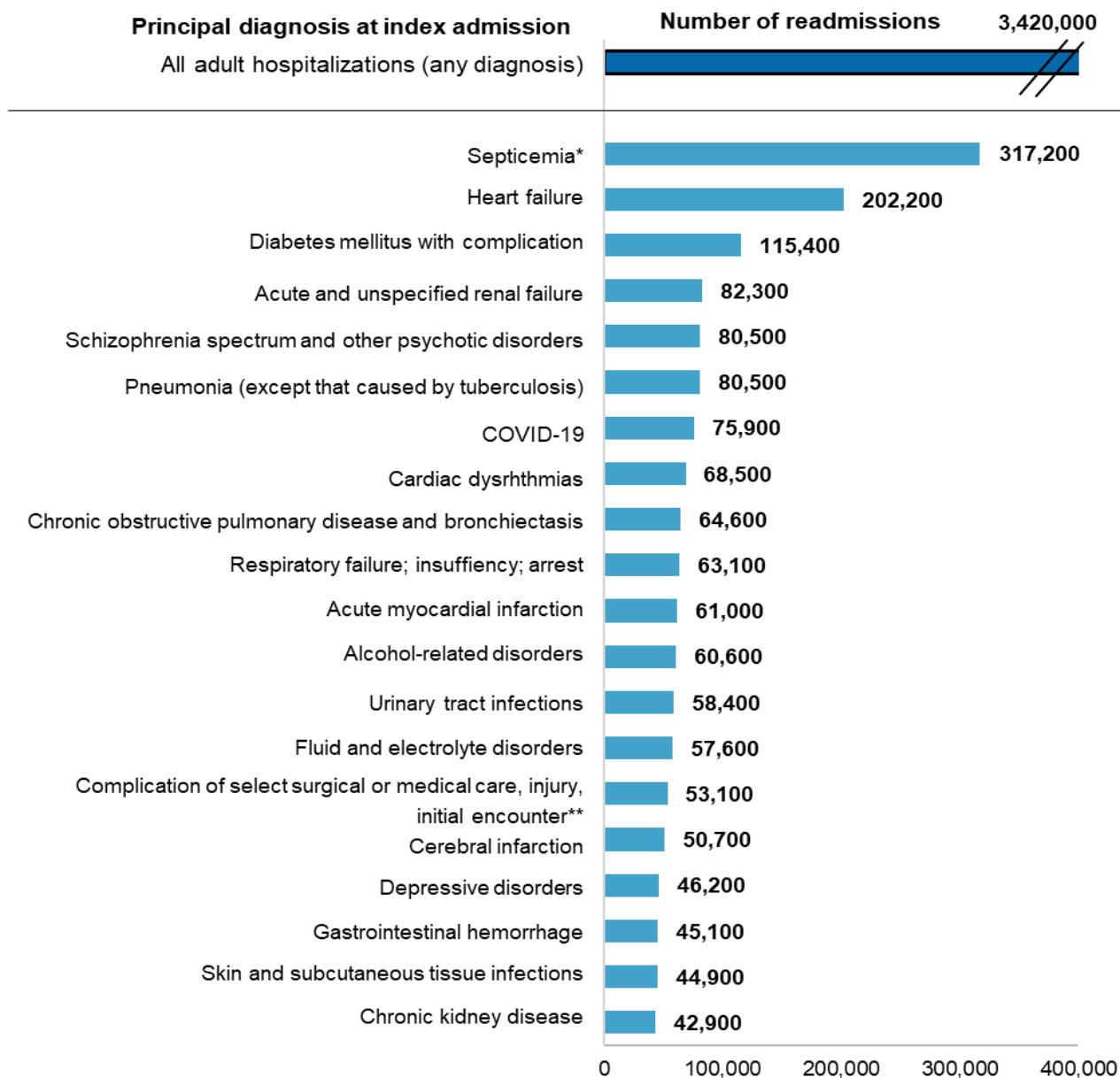
- In 2020, at index admission, septicemia, heart failure, and diabetes with complications accounted for almost 20 percent of all adult hospital readmissions.
- In 2020, COVID-19 emerged as one of the top 10 conditions at index admission with the highest number of adult readmissions.
- In 2020, adult hospitalizations for sickle cell trait/anemia had the highest rate of 30-day all-cause readmissions among patients with an expected payer of Medicare or Medicaid (37.7 and 41.0 per 100 index admissions, respectively).
- In 2020, schizophrenia and alcohol-related disorders were among the top five conditions with the highest number of readmissions for adult stays with an expected payer of Medicaid or self-pay/no charge.
- In 2020, complications of transplanted organs or tissue at index admission had the highest average cost of 30-day all-cause readmissions among adult hospitalizations with an expected payer of Medicare or private insurance.

## Findings

### Conditions with the highest number of adult hospital readmissions

Figure 1 presents the 20 principal diagnoses (conditions) at index admission with the highest number of 30-day all-cause hospital readmissions among adults in 2020.

**Figure 1. Top 20 principal diagnoses with the highest number of 30-day all-cause adult hospital readmissions, 2020**



**Notes:** Diagnoses are grouped using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. CCSR categories classified as “neoplasms” (cancer) or “factors influencing health status and contact with health services” (e.g., encounter for antineoplastic therapies) are excluded from reporting. // indicates a break in the axis. Number of readmissions is rounded to the nearest hundred.

\* The CCSR for septicemia includes all sepsis infection codes and does not include the criteria of organ dysfunction.

\*\* This includes complications, such as infection, for surgical or medical care other than those from cardiovascular, genitourinary, or internal orthopedic devices or from organ/tissue transplants.

**Source:** Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2020.

- **In 2020, the three conditions with the highest number of 30-day all-cause readmissions (septicemia, heart failure, and diabetes with complications) at index admission accounted for more than 20 percent of all adult hospital readmissions.**

Hospital stays for septicemia had the highest number of 30-day all-cause readmissions (317,200) in 2020, accounting for 11.4 percent of all adult readmissions. Stays for heart failure and diabetes with complications had the second and the third highest number of readmissions (202,200 and 115,400, respectively).

- **In 2020, COVID-19 emerged as one of the top 10 conditions at index admission associated with the highest number of adult readmissions.**

Adult hospitalizations for COVID-19 in 2020 had 75,900 30-day all-cause readmissions, making it the seventh highest among the top 10 conditions at index admission with the highest number of readmissions.

- **The top 20 conditions at index admission with the highest number of 30-day all-cause readmissions accounted for 60 percent of all adult readmissions.**

Among the top 20 principal diagnoses at index admission associated with the highest number of readmissions, four circulatory system diseases—heart failure, cardiac dysrhythmias, acute myocardial infarction, and cerebral infarction—constituted 13.7 percent of all adult readmissions. Three respiratory conditions at index admission—pneumonia, chronic obstructive pulmonary disease (COPD), and respiratory failure—accounted for another 7.5 percent of readmissions. Three genitourinary conditions at index admission—acute and unspecified renal failure, urinary tract infections, and chronic kidney disease—accounted for 6.6 percent of readmissions. Three mental and substance use disorders—schizophrenia, depressive disorders, and alcohol-related disorders—accounted for 6.7 percent of readmissions.

Notably, hospital stays for five conditions—heart failure, diabetes with complications, pneumonia, COPD, and urinary tract infection—can be considered potentially preventable according to the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.<sup>5</sup> These five conditions at index admission accounted for nearly one in five readmissions (18.7%).

Table 1 presents the five conditions at index admission with the highest number of 30-day all-cause hospital readmissions among adults by expected payer in 2020.

**Table 1. Top five principal diagnoses with the highest number of 30-day all-cause adult hospital readmissions, by expected payer, 2020**

Principal diagnosis (at index admission)	Number of index admissions	30-day readmissions			Percentage of total payer- specific readmissions
		Rank	Number	Rate†	
<b>Medicare</b>	<b>11,784,200</b>	–	<b>2,002,700</b>	<b>17.0</b>	<b>100.0</b>
Septicemia*	1,120,500	1	207,300	18.5	10.4
Heart failure	661,300	2	147,800	22.4	7.4
Acute and unspecified renal failure	297,300	3	60,000	20.2	3.0
Pneumonia (except that caused by tuberculosis)	335,900	4	58,900	17.5	2.9
Diabetes mellitus with complication	264,400	5	58,700	22.2	2.9
<b>Medicaid</b>	<b>4,948,400</b>	–	<b>693,300</b>	<b>14.0</b>	<b>100.0</b>
Septicemia*	294,800	1	54,200	18.4	7.8
Schizophrenia spectrum and other psychotic disorders	163,500	2	37,800	23.1	5.5
Diabetes mellitus with complication	143,000	3	33,000	23.1	4.8
Heart failure	113,800	4	31,400	27.6	4.5
Alcohol-related disorders	129,700	5	29,500	22.8	4.3
<b>Private insurance</b>	<b>5,962,500</b>	–	<b>521,200</b>	<b>8.7</b>	<b>100.0</b>
Septicemia*	314,300	1	39,600	12.6	7.6
Heart failure	85,500	2	14,600	17.1	2.8
Diabetes mellitus with complication	108,800	3	14,000	12.9	2.7
Hypertension and hypertensive-related conditions complicating pregnancy, childbirth, and the puerperium	194,100	4	12,100	6.2	2.3
COVID-19	180,900	5	10,600	5.9	2.0
<b>Self-pay/No charge‡</b>	<b>1,013,200</b>	–	<b>122,400</b>	<b>12.1</b>	<b>100.0</b>
Septicemia*	74,500	1	9,600	12.9	7.8
Alcohol-related disorders	40,600	2	7,600	18.7	6.2
Diabetes mellitus with complication	43,500	3	7,200	16.4	5.9
Depressive disorders	36,900	4	5,200	14.0	4.2
Schizophrenia spectrum and other psychotic disorders	26,700	5	4,800	18.0	3.9

**Notes:** Diagnoses are grouped using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. CCSR categories classified as “neoplasms” (cancer) or “factors influencing health status and contact with health services” (e.g., encounter for antineoplastic therapies) are excluded from reporting. A minimum volume threshold for index admissions was required for a CCSR category to be reported: 10,000 for Medicare, Medicaid, and private insurance and 5,000 for self-pay/no charge. Numbers of index admissions and readmissions are rounded to the nearest hundred.

\* The CCSR for septicemia includes all sepsis infection codes and does not include the criteria of organ dysfunction.

† Readmission rate is per 100 index admissions.

‡ 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), Nationwide Readmissions Database (NRD), 2020.

- **In 2020, septicemia was the top principal diagnosis at index admission with the highest number of 30-day all-cause readmissions regardless of payer.**

Among adult hospitalizations with an expected payer of Medicare, septicemia had the highest number of readmissions (207,300) in 2020, accounting for 10.4 percent of adult Medicare readmissions. Septicemia was also the top condition with the highest number of readmissions for stays with an expected payer of Medicaid (54,200), private insurance (39,600), or self-pay/no charge (9,600), constituting nearly 8 percent of all adult readmissions for each of these expected payers.

- **Heart failure and diabetes with complications were among the top five conditions with the highest number of readmissions across three expected payers (Medicare, Medicaid, and private insurance).**

Heart failure was among the five conditions with the highest number of 30-day all-cause readmissions for stays with an expected payer of Medicare (accounting for 7.4% of all adult Medicare readmissions), Medicaid (4.5%), or private insurance (2.8%). It was also a condition with the highest readmission rates—Medicare: 22.4 per 100 index admissions; Medicaid: 27.6; and private insurance: 17.1. Diabetes with complications was another condition with the highest number and rate of readmissions for each of these expected payers and for self-pay/no charge.

- **Schizophrenia and alcohol-related disorders were among the top five conditions with the highest number of readmissions for stays with an expected payer of Medicaid or self-pay/no charge.**

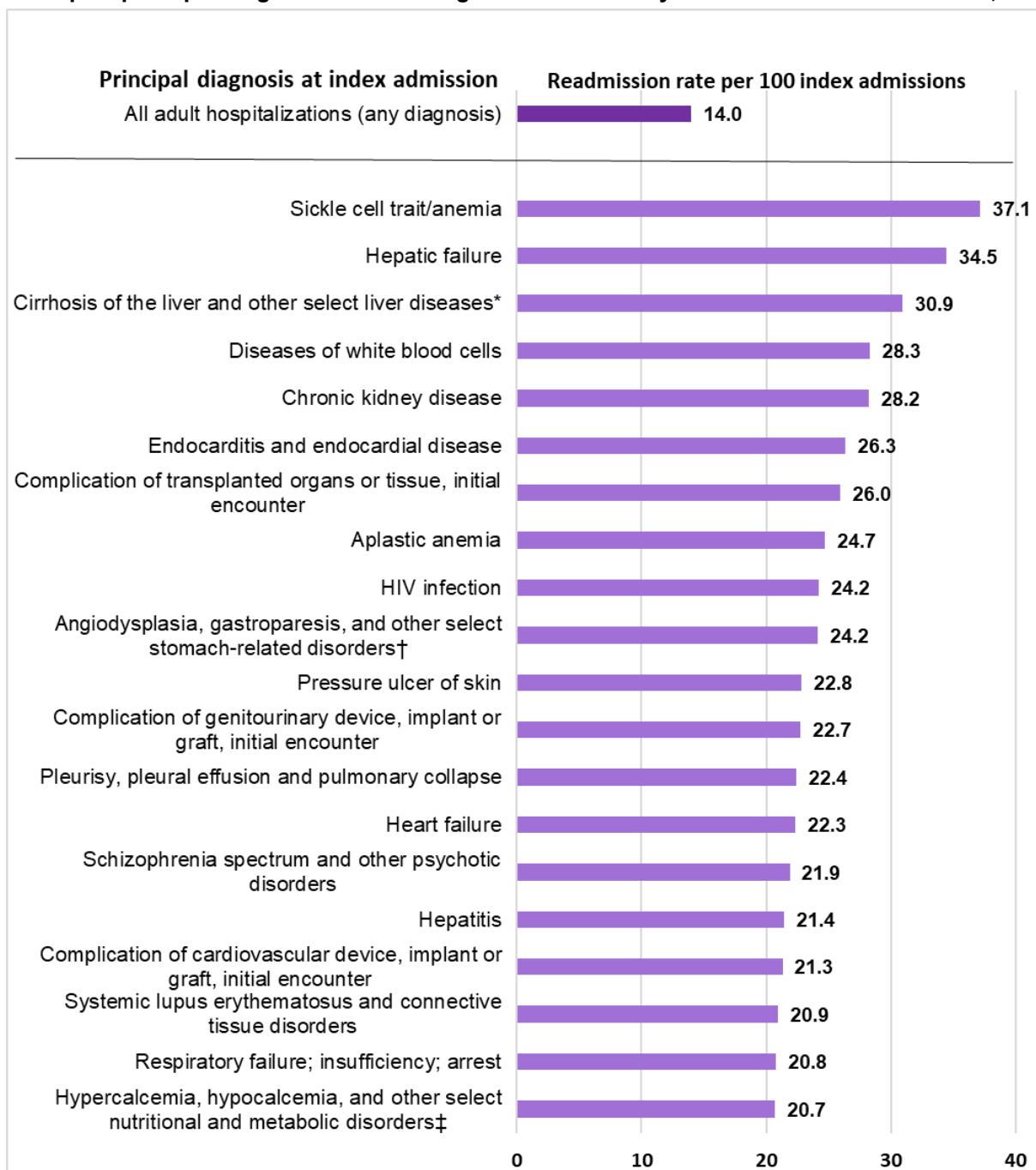
Among adult hospitalizations with an expected payer of Medicaid, schizophrenia at index admission ranked the second highest and alcohol-related disorders ranked the fifth highest in 30-day all-cause readmissions. Likewise, for adult hospitalizations with an expected payer of self-pay/no charge, alcohol-related disorders at index admission ranked the second highest and schizophrenia ranked the fifth highest in number of readmissions. Both conditions also had one of the highest readmission rates—schizophrenia: 23.1 and 18.0 per 100 index admissions, respectively, for stays with an expected payer of Medicaid or self-pay/no charge; and alcohol-related disorders: 22.8 and 18.7 per 100 index admissions, respectively, for stays with an expected payer of Medicaid or self-pay/no charge.

Notably, behavioral health conditions were three of the top five conditions with the highest number of readmissions with an expected payer of self-pay/no charge: alcohol-related disorders, depressive disorders, and schizophrenia.

Conditions with the highest rate of adult hospital readmissions, 2020

Figure 2 presents the 20 conditions at index admission with the highest rate of 30-day all-cause hospital readmissions among adults in 2020.

**Figure 2. Top 20 principal diagnoses with the highest rate of 30-day all-cause adult readmissions, 2020**



**Notes:** Diagnoses are grouped using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. Principal diagnosis is assigned to a single default CCSR category. CCSR categories classified as “neoplasms” (cancer) or “factors influencing health status and contact with health services” (e.g., encounter for antineoplastic therapies) are excluded from reporting. A minimum volume threshold of 10,000 index admissions was required for a CCSR category to be reported.

\* This primarily includes cirrhosis of the liver as well as other liver diseases, excluding hepatic failure.

† This primarily includes angiodysplasia of the stomach and duodenum, gastroparesis, and adult hypertrophic pyloric stenosis, as well as other select disorders of the stomach and duodenum.

‡ This primarily includes hypercalcemia, hypocalcemia, hypomagnesemia, and organ-limited amyloidosis as well as other select nutritional and metabolic disorders.

**Source:** Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2020.

- **In 2020, adult hospitalizations for sickle cell trait/anemia had the highest readmission rate.**

Hospital stays for sickle cell trait/anemia had the highest 30-day all-cause readmission rate (37.1 per 100 index admissions), which was nearly three times as high as the average readmission rate for all adult stays (14.0 per 100 index admissions). Another two conditions related to blood and immune system disorders also had the highest readmission rates—diseases of white blood cells (28.3 per 100 index admissions) and aplastic anemia (24.7 per 100 index admissions).

- **Three liver-related diseases (hepatic failure, cirrhosis of the liver, and hepatitis) were among the top 20 principal diagnoses at index admission associated with the highest readmission rates.**

Hepatic failure at index admission had the second highest readmission rate (34.5 per 100 index admissions) among adult hospitalizations, followed by stays for cirrhosis of the liver (30.9 per 100 index admissions). Stays for hepatitis also had one of the highest readmission rates (21.4 per 100 index admissions), albeit lower than those for the other two conditions.

- **High readmission rates were common among adult hospitalizations for chronic kidney disease, cardiovascular system diseases, respiratory system diseases, and complications of transplanted organs or medical devices.**

More than one in four adult hospitalizations for chronic kidney disease (28.2 per 100 index admissions), endocarditis and endocardial disease (26.3 per 100 index admissions), and complications of transplanted organs or tissues (26.0 per 100 index admissions) had subsequent readmissions within 30 days of discharge. About one in five hospital stays for heart failure (22.3 per 100 index admissions); pleurisy and pulmonary collapse (22.4 per 100 index admissions); respiratory failure (20.8 per 100 index admissions); and complications of genitourinary or of cardiovascular device, implant, or graft had 30-day all-cause readmissions (22.7 and 21.3 per 100 index admissions, respectively).

Table 2 presents the five conditions at index admission with the highest rate of 30-day all-cause hospital readmissions among adults by expected payer in 2020.

**Table 2. Top five principal diagnoses with the highest rate of 30-day all-cause adult readmissions, by expected payer, 2020**

Principal diagnosis (at index admission)	Number of index admissions	30-day readmissions		
		Rank	Rate*	Number
<b>Medicare</b>	<b>11,784,200</b>	–	<b>17.0</b>	<b>2,002,700</b>
Sickle cell trait/anemia	21,800	1	37.7	8,200
Hepatic failure	34,800	2	34.3	11,900
Cirrhosis of the liver and other select liver diseases†	43,600	3	30.5	13,300
Chronic kidney disease	110,000	4	28.5	31,400
Complication of transplanted organs or tissue, initial encounter	29,600	5	26.4	7,800
<b>Medicaid</b>	<b>4,948,400</b>	–	<b>14.0</b>	<b>693,300</b>
Sickle cell trait/anemia	30,400	1	41.0	12,500
Hepatic failure	17,000	2	37.5	6,400
Cirrhosis of the liver and other select liver diseases†	35,300	3	35.0	12,300
Chronic kidney disease	21,500	4	33.1	7,100
Complication of transplanted organs or tissue, initial encounter	16,800	5	27.9	4,700
<b>Private insurance</b>	<b>5,962,500</b>	–	<b>8.7</b>	<b>521,200</b>
Hepatic failure	12,100	1	32.9	4,000
Cirrhosis of the liver and other select liver diseases†	25,000	2	27.2	6,800
Complication of transplanted organs or tissue, initial encounter	11,800	3	24.6	2,900
Complication of genitourinary device, implant or graft, initial encounter	10,800	4	20.6	2,200
Chronic kidney disease	15,400	5	19.7	3,000
<b>Self-pay/No charge‡</b>	<b>1,013,200</b>	–	<b>12.1</b>	<b>122,400</b>
Cirrhosis of the liver and other select liver diseases†	8,800	1	27.9	2,400
Alcohol-related disorders	40,600	2	18.7	7,600
Schizophrenia spectrum and other psychotic disorders	26,700	3	18.0	4,800
Heart failure	26,800	4	17.0	4,500
Hepatitis	5,600	5	16.9	900

**Notes:** Diagnoses are grouped using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. CCSR categories classified as “neoplasms” (cancer) or “factors influencing health status and contact with health services” (e.g., encounter for antineoplastic therapies) are excluded from reporting. A minimum volume threshold for index admissions was required for a CCSR category to be reported: 10,000 for Medicare, Medicaid, and private insurance and 5,000 for self-pay/no charge. Numbers of index admissions and readmissions are rounded to the nearest hundred.

\* Readmission rate is per 100 index admissions.

† This primarily includes cirrhosis of the liver as well as other liver diseases, excluding hepatic failure.

‡ 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), Nationwide Readmissions Database (NRD), 2020.

- **Hospital stays for sickle cell trait/anemia had the highest 30-day all-cause readmission rate among adult hospitalizations with an expected payer of Medicare or Medicaid.**

Hospital stays for sickle cell trait/anemia had the highest readmission rate among patients with Medicare or Medicaid coverage. The rate was higher for stays with an expected payer of Medicaid than for stays with an expected payer of Medicare (41.0 vs. 37.7 per 100 index admissions).



- **Cirrhosis of the liver was among the top five conditions with the highest readmission rates across all four expected payer groups (Medicare, Medicaid, private insurance, self-pay/no charge).**

The 30-day all-cause readmission rate for cirrhosis of the liver ranked the third highest among patients with an expected payer of Medicare or Medicaid, the second highest among patients with an expected payer of private insurance, and the highest among patients with an expected payer of self-pay/no charge. Across payers, the readmission rate was highest for stays with an expected payer of Medicaid (35.0 per 100 index admissions), followed by stays with an expected payer of Medicare (30.5 per 100 index admissions). Both rates were higher than those for stays with an expected payer of private insurance (27.2 per 100 index admissions) or self-pay/no charge (27.9 per 100 index admissions).

- **Hepatic failure, chronic kidney disease, and complications of transplanted organs or tissue were all among the five highest readmission rates for adult hospitalizations with an expected payer of Medicare, Medicaid, or private.**

Hospital stays for hepatic failure had the second highest readmission rate among patients with an expected payer of Medicare or Medicaid but the highest among patients with an expected payer of private insurance. The readmission rate was higher for stays with an expected payer of Medicaid (37.5 per 100 index admissions) than for those with an expected payer of Medicare (34.3) or private insurance (32.9). Likewise, the readmission rate for chronic kidney disease was higher for stays with an expected payer of Medicaid (33.1 per 100 index admissions) than for those with an expected payer of Medicare (28.5) or private insurance (19.7). Complications of transplanted organs or tissue had higher readmission rates for stays with an expected payer of Medicaid (27.9 per 100 index admissions) or Medicare (26.4) than for stays with an expected payer of private insurance (24.6).

- **Alcohol-related disorders, schizophrenia, and heart failure were among the top five conditions with the highest readmission rates for adult stays with an expected payer of self-pay/no charge.**

Among hospital stays with an expected payer of self-pay/no charge, nearly one in five stays for alcohol-related disorders (18.7 per 100 index admissions), schizophrenia (18.0), and heart failure (17.0) had 30-day all-cause readmissions after discharge of the index stay.

*Conditions with the highest average cost of adult hospital readmissions, 2020*

Figure 3 presents the 20 conditions at index admission with the highest average cost of 30-day all-cause hospital readmissions among adults in 2020.

**Figure 3. Top 20 principal diagnoses with the highest average cost of 30-day all-cause adult readmissions, 2020**



**Notes:** Diagnoses are grouped using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. CCSR categories classified as “neoplasms” (cancer) or “factors influencing health status and contact with health services” (e.g., encounter for antineoplastic therapies) are excluded from reporting. A minimum volume threshold of 10,000 index admissions was required for a CCSR category to be reported. Average cost of readmission is rounded to the nearest \$100. Costs reflect the actual expenses incurred in the production of hospital services.

\* This primarily includes nonruptured cerebral aneurysm and posterior reversible encephalopathy, as well as other select and ill-defined cerebrovascular diseases.

**Source:** Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2020.

- **In 2020, hospital stays for arterial dissections had the highest average cost of 30-day all-cause readmissions.**

The average cost of 30-day all-cause readmissions after an index stay for arterial dissections was \$32,300, the highest among adult readmissions. It was nearly 1.8 times higher than the average cost of all adult readmissions (\$17,700). Complications of transplanted organs or tissue ranked the second highest in average cost of readmissions (\$30,500).

- **More than half of the top 20 conditions at index admission with the highest average cost of 30-day all-cause readmissions involved circulatory system diseases.**

Of the top 20 conditions at index admission with the highest average readmission cost, 11 involved circulatory system diseases: arterial dissections (\$32,300); myocarditis and cardiomyopathy (\$29,200); chronic rheumatic heart disease (\$28,400); endocarditis and endocardial disease (\$27,800); cardiac and circulatory congenital anomalies (\$27,400); pulmonary heart disease (\$25,500); nonrheumatic and unspecified valve disorders (\$25,100); complications of cardiovascular device, implant, or graft (\$24,600); artery aneurysms (\$24,600); cardiac arrest and ventricular fibrillation (\$24,200); and nonruptured cerebral aneurysm (\$23,900).

Table 3 presents the five conditions at index admission with the highest average cost of 30-day all-cause hospital readmissions among adults by expected payer in 2020.

**Table 3. Top five principal diagnoses with the highest average cost of 30-day all-cause adult readmissions, by expected payer, 2020**

Principal diagnosis (at index admission)	Number of index admissions	30-day readmissions		
		Rank	Average Cost, \$	Aggregate cost, \$ (millions)
<b>Medicare</b>	<b>11,784,200</b>	–	<b>\$18,100</b>	<b>\$36,200</b>
Complications of transplanted organs or tissue, initial encounter	29,600	1	\$27,400	\$214
Chronic rheumatic heart disease	15,600	2	\$26,800	\$79
Nonrheumatic and unspecified valve disorders	94,500	3	\$24,800	\$329
Diseases of white blood cells	10,100	4	\$24,400	\$64
Complications of cardiovascular device, implant or graft, initial encounter	98,400	5	\$24,000	\$518
<b>Medicaid</b>	<b>4,948,400</b>	–	<b>\$16,500</b>	<b>\$11,400</b>
Acute hemorrhagic cerebrovascular disease	11,800	1	\$26,400	\$44
Complications of cardiovascular device, implant or graft, initial encounter	17,700	2	\$24,800	\$111
Complications of internal orthopedic device, implant or graft, initial encounter	13,400	3	\$24,100	\$44
Septicemia*	294,800	4	\$22,700	\$1,233
Cirrhosis of the liver and other select liver diseases†	35,300	5	\$22,700	\$280
<b>Private insurance</b>	<b>5,962,500</b>	–	<b>\$19,500</b>	<b>\$10,200</b>
Complications of transplanted organs or tissue, initial encounter	11,800	1	\$33,200	\$96
Cirrhosis of the liver and other select liver diseases†	25,000	2	\$29,600	\$201
Heart failure	85,500	3	\$28,900	\$422
Complications of cardiovascular device, implant or graft, initial encounter	19,100	4	\$28,900	\$85
Acute hemorrhagic cerebrovascular disease	18,400	5	\$27,700	\$57
<b>Self-pay/No charge‡</b>	<b>1,013,200</b>	–	<b>\$12,700</b>	<b>\$1,600</b>
Obesity	5,900	1	\$35,600	\$5
Fracture of the lower limb (except hip), initial encounter	13,600	2	\$17,800	\$19
Acute myocardial infarction	23,800	3	\$17,600	\$38
Pneumonia (except that caused by tuberculosis)	15,900	4	\$17,500	\$29
COVID-19	23,400	5	\$17,300	\$24

**Notes:** Diagnoses are grouped using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. CCSR categories classified as “neoplasms” (cancer) or “factors influencing health status and contact with health services” (e.g., encounter for antineoplastic therapies) are excluded from reporting. A minimum volume threshold for index admissions was required for a CCSR category to be reported: 10,000 for Medicare, Medicaid, and private insurance and 5,000 for self-pay/no charge. Numbers of index admissions and readmissions are rounded to the nearest hundred. Costs reflect the actual expenses incurred in providing hospital services.

\* The CCSR for septicemia includes all sepsis infection codes and does not include the criteria of organ dysfunction.

† This primarily includes cirrhosis of the liver as well as other liver diseases, excluding hepatic failure.

‡ 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), Nationwide Readmissions Database (NRD), 2020.

- **In 2020, hospital stays for complications of transplanted organs or tissue had the highest average cost of 30-day all-cause readmissions among adult hospitalizations with an expected payer of Medicare or private insurance.**

Complications of transplanted organs or tissue at index admission was associated with not only high readmission rates (table 2) but also the highest readmission costs (table 3). The average cost of 30-day all-cause readmissions was the highest among adult readmissions with an expected payer of Medicare (\$27,400; 51% higher than the Medicare average cost of readmission) or private insurance (\$33,200; 70% higher than the private average cost of readmission).

- **Cirrhosis of the liver was one of the top five conditions at index admission with the highest readmission cost for stays with an expected payer of Medicaid or private insurance.**

Cirrhosis of the liver at index admission was associated with high readmission rates (table 2) and costs (table 3). The average cost of readmissions ranked the second highest of adult readmissions with an expected payer of private insurance (\$29,600) and the fifth highest of adult readmissions with an expected payer of Medicaid (\$22,700).

- **Septicemia at index admission was among the top five conditions with the highest average cost of readmissions for stays with an expected payer of Medicaid.**

For adult hospitalizations with an expected payer of Medicaid, septicemia at index admission had the fourth highest average readmission cost at \$22,700 (or 34% higher than the Medicaid average readmission cost) and an aggregate cost of \$1.2 billion, which accounted for 10.8 percent of total adult Medicaid readmission costs.

- **COVID-19 and pneumonia emerged among the top five conditions with the highest average cost of readmissions for stays with an expected payer of self-pay/no charge.**

In 2020, among adult stays with an expected payer of self-pay/no charge, pneumonia at index admission ranked the fourth highest and COVID-19 ranked the fifth highest in average cost of 30-day all-cause readmissions at \$17,500 and \$17,300, respectively.

## References

<sup>1</sup> Birkmeyer JD, Barnato A, Birkmeyer N, Bessler R, Skinner J. The impact of the COVID-19 pandemic on hospital admissions in the United States. *Health Aff (Millwood)*. 2020;39(11):2010-7. <https://doi.org/10.1377/hlthaff.2020.00980>.

<sup>2</sup> Ghoshal S, Rigney G, Cheng D, Brumit R, Gee MS, Hodin RA et al. Institutional surgical response and associated volume trends throughout the COVID-19 pandemic and postvaccination recovery period. *JAMA Netw Open*. 2022;5(8):e2227443. PMID 35980636.

<sup>3</sup> Jiang HJ, Hensche M. Characteristics of 30-Day All-Cause Hospital Readmissions, 2016–2020. HCUP Statistical Brief #304. Rockville, MD: U.S. Agency for Healthcare Research and Quality; September 2023. [www.hcup-us.ahrq.gov/reports/statbriefs/sb304-readmissions-2016-2020.pdf](http://www.hcup-us.ahrq.gov/reports/statbriefs/sb304-readmissions-2016-2020.pdf).

<sup>4</sup> Weiss AJ, Jiang HJ. Overview of Clinical Conditions With Frequent and Costly Hospital Readmissions by Payer, 2018. HCUP Statistical Brief #278. Rockville, MD: U.S. Agency for Healthcare Research and Quality; July 2021. [www.hcup-us.ahrq.gov/reports/statbriefs/sb278-Conditions-Frequent-Readmissions-By-Payer-2018.pdf](http://www.hcup-us.ahrq.gov/reports/statbriefs/sb278-Conditions-Frequent-Readmissions-By-Payer-2018.pdf).

<sup>5</sup> AHRQ PQI Technical Documentation, Version v2023. Rockville, MD: Agency for Healthcare Research and Quality; August 2023. [https://qualityindicators.ahrq.gov/measures/pqi\\_resources](https://qualityindicators.ahrq.gov/measures/pqi_resources).

## Data Source

The estimates in this Statistical Brief are based on data from the Healthcare Cost and Utilization Project (HCUP) 2020 Nationwide Readmissions Database (NRD). For additional information about the HCUP NRD, please visit <https://hcup-us.ahrq.gov/db/nation/nrd/nrddbdocumentation.jsp>.

## Population Studied

All inpatient stays for adults aged 18 years and older were included in the analysis. A hospital admission that occurred within 30 days after discharge of the index admission was considered a readmission. That is, when patients are discharged from the hospital, they are followed for 30 days in the data. If any readmission to the same hospital or a different hospital occurs during this period, the admission is counted as a readmission. No more than one readmission is counted within the 30-day period because the outcome measure assessed is the “percentage of admissions that are readmitted.” If a patient was transferred to a different hospital on the same day or within the same hospital, the two events were combined as a single stay and the second event was not counted as a readmission; that is, transfers were not considered readmissions. In the case of admissions for which there was more than one readmission in the 30-day period, the data presented in this Statistical Brief reflect the characteristics and costs of the first readmission.

Every qualifying hospital stay is counted as a separate initial (starting point) admission. Thus, a single patient can be counted multiple times during the course of the January through November observation period. In addition, initial admissions do not require a prior “clean period” with no hospitalizations; that is, the initial admission may be a readmission for a prior stay. Admissions were disqualified from the analysis as initial admissions if they could not be followed for 30 days for one of the following reasons: (1) the patient died in the hospital, (2) information on length of stay was missing, or (3) the patient was discharged in December. In addition, inpatient stays with a principal diagnosis of neoplasms (i.e., cancer) or factors influencing health status and contact with health services (e.g., encounter for antineoplastic therapies) were excluded from the reporting of readmission statistics.

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.

## Definitions

### Diagnoses

The *principal diagnosis* is that condition established after study to be chiefly responsible for the patient's admission to the hospital. The principal diagnosis in this Statistical Brief is based on the index admission.

### ICD-10-CM

ICD-10-CM is the International Classification of Diseases, Tenth Revision, Clinical Modification. There are over 70,000 ICD-10-CM diagnosis codes.

### Clinical Classifications Software Refined (CCSR) for ICD-10-CM diagnoses

The CCSR aggregates more than 70,000 ICD-10-CM diagnosis codes into 540 clinically meaningful categories. 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. 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. For this Statistical Brief, v2022.1 of the CCSR was used. For more information on the CCSR, see [https://hcup-us.ahrq.gov/toolssoftware/ccsr/ccs\\_refined.jsp](https://hcup-us.ahrq.gov/toolssoftware/ccsr/ccs_refined.jsp).

Notably, the CCSR category for septicemia includes all sepsis infection codes. However, it does not include additional criteria regarding organ failure that are part of many recent publications. Therefore, the number of index admissions identified as septicemia includes not only those with septic shock and severe sepsis, but also those with less severe forms of sepsis.

## 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

For this Statistical Brief, a hierarchy was used to assign the payer category based on the primary and secondary expected payers to give precedence to public payers (Medicare and then Medicaid) over commercial insurance.

- If the primary or secondary expected payer indicates Medicare, then the payer category is assigned to Medicare. This categorization includes patients who are dually eligible for Medicare and Medicaid under Medicare.
- If not Medicare, and the primary or secondary expected payer indicates Medicaid, then the payer category is Medicaid.
- If not Medicare or Medicaid, and the primary or secondary expected payer indicates private insurance, then the payer category is private.
- If not Medicare, Medicaid, or private, and the primary expected payer indicates self-pay, no charge, or other categories such as charity, then the payer category is self-pay/no charge.
- Stays for other types of payers are not reported in this Statistical Brief because this is a small group of mixed payers, such as State and local programs.

Categorization of readmission counts by expected payer was based on the index stay. The concordance between the expected payer coded at the index stay and the expected payer coded at readmission varied by payer: 98 percent for Medicare, 95 percent for Medicaid, 93 percent for private, and 80 percent for self-pay/no charge (percentages based on the 2013 NRD).

## Total 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.<sup>a</sup> *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 hospitalwide 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 dollars. Further information on the Cost-to-Charge Ratio can be found at <https://hcup-us.ahrq.gov/db/ccr/costtocharge.jsp>.

Costs are reported as the average cost of readmissions and the aggregate cost summed over all the readmissions.

## Calculations

### Readmission rate

Readmission rate per 100 index admissions was calculated as follows:

- Numerator of the number of admissions for which there was at least one subsequent hospital admission within 30 days
- Denominator of total number of admissions from January through November of the same year

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<sup>a</sup> Agency for Healthcare Research and Quality. Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). Updated November 3, 2021. [www.hcup-us.ahrq.gov/db/state/costtocharge.jsp](http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp).

## Imputation of missing charges and costs

The National Inpatient Sample (NIS) is missing information on total hospital charges on less than one percent of records (0.9%) for 2020. The missing charges were imputed using the average total hospital charges for the Diagnosis Related Group calculated using the 2020 NIS. The imputation of total hospital charges occurred before the calculation of total hospital costs. The imputation of missing charges and the calculation of hospital costs were performed per discharge before the calculation of average and aggregate hospital costs.

## 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 partnership and sponsored by AHRQ. HCUP databases bring together the data collection efforts of State data organizations, hospital associations, 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 the 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. For more information about HCUP, see <https://hcup-us.ahrq.gov/>.

HCUP would not be possible without the contributions of the following data collection HCUP Partners from across the United States:

<b>Alaska</b> Department of Health	<b>Nebraska</b> Hospital Association
<b>Alaska</b> Hospital and Healthcare Association	<b>Nevada</b> Department of Health and Human Services
<b>Arizona</b> Department of Health Services	<b>New Hampshire</b> Department of Health & Human Services
<b>Arkansas</b> Department of Health	<b>New Jersey</b> Department of Health
<b>California</b> Department of Health Care Access and Information	<b>New Mexico</b> Department of Health
<b>Colorado</b> Hospital Association	<b>New York State</b> Department of Health
<b>Connecticut</b> Hospital Association	<b>North Carolina</b> Department of Health and Human Services
<b>Delaware</b> Division of Public Health	<b>North Dakota</b> (data provided by the Minnesota Hospital Association)
<b>District of Columbia</b> Hospital Association	<b>Ohio</b> Hospital Association
<b>Florida</b> Agency for Health Care Administration	<b>Oklahoma</b> State Department of Health
<b>Georgia</b> Hospital Association	<b>Oregon</b> Association of Hospitals and Health Systems
<b>Hawaii</b> LauLima Data Alliance	<b>Oregon</b> Health Authority
<b>Hawaii</b> University of Hawai'i at Hilo	<b>Pennsylvania</b> Health Care Cost Containment Council
<b>Illinois</b> Department of Public Health	<b>Rhode Island</b> Department of Health
<b>Indiana</b> Hospital Association	<b>South Carolina</b> Revenue and Fiscal Affairs Office
<b>Iowa</b> Hospital Association	<b>South Dakota</b> Association of Healthcare Organizations
<b>Kansas</b> Hospital Association	<b>Tennessee</b> Hospital Association
<b>Kentucky</b> Cabinet for Health and Family Services	<b>Texas</b> Department of State Health Services
<b>Louisiana</b> Department of Health	<b>Utah</b> Department of Health
<b>Maine</b> Health Data Organization	<b>Vermont</b> Association of Hospitals and Health Systems
<b>Maryland</b> Health Services Cost Review Commission	<b>Virginia</b> Health Information
<b>Massachusetts</b> Center for Health Information and Analysis	<b>Washington</b> State Department of Health
<b>Michigan</b> Health & Hospital Association	<b>West Virginia</b> Department of Health and Human Resources
<b>Minnesota</b> Hospital Association	<b>Wisconsin</b> Department of Health Services
<b>Mississippi</b> State Department of Health	<b>Wyoming</b> Hospital Association
<b>Missouri</b> Hospital Industry Data Institute	
<b>Montana</b> Hospital Association	

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## For More Information

For more information on readmissions and revisits, refer to the HCUP Statistical Briefs topic area located at <https://hcup-us.ahrq.gov/reports/statbriefs/sbtopic.jsp>.

For additional HCUP statistics, visit:

- HCUP Fast Stats at <https://datatools.ahrq.gov/hcup-fast-stats> for easy access to the latest HCUP-based statistics for healthcare information topics
- HCUPnet, HCUP's interactive query system, at <https://datatools.ahrq.gov/hcupnet>
- HCUP Summary Trend Tables at <https://hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp> for monthly information on hospital utilization

For more information about HCUP, visit <https://hcup-us.ahrq.gov/>.

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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 email us at [hcup@ahrq.gov](mailto:hcup@ahrq.gov) or send a letter to the address below:

Joel W. Cohen, Ph.D., Director  
Center for Financing, Access and Cost Trends  
Agency for Healthcare Research and Quality  
5600 Fishers Lane  
Rockville, MD 20857

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