Diabetes-Related Inpatient Stays, 2018

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Introduction

In 2018, 34.2 million individuals in the United States had ever been diagnosed with diabetes, constituting 10.5 percent of the U.S. population overall.[1] This does not include another 7.3 million individuals aged 18 years or older estimated to have undiagnosed diabetes (as determined by measured fasting plasma glucose or A1C levels).[1]

The most common form of diabetes is type 2 diabetes, which is characterized by the body's improper use of insulin.[2] Type 2 diabetes is most often diagnosed in adulthood and is associated with nonoptimal weight, poor diet, and lack of exercise.[2] Type 1 diabetes is characterized by the body's inability to produce insulin and is more often diagnosed in childhood than type 2 diabetes.[2] Both types of diabetes, if untreated, result in elevated levels of blood glucose that can lead to serious complications over time, such as cardiovascular disease, kidney damage, stroke, blindness, and limb amputation.[3] Diabetes and the sequelae of the disease are associated with approximately 8 million hospitalizations annually.[1]

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents statistics on nonmaternal[a] inpatient stays involving type 1 or type 2 diabetes among patients aged 1 year or older using weighted estimates from the 2018 National Inpatient Sample (NIS). Patient and hospital characteristics, as well as average length of stay, cost per stay, and in-hospital mortality, are examined by type of diabetes and compared with stays without a diabetes diagnosis. Additionally, reasons for hospitalization and comorbidities among stays involving type 1 or type 2 diabetes 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 2018, there were more than 8 million hospital stays involving type 1 or type 2 diabetes. Type 2 diabetes accounted for 95 percent of these stays.
- Whereas the largest portion of stays involving type 1 diabetes was for patients aged 18–34 years (33 percent), the largest portion of stays involving type 2 diabetes was for patients aged 65–84 years (50 percent).
- Of stays involving type 1 or type 2 diabetes, 20 and 18 percent, respectively, were for Black patients (vs. 14 percent of stays for patients without diabetes).
- For adults aged 18–64 years, the in-hospital mortality rate was twice as high for stays for type 2 as those for type 1 diabetes (40.9 vs. 20.4 per 10,000 stays).
- The leading principal diagnosis for stays involving type 1 diabetes was diabetes—accounting for half of all stays with any diagnosis of type 1 diabetes, followed by septicemia and acute/unspecified renal failure. The leading principal diagnosis for stays involving type 2 diabetes was septicemia—accounting for 10 percent of all stays with any diagnosis of type 2 diabetes.

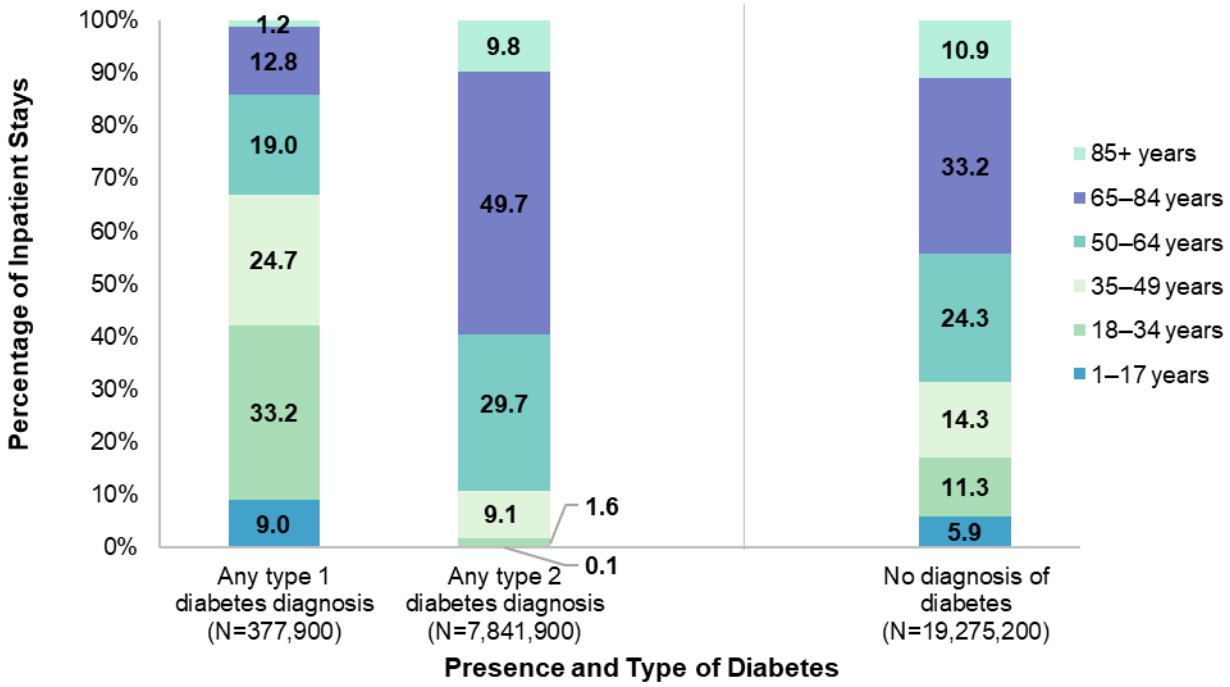
[a] It can be challenging to distinguish between pre-existing diabetes (chronic disease) and gestational diabetes (which resolves postpartum) in certain datasets and this is especially true when the condition is first detected during pregnancy itself. Since diabetes during pregnancy is a unique condition with predictable metabolic changes, including inherent insulin resistance, it may be appropriate to analyze this subpopulation separately. Thus, this Statistical Brief excludes maternal stays, including those with pre-existing diabetes (type 1 or type 2) or with gestational diabetes, both of which have unique concerns for the mother and infant that are different from diabetes occurring among nonmaternal stays.

Findings

Characteristics of inpatient stays involving diabetes, 2018

Figure 1 displays the percentage of nonmaternal inpatient stays involving type 1 or type 2 diabetes by patient age group, compared with stays without a diabetes diagnosis, in 2018.

Figure 1. Patient age distribution of nonmaternal inpatient stays, by presence and type of diabetes, 2018



Notes: Stays were categorized based on all-listed diagnoses as having type 1 diabetes or type 2 diabetes, excluding the following: stays with any diagnosis of diabetes due to an underlying condition, diabetes that was drug or chemical induced, or other specified type (N=54,500); stays with codes for both type 1 and type 2 diabetes (N=6,000); and stays with a diagnosis of diabetes where the codes on the record were not specific enough to categorize the patient as having type 1 or type 2 diabetes (N=1,000). Number of stays is rounded to the nearest hundred. Percentages are calculated from unrounded values.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2018

- **In 2018, there were more than 8 million hospitalizations involving type 1 or type 2 diabetes.**

  In 2018, there were 8,219,800 stays involving type 1 or type 2 diabetes and 19,275,200 stays that did not involve diabetes—meaning that for every 2.3 hospitalizations without a diabetes diagnosis, there was 1 hospitalization involving type 1 or type 2 diabetes. Of stays involving type 1 or type 2 diabetes, 5 percent were for patients with type 1 diabetes and 95 percent were for patients with type 2 diabetes.

- **Whereas the largest portion of stays involving type 1 diabetes was for patients aged 18–34 years, the largest portion of stays involving type 2 diabetes was for patients aged 65–84 years.**

  One-third (33.2 percent) of stays involving type 1 diabetes were for young adults aged 18–34 years, compared with 1.6 percent of stays involving type 2 diabetes and 11.3 percent of stays for patients without diabetes. Another 9.0 percent of stays involving type 1 diabetes were for children aged 1–17 years, compared with 0.1 and 5.9 percent of stays involving type 2 and no diabetes, respectively. In contrast, half (49.7 percent) of stays involving type 2 diabetes were for older adults aged 65–84 years, compared with 12.8 percent of stays involving type 1 diabetes and 33.2 percent of stays for patients without diabetes.

Table 1 presents additional patient characteristics of stays involving type 1 or type 2 diabetes, compared with those without a diabetes diagnosis, in 2018.

Table 1. Characteristics of nonmaternal inpatient stays involving diabetes, compared with those without a diabetes diagnosis, 2018

Characteristic	Any type 1 diabetes diagnosis	Any type 2 diabetes diagnosis	No diagnosis of diabetes
Total, N	**377,900**	**7,841,900**	**19,275,200**
Male, %	49.8	51.2	48.2
Expected payer, %			
Medicare	31.7	65.7	47.7
Medicaid	30.4	11.9	17.8
Private insurance	27.6	16.9	26.1
Self-pay/No charge*	7.5	3.1	5.2
Other	2.7	2.3	3.1
Community income, %			
Quartile 1 (lowest)	32.0	32.9	28.0
Quartile 2	27.6	27.3	26.3
Quartile 3	22.6	22.2	23.6
Quartile 4 (highest)	16.0	15.8	20.2
Race/ethnicity, %			
Asian/Pacific Islander	1.2	2.8	2.1
Black	19.6	17.5	13.5
Hispanic	10.5	12.2	9.6
White	62.7	61.6	68.7
Other	3.3	3.7	3.4
Location of residence, %			
Metro	82.8	82.4	83.1
Rural, metro-adjacent	11.0	11.5	10.7
Rural, remote	5.6	5.7	5.5

Notes: Stays were categorized based on all-listed diagnoses as having type 1 diabetes or type 2 diabetes, excluding the following: stays with any diagnosis of diabetes due to an underlying condition, diabetes that was drug or chemical induced, or other specified type (N=54,500); stays with codes for both type 1 and type 2 diabetes (N=6,000); and stays with a diagnosis of diabetes where the codes on the record were not specific enough to categorize the patient as having type 1 or type 2 diabetes (N=1,000). Number of stays is rounded to the nearest hundred. Percentages are calculated from unrounded values. Less than 3% of stays were missing data on race/ethnicity, less than 2% of stays were missing data on community income, and less than 1% of stays were missing data on expected payer and location of residence. No stays were missing data on sex.

* 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), 2018

- **Medicare, Medicaid, and private insurance each accounted for approximately 30 percent of stays involving type 1 diabetes.**

  Whereas Medicare was the most common expected payer of stays involving type 2 diabetes (65.7 percent) and no diabetes (47.7 percent), Medicare (31.7 percent), Medicaid (30.4 percent), and private insurance (27.6 percent) each accounted for approximately 30 percent of stays involving type 1 diabetes. Additionally, a greater percentage of stays involving type 1 diabetes (7.5 percent) had an expected payer of self-pay/no charge than stays involving type 2 diabetes (3.1 percent) or no diabetes (5.2 percent).

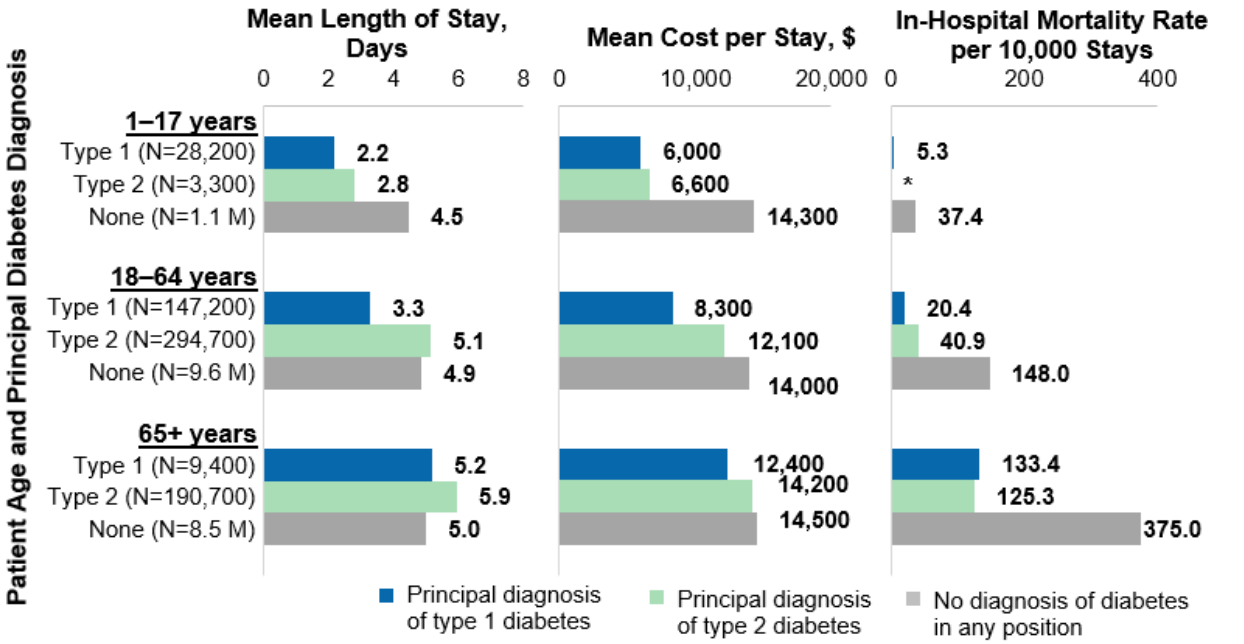
- **A higher percentage of stays involving diabetes were for patients from the lowest income areas and racial/ethnic minorities, compared with stays for patients without diabetes.**

  Nearly one-third of stays involving type 1 diabetes (32.0 percent) or type 2 diabetes (32.9 percent) were among individuals from the lowest income communities (quartile 1), compared with 28.0 percent of stays without a diabetes diagnosis. Conversely, 20.2 percent of stays for patients without diabetes were among individuals from the highest income communities (quartile 4), compared with 16.0 and 15.8 percent of stays involving type 1 or type 2 diabetes, respectively. Compared with stays without a diabetes diagnosis, a higher percentage of stays involving type 1 or type 2 diabetes were among Black patients and a higher percentage of stays involving type 2 diabetes were among the Asian/Pacific Islander and Hispanic racial/ethnic groups. The distributions of sex and patient location were similar across stays involving type 1, type 2, and no diabetes.

Outcomes of inpatient stays for diabetes, 2018

Figure 2 displays the mean length of stay, mean cost per stay, and rate of in-hospital deaths per 10,000 stays, by patient age group, for stays with a principal diagnosis of type 1 or type 2 diabetes in 2018. These statistics also are shown for stays without any diagnosis of diabetes in any position.

Figure 2. Outcomes of nonmaternal stays among patients hospitalized for diabetes, compared with those without a diabetes diagnosis, 2018



Abbreviation: M, million

Notes: Stays were categorized based on all-listed diagnoses as having type 1 diabetes or type 2 diabetes, excluding the following: stays with any diagnosis of diabetes due to an underlying condition, diabetes that was drug or chemical induced, or other specified type (N=54,500); stays with codes for both type 1 and type 2 diabetes (N=6,000); and stays with a diagnosis of diabetes where the codes on the record were not specific enough to categorize the patient as having type 1 or type 2 diabetes (N=1,000). Among these stays, only those with a principal diabetes diagnosis are shown. Number of stays and mean cost per stay are rounded to the nearest hundred.

* Not shown because there were fewer than 11 in-hospital deaths in this group.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2018

- **For adults aged 18–64 years, stays with a principal diagnosis of type 2 diabetes were longer, were more costly, and had a higher in-hospital mortality rate than those for type 1 diabetes.**

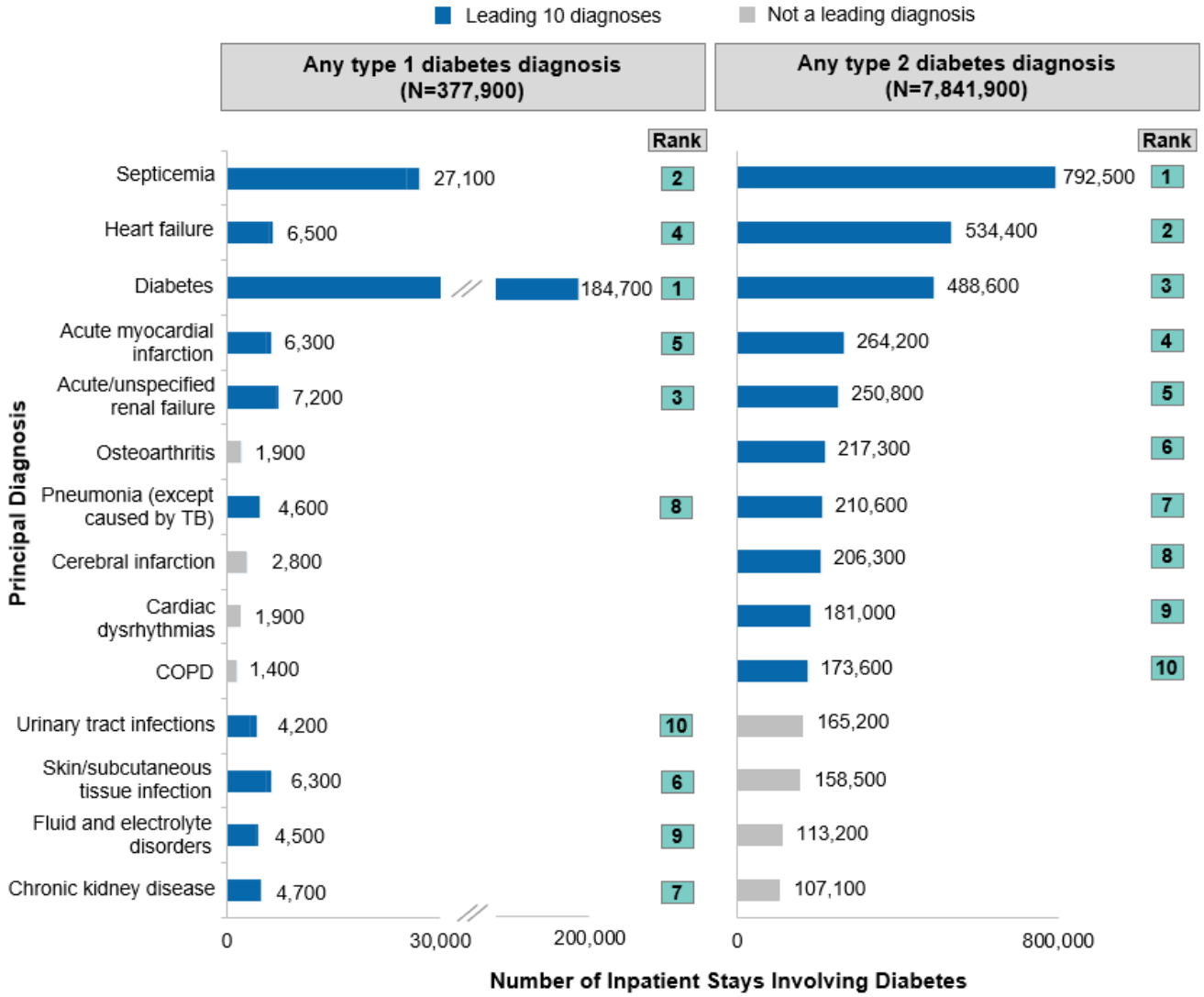
  Among adults aged 18–64 years, stays principally for type 2 diabetes were nearly 2 days longer (5.1 vs. 3.3 days) and nearly $4,000 more costly ($12,100 vs. $8,300) than those for type 1 diabetes. For this age group, the in-hospital mortality rate for type 2 diabetes stays was twice as high as the rate for type 1 diabetes stays (40.9 vs. 20.4 per 10,000 stays).

  Among children aged 1–17 years, stays for type 2 diabetes were less common than stays for type 1 diabetes (3,300 vs. 28,200 stays) but longer on average (2.8 vs. 2.2 days). Among adults aged 65 years or older, the mean length and cost per stay were higher for stays for type 2 diabetes than for stays for type 1 diabetes, but the in-hospital mortality rate was similar. Regardless of age group, stays for type 1 or type 2 diabetes had a lower in-hospital mortality rate than stays that did not involve diabetes. Costs of stays for diabetes were lower than costs of stays that did not involve diabetes, except for adults aged 65 years or older hospitalized for type 2 diabetes.

Conditions associated with hospitalizations for diabetes, 2018

Figure 3 displays the top 10 principal diagnoses (i.e., the primary reason for hospitalization) for all stays involving type 1 or type 2 diabetes in 2018. The conditions are sorted by the volume of stays involving Type 2 diabetes.

Figure 3. Top 10 reasons for hospitalization for stays involving type 1 or type 2 diabetes, 2018



Abbreviations: COPD, chronic obstructive pulmonary disease; TB, tuberculosis

Notes: Stays were categorized based on all-listed diagnoses as having type 1 diabetes or type 2 diabetes, excluding the following: stays with any diagnosis of diabetes due to an underlying condition, diabetes that was drug or chemical induced, or other specified type (N=54,500); stays with codes for both type 1 and type 2 diabetes (N=6,000); and stays with a diagnosis of diabetes where the codes on the record were not specific enough to categorize the patient as having type 1 or type 2 diabetes (N=1,000). Diagnoses are grouped according to the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses version 2021.1. The unspecific category *Complication of other surgical or medical care, injury, initial encounter* is not shown, although it ranked third for stays involving type 1 diabetes (N=116,900). Number of stays is rounded to the nearest hundred. // indicates a break in the axis.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2018

- **Diabetes was the leading reason for hospitalization among stays involving type 1 diabetes and the third leading reason among stays involving type 2 diabetes.**

  Of the 377,900 stays with any type 1 diabetes diagnosis, approximately half (184,700) had a principal diagnosis of diabetes. In contrast, of the 7,841,900 stays with any type 2 diabetes diagnosis, diabetes was the third most common principal diagnosis, accounting for only 6 percent of stays

(488,600). Septicemia (792,500 stays; 10 percent) and heart failure (534,400 stays; 7 percent) were the leading reasons for hospitalization among stays with any diagnosis of type 2 diabetes.

- **The leading principal diagnoses were mostly similar for stays involving type 1 and type 2 diabetes.**

  Although the specific order varied, 6 of the top 10 principal diagnoses were the same for stays involving type 1 and type 2 diabetes: septicemia, heart failure, diabetes, acute myocardial infarction, acute/unspecified renal failure, and pneumonia. Four diagnoses ranked in the top 10 most common principal diagnoses for type 1 but not type 2 diabetes: urinary tract infections, skin/subcutaneous tissue infection, fluid and electrolyte disorders, and chronic kidney disease. Four diagnoses ranked in the top 10 most common principal diagnoses for type 2 but not type 1 diabetes: osteoarthritis, cerebral infarction, cardiac dysrhythmias, and chronic obstructive pulmonary disease.

Table 2 lists the top 10 comorbidities (i.e., secondary diagnoses) for stays where diabetes was the primary reason for the hospital stay in 2018. The conditions are sorted by the volume of stays involving Type 2 diabetes.

Table 2. Top 10 comorbidities for nonmaternal stays with a principal diagnosis of diabetes, 2018

Secondary diagnosis	Principal diagnosis of type 1 diabetes (N=184,700)		Principal diagnosis of type 2 diabetes (N=488,600)	
	Rank	%	Rank	%
Disorders of lipid metabolism	6	20.1	1	49.7
Fluid and electrolyte disorders	1	59.1	2	44.8
Hypertension with complications*	—†	—†	3	41.1
Essential hypertension	5	21.2	4	40.1
Chronic kidney disease	10	16.4	5	35.8
Pressure ulcer of skin	—†	—†	6	34.7
Nonpressure ulcer of skin	—†	—†	7	31.3
Coronary atherosclerosis*	—†	—†	8	29.3
Acute/unspecified renal failure	2	29.3	9	28.6
Skin/subcutaneous tissue infections	—†	—†	10	28.2
Tobacco-related disorders	3	25.9	—†	—†
Polyneuropathies	4	25.0	—†	—†
Depressive disorders	7	17.1	—†	—†
Implant, device or graft encounter	8	17.1	—†	—†
Esophageal disorders	9	16.7	—†	—†

Notes: Stays were categorized based on all-listed diagnoses as having type 1 diabetes or type 2 diabetes, excluding the following: stays with any diagnosis of diabetes due to an underlying condition, diabetes that was drug or chemical induced, or other specified type (N=54,500); stays with codes for both type 1 and type 2 diabetes (N=6,000); and stays with a diagnosis of diabetes where the codes on the record were not specific enough to categorize the patient as having type 1 or type 2 diabetes (N=1,000). Diagnoses are grouped according to the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses version 2021.1. Secondary diagnoses of diabetes and unspecific diagnoses, including *Other specified status* (81.0% and 80.5% of stays principally for type 1 or type 2 diabetes, respectively), *Other specified and unspecified disorders of stomach and duodenum* (17.9% of stays principally for type 1 diabetes), and *Personal/family history of disease* (32.9% and 43.0% of stays principally for type 1 or type 2 diabetes respectively), are not shown, although they ranked among the leading 10 diagnoses. Number of stays is rounded to the nearest hundred. Percentages are calculated from unrounded values.

* Full descriptions of the CCSR category: *Hypertension with complications and secondary hypertension; Coronary atherosclerosis and other heart disease.*

† Not in the top 10 diagnoses.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2018

- **Fluid and electrolyte disorders were the leading comorbidity among stays for type 1 diabetes and the second leading comorbidity among stays for type 2 diabetes.**

  Fluid and electrolyte disorders were documented for 59.1 percent of stays principally for type 1 diabetes and for 44.8 percent of stays principally for type 2 diabetes. Other common comorbidities both among stays for type 1 diabetes and among stays for type 2 diabetes were acute/unspecified renal failure, essential hypertension, disorders of lipid metabolism, and chronic kidney disease. Five diagnoses ranked among the top 10 most common comorbidities among stays for type 1 but not type 2 diabetes: tobacco-related disorders; polyneuropathies; depressive disorders; implant, device or graft encounters; and esophageal disorders. Five diagnoses ranked among the top 10 most common comorbidities among stays for type 2 but not type 1 diabetes: hypertension with complications and secondary hypertension, pressure ulcer of skin, nonpressure ulcer of skin, coronary atherosclerosis and other heart disease, and skin/subcutaneous tissue infections.

References

[1] Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2020. 2020. www.diabetesresearch.org/file/national-diabetes-statistics-report-2020.pdf. Accessed March 8, 2021.
[2] Centers for Disease Control and Prevention. Diabetes. Page last reviewed June 11, 2020. www.cdc.gov/diabetes/basics/diabetes.html. Accessed March 16, 2021.
[3] World Health Organization. Diabetes. April 13, 2021. www.who.int/news-room/fact-sheets/detail/diabetes. Accessed March 16, 2021.

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 Healthcare Cost and Utilization Project (HCUP) 2018 National Inpatient Sample (NIS).

Definitions

Diagnoses, ICD-10-CM, Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses and Major Diagnostic Categories (MDCs)
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.[b] 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. For this Statistical Brief, v2021.1 of the CCSR was used.

MDCs assign ICD-10-CM principal diagnosis codes to 1 of 25 general diagnosis categories.

[b] 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 November 2020. www.hcup-us.ahrq.gov/toolssoftware/ccsr/ccs_refined.jsp. Accessed January 22, 2021.

Case definition
The CCSR categories that define diabetes are:

- END002: Diabetes mellitus without complication
- END003: Diabetes mellitus with complication
- END004: Diabetes mellitus, type 1
- END005: Diabetes mellitus, type 2
- END006: Diabetes mellitus, due to underlying condition, drug or chemical induced, or other specified type

For this Statistical Brief, mutually exclusive categories for type of diabetes were created. Stays were categorized based on all-listed diagnoses as having type 1 diabetes (END004) or type 2 diabetes (END005), *excluding*:

- Stays with any diagnosis of END006 with or without a type 1 or type 2 diagnosis (N=54,500)
- Stays with codes for both type 1 and type 2 diabetes (END004 and END005, N=6,000)
- Stays with a diagnosis of diabetes where the code was not specific enough to categorize the patient as having type 1 or type 2 diabetes (END002 or END003 without another diabetes code, N=1,000)

This Statistical Brief includes patients aged 1 year and older and excludes maternal stays as defined by MDC 14, *Pregnancy, Childbirth And Puerperium*.

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.

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).[c] *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 dollars.

Location of patients' residence
Place of residence is based on the rural-urban continuum codes (RUCC) for U.S. counties developed by the United States Department of Agriculture (USDA).[d] RUCC classifies metropolitan counties by population size and nonmetropolitan counties by the size of the urban population and whether the county is adjacent or not adjacent to a metropolitan area. For this Statistical Brief, we collapsed the RUCC

[c] 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 September 2020. www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed January 22, 2021.
[d] United States Department of Agriculture. Rural-Urban Continuum Codes. www.ers.usda.gov/data-products/rural-urban-continuum-codes/. Accessed January 22, 2021.

codes into the following three categories:

Metropolitan (metro) area:

- Counties in metro areas of 1 million population or more
- Counties in metro areas of 250,000 to 1 million population
- Counties in metro areas of fewer than 250,000 population

Rural-adjacent to metro area:

- Urban population of 20,000 or more, adjacent to a metro area
- Urban population of 2,500 to 19,999, adjacent to a metro area
- Completely rural or less than 2,500 urban population, adjacent to a metro area

Rural-remote area:

- Urban population of 20,000 or more, not adjacent to a metro area
- Urban population of 2,500 to 19,999, not adjacent to a metro area
- Completely rural or less than 2,500 urban population, not adjacent to a metro 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.[e] 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

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.

Discharge status
Discharge status reflects the disposition of the patient at discharge from the hospital and includes whether the patient died in the hospital.

Reporting of race and ethnicity
Data on Hispanic ethnicity are collected differently among the States and also can differ from the census methodology of collecting information on race (White, Black, Asian/Pacific Islander, American Indian/Alaska Native, Other [including mixed race]) separately from ethnicity (Hispanic, non-Hispanic). State data organizations often collect Hispanic ethnicity as one of several categories that include race.

[e] Claritas. Claritas Demographic Profile by ZIP Code. https://claritas360.claritas.com/mybestsegments/. Accessed January 22, 2021.

Therefore, for multistate analyses, HCUP creates the combined categorization of race and ethnicity for data from States that report ethnicity separately. When a State data organization collects Hispanic ethnicity separately from race, HCUP uses Hispanic ethnicity to override any other race category to create a Hispanic category for the uniformly coded race/ethnicity data element, while also retaining the original race and ethnicity data. This Statistical Brief reports race/ethnicity for the following categories: non-Hispanic Asian/Pacific Islander, non-Hispanic Black, Hispanic, non-Hispanic White, and non-Hispanic Other.

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
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 2018 NIS is 7,105,498 (weighted, this represents 35,527,481 inpatient stays).

For More Information

For other information on diabetes, refer to the HCUP Statistical Briefs located at www.hcup-us.ahrq.gov/reports/statbriefs/sb_diabetes.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/
- HCUP Summary Trend Tables at www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp for monthly information on hospital utilization

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 2020. www.hcup-us.ahrq.gov/nisoverview.jsp. Accessed January 22, 2021.

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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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