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Costs of Emergency Department Visits for Mental and Substance Use Disorders in the United States, 2017

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Highlights

- In 2017, mental and substance use disorder (MSUD) emergency department (ED) visits had service delivery costs of more than $5.6 billion, which represented more than 7 percent of the $76.3 billion total ED visit costs.
- The average cost was $520 per ED visit across the 10.7 million MSUD ED visits, which was similar to the $530 average cost for all 144.8 million ED visits.
- The five most costly MSUD diagnoses (alcohol-related disorders; anxiety and fear-related disorders; depressive disorders; suicidal ideation/attempt/intentional self-harm; schizophrenia spectrum and other psychotic disorders) accounted for 70 percent of total MSUD ED visit costs.
- The share of costs for ED visits with routine discharges home was smaller for MSUD ED visits than for all ED visits (70.3 vs. 80.8 percent). In contrast, the share of costs for ED visits resulting in admission to the hospital was larger for MSUD ED visits than for all ED visits (12.5 vs. 9.4 percent).
- Medicaid had the largest share of ED visit costs for alcohol, suicidal, and schizophrenia disorders; private insurance had the largest cost share for anxiety disorders.

Introduction

Hospital emergency department (ED) visits have been growing rapidly, with the rate of increase exceeding that for hospital inpatient care.[1] The rate of ED visits for mental health and substance abuse diagnoses increased 44.1 percent from 2006 to 2014, to a rate of 20.3 visits per 1,000 population.[2] According to a 2016 study, ED episodes of care payments represented 12.5 percent of national health expenditures in 2010.[3] Therefore, service delivery costs associated with ED visits are an important health policy concern. Service delivery costs specific to hospital ED use can now be estimated using newly developed Cost-to-Charge Ratios (CCRs) for ED data from the Healthcare Cost and Utilization Project (HCUP).

This HCUP Statistical Brief presents statistics on the costs of ED visits with diagnoses of mental and substance use disorders (MSUDs) in the United States using the 2017 Nationwide Emergency Department Sample (NEDS). ED visits include patients treated and released from the ED as well as those admitted to the same hospital through the ED. Total (aggregate) and average costs for MSUD ED visits are presented by MSUD diagnosis category. Total and average costs for MSUD ED visits are also presented by select patient and hospital characteristics compared with costs for all ED visits. The distribution of total ED visit costs for the five most costly MSUD diagnoses is presented by patient age group and primary expected payer. Because of the large sample size of the NEDS data, small differences can be statistically significant. Thus, only

* The authors have revised this Statistical Brief to use the first- and second-listed diagnosis codes instead of all-listed diagnoses for the purpose of estimating the costs per visit. The combination of first- and second-listed diagnosis codes appears to be plausible for estimating emergency department (ED) resource use, as ED coding practices may not always use the first-listed diagnosis to capture conditions accountable for the majority of resource use. All-listed diagnoses may be more suitable if the focus of the analysis is ED visit utilization or disease prevalence.

[1] Dieleman JL, Squires E, Bui AL, Campbell M, Chapin A, Hamavid H, et al. Factors associated with increases in US health care spending, 1996-2013. JAMA. 2017;318(17):1668–78.

[2] Moore BJ, Stocks C, Owens PL. Trends in Emergency Department Visits, 2006–2014. HCUP Statistical Brief #227. September 2017. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/reports/statbriefs/sb227-Emergency-Department-Visit-Trends.pdf. Accessed March 18, 2020.

[3] Galarraga JE, Pines JM. Costs of ED episodes of care in the United States. The American Journal of Emergency Medicine. 2016;34(3):357–65.

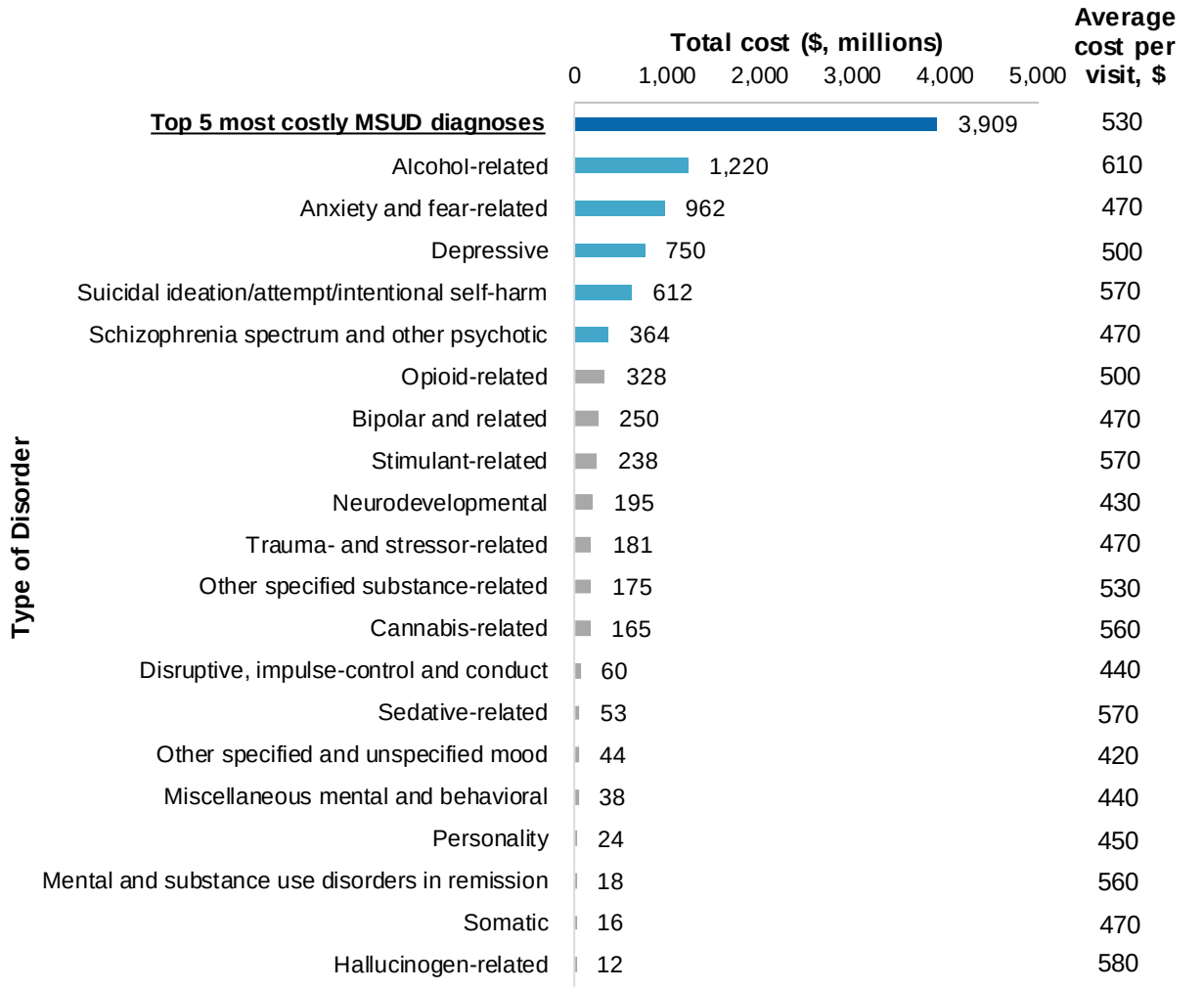
percentage differences in estimates or proportions greater than or equal to 10 percent are discussed in the text.

Findings

Costs for MSUD ED visits by most costly diagnoses, 2017

Figure 1 presents total and average emergency department (ED) visit costs for the 20 highest cost mental and substance use disorder (MSUD) diagnoses in 2017. Bars in Figure 1 represent the total ED visit cost associated with the diagnosis; the column to the right in the figure provides the average ED visit cost for each diagnosis group. The first- and second-listed diagnoses were used for this analysis; therefore, a single MSUD ED visit can be counted in more than one MSUD diagnosis group (e.g., depressive disorders and alcohol-related disorders) if the ED visit record indicated more than one type of MSUD diagnosis. Thus, the sum of MSUD ED visit costs across diagnoses will not agree with total ED visit costs reported in Tables 1 and 2 because some ED visits are counted in more than one diagnosis category in Figure 1.

Figure 1. Total and average ED visit costs for the most costly MSUD diagnoses, 2017



Abbreviations: ED, emergency department; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification; MSUD, mental and substance use disorder

Notes: Average cost estimates are rounded to the nearest $10. Diagnosis groups are defined using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. First- and second-listed diagnoses were used for this analysis; therefore, a single MSUD ED visit can be counted in more than one MSUD diagnosis group if the ED visit record indicated more than one type of MSUD diagnosis. Aggregate costs for any ED visit with an MSUD diagnosis were $5.616 billion. Total cost for the five most costly MSUD ED visit diagnoses was calculated from values that were not rounded.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2017

- **Total costs for ED visits with at least one of the top five MSUD diagnoses accounted for $3.9 billion in 2017, 70 percent of the $5.6 billion in total MSUD ED visit costs.[4]**

  In 2017, MSUD ED visits cost a total of $5,616 million. The following were the five most costly MSUD ED visit diagnoses and percentage of total MSUD ED visit costs:

  - Alcohol-related disorders ($1,220 million, 21.7 percent of the $5,616 million total MSUD ED visit costs)

[4] The sum of MSUD ED visit costs and percentages of total MSUD ED visit costs across diagnoses will not match costs for ED visits with at least one of the top five MSUD diagnoses because some ED visits are counted in more than one diagnosis category. A separate analysis was run to deduplicate these results when reporting the combined total for the top five most costly MSUD diagnoses in the ED. In addition, total cost for the five most costly MSUD ED visit diagnoses was calculated from values that were not rounded.

- Anxiety and fear-related disorders ($962 million aggregate costs, 17.1 percent)
- Depressive disorders ($750 million, 13.4 percent)
- Suicidal ideation/attempt/intentional self-harm ($612 million, 10.9 percent)
- Schizophrenia spectrum and other psychotic disorders ($364 million, 6.5 percent)

Costs for MSUD ED visits overall and by select patient characteristics, 2017
Table 1 presents the distribution of total costs and the average cost per visit for MSUD ED visits and all ED visits by select patient characteristics in 2017.

Table 1. Percentage of total costs and average costs for MSUD ED visits by patient characteristics, 2017

Patient characteristic	Mental and substance use disorder ED visits (N=10.7 million visits; $5.6 billion total costs)		Total ED visits (N=144.8 million visits; $76.3 billion total costs)	
	Total costs, %	Average cost per visit, $	Total costs, %	Average cost per visit, $
Total	100.0	520	100.0	530
Age group, years				
0–9	1.1	340	5.6	250
10–14	3.2	440	2.4	340
15–17	4.5	490	2.3	420
18–44	50.4	500	35.0	490
45–64	31.8	570	28.6	630
65+	9.1	630	26.4	690
Sex				
Male	52.3	520	44.1	520
Female	47.7	530	55.9	530
Primary expected payer				
Medicare	18.5	560	30.1	660
Medicaid	36.0	500	25.0	420
Private insurance	26.1	550	30.3	560
Self-pay/No charge[a]	15.7	500	10.6	460
Other	3.4	540	3.7	510
Discharge from ED				
Routine	70.3	530	80.8	530
Transfer to short-term hospital	3.3	800	3.5	1,160
Transfer to other facility	10.2	680	2.7	1,030
Home health care	0.4	1,190	0.8	1,930
Against medical advice	2.0	500	1.3	450
Inpatient admission	12.5	360	9.4	360
Died in ED	0.1	1,030	0.3	1,190
Destination unknown	0.4	750	0.4	1,060

Abbreviation: ED, emergency department; MSUD, mental and substance use disorder

Notes: Statistics for ED visits with missing or invalid patient characteristics are not presented. In 2017, about 13% of all ED visits (weighted) in the NEDS are missing information about ED charges and therefore ED cost cannot be estimated. Estimates of the total cost use the product of the number of cases and the average estimated cost to account for records with missing information. The share of total costs is calculated with unrounded numbers. Total cost decompositions among different descriptive statistics or utilizing multiple levels of aggregation in a single computation could lead to slightly different total cost estimates due to the use of slightly different and more specific estimates of the missing information. Therefore, the share of total cost across characteristic values may not sum to 100. Average cost estimates are rounded to the nearest $10.

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

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2017

- **Young children had a smaller share of MSUD ED costs compared with costs for all ED visits; middle-aged adults had a larger share.**

  Although children aged 0–9 years accounted for 5.6 percent of all ED costs, they represented a smaller proportion of MSUD ED costs (1.1 percent). Adults aged 18–44 years represented a substantial proportion of MSUD ED costs (50.4 percent) but a lower proportion of all ED costs (35.0 percent).

- **The share of costs for routine ED discharges was lower for MSUD ED visits compared with all ED visits; the share of costs for MSUD ED visits admitted to the same hospital was higher.**

  ED visits that ended in a routine discharge (to home) accounted for 80.8 percent of all ED visit costs. In contrast, the percentage of costs for MSUD ED visits with a routine discharge was lower at 70.3 percent. Conversely, MSUD ED visits resulting in inpatient admission to the same hospital represented a larger percentage of MSUD ED visit costs (12.5 percent) compared with all ED visit costs (9.4 percent). Transfers from the ED to other facilities (other than short-term hospitals) represented a larger percentage of MSUD ED visits costs (10.2 percent) compared with all ED visit costs (2.7 percent).

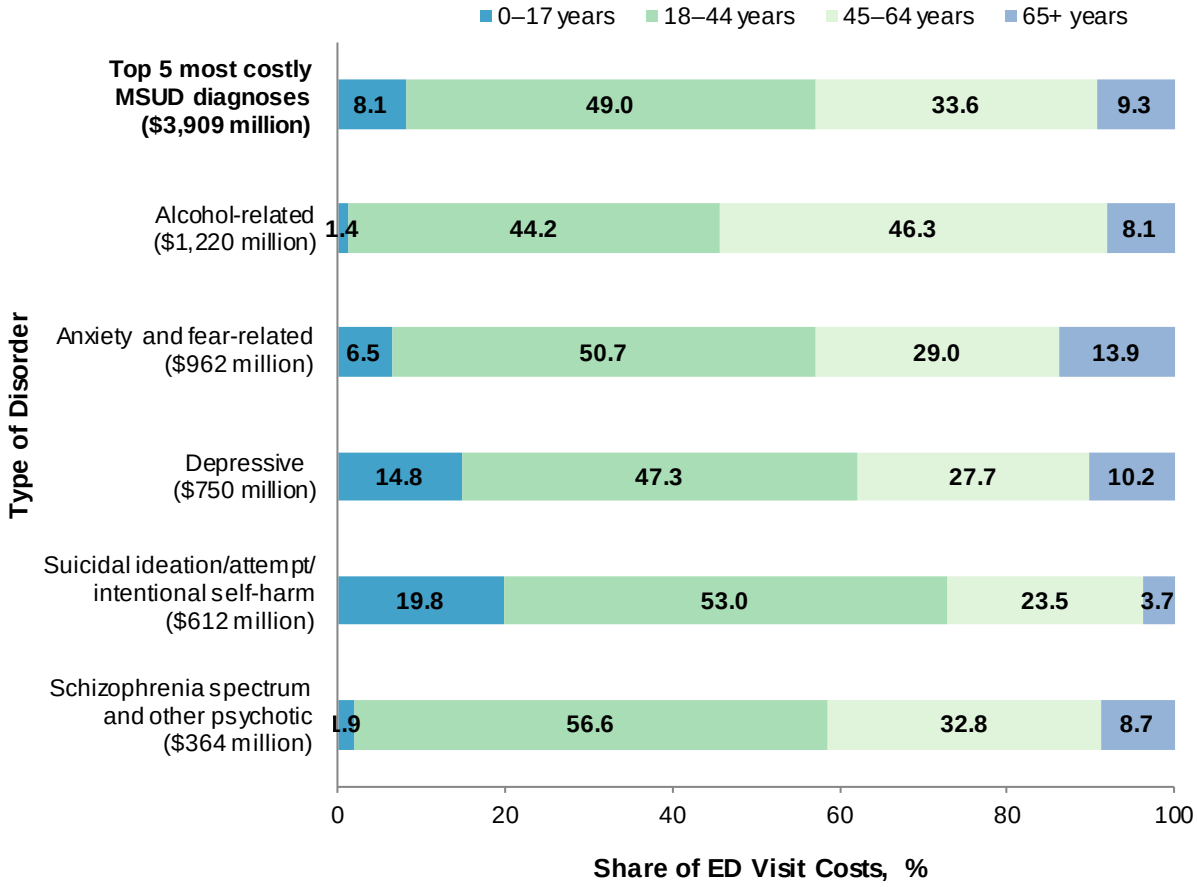
- **Overall, the average cost per ED visit was similar for MSUD ED visits compared with all ED visits.**

  MSUD ED visits overall had an average visit cost of $520 compared with $530 for all ED visits. For most patient characteristics, this relationship held approximately, but there were some exceptions. For patients who were transferred to another short-term hospital or care facility (e.g., skilled nursing or intermediate care facility), average costs for all ED visits were higher than average costs for MSUD ED visits ($1,160 vs. $800 per visit). For children and patients with an expected payer of Medicaid, average costs for MSUD visits were higher than average costs for all ED visits (from 17 to 36 percent higher for children and 19 percent higher for an expected payer of Medicaid).

Distribution of ED visit costs by age group and primary expected payer for the highest cost MSUD diagnoses, 2017

Figure 2 presents the distribution of ED visit costs by age group for the five most costly MSUD diagnoses in 2017.

Figure 2. Distribution of total ED visit costs for the five most costly MSUD diagnoses, by age group, 2017



Abbreviations: ED, emergency department; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification; MSUD, mental and substance use disorder

Notes: Diagnosis groups are defined using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. Total cost for the five most costly MSUD ED visit diagnoses was calculated from values that were not rounded.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2017

- **The two MSUD diagnoses with the largest percentage of patients aged 65 years and over were anxiety and fear-related disorders and depressive disorders.**

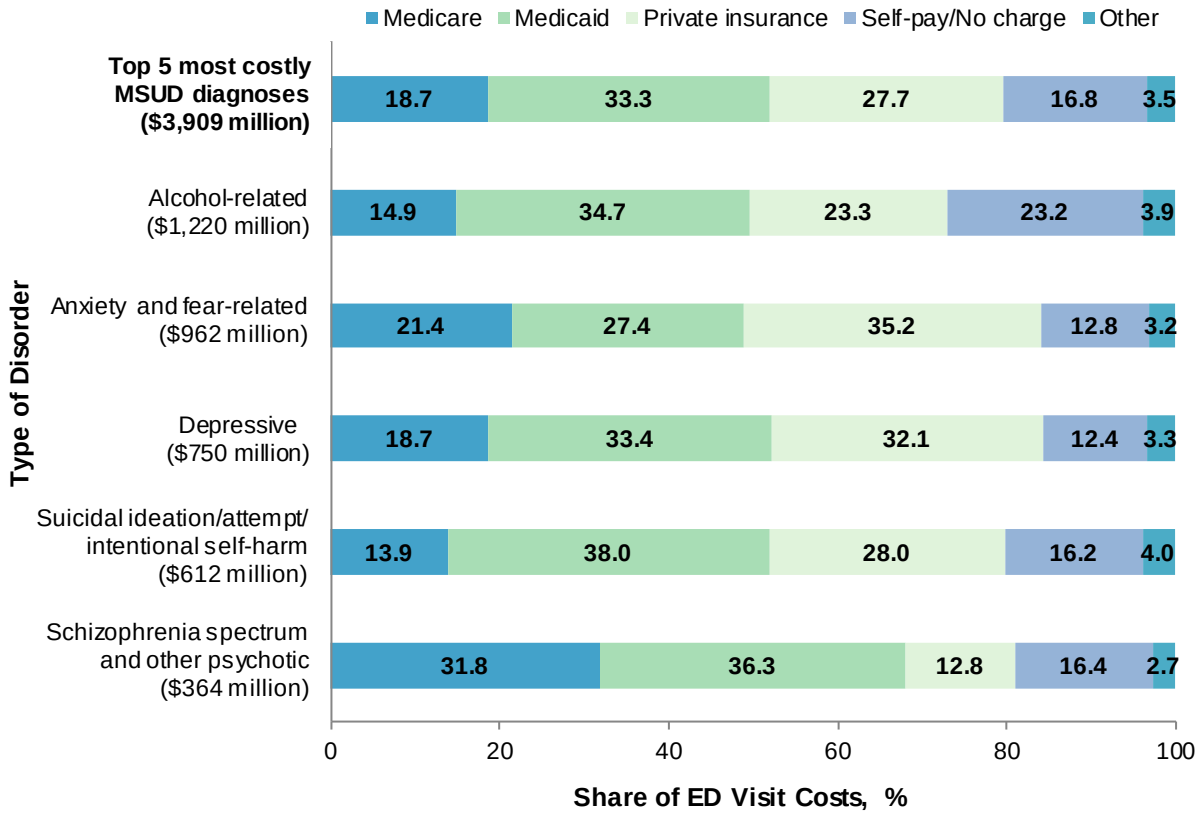
  Among ED visits with at least one of the five most costly MSUD diagnoses, the highest shares of MSUD ED visit costs for patients aged 65 years and older were for anxiety and fear-related disorders (13.9 percent) and depressive disorders (10.2 percent).

- **Approximately one-fifth of ED visit costs for suicidal ideation/attempt/intentional self-harm were for children aged 0–17 years.**

  Although children aged 0–17 years accounted for only 8.1 percent of ED visit costs for the five most costly MSUD diagnoses overall, they accounted for 19.8 percent of ED costs for suicidal ideation/attempt/intentional self-harm and 14.8 percent of ED costs for depressive disorders.

Figure 3 presents the distribution of ED visit costs by primary expected payer for the five most costly MSUD conditions in 2017.

Figure 3. Distribution of total ED visit costs for the five most costly MSUD diagnoses, by primary expected payer, 2017



Abbreviations: ED, emergency department; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification; MSUD, mental and substance use disorder

Notes: Self-pay/No charge: includes self-pay, no charge, charity, and no expected payment. Diagnosis groups are defined using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. Total cost for the five most costly MSUD ED visit diagnoses was calculated from values that were not rounded.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2017

- **Medicaid had the largest share of total costs for ED visits with alcohol-related, suicidal, and schizophrenia diagnoses. Private insurance had the largest share of ED visit costs for anxiety and fear-related disorders.**

  ED visits with a primary expected payer of Medicaid represented the largest share of ED visit costs for alcohol-related disorders (34.7 percent), suicidal ideation/attempt/intentional self-harm (38.0 percent), and schizophrenia spectrum and other psychotic disorders (36.3 percent).

  ED visits with a primary expected payer of private insurance represented the largest share of ED visit costs for anxiety and fear-related disorders (35.2 percent).

  The share of ED visit costs for depressive disorders was similar for Medicaid and private insurance (33.4 and 32.1 percent shares, respectively).

Costs for MSUD ED visits overall and by select hospital characteristics, 2017
Table 2 presents the distribution of total costs and the average cost per visit for MSUD ED visits and all ED visits by select hospital characteristics in 2017.

Table 2. Percentage of total costs and average costs for MSUD ED visits by hospital characteristics, 2017

Hospital characteristic	Mental and substance use disorder ED visits (N=10.7 million visits; $5.6 billion total costs)		Total ED visits (N=144.8 million visits; $76.3 billion total costs)	
	Total costs, %	Average cost per visit, $	Total costs, %	Average cost per visit, $
Total	100.0	520	100.0	530
Region				
Northeast	23.1	520	18.8	550
Midwest	23.4	560	24.3	560
South	31.0	480	36.1	480
West	25.3	640	23.5	650
Location				
Large metropolitan	55.9	540	52.8	540
Small metropolitan	31.1	500	32.2	510
Micropolitan	8.8	490	9.7	490
Rural	4.3	590	5.4	560
Ownership				
Public	17.7	530	16.4	550
Private, nonprofit	71.3	540	72.0	540
Private, for-profit	11.0	440	11.5	420
Teaching status/location				
Metropolitan nonteaching	22.1	500	24.2	500
Metropolitan teaching	64.9	530	60.7	540
Nonmetropolitan	13.1	520	15.1	510
Trauma level designation				
Level I	23.8	570	18.3	600
Level II	16.3	510	15.7	520
Level III	13.0	530	13.4	530
Not a trauma center	46.7	510	52.5	510

Abbreviations: ED, emergency department; MSUD, mental and substance use disorder

Notes: Statistics for ED visits with missing or invalid patient characteristics are not presented. In 2017, about 13% of all ED visits (weighted) in the NEDS are missing information about ED charges and therefore ED cost cannot be estimated. Estimates of the total cost use the product of the number of cases and the average estimated cost to account for records with missing information. The share of total costs is calculated with unrounded numbers. Total cost decompositions among different descriptive statistics or utilizing multiple levels of aggregation in a single computation could lead to slightly different total cost estimates due to the use of slightly different and more specific estimates of the missing information. Therefore, the share of total cost across characteristic values may not sum to 100. Average cost estimates are rounded to the nearest $10.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2017

- **The share of MSUD ED costs was higher compared with costs for all ED visits among hospitals located in the Northeast but lower for hospitals in the South.**

  Across regions, the share of MSUD ED costs was higher than the share of costs for all ED visits in the Northeast (23.1 vs. 18.8 percent). The opposite was true in the South where the share of MSUD ED costs was lower than the share of costs for all ED visits (31.0 vs. 36.1 percent).

- **Trauma Level I hospitals had a higher share and nontrauma hospitals had a lower share of MSUD ED costs compared with costs for all ED visits.**

  The share of MSUD ED costs was higher than the share of costs for all ED visits at Trauma Level I hospitals (23.8 vs. 18.3 percent). The share of MSUD ED costs was lower than the share of costs for all ED visits at nontrauma hospitals (46.7 vs. 52.5 percent).

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 Nationwide Emergency Department Sample (NEDS).

Definitions

Diagnoses, ICD-10-CM, and Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses
For emergency department (ED) visits that are treated and released, the *first-listed diagnosis* represents the condition, symptom, or problem identified in the medical record to be chiefly responsible for the ED services provided. In cases where the first-listed diagnosis is a symptom or problem, a diagnosis has not been established (confirmed) by the provider. For ED visits that result in an inpatient admission, the first-listed diagnosis is the *principal diagnosis*, the 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 the ED visit or inpatient admission, that require or affect patient care treatment received or management, or that develop during the inpatient stay. *All-listed diagnoses* include the first-listed (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.[5] 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. 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, ED visits were categorized using first- and second-listed diagnosis codes. The combination of first- and second-listed diagnosis codes was determined to be a more appropriate method to estimate emergency department (ED) resource use, as ED coding practices may not always use the first-listed diagnosis to capture conditions accountable for the majority of resource use. All-listed diagnoses may be more suitable if the focus of the analysis is ED visit utilization or disease prevalence.

[5] 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.

ED visits classified in the same diagnosis category were counted only once, but ED visits that were classified into more than one CCSR diagnosis category were counted separately in each diagnosis category. Therefore, the figures providing costs by diagnosis are not mutually exclusive. Costs for the diagnoses presented in the figures should not be added together.

Case definition
The mental and substance use disorder (MSUD) diagnoses used in this Statistical Brief were defined using diagnosis categories in the CCSR.[6] ED visits for MSUD were identified by scanning the first- and second-listed diagnosis codes on the visit record, assigning CCSR categories to each, and then retaining those codes falling into the mental, behavioral, and neurodevelopmental disorders chapter (i.e., CCSR categories starting with "MBD"). One category in the chapter, MBD024: Tobacco-related disorders, was excluded from consideration.

Types of hospitals included in the HCUP Nationwide Emergency Department Sample
The Nationwide Emergency Department Sample (NEDS) is based on emergency department (ED) data from community acute care hospitals, which are defined as short-term, non-Federal, general, and other specialty hospitals available to the public. Included among community hospitals are pediatric institutions and hospitals that are part of academic medical centers. Excluded are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Hospitals included in the NEDS have EDs, and no more than 90 percent of their ED visits result in admission.

Unit of analysis
The unit of analysis is the emergency department (ED) visit, not a person or patient. This means that a person who is seen in the ED multiple times in 1 year will be counted each time as a separate visit in the ED.

Costs and charges
Total ED charges were converted to costs using HCUP Cost-to-Charge Ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services (CMS).[7] *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 cost-to-charge ratio constructed specifically for the hospital ED is used. Hospital charges reflect the amount the hospital billed for the entire ED visit and do not include professional (physician) fees. Total ED charges were not available on all NEDS records. For this Statistical Brief, aggregate costs were estimated as the product of weighted number of visits and average cost in each reporting category.

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.[8] The largest source of difference comes from the HCUP coverage of ED treatment only in contrast to the NHEA inclusion of inpatient and other outpatient costs associated with 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.[9]

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

[6] Ibid.
[7] The HCUP Cost-to-Charge Ratios (CCRs) for Emergency Department Files were not publicly available at the time of publication, so an internal version was used in this Statistical Brief.
[8] 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.
[9] 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.

hospitals to payers, adjusted to provide estimates of costs using hospital-wide cost-to-charge ratios, in contrast to the NHEA measurement of spending or revenue. HCUP costs estimate the amount of money required to produce hospital services, including expenses for wages, salaries, and benefits paid to staff as well as utilities, maintenance, and other similar expenses required to run a hospital. NHEA spending or revenue measures the amount of income received by the hospital for treatment and other services provided, including payments by insurers, patients, or government programs. The difference between revenues and costs includes profit for for-profit hospitals or surpluses for nonprofit hospitals.

Expected payer
To make coding uniform across all HCUP data sources, the primary expected payer for the ED visit 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

ED visits 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 an ED visit, 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

Discharge status
Discharge status reflects the disposition of the patient at discharge from the ED and includes the following seven categories: routine (to home); transfer to another short-term hospital; other transfers (including skilled nursing facility, intermediate care, and another type of facility such as a nursing home); home health care; against medical advice (AMA); admitted as an inpatient to the same hospital; died in the hospital; or destination unknown.

Hospital characteristics
Data on hospital ownership and status as a teaching hospital was obtained from the American Hospital Association (AHA) Annual Survey of Hospitals. Hospital ownership/control includes categories for government nonfederal (public), private not-for-profit (voluntary), and private investor-owned (proprietary). Teaching hospital is defined as having a residency program approved by the American Medical Association, being a member of the Council of Teaching Hospitals, or having a ratio of full-time equivalent interns and residents to beds of 0.25 or higher.

Hospital location is based on a simplified adaptation of the Urban Influence Codes (UIC) developed by the United States Department of Agriculture (USDA) Economic Research Service (ERS). Starting with 2014 data, the categorization is based on the 2013 version of the UIC. Prior to 2014, the categorization was based on the 2003 version of the UIC. The 12 categories of the UIC are combined into four broader

categories that differentiate between large metropolitan (1 million residents or more), small metropolitan (fewer than 1 million residents), micropolitan, and non-urban residual (rural).

Trauma designation for trauma centers treating adults and children was identified through the Trauma Information Exchange Program (TIEP) database, a national inventory of trauma centers in the United States.[10] A trauma center is a hospital that is equipped to provide comprehensive emergency medical services 24 hours a day, 365 days per year to patients with traumatic injuries. In 1976, the American College of Surgeons Committee on Trauma (ACS/COT) defined five levels of trauma centers:[11]

- Level I centers have comprehensive resources, are able to care for the most severely injured, and provide leadership in education and research.
- Level II centers have comprehensive resources and are able to care for the most severely injured, but do not provide leadership in education and research.
- Level III centers provide prompt assessment and resuscitation, emergency surgery, and, if needed, transfer to a level I or II center.
- Level IV/V centers provide trauma support in remote areas in which no higher level of care is available. These centers resuscitate and stabilize patients and arrange transfer to an appropriate trauma facility.

For this Statistical Brief, trauma hospitals were defined as those classified by the ASC/COT as a level I, II, or III trauma center. This is consistent with the classification of trauma centers used in the NEDS. The ACS/COT has a program that verifies hospitals as trauma level I, II, or III.[12] It is important to note that although all level I, II, and III trauma centers offer a high level of trauma care, there may be differences in the specific services and resources offered by hospitals of different levels. Trauma levels IV and V are designated at the State level (and not by ACS/COT) with varying criteria applied across States.

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

[10] American Trauma Society. Trauma Information Exchange Program (TIEP). www.amtrauma.org/page/TIEP. Accessed June 11, 2020.
[11] MacKenzie EJ, Hoyt DB, Sacra JC, et al. National inventory of hospital trauma centers. *JAMA*. 2003;289:1515-1522.
[12] American College of Surgeons Committee on Trauma, Verification, Review, and Consultation Program for Hospitals. Additional details are available at www.facs.org/quality-programs/trauma/vrc. Accessed July 17, 2020.

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 NEDS

The HCUP Nationwide Emergency Department Sample (NEDS) is a unique and powerful database that yields national estimates of emergency department (ED) visits. The NEDS was constructed using records from both the HCUP State Emergency Department Databases (SEDD) and the State Inpatient Databases (SID). The SEDD capture information on ED visits that do not result in an admission (i.e., patients who were treated in the ED and then released from the ED, or patients who were transferred to another hospital); the SID contain information on patients initially seen in the ED and then admitted to the same hospital. The NEDS was created to enable analyses of ED utilization patterns and support public health professionals, administrators, policymakers, and clinicians in their decision making regarding this critical source of care. The NEDS is produced annually beginning in 2006. Over time, the sampling frame for the NEDS has changed; thus, the number of States contributing to the NEDS varies from year to year. The NEDS is intended for national estimates only; no State-level estimates can be produced. The

unweighted sample size for the 2017 NEDS is 33,506,645 visits (weighted, this represents 144,814,803 ED visits).

For More Information

For other information on emergency department visits, refer to the HCUP Statistical Briefs located at www.hcup-us.ahrq.gov/reports/statbriefs/sb_ed.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 Nationwide Emergency Department Sample (NEDS), please refer to the following database documentation:

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

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AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of healthcare in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please e-mail us at hcup@ahrq.gov or send a letter to the address below:

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