Cancer-Related Hospitalizations for Adults, 2017

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Introduction

Cancer is the second leading cause of death in the United States overall, behind heart disease.[1] In 2017, cancer was the number one cause of death among individuals aged 45–64 years, accounting for 28.4 percent of deaths, and it was the second leading cause of death for those aged 65 years and older, accounting for 20.7 percent of deaths.[1] The most common types of cancer are breast, lung and bronchus, prostate, and colon and rectal cancers, which combined account for nearly 50 percent of all new cases of cancer.[2] In 2018, total healthcare expenditures associated with cancer were estimated at more than $112 billion.[3]

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents statistics on adult nonmaternal hospital stays involving cancer using the 2017 National Inpatient Sample (NIS). This analysis compares characteristics of cancer-related hospital stays with adult nonmaternal hospital stays for all other conditions. The most common cancer-related hospitalizations are identified by type of cancer. For stays with a secondary diagnosis of cancer, the most frequent principal diagnoses are presented. 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 discussed in the text.

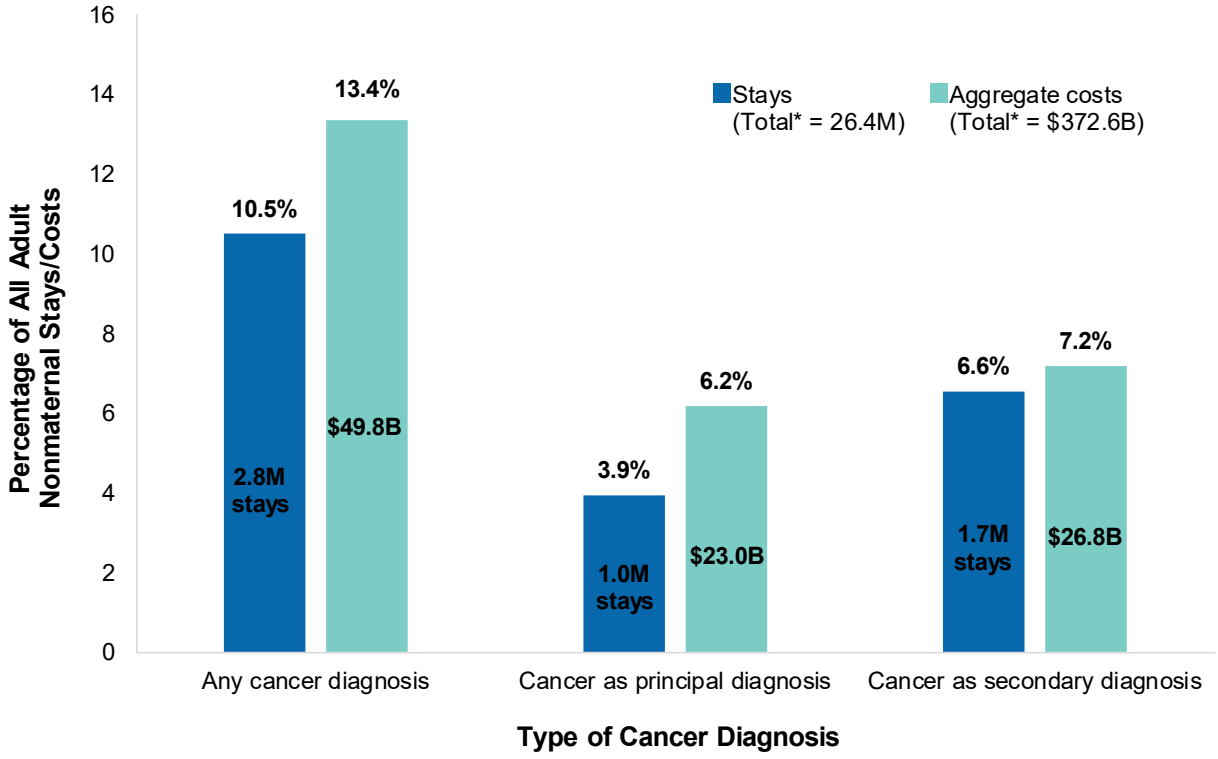
Highlights

- In 2017, there were 2.8 million cancer-related adult nonmaternal hospitalizations. Of these, 1.0 million stays had cancer as the principal diagnosis and an aggregate cost of $23.0 billion, accounting for 6.2 percent of adult nonmaternal inpatient hospital costs.
- On average, the cost of an adult nonmaternal hospital stay in 2017 was substantially higher for cancer ($22,100) than for other principal diagnoses ($13,800).
- The most common principal cancer diagnoses in 2017 were secondary malignancies, colorectal cancer, and respiratory cancers. These cancers accounted for more than one-third of the aggregate cost of hospital stays principally for cancer.
- For hospital stays with a secondary diagnosis of cancer, the principal diagnosis varied widely, with the most common being septicemia (14.4 percent), encounter for antineoplastic therapies (6.1 percent), and pneumonia (3.9 percent).

Findings

Characteristics of adult hospitalizations involving cancer, 2017
Figure 1 presents the percentage of all adult (aged 18 years or older) nonmaternal inpatient stays that involved cancer and the associated aggregate hospital cost, by whether the cancer was a principal or secondary diagnosis, in 2017.

Figure 1. Percentage of adult nonmaternal hospital stays involving cancer and aggregate costs, by type of cancer diagnosis, 2017



Abbreviations: B, billions; M, millions

Note: The difference between the 2.8M stays with any cancer diagnosis and the sum of the 1.0M stays with cancer as a principal diagnosis and 1.7M stays with cancer as a secondary diagnosis is due to rounding.

* Totals for adult nonmaternal stays/costs include stays *with and without* cancer.

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

- **Cancer-related stays accounted for more than 10 percent of adult nonmaternal hospital stays and aggregate costs.**

  In 2017, there were 2.8 million cancer-related nonmaternal hospitalizations among adults in the United States, accounting for 10.5 percent of the 26.4 million adult nonmaternal hospitalizations. In more than one-third of these cancer-related hospitalizations, cancer was the principal diagnosis (1.0 million stays). Adult stays principally for cancer cost $23.0 billion, accounting for 6.2 percent of the $372.6 billion aggregate adult nonmaternal hospital costs.

- **There were 1.7 times more adult hospitalizations with cancer as a secondary diagnosis than as a principal diagnosis.**

  In addition to the 1.0 million adult hospital stays with a principal diagnosis of cancer, there were 1.7 million stays with a secondary diagnosis of cancer, where patients were hospitalized with a principal diagnosis other than cancer. Stays with a secondary diagnosis of cancer cost $26.8 billion in aggregate, bringing the total cost of cancer-related hospital stays to $49.8 billion.

Table 1 presents characteristics of adult nonmaternal hospitalizations principally for cancer compared with stays for all other conditions in 2017.

Table 1. Characteristics of adult nonmaternal hospitalizations principally for cancer versus hospitalizations for other conditions, 2017

Characteristic	Hospitalizations principally for cancer	Hospitalizations principally for other conditions
Number of stays	1,040,000	25,395,700
Percentage of all adult nonmaternal stays	3.9	96.1
Age, years, %	100.0	100.0
18–44	7.8	17.8
45–64	39.4	32.7
65+	52.8	49.5
Sex, %	100.0	100.0
Male	52.2	48.5
Female	47.8	51.5
Primary expected payer, %	100.0	100.0
Medicare	51.2	55.0
Medicaid	10.7	15.0
Private insurance	32.7	22.7
Self-pay/No charge*	2.6	4.5
Other	2.8	2.8
Died in hospital, %	4.9	2.5
Length of stay, mean days	6.5	5.0
Cost per stay, mean $	22,100	13,800
Cost per day, mean $	3,400	2,800
Aggregate cost, $, billions	23.0	349.6

Notes: Number of stays is rounded to the nearest hundred. Mean cost per stay and mean cost per day are rounded to the nearest $100.

* 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

- **Hospital stays principally for cancer were more common among patients aged 45–64 years, had higher average costs, and had a higher in-hospital mortality rate than stays principally for other conditions.**

  Compared with hospital stays principally for other conditions, stays with a principal diagnosis of cancer occurred more frequently among those aged 45–64 years (39.4 vs. 32.7 percent) and less frequently among those aged 18–44 years (7.8 vs. 17.8 percent). The in-hospital mortality rate of hospital stays with a principal diagnosis of cancer was 4.9 percent—substantially higher than the rate for other adult nonmaternal stays (2.5 percent). On average, adult hospitalizations principally for cancer were 1.5 days longer and cost more than stays for other conditions: 6.5 versus 5.0 days; $22,100 versus $13,800 per stay; and $3,400 versus $2,800 per day.

- **Compared with hospital stays principally for other conditions, the share of stays principally for cancer was larger for private insurance and smaller for Medicaid.**

  Private insurance was the primary expected payer for 32.7 percent of stays for cancer versus 22.7 percent of stays for other conditions. In contrast, Medicaid was the expected payer for 10.7 percent of stays for cancer versus 15.0 percent of stays for other conditions.

Table 2 presents the rate per 10,000 population of adult nonmaternal hospital stays principally for cancer compared with stays for all other conditions in 2017.

Table 2. Rate per 10,000 population of adult nonmaternal hospitalizations principally for cancer versus for other conditions, by patient and hospital characteristics, 2017

Characteristic	Rate per 10,000 population	
	Hospitalizations principally for cancer	Hospitalizations principally for other conditions
Age, years		
18–44	7.0	387.3
45–64	48.6	986.3
65+	108.2	2,476.4
Community-level income		
Quartile 1 (lowest)	42.6	1,239.0
Quartile 2	41.1	1,051.0
Quartile 3	39.6	913.7
Quartile 4 (highest)	39.6	764.4
Location of patient residence		
Large central metropolitan area	39.8	937.4
Large fringe metropolitan area (suburbs)	43.4	976.6
Medium or small metropolitan area	39.2	1,007.7
Micropolitan or noncore area (rural)	44.6	1,189.0
Hospital region		
Northeast	50.0	1,087.8
Midwest	43.4	1,092.9
South	40.9	1,055.8
West	33.8	803.2

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

- **Individuals aged 65 years and older had a population rate of hospitalizations principally for cancer that was more than 15 times higher than the rate among those aged 18–44 years.**

  The rate of stays with a principal diagnosis of cancer was more than 15 times higher among patients aged 65 years and older than among those aged 18–44 years (108.2 vs. 7.0 per 10,000 population). Among stays principally for other (noncancer) conditions, the hospitalization rate was just over 6 times higher among those aged 65 years and older versus those aged 18–44 years.

- **The Northeast had the highest population rate of hospitalizations principally for cancer, and the West had the lowest rate.**

  By region, the population rate of hospitalizations for cancer was highest in the Northeast (50.0 per 10,000 population) and lowest in the West (33.8 per 10,000 population). The rate principally for other (noncancer) conditions also was lowest in the West but was similar in the other three regions.

Most common principal and secondary diagnoses among adult hospitalizations involving cancer, 2017
Table 3 presents the length of stay, average cost, and aggregate cost of adult nonmaternal hospitalizations with a principal diagnosis of cancer for the 20 most common types of cancer in 2017.

Table 3. Top 20 types of cancer among adult nonmaternal hospitalizations with a principal diagnosis of cancer, 2017

Principal cancer diagnosis	Number of stays	Length of stay, mean days	Cost, $		
			Per stay, mean	Per day, mean	Aggregate, millions
All stays with a principal diagnosis of cancer	**1,040,000**	**6.5**	**22,100**	**3,400**	**23,012.8**
Secondary malignancies	182,000	6.4	19,000	3,000	3,463.9
Gastrointestinal cancers - colorectal	125,600	6.9	21,500	3,100	2,704.8
Respiratory cancers	122,000	6.3	19,000	3,000	2,323.1
Male reproductive system cancers - prostate	75,600	2.2	14,900	6,800	1,128.5
Urinary system cancers - kidney	44,600	4.0	17,400	4,300	774.3
Breast cancer - all other types*	40,200	3.3	17,200	5,300	692.0
Non-Hodgkin lymphoma	37,900	10.1	34,100	3,400	1,293.6
Endocrine system cancers - pancreas	37,600	7.0	21,000	3,000	787.6
Nervous system cancers - brain	33,300	6.4	25,800	4,000	857.0
Urinary system cancers - bladder	26,500	6.6	22,400	3,400	592.2
Gastrointestinal cancers - stomach	22,700	8.0	23,900	3,000	542.2
Female reproductive system cancers - ovary	22,400	5.4	17,500	3,200	391.9
Multiple myeloma	20,800	11.1	32,900	3,000	685.2
Female reproductive system cancers - endometrium	19,100	3.9	16,500	4,200	315.6
Gastrointestinal cancers - liver	16,700	5.5	18,500	3,400	308.2
Leukemia - acute myeloid leukemia	14,800	19.5	64,700	3,300	957.5
Gastrointestinal cancers - esophagus	14,000	8.7	28,100	3,200	394.3
Malignant neuroendocrine tumors	13,800	6.9	22,100	3,200	305.0
Head and neck cancers - lip and oral cavity	12,300	7.1	30,400	4,300	376.0
Endocrine system cancers - thyroid	9,800	3.1	16,000	5,200	156.1

Abbreviation: ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Diagnoses were identified using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. Number of stays is rounded to the nearest hundred. Mean cost per stay and mean cost per day are rounded to the nearest $100.

* Does not include breast cancer - ductal carcinoma in situ.

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

- **Secondary malignancies, colorectal cancer, and respiratory cancers accounted for more than one-third of the aggregate cost of hospital stays with cancer as a principal diagnosis.**

  The most common adult hospitalizations principally for cancer in 2017 were for secondary malignancies, most frequently secondary brain, bone, and liver cancers (182,000 stays); colorectal cancer (125,600 stays); and respiratory cancers (122,000 stays). Aggregate costs were highest for the same set of cancers: secondary malignancies ($3.5 billion), colorectal cancer ($2.7 billion), and respiratory cancers ($2.3 billion). These three cancers accounted for more than one-third of the aggregate cost of hospital stays principally for cancer.

- **Acute myeloid leukemia, non-Hodgkin lymphoma, and multiple myeloma had the highest average cost per stay and longest average length of stay among the most common types of cancer.**

  Among the top 20 most common types of cancer, the most expensive cancer-related hospitalizations, in terms of average cost per stay, were for acute myeloid leukemia ($64,700), non-Hodgkin lymphoma ($34,100), and multiple myeloma ($32,900). These three cancers also had the longest average lengths of stay: 19.5, 10.1, and 11.1 days, respectively. The highest average cost per day was for prostate cancer ($6,800), breast cancer (except ductal carcinoma in situ) ($5,300), and thyroid cancer ($5,200). These three cancers also had the shortest average lengths of stay: 2.2, 3.3, and 3.1 days, respectively.

Table 4 presents the 10 most common types of cancer among adult nonmaternal hospitalizations with a secondary diagnosis of cancer in 2017.

Table 4. Top 10 types of cancer among adult nonmaternal hospitalizations with a secondary diagnosis of cancer, 2017

Secondary cancer diagnosis	Number of stays	Percentage of stays
All stays with a secondary diagnosis of cancer	**1,732,900**	**100.0**
Secondary malignancies	569,800	32.9
Respiratory cancers	248,800	14.4
Non-Hodgkin lymphoma	163,800	9.5
Male reproductive system cancers - prostate	122,000	7.0
Breast cancer - all other types*	116,100	6.7
Gastrointestinal cancers - colorectal	107,900	6.2
Multiple myeloma	94,100	5.4
Leukemia - chronic lymphocytic leukemia	73,100	4.2
Myelodysplastic syndrome	69,400	4.0
Endocrine system cancers - pancreas	62,200	3.6
Any of the top 10 secondary cancer diagnoses	**1,306,300**	**75.4**

Abbreviation: ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Diagnoses were identified using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. Secondary diagnoses were based on any listed diagnosis for stays without a principal diagnosis of cancer. As a result, the same inpatient stay could be counted for more than one type of secondary cancer if multiple cancers were reported during the hospitalization.

* Does not include breast cancer - ductal carcinoma in situ.

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

- **Secondary malignancies, respiratory cancers, and non-Hodgkin lymphoma accounted for half of hospital stays with cancer as a secondary diagnosis.**

  Of the 1.7 million hospital stays with a secondary diagnosis of cancer, three-fourths (75.4 percent) involved at least one of the top 10 types of cancer. The most common hospitalizations involving a secondary diagnosis of cancer were for secondary malignancies, most frequently secondary bone, liver, and lung cancers (569,800 stays); respiratory cancers (248,800 stays); and non-Hodgkin lymphoma (163,800 stays). Half (50.0 percent) of the hospital stays that had a secondary diagnosis of cancer involved at least one of these three cancers.

Table 5 presents the top 10 principal diagnoses for adult nonmaternal hospitalizations involving a secondary diagnosis of cancer in 2017.

Table 5. Top 10 principal diagnoses among adult nonmaternal hospitalizations with a secondary diagnosis of cancer, 2017

Principal diagnosis	Number of stays	Percentage of stays
All stays with a secondary diagnosis of cancer	**1,732,900**	**100.0**
Septicemia	250,000	14.4
Encounter for antineoplastic therapies	105,900	6.1
Pneumonia (except that caused by tuberculosis)	67,200	3.9
Acute and unspecified renal failure	59,700	3.4
Heart failure	55,400	3.2
Conditions due to neoplasm or the treatment of neoplasm	52,300	3.0
Chronic obstructive pulmonary disease and bronchiectasis	48,400	2.8
Respiratory failure; insufficiency; arrest	41,600	2.4
Complication of other surgical or medical care, injury, initial encounter	40,000	2.3
Urinary tract infections	35,700	2.1

Abbreviation: ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Note: Diagnoses were identified using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses.

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

- **Septicemia and encounter for antineoplastic therapies were the principal diagnoses for one-fifth of secondary cancer-related stays, with the remaining principal diagnoses varying widely.**

  About one in seven (14.4 percent) adult nonmaternal hospital stays with a secondary diagnosis of cancer had a principal diagnosis of septicemia. Another 6.1 percent of secondary cancer-related stays were principally for antineoplastic therapies (radiation therapy, chemotherapy, immunotherapy). Approximately 3.9 percent of stays with a secondary diagnosis of cancer had a principal diagnosis of pneumonia (except that caused by tuberculosis). The remaining principal diagnoses each amounted to less than 3.5 percent of adult nonmaternal hospital stays with a secondary diagnosis of cancer.

References

[1] Heron M. Deaths: leading causes for 2017. National Vital Statistics Reports. 2019;68(6):1–77.
[2] National Cancer Institute: Surveillance, Epidemiology, and End Results Program. Cancer Stat Facts: Common Cancer Sites. www.seer.cancer.gov/statfacts/html/common.html. Accessed October 15, 2020.
[3] Agency for Healthcare Research and Quality. MEPS Summary Tables: Medical Conditions, 2016 and Later. Medical Expenditure Panel Survey. Generated interactively. www.meps.ahrq.gov/mepstrends/hc_cond_icd10/. Accessed October 15, 2020.

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). Supplemental sources included population denominator data for use with HCUP databases, derived from information available from the U.S. Census Bureau and Claritas, a vendor that produces population estimates and projections based on data from the U.S. Census Bureau. [a,b]

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. *Secondary diagnoses* are conditions that coexist at the time of admission that require or affect patient care treatment received or management, or that develop during the inpatient stay. *All-listed diagnoses* include the principal diagnosis plus the secondary conditions.

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 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.[c] 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/ccsr/ccs_refined.jsp#download.

[a] Barrett M, Coffey R, Levit K. Population Denominator Data Sources and Data for Use with HCUP Databases (Updated with 2018 Population Data). HCUP Methods Series Report #2019-02. October 24, 2019. U.S. Agency for Healthcare Research and Quality. www.hcup-us.ahrq.gov/reports/methods/2019-02.pdf. Accessed February 3, 2020.
[b] Claritas. Claritas Demographic Profile by ZIP Code. https://claritas360.claritas.com/mybestsegments/. Accessed February 3, 2020.
[c] 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/ccsr/ccs_refined.jsp. Accessed February 27, 2020.

Case definition
Cancer-related hospital stays were defined as discharges with any ICD-10-CM diagnosis code in the following CCSR: NEO001–NEO071. Each discharge was classified into one of three mutually exclusive categories: principal diagnosis of cancer, secondary diagnosis of cancer, or noncancer. A discharge was classified as having a principal diagnosis of cancer if the CCSR default assignment for the principal diagnosis code indicated cancer. For discharges not classified with a principal diagnosis of cancer, a discharge was classified as having a secondary diagnosis of cancer if any listed CCSR for any listed diagnosis indicated cancer. All other discharges were classified as noncancer. For secondary cancer diagnoses, a discharge could be counted as having more than one type of cancer.

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.

Population rates
Rates of stays per 10,000 population were calculated using 2017 hospital discharge totals in the numerator and U.S. Census Bureau or Claritas[d] estimates of the 2017 U.S. population aged 18 years or older in the denominator. Population denominators are specific to the characteristics reported (e.g., age, community-level income). Individuals hospitalized multiple times are counted more than once in the numerator.

$$\text{Population rate of stays} = \left(\frac{\text{number of stays among patients aged 18+ years}}{\text{number of U.S. residents aged 18+ years}}\right) \times 10{,}000$$

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).[e] *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.

Mean cost per day is calculated as the mean cost per stay divided by the mean length of stay.

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.[f] The largest source of difference comes from the HCUP coverage of inpatient treatment only in contrast to

[d] Claritas. Claritas Demographic Profile by ZIP Code. https://claritas360.claritas.com/mybestsegments/. Accessed February 3, 2020.
[e] 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/costtocharge.jsp. Accessed February 3, 2020.
[f] 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?redirect=/NationalHealthExpendData/. Accessed February 3, 2020.

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.[g]

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.

Location of patients' residence
Place of residence is based on the urban-rural classification scheme for U.S. counties developed by the National Center for Health Statistics (NCHS) and based on the Office of Management and Budget (OMB) definition of a metropolitan service area as including a city and a population of at least 50,000 residents:

- Large Central Metropolitan: Counties in a metropolitan area with 1 million or more residents that satisfy at least one of the following criteria: (1) containing the entire population of the largest principal city of the metropolitan statistical area (MSA), (2) having their entire population contained within the largest principal city of the MSA, or (3) containing at least 250,000 residents of any principal city in the MSA
- Large Fringe Metropolitan: Counties in a metropolitan area with 1 million or more residents that do not qualify as large central metropolitan counties
- Medium Metropolitan: Counties in a metropolitan area of 250,000–999,999 residents
- Small Metropolitan: Counties in a metropolitan area of 50,000–249,999 residents
- Micropolitan: Counties in a nonmetropolitan area of 10,000–49,999 residents
- Noncore: Counties in a nonmetropolitan and nonmicropolitan area

Community-level income
Community-level income is based on the median household income of the patient's ZIP Code of residence. Quartiles are defined so that the total U.S. population is evenly distributed. Cut-offs for the quartiles are determined annually using ZIP Code demographic data obtained from Claritas, a vendor that produces population estimates and projections based on data from the U.S. Census Bureau.[h] The value ranges for the income quartiles vary by year. The income quartile is missing for patients who are homeless or foreign.

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

[g] 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.
[h] Claritas. Claritas Demographic Profile by ZIP Code. https://claritas360.claritas.com/mybestsegments/. Accessed February 3, 2020.

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

For this Statistical Brief, when more than one payer is listed for a hospital discharge, the first-listed payer is used.

Region
Region is one of the four regions defined by the U.S. Census Bureau:

- Northeast: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania
- Midwest: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas
- South: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas
- West: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii

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 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 Laulima Data Alliance
Hawaii University of Hawai'i at Hilo
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
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

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
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 cancer-related hospitalizations, refer to the HCUP Statistical Briefs located at www.hcup-us.ahrq.gov/reports/statbriefs/sb_cancer.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 (Nationwide) 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 email us at hcup@ahrq.gov or send a letter to the address below:

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