

Opioid-Related and Stimulant-Related Adult Inpatient Stays, 2012–2018

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Introduction

Substance use continues to be a primary public health concern, with substance use disorders placing a considerable burden on individuals, families, the healthcare system, and the economy.¹ To date, the national focus largely has been on the more than 10 million Americans misusing opioids.² More recently, however, concerns have shifted to the rising number of individuals abusing multiple substances, such as those who use stimulants to counter the sedative effects of opioids.^{3,4}

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents statistics on inpatient stays involving dependence on, abuse of, and poisoning and adverse effects from opioids (e.g., prescription opioids, heroin) and stimulants (e.g., cocaine, psychostimulants, amphetamines). Data are from adults aged 18 years and older in the 2012–2014 and 2016–2018 National Inpatient Sample (NIS) and State Inpatient Databases (SID). National trends in opioid- and stimulant-related stays are shown from 2012 to 2014 and 2016 to 2018, overall and by primary expected payer. Additionally, characteristics of stays involving opioids and stimulants and State-specific rates of opioid- and stimulant-related stays are examined in 2012 and 2018. Because of the large sample size of the NIS and SID data, small differences can be statistically significant but not clinically important. Thus, only differences greater than or equal to 10 percent are discussed in the text.

Findings

Trends in opioid- and stimulant-related inpatient stays, 2012–2014 and 2016–2018

Figure 1 displays trends in the number and population rate of inpatient stays with an opioid-related diagnosis but no stimulant-related diagnosis (*opioid-only stays*), stimulant-related diagnosis but no opioid-related diagnosis (*stimulant-only stays*), or both opioid-related and stimulant-related diagnoses from 2012 to 2014 and from 2016 to 2018.

The 2012–2014 trend is based on International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)-coded data, whereas the 2016–2018 trend is based on International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM)-coded data. Notably, the ICD-10-CM coding system expanded the number and types of codes available to

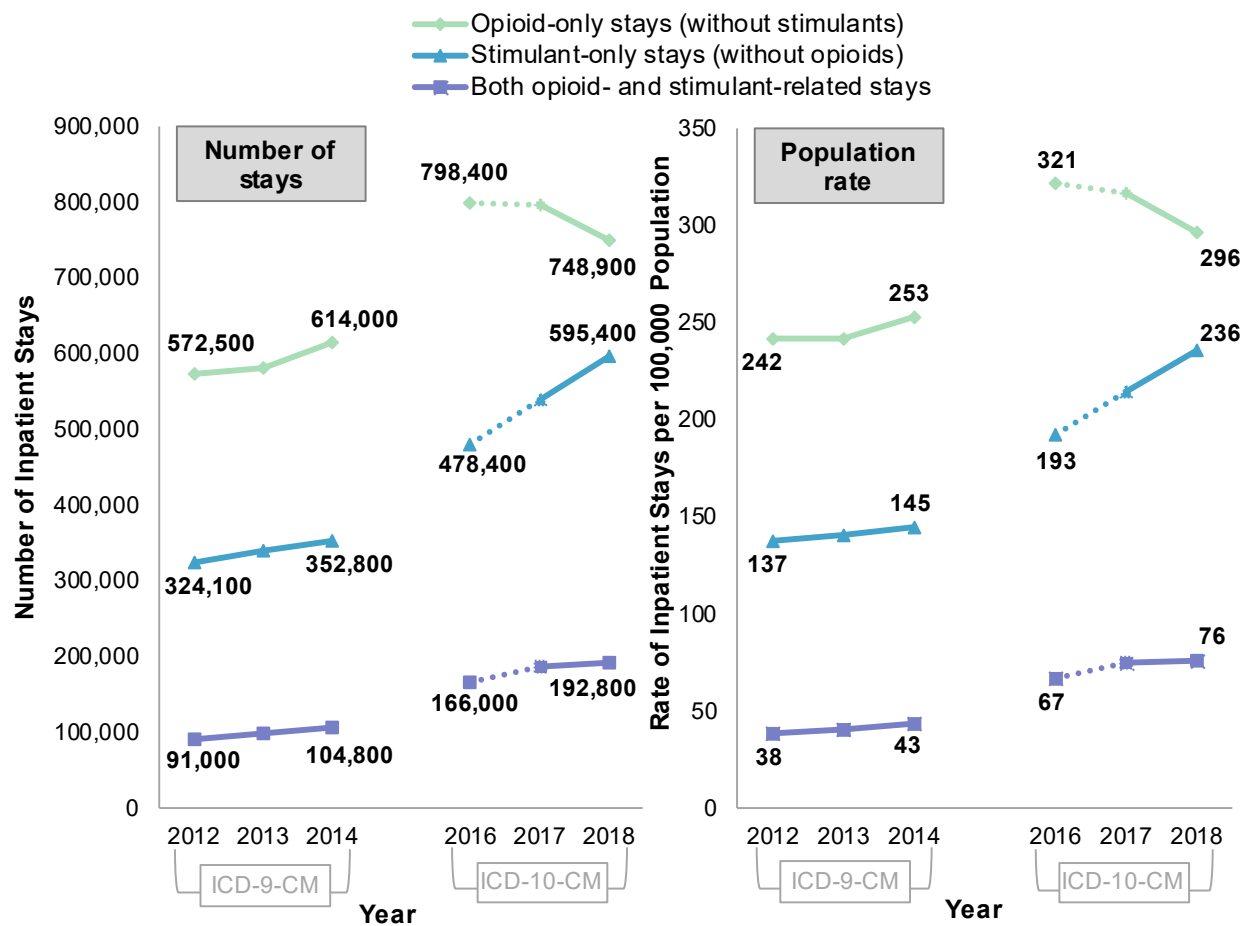
Highlights

- From 2012 to 2018, there were more hospital stays related to opioids only (without stimulants) than there were related to stimulants only (without opioids).
- The population rate of stimulant-only stays was stable from 2012 to 2014, whereas the rate increased by 22 percent from 2016 to 2018.
- The rate of inpatient stays involving both opioids and stimulants increased by 13.2 percent from 2012 to 2014 and by 13.4 percent from 2016 to 2018.
- In 2018, individuals aged 18–45 and 46–64 years had the highest rates of stays involving stimulants (either alone or with opioids), whereas individuals aged 65–74 and 75 years and older had the highest rates of opioid-only stays.
- In 2012 and 2018, the population rate of stimulant-related stays (either alone or with opioids) was higher for Black populations than for White populations.
- In 2018, for stays with a primary expected payer of Medicaid, the number of stimulant-only stays surpassed the number of opioid-only stays. In contrast, for stays with a primary expected payer of Medicare or private insurance, there were more opioid-only stays than stimulant-only stays in 2018.
- In 2012, only two States had higher rates of stimulant-only stays than rates of opioid-only stays. However, by 2018, 10 States had higher rates of stimulant-only stays.

include unspecified opioid and stimulant use, for which dependence or abuse could not be determined. In contrast, the ICD-9-CM system includes only classifications for dependence and abuse but no codes for unspecified use.

As a result of the coding changes, more cases related to opioids and stimulants may be identified under the ICD-10-CM coding system than the ICD-9-CM coding system. For example, of the 1,537,100 stays involving opioids or stimulants identified in 2018, 11 percent were identified only by unspecified use codes. In addition, the identification of cases may be affected by the transition period itself, in which there may be differential adoption of new codes. Figure 1 establishes new baseline estimates of such cases using the ICD-10-CM coding system in 2016. It is expected that hospitals required a transition period to become more familiar with the ICD-10-CM coding system. The transition period for the uptake of the ICD-10-CM coding period is represented as a dashed line, rather than a solid line, in the graph.

Figure 1. The number and population rate of opioid- and stimulant-related adult inpatient stays in the United States, 2012–2014 and 2016–2018



Abbreviations: ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Note: The number of inpatient stays was rounded to the nearest hundred.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2012–2014 and 2016–2018

■ **During both periods, there were more opioid-only inpatient stays than stimulant-only stays.**

In 2012, among adults aged 18 years and older, there were 572,500 opioid-related inpatient stays without evidence of stimulant use but only 324,100 stimulant-related stays without evidence of opioid

use, a difference of 248,400 stays. In 2018, the difference in the number of opioid-only stays (748,900) and the number of stimulant-only stays (595,400) was 153,500 stays.

- **From 2016 to 2018, the population rate of stimulant-only stays increased by 22 percent.**

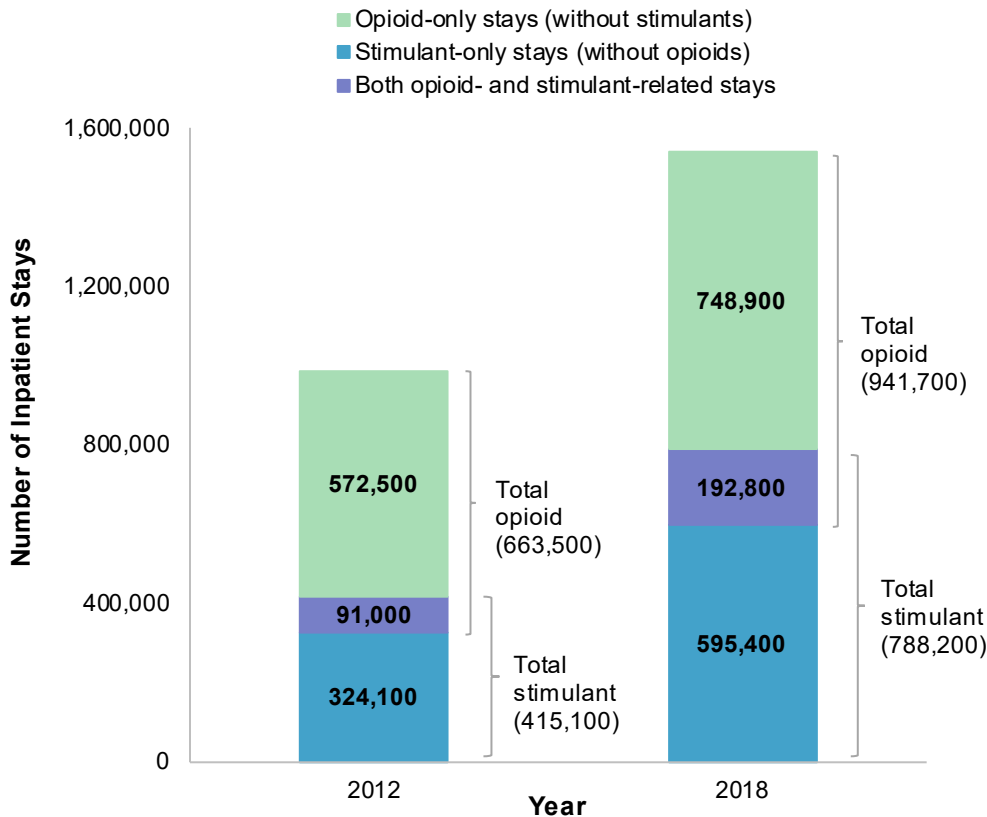
During the ICD-9-CM period from 2012 to 2014, the rate of stays related to opioids only or related to stimulants only remained relatively stable, with a change in rates of less than 6 percent (242 to 253 and 137 to 145 per 100,000 population, respectively). During the ICD-10-CM period from 2016 to 2018, the rate of opioid-only stays also remained relatively stable, with a change in rates of less than 8 percent (321 to 296 per 100,000 population). However, the rate of stimulant-only stays increased by 22.3 percent, from 193 to 236 per 100,000 population.

- **During both 2012–2014 and 2016–2018, the population rate of inpatient stays involving both opioids and stimulants increased.**

The rate of inpatient stays involving both opioids and stimulants increased by 13.2 percent from 2012 to 2014, from 38 to 43 per 100,000 population, and by 13.4 percent from 2016 to 2018, from 67 to 76 per 100,000 population. The rate of stays involving both substances was much lower than the rate of opioid-only and stimulant-only stays (e.g., 76 vs. 296 and 236 per 100,000 population in 2018, respectively).

Figure 2 displays the distribution of opioid- and stimulant-related inpatient stays, including overlap for stays involving both substances, in 2012 and 2018.

Figure 2. The distribution of opioid- and stimulant-related adult inpatient stays in the United States, 2012 and 2018



Note: The number of inpatient stays was rounded to the nearest hundred.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2012 and 2018

- **Among inpatient stays involving any opioid diagnosis, the percentage of stays with a concurrent stimulant diagnosis was 14 percent in 2012 and 20 percent in 2018.**

Among all inpatient stays involving an opioid diagnosis, the percentage with a concurrent stimulant diagnosis was 13.7 percent in 2012 (91,000 of 663,500) and 20.5 percent in 2018 (192,800 of 941,700). The percentage of all stimulant-related stays with a concurrent opioid diagnosis was 21.9 percent in 2012 (91,000 of 415,100) and 24.5 percent in 2018 (192,800 of 788,200).

Characteristics of opioid- and stimulant-related inpatient stays, 2012 and 2018

Table 1 presents the population rates of adult inpatient stays involving opioids and stimulants in 2012 and 2018 by patient characteristic. Stays involving opioids without stimulants, stays involving stimulants without opioids, and stays involving both types of substances are examined separately.

Table 1. Population rate of opioid- and stimulant-related adult inpatient stays in the United States, by patient characteristic, 2012 and 2018

Patient characteristic	Rate of stays per 100,000 adult population					
	Opioid-only stays (without stimulants)		Stimulants-only stays (without opioids)		Both opioid- and stimulant-related stays	
	2012*	2018†	2012*	2018†	2012*	2018†
Total	242	296	137	236	38	76
Age, years						
18–45	221	215	141	254	49	109
46–64	276	355	192	323	40	70
65–74	244	390	35	85	5	16
75+	237	403	4	14	1	2
Sex						
Male	239	284	179	311	47	92
Female	245	308	97	164	31	61
Race/ethnicity						
Asian/Pacific Islander	37	47	29	54	4	8
Black	274	324	459	616	80	112
Hispanic	125	155	109	185	27	50
White	256	338	84	180	33	78
Other	353	376	230	381	70	132
Location of residence						
Metro	243	295	144	225	41	76
Rural, metro adjacent	219	284	80	197	23	62
Rural, remote	227	293	68	213	19	50
Community income						
Quartile 1 (lowest)	306	384	247	418	60	122
Quartile 2	234	304	122	224	34	71
Quartile 3	212	268	89	150	28	57
Quartile 4 (highest)	182	206	55	89	22	40

Note: Sex was missing for <1% of stays across the substance groups and years, race/ethnicity and location of residence were missing for <6% of stays, and community income was missing for <8% of stays.

* Data are from the ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification coding system

† Data are from the ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification coding system

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2012 and 2018

- **In 2018, individuals aged 65–74 and 75 years and older had the highest rate of opioid-only stays, whereas individuals aged 18–45 and 46–64 years had the highest rates of stays involving stimulants.**

In 2018, the population rate of stays involving opioids but not stimulants was approximately 390 and 403 per 100,000 for individuals aged 65–74 and 75 years and older (compared with 355 or less among other age groups). These rates were the highest observed for any age group in the years and substance categories shown. Individuals aged 65–74 and 75 years and older had much lower rates of stays involving stimulants (85 per 100,000 or less for stimulants only and both opioids and stimulants). In contrast, in 2018, the rate of stays involving stimulants alone was highest among adults aged 46–64 years (323 per 100,000) and the rate of stays involving both substances was highest for individuals aged 18–45 years (109 per 100,000).

- **The rate of stimulant-only stays was highest for the Black population.**

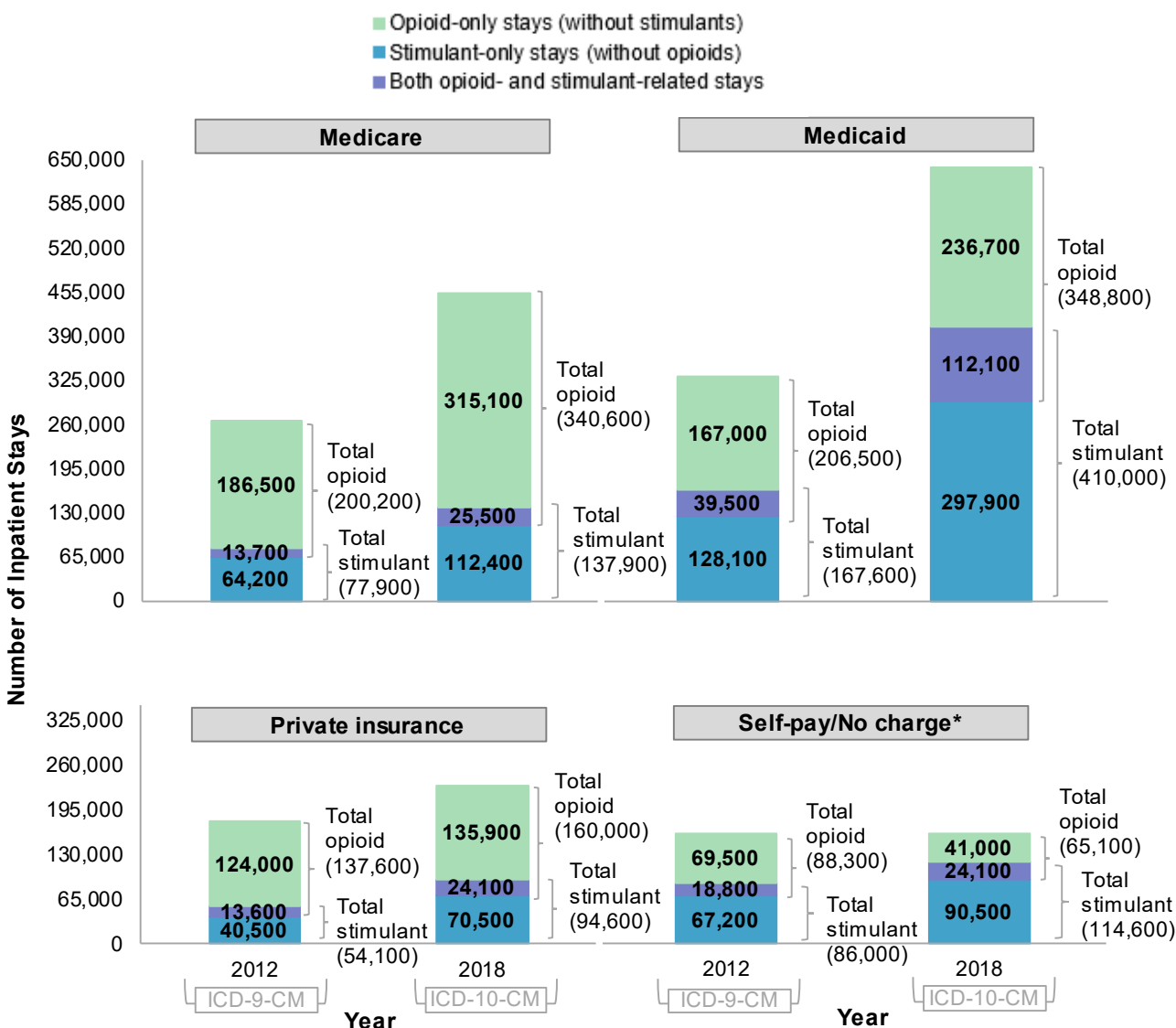
In 2018, the rate of stays involving stimulants but not opioids was 616 per 100,000 for the Black population, compared with less than 400 per 100,000 for all other racial/ethnic groups. Additionally, the rate of stays involving both stimulants and opioids was highest for Other racial/ethnic and Black populations (132 and 112 per 100,000, respectively), compared with less than 80 per 100,000 for Asian/Pacific Islander, Hispanic, and White populations. In 2018, the rate of opioid-only stays was highest for Other racial/ethnic populations (376 per 100,000), followed by White and Black populations (338 and 324 per 100,000, respectively).

- **Metro and rural-remote areas had similar rates of opioid-only and stimulant-only stays, but the rate of stays involving both substances decreased with rurality.**

In 2018, metro and rural-remote areas had similar rates of opioid-only stays (295 and 293 per 100,000 population, respectively) and stimulant-only stays (225 and 213). However, the rate of stays involving both opioids and stimulants was higher in urban areas than in rural areas (76 per 100,000 population in metro areas and 50 per 100,000 population in rural-remote areas).

Figure 3 displays the number of opioid- and stimulant-related adult inpatient stays, by primary expected payer, in 2012 and 2018.

Figure 3. The number of opioid- and stimulant-related adult inpatient stays in the United States, by primary expected payer, 2012 and 2018



Abbreviations: ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Note: The figure excludes discharges with other expected payers (N=30,700 in 2012 and 39,600 in 2018). Expected payer was missing for <0.3% of stays in each of the substance categories shown. The number of inpatient stays was rounded to the nearest hundred.

*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), 2012 and 2018

- **In 2018, for stays with a primary expected payer of Medicaid, the number of stimulant-only stays surpassed the number of opioid-only stays.**

In 2018, the number of stimulant-only stays with a primary expected payer of Medicaid exceeded the number of opioid-only stays with Medicaid (297,900 vs. 236,700 stays, respectively). Conversely, in 2012, the number of opioid-only stays exceeded the number of stimulant-only stays with Medicaid (167,000 vs. 128,100, respectively).

- **In 2018, for stays with a primary expected payer of Medicare or private insurance, there were more opioid-only than stimulant-only stays.**

In 2018, among stays involving opioids or stimulants with a primary expected payer of Medicare, more than two-thirds were related to opioids only (315,100 stays) and one-fourth were related to stimulants only (112,400 stays). Only 25,500 stays related to both stimulants and opioids had an expected payer of Medicare. Similarly, in 2012, most Medicare stays related to opioids or stimulants were opioid-only stays (186,500 stays, or 70.5 percent).

In 2018, among stays involving opioids or stimulants with a primary expected payer of private insurance, more than 50 percent of stays were related to opioids only (135,900 stays) and about 30 percent were related to stimulants only (70,500 stays). Only 24,100 stays related to both stimulants and opioids had an expected payer of private insurance. In 2012, 124,000 opioid-only stays had an expected payer of private insurance, followed by 40,500 stimulant-only stays and 13,600 stays related to both stimulants and opioids.

- **In 2018, more opioid-only stays had a primary expected payer of Medicare than any other expected payer, and more stimulant-only stays and stays related to both stimulants and opioids had an expected payer of Medicaid than any other expected payer.**

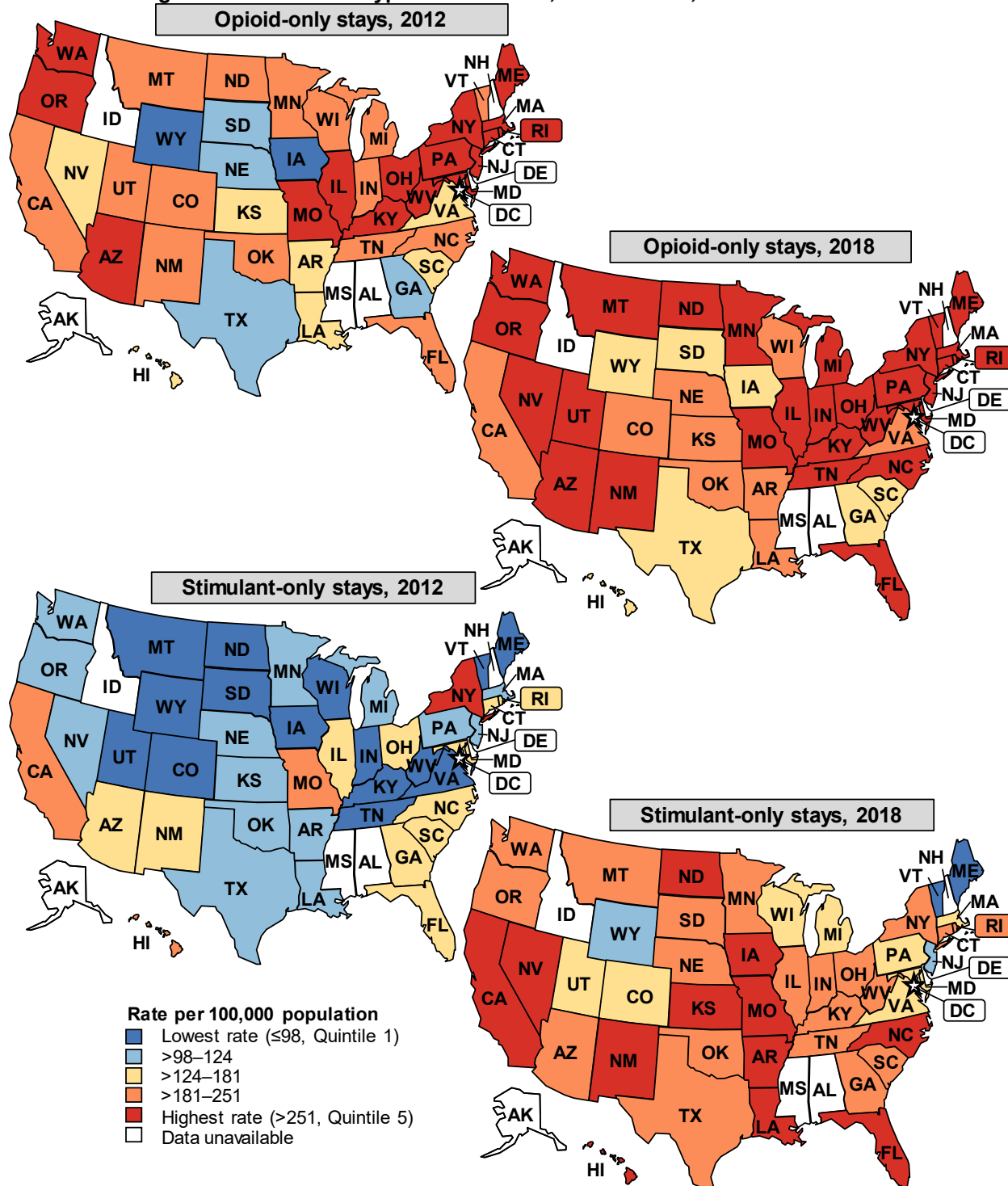
In 2018, 315,100 opioid-only stays had a primary expected payer of Medicare, 33.1 percent more than opioid-only stays with Medicaid (236,700 stays), more than two times the number of opioid-only stays with private insurance (135,900), and more than seven times the number of stays that were self-pay/no charge (41,000).

In comparison, 297,900 stimulant-only stays had a primary expected payer of Medicaid, more than twice the number with Medicare (112,400), more than four times the number with private insurance (70,500), and more than three times the number that were self-pay/no charge (90,500). Similarly, 112,100 stays related to both opioids and stimulants had an expected payer of Medicaid, more than four times the number with Medicare (25,500), private insurance (24,100), or self-pay/no charge (24,100).

State-specific opioid- and stimulant-related inpatient stays, 2012 and 2018

Figure 4 presents the State-specific population rates of opioid-only and stimulant-only adult inpatient stays in 2012 and 2018.

Figure 4. Population rates of opioid- and stimulant-related adult inpatient stays without a concurrent diagnosis for the other type of substance, for 44 States, 2012 and 2018



Note: Quintiles were calculated using the distribution of 2012 population rates for opioid-only and stimulant-only inpatient stays across the 44 States included in this analysis. All 2012 opioid rates and all 2012 stimulant rates were used, totaling 88 data values.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) from 44 States, 2012 and 2018

- **In 2018, 28 States had population rates of opioid-only stays of greater than 251 per 100,000 population).**

In 2012, out of the 44 States included in this Brief, 16 States had a rate of opioid-only stays in the highest quintile (greater than 251 stays per 100,000 population): Arizona, Connecticut, Illinois, Kentucky, Maine, Maryland, Massachusetts, Missouri, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Washington, and West Virginia. In 2018, this list included the same 16 States plus 12 additional States: Florida, Indiana, Michigan, Minnesota, Montana, Nevada, New Mexico, North Carolina, North Dakota, Tennessee, Utah, and Vermont.

In 2018, none of the 44 States had an opioid-only rate at or below 124 per 100,000 population (the lowest two quintiles).

- **In 2018, 11 States had population rates of stimulant-only stays of greater than 251 per 100,000 population.**

In 2012, only New York had a rate of stimulant-only stays in the highest quintile (greater than 251 stays per 100,000 population) and only three States (California, Hawaii, and Missouri) had rates in the second highest quintile (greater than 181 to 251 stays per 100,000 population). In 2018, 12 States (no longer New York) had a rate of stimulant-only stays in the highest quintile: Arkansas, California, Florida, Hawaii, Iowa, Kansas, Louisiana, Missouri, Nevada, New Mexico, North Carolina, and North Dakota.

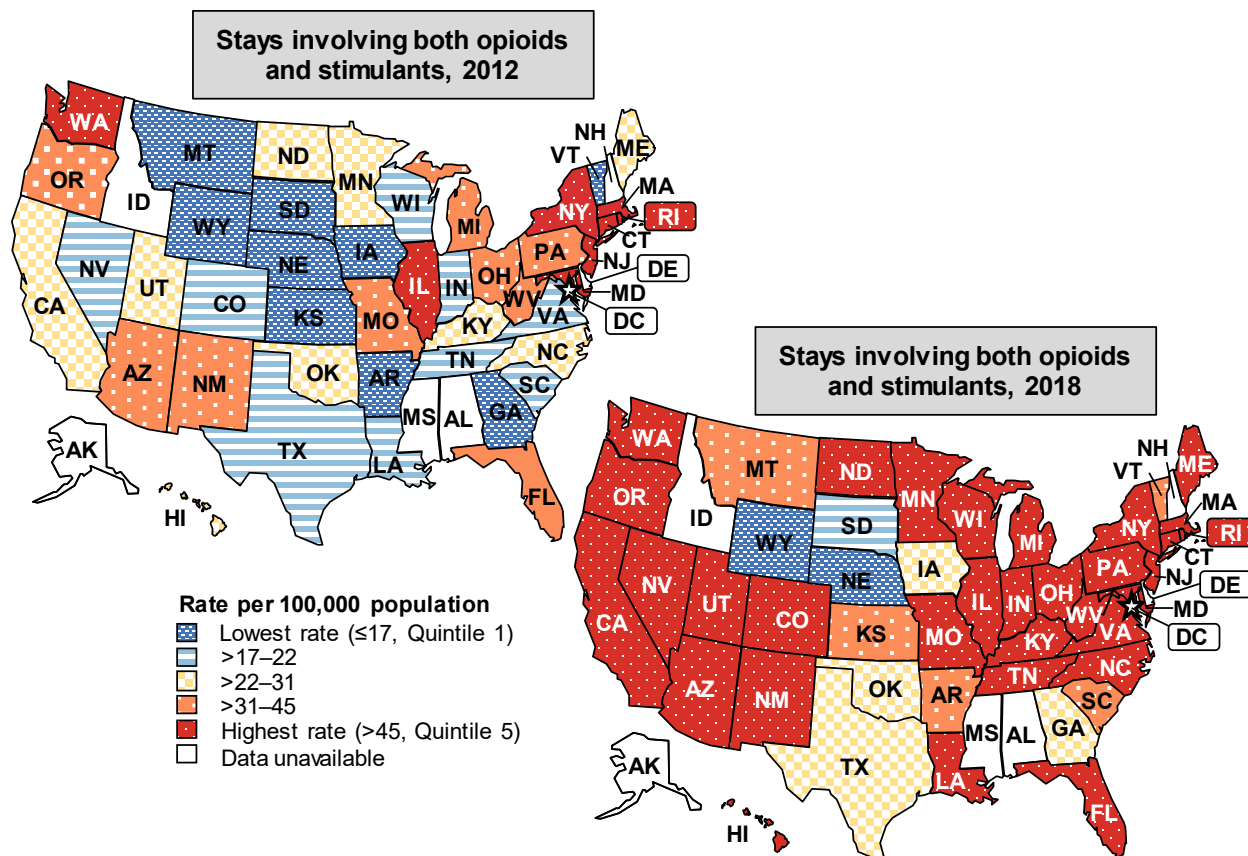
In 2012, 29 States had a stimulant-only rate in the lowest two quintiles (at or below 124 stays per 100,000 population). In 2018, only four States had a stimulant-only stay rate at or under 124 per 100,000 population (Maine, New Jersey, Vermont, and Wyoming).

- **In 2018, 10 States had higher population rates of stimulant-only stays than rates of opioid-only stays.**

In 2012, in only two States (Georgia and Hawaii) was the rate of stimulant-only stays in a higher quintile than the rate of opioid-only stays. In 2018, the population rate of stimulant-only stays was higher than the rate of opioid-only stays (based on quintiles) in 10 States: Arkansas, California, Georgia, Hawaii, Iowa, Kansas, Louisiana, South Carolina, South Dakota, and Texas. For the remaining 34 States examined, the population rate of opioid-only stays was greater than the rate of stimulant-only stays.

Figure 5 presents State-specific rates of adult inpatient stays involving both opioids and stimulants in 2012 and 2018.

Figure 5. Population rates of adult inpatient stays involving both opioids and stimulants, for 44 States, 2012 and 2018



Note: Quintiles were calculated using the distribution of 2012 population rates for inpatient stays involving both opioids and stimulants across the 44 States included in this analysis. Thus, the population rates in each quintile are different from those presented in Figure 4.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) from 44 States, 2012 and 2018

■ **In 2018, 32 States had a population rate of inpatient stays involving both opioids and stimulants that was above 45 per 100,000 population (highest quintile).**

In 2012, out of the 44 States included in this Brief, 8 States had a population rate of stays involving both opioids and stimulants of greater than 45 per 100,000 population (highest quintile): Connecticut, Illinois, Maryland, Massachusetts, New Jersey, New York, Rhode Island, and Washington. In 2018, this list expanded to include 24 additional States: Arizona, California, Colorado, Florida, Hawaii, Indiana, Kentucky, Louisiana, Maine, Michigan, Minnesota, Missouri, Nevada, New Mexico, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Utah, Virginia, West Virginia, and Wisconsin.

In 2018, only three States (Nebraska, South Dakota, and Wyoming) had a population rate of stays involving both opioids and stimulants at or under 22 per 100,000 (lowest two quintiles).

References

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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 2012–2014 and 2016–2018 National Inpatient Sample (NIS) and State Inpatient Databases (SID) for 44 States (all except Alabama, Alaska, Delaware, the District of Columbia, Idaho, Mississippi, and New Hampshire). Supplemental sources included population denominator data for use with HCUP databases, derived from information available from Claritas, a vendor that produces population estimates and projections based on data from the U.S. Census Bureau.^a

Definitions

Diagnoses, ICD-9-CM, ICD-10-CM, and 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-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are approximately 14,000 ICD-9-CM diagnosis codes.

ICD-10-CM is the International Classification of Diseases, Tenth Revision, Clinical Modification. In October 2015, ICD-10-CM replaced the 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

^a Claritas. Claritas Demographic Profile by ZIP Code. <https://claritas360.claritas.com/mybestsegments/>. Accessed February 3, 2020.

^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 January 2020. www.hcup-us.ahrq.gov/toolsoftware/ccsr/ccs_refined.jsp. Accessed February 27, 2020.

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, all-listed diagnosis codes are assigned to the CCSR for opioids and stimulants. 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.

Case definition

The ICD-9-CM codes defining opioid- and stimulant-related inpatient stays are shown in Table 2.

Table 2. ICD-9-CM codes defining opioid- and stimulant-related stays

ICD-9-CM code	Description
Opioids	
30400	Opioid type dependence, unspecified
30401	Opioid type dependence, continuous
30402	Opioid type dependence, episodic
30470	Combinations of opioid type drug with any other drug dependence, unspecified
30471	Combinations of opioid type drug with any other drug dependence, continuous
30472	Combinations of opioid type drug with any other drug dependence, episodic
30550	Opioid abuse, unspecified
30551	Opioid abuse, continuous
30552	Opioid abuse, episodic
96500	Poisoning by opium
96501	Poisoning by heroin
96502	Poisoning by methadone
96509	Poisoning by other opiates and related narcotics
E8500	Accidental poisoning by heroin
E8501	Accidental poisoning by methadone
E8502	Accidental poisoning by other opiates and related narcotics
E9350	Heroin causing adverse effects in therapeutic use
E9351	Methadone causing adverse effects in therapeutic use
E9352	Other opiates and related narcotics causing adverse effects in therapeutic use
E9401	Opiate antagonists causing adverse effects in therapeutic use
Stimulants	
30420	Cocaine dependence, unspecified
30421	Cocaine dependence, continuous
30422	Cocaine dependence, episodic
30440	Amphetamine and other psychostimulant dependence, unspecified
30441	Amphetamine and other psychostimulant dependence, continuous
30442	Amphetamine and other psychostimulant dependence, episodic
30560	Cocaine abuse, unspecified
30561	Cocaine abuse, continuous
30562	Cocaine abuse, episodic
30570	Amphetamine and other psychostimulant abuse, unspecified
30571	Amphetamine and other psychostimulant abuse, continuous
30572	Amphetamine and other psychostimulant abuse, episodic
9697	Poisoning by psychostimulants
96972	Poisoning by amphetamine
96973	Poisoning by methylphenidate

ICD-9-CM code	Description
96979	Poisoning by psychostimulant NEC
97081	Poisoning by cocaine
E8542	Accidental poisoning by psychostimulants
E9397	Psychostimulants causing adverse effects in therapeutic use

Abbreviations: ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; NEC, not elsewhere classified

In the ICD-10-CM period, opioid- and stimulant-related inpatient stays were identified using the following CCSR categories:

- Opioids: MBD018
- Stimulants: MBD021, excluding caffeine-related codes

In this Statistical Brief, we created three mutually exclusive categories: for stays with opioid-related but not stimulant-related diagnoses (opioid-only stays), for stays with stimulant-related but not opioid-related diagnoses (stimulant-only stays), and for stays that had codes for both opioids and stimulants.

Note that the ICD-10-CM coding system has one fundamental difference from the ICD-9-CM coding system for substance-related stays. In addition to the classifications for dependence, abuse, poisoning, and adverse effects that are shared by both coding systems, the ICD-10-CM coding system includes a classification for unspecified use that the ICD-9-CM coding system does not.

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.

Types of hospitals included in HCUP State Inpatient Databases

This analysis used State Inpatient Databases (SID) limited to 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). Community hospitals include obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical center hospitals. Excluded for this analysis are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. 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 was included in the analysis.

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 100,000 population were calculated using 2012–2014 and 2016–2018 hospital discharge totals in the numerator and Claritas[°] estimates of the 2012–2014 and 2016–2018 U.S. population aged 18 years or older in the denominator, specific to each data year. Individuals hospitalized multiple times are counted more than once in the numerator.

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

$$\text{Population rate of stays} = \left(\frac{\text{number of stays nationally or per State among adults aged 18+ years}}{\text{number of U.S. or State residents aged 18+ years}} \right) \times 100,000$$

Percentage difference

Percentage differences between groups were calculated using the following formula:

$$\text{Percentage difference} = \left(\frac{\text{Group 1 value} - \text{Group 2 value}}{\text{Group 2 value}} \right) \times 100$$

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 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

^d United States Department of Agriculture. Rural-Urban Continuum Codes. www.ers.usda.gov/data-products/rural-urban-continuum-codes/. Accessed February 27, 2020.

^e Claritas. Claritas Demographic Profile by ZIP Code. <https://claritas360.claritas.com/mybestsegments/>. Accessed February 3, 2020.

Prior to 2017 data, hospital stays that were expected to be billed to the State Children's Health Insurance Program (SCHIP) may be classified as Medicaid or Other, depending on the structure of the State program. Because most State data do not identify SCHIP as a separate expected payer, it is not possible to present this information separately.

Beginning with 2017 data, 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.

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. 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: Hispanic, non-Hispanic White, non-Hispanic Black, non-Hispanic Asian/Pacific Islander, 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	Nevada Department of Health and Human Services
Alaska State Hospital and Nursing Home Association	New Hampshire Department of Health & Human Services
Arizona Department of Health Services	New Jersey Department of Health
Arkansas Department of Health	New Mexico Department of Health
California Office of Statewide Health Planning and Development	New York State Department of Health
Colorado Hospital Association	North Carolina Department of Health and Human Services
Connecticut Hospital Association	North Dakota (data provided by the Minnesota Hospital Association)
Delaware Division of Public Health	Ohio Hospital Association
District of Columbia Hospital Association	Oklahoma State Department of Health
Florida Agency for Health Care Administration	Oregon Association of Hospitals and Health Systems
Georgia Hospital Association	Oregon Office of Health Analytics
Hawaii Laulima Data Alliance	Pennsylvania Health Care Cost Containment
Hawaii University of Hawai'i at Hilo	
Illinois Department of Public Health	
Indiana Hospital Association	

Iowa Hospital Association	Council
Kansas Hospital Association	Rhode Island Department of Health
Kentucky Cabinet for Health and Family Services	South Carolina Revenue and Fiscal Affairs Office
Louisiana Department of Health	South Dakota Association of Healthcare Organizations
Maine Health Data Organization	Tennessee Hospital Association
Maryland Health Services Cost Review Commission	Texas Department of State Health Services
Massachusetts Center for Health Information and Analysis	Utah Department of Health
Michigan Health & Hospital Association	Vermont Association of Hospitals and Health Systems
Minnesota Hospital Association	Virginia Health Information
Mississippi State Department of Health	Washington State Department of Health
Missouri Hospital Industry Data Institute	West Virginia Department of Health and Human Resources, West Virginia Health Care Authority
Montana Hospital Association	Wisconsin Department of Health Services
Nebraska Hospital Association	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 2012 NIS is 7,296,968 (weighted, this represents 36,484,846 inpatient stays). The unweighted sample size for the 2018 NIS is 7,105,498 (weighted, this represents 35,527,481 inpatient stays).

About the SID

The HCUP State Inpatient Databases (SID) are hospital inpatient databases from data organizations participating in HCUP. The SID contain the universe of the inpatient discharge abstracts in the participating HCUP States, translated into a uniform format to facilitate multistate comparisons and analyses. Together, the SID encompass more than 95 percent of all U.S. community hospital discharges. The SID can be used to investigate questions unique to one State, to compare data from two or more States, to conduct market-area variation analyses, and to identify State-specific trends in inpatient care utilization, access, charges, and outcomes.

For More Information

For other information on mental and/or substance use disorders, including opioid-related stays, refer to the HCUP Statistical Briefs located at www.hcup-us.ahrq.gov/reports/statbriefs/sb_mhsa.jsp.

For additional HCUP statistics, visit:

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

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

For a detailed description of HCUP and more information on the design of the National Inpatient Sample (NIS) and the State Inpatient Databases (SID), 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.

Agency for Healthcare Research and Quality. Overview of the State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2019. www.hcup-us.ahrq.gov/sidoverview.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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