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Mental and Substance Use Disorders Among Hospitalized Teenagers, 2012

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Highlights

- In 2012, 310,100 community hospital stays among teenagers (ages 13 to 19 years) included at least one mental or substance use disorder diagnosis, accounting for more than one-fourth of all hospital stays in this age group (28.1 percent).
- Females made up 61.3 percent of stays with mental disorders alone, but only 35.7 percent with substance use disorders alone and 44.7 percent with co-occurring mental and substance use disorders.
- Mood disorders were the most common mental disorder (199,200 stays), followed by anxiety disorders (85,800 stays) and attention and conduct disorders (81,700 stays).
- The rate of stays including attention and conduct disorders was 25 percent lower for 19-year-olds than for 13-year-olds (19-year-olds: 192 stays per 100,000 population; 13-year-olds: 261 stays per 100,000 population).
- Cannabis use disorders were the most common substance use disorder (54,100 stays), followed by alcohol use disorders (27,500 stays) and opioid use disorders (14,500 stays).
- The rate of stays including opioid use disorders was more than 40 times higher among 19-year-olds than among 13-year-olds (19-year-olds: 137 stays per 100,000 population; 13-year-olds: 3 stays per 100,000 population).

Introduction

Young people are at increased risk for mental and substance use disorders (M/SUDs) because of a number of factors, including rapid physical and emotional changes, family history, home environment, and peer influences.[1,2] In the United States, one in five young people between the ages of 13 and 18 years (21.4 percent) are currently experiencing or have had a seriously debilitating mental disorder at some point in the past.[3] During 2012, 9.1 percent of young people between the ages of 12 and 17 years (about 2.2 million) experienced a major depressive episode—and among these, an estimated 34.0 percent (753,000) also used illicit drugs.[4] Further, epidemiologic surveys of adults suggest that substance use among young people frequently continues and worsens into adulthood. For example, the prevalence of alcohol use disorders is consistently higher among adults who initiated use by age 14 years than among those who first used at age 18 years or older.[5] Thus, effective prevention, treatment, and recovery support services targeting young people with M/SUDs represent a critical opportunity not only to improve functioning and well-being in the short term but also to affect the life course trajectories of emerging adults.

The delivery and financing of M/SUD care for young people have undergone tremendous changes in the past 30 years in

[1] Hesselbrock VM, Hesselbrock MN. Developmental perspectives on the risk for developing substance abuse problems. In: WR Miller & KM Carroll (Eds.), Rethinking Substance Abuse: What the Science Shows, and What We Should Do About It. New York: Guilford Press; 2010:97–114.
[2] Merikangas KR, Nakamura EF, Kessler RC. Epidemiology of mental disorders in children and adolescents. Dialogues in Clinical Neuroscience. 2009;11(1):7–20.
[3] National Institute of Mental Health. Statistics: Any Disorder Among Children. http://www.nimh.nih.gov/health/statistics/prevalence/any-disorder-among-children.shtml. Accessed January 25, 2016.
[4] Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. 2013 National Survey on Drug Use and Health: Mental Health Detailed Tables. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014. http://www.samhsa.gov/data/sites/default/files/2013MHDetTabs/NSDUH-MHDetTabs2013.pdf. Accessed January 25, 2016.
[5] Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. Results From the 2013 National Survey on Drug Use and Health: Summary of National Findings. HHS Publication No. (SMA) 14-4863. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014. http://www.samhsa.gov/data/sites/default/files/NSDUHresultsPDFWHTML2013/Web/NSDUHresults2013.pdf. Accessed January 25, 2016.

the United States. The evidence base for pharmacologic and psychosocial treatments of M/SUDs has improved.[6] Medicaid expansions and the State Children's Health Insurance Program have increased the number of youths eligible for public insurance that covers M/SUD services, and State and Federal mental health parity laws have led to more comprehensive coverage of M/SUDs in private insurance plans.[7] The Affordable Care Act defines services for M/SUDs as essential health benefits that must be included in plans offered through State health exchanges.[8]

Hospital admissions and lengths of stay for M/SUDs have decreased, in part because of treatment by primary care clinicians and the use of managed behavioral health care arrangements. Although many M/SUDs are addressed effectively in ambulatory care and other community settings, hospitalization remains a key component of the continuum of care for youths with M/SUDs, particularly those who require crisis care.[7]

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents results from the Kids' Inpatient Database (KID) on hospital stays among teenagers (i.e., patients aged 13 to 19 years, inclusive), including M/SUD diagnoses in 2012. Rates of mental disorder (MD) and substance use disorder (SUD) diagnoses first are estimated for each of the top 10 major diagnostic categories among all hospital stays. Characteristics of stays including M/SUDs are then described and compared with all other types of stays. Separate estimates are provided for stays including the following:

- All MD diagnoses without SUD (*MD alone*)
- All SUD diagnoses without MD (*SUD alone*)
- Co-occurring MD and SUD diagnoses (*co-occurring M/SUDs*)

The percentage of stays including MD alone, SUD alone, and co-occurring M/SUDs are provided by patient age. Additional estimates are provided for the three most common MD diagnoses and the three most common SUD diagnoses, and differences in rates per 100,000 population by age and sex are described. In this Statistical Brief, hospital stays are designated as including MD or SUD diagnoses if a relevant ICD-9-CM code appeared as any principal or secondary ("all-listed") diagnosis or external cause of injury or poisoning. All differences noted in the text are statistically significant at the .01 level.

[6] Institute of Medicine (U.S.), Committee on Crossing the Quality Chasm: Adaption to Mental Health and Addictive Disorders, and Board on Health Care Services. Improving the Quality of Health Care for Mental and Substance-Use Conditions. Washington, DC: The National Academies Press; 2006.
[7] Glied S, Evans Cuellar A. Trends and issues in child and adolescent mental health. Health Affairs. 2003; 22(3):39–50.
[8] HealthCare.gov. What Marketplace Health Plans Cover. https://www.healthcare.gov/coverage/what-marketplace-plans-cover/. Accessed October 15, 2015.

Findings

MD and SUD diagnoses among the top 10 reasons for hospital stays among teenagers, 2012
Table 1 presents the number and percentage of all stays among teenagers for the top 10 major diagnostic categories. Within each category, the percentage of stays including any MD diagnosis and any SUD diagnosis are reported.

Table 1. Number and percentage of hospital stays for the top 10 major diagnostic categories among teenagers and percentage of stays including any MD and any SUD diagnosis by major diagnostic category, 2012

Major diagnostic category	Rank	Number of all stays	% of all stays	% of stays with any MD or SUD	
				Any MD	Any SUD
Pregnancy, childbirth, and the puerperium	1	367,800	34.1	5.3	1.7
Mental disorders	2	162,100	14.7	100.0	27.2
Digestive system	3	93,900	8.5	13.6	2.5
Musculoskeletal system and connective tissue	4	62,400	5.7	11.7	3.3
Nervous system	5	61,200	5.6	23.3	5.4
Respiratory system	6	51,300	4.7	14.9	4.1
Endocrine, nutritional, and metabolic disorders	7	38,200	3.5	22.1	3.9
Injuries, poisoning, and toxic effects of drugs	8	34,000	3.1	60.9	29.6
Skin, subcutaneous tissue, breast diseases	9	26,300	2.4	13.5	5.2
Kidney and urinary tract disorders	10	25,000	2.3	13.0	2.7

Abbreviations: MD, mental disorder; SUD, substance use disorder

Note: Major diagnostic category is based on principal diagnosis at discharge. MD and SUD diagnoses are based on any principal or secondary (all-listed) diagnosis or external cause of injury or poisoning. Detailed ICD-9-CM codes are provided under case definitions. Teenagers are defined as ages 13 to 19 years (inclusive).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Kids' Inpatient Database (KID), 2012

- **Mental disorders were the second most common reason for teenagers' hospital stays in 2012.**

  Among all hospital stays of teenagers in 2012, 14.7 percent were primarily due to an MD—second only to stays related to pregnancy, childbirth, and the puerperium (teenage pregnancy). The number of stays due to an MD (162,100 stays) was more than 70 percent higher than stays for the third most common reason—diseases and disorders of the digestive system (93,900 stays).

- **Secondary diagnoses of MD and SUD were common among teenagers who were hospitalized for reasons not related primarily to an MD.**

  More than one in five hospital stays for diseases of the nervous system (23.3 percent) and stays for endocrine, nutritional, and metabolic disorders (22.1 percent) also included at least one MD diagnosis. About 61 percent of hospital stays primarily for injury, poisoning, or toxic effects of drugs included at least one MD diagnoses.

  More than one in four stays primarily for an MD also included a SUD diagnosis (27.2 percent with co-occurring diagnoses), and nearly 30 percent of stays for injury, poisoning, or toxic effects of drugs included one or more SUD diagnoses (29.6 percent).

Characteristics of hospital stays including MD and SUD diagnoses among teenagers, 2012
Table 2 presents the number and percentage of stays among teenagers including MD alone (i.e., without SUD diagnoses), SUD alone (i.e., without MD diagnoses), co-occurring M/SUDs, and all other types of stays. Rates per 100,000 teenage population, both overall and by sex, also are presented.

Table 2. Hospital stays including M/SUD diagnoses among teenagers, 2012

Variable	Type of stay		Type of M/SUD-related stay		
	MD or SUD diagnosis	No MD or SUD diagnoses	MD alone	SUD alone	Co-occurring M/SUDs
All-listed M/SUD diagnosis (principal or secondary)					
Number of stays	310,100	793,800	220,300	21,000	69,000
All stays, %	28.1	71.9	20.0	1.9	6.2
M/SUD stays, %	—	—	71.0	6.8	22.2
Stays per 100,000 population	1,046.8	2,679.4	743.7	70.8	232.4
Resource use					
Aggregate costs, billions U.S. $	2.6	6.9	2.0	0.2	0.4
Mean cost per stay, U.S. $	8,500	8,900	9,100	10,300	6,000
Mean LOS, days	5.7	3.3	6.8	3.7	6.5
Patient characteristics					
Patient sex**, %**					
Female	56.5	72.0	61.3	35.7	44.7
Male	43.5	28.0	38.7	64.3	55.3
Stays per 100,000 population					
Female	1,214.4	3,958.8	930.9	48.1	235.3
Male	887.3	1,462.9	565.5	92.3	229.6
Primary expected payer,%					
Public	44.0	52.7	44.5	33.1	39.8
Private	45.6	38.5	46.2	49.8	47.5
Uninsured	5.1	4.2	3.9	12.6	6.7
Other	5.3	4.7	5.4	4.5	6.0

Abbreviations: LOS, length of stay; MD, mental disorder; SUD, substance use disorder; M/SUD, mental and substance use disorder

Notes: MD and SUD diagnoses are based on any principal or secondary (all-listed) diagnosis or external cause of injury or poisoning. Teenagers are defined as ages 13 to 19 years (inclusive).Medicare and Medicaid coverage were combined into one public coverage category. Dashes indicate that data are not applicable. Numbers may not add up to totals because of rounding.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Kids' Inpatient Database (KID), 2012

- **More than one in four hospital stays among teenagers included at least one MD or SUD as a principal or secondary diagnosis.**

  Table 2 shows that 28.1 percent of stays among teenagers in 2012 included at least one MD or SUD diagnosis among all diagnoses listed in patient records. Among these 310,100 stays, more than two-thirds (71.0 percent) included an MD alone (there were no SUD diagnoses, although other non-M/SUDs may have been present). Teenagers with a SUD alone accounted for 6.8 percent of these 310,100 stays, and those with co-occurring M/SUDs accounted for approximately 22.2 percent.

- **On average, hospital stays that included at least one MD or SUD diagnosis had longer lengths of stay but similar costs compared with non-M/SUD stays.**

  Average length of stay was more than 70 percent higher for all M/SUD stays than for all other stays (5.7 vs. 3.3 days), but average costs were similar ($8,500 for M/SUD stays vs. $8,900 for all other stays). However, among M/SUD stays, the average cost for patients with co-occurring conditions ($6,000) was lower than for patients with MD alone ($9,100) and patients with SUD alone ($10,300).

- **Longer hospital stays among M/SUD hospital stays was driven by the presence of MDs, not SUDs.**

  Stays including an MD alone were on average 84 percent longer than stays including a SUD alone (6.8 days for MD alone vs. 3.7 days for SUD alone). Similarly, stays including both an MD and a SUD were on average 75 percent longer than stays including a SUD alone (6.5 days for co-occurring M/SUDs vs. 3.7 days for SUD alone).

- **Females accounted for the majority of hospital stays with MD alone, whereas males accounted for the majority of stays with SUD alone and those with co-occurring M/SUDs.**

  Females accounted for 61.3 percent of stays with MD alone (without a co-occurring SUD), but only 35.7 percent of stays with SUD alone and 44.7 percent of stays with co-occurring M/SUDs.

  Nearly three-quarters of stays without M/SUDs (72 percent) were among females because of the preponderance of maternal stays in this group.

- **Patients with MD or SUD diagnoses were more likely to be uninsured than patients without MD or SUD diagnoses.**

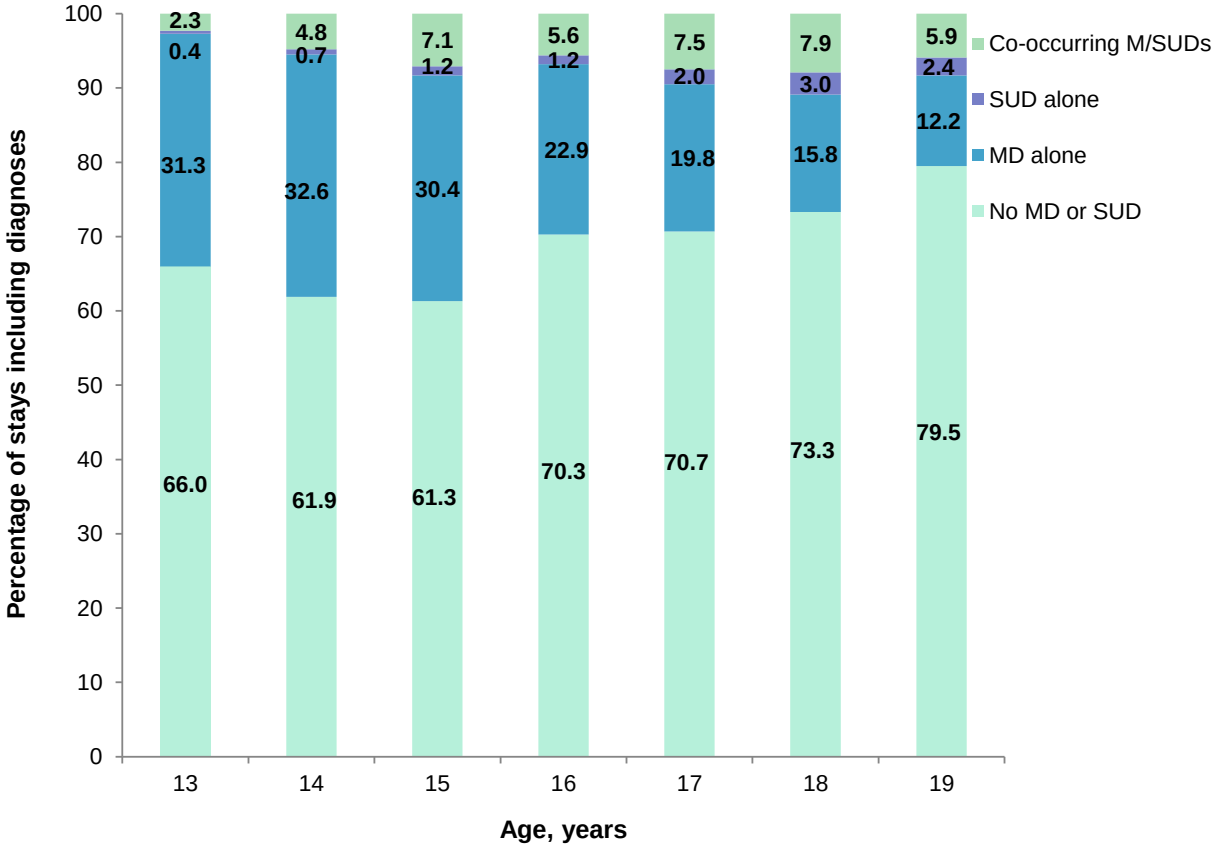
  Among stays with at least one MD or SUD diagnosis, 5.1 percent were uninsured— 21 percent higher than for all other types of stays (4.2 percent).

  Stays including an MD or SUD diagnosis were less often billed to Medicaid or Medicare, compared with all other stays: 44.0 percent of M/SUD stays were billed to Medicaid or Medicare versus 52.7 percent of non-M/SUD stays.

  Nearly 13 percent of stays including a SUD alone were not covered by insurance— approximately three times greater than stays without M/SUD diagnoses (4.2 percent) and stays with an MD alone (3.9 percent).

Hospital stays including MD and SUD diagnoses among teenagers, by age, 2012
Figure 1 presents the percentage of stays among teenagers including MD alone, SUD alone, co-occurring M/SUD, and no MD or SUD diagnoses by each year of patient age.

Figure 1. Percentage of stays including M/SUD diagnoses among teenagers, by age, 2012



Abbreviations: MD, mental disorder; M/SUD, mental and substance use disorder; SUD, substance use disorder

Note: MD and SUD diagnoses are based on any principal or secondary (all-listed) diagnosis or external cause of injury or poisoning. Teenagers are defined as ages 13 to 19 years (inclusive).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Kids' Inpatient Database (KID), 2012

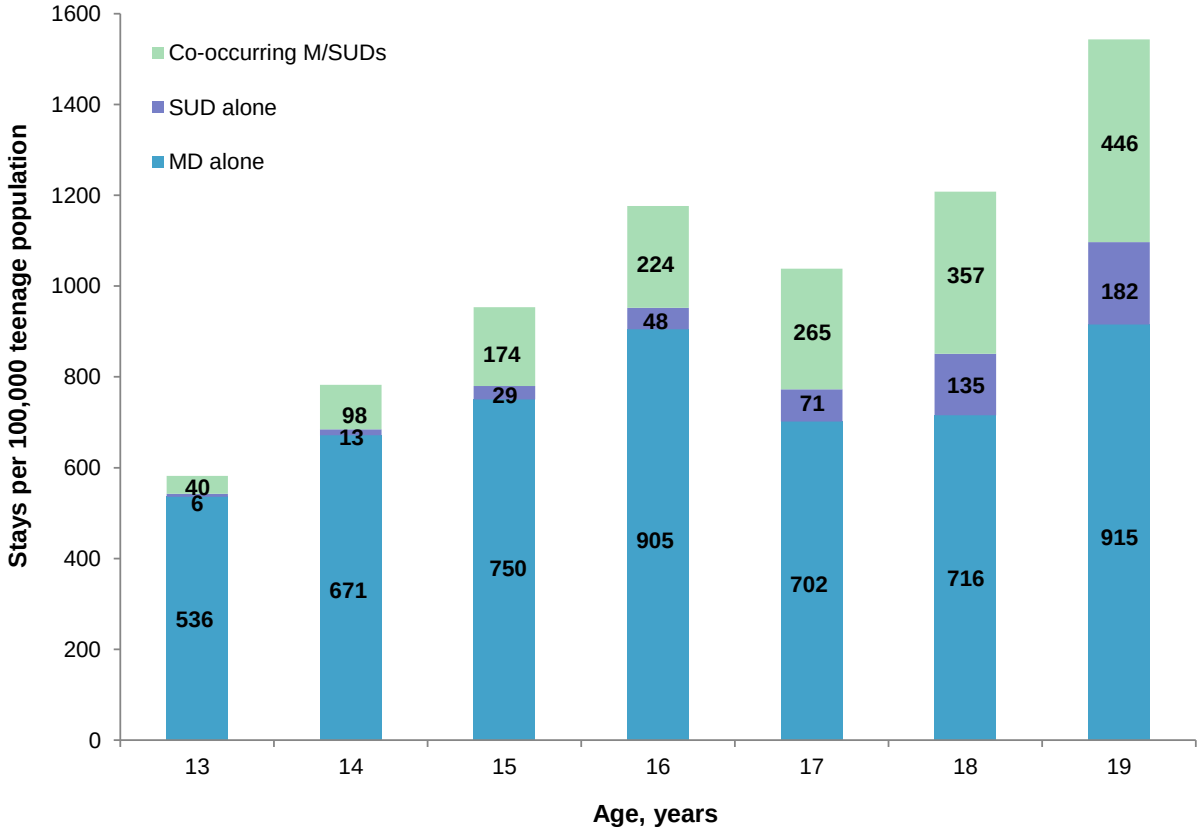
- **Approximately one in three hospitalized 13-year-olds had an MD or SUD disorder diagnosis, compared with one in five hospitalized 19-year-olds.**

  One-third of stays among 13-year-old patients included at least one MD or SUD diagnosis: 31.3 percent had an MD alone, 2.3 percent had co-occurring M/SUDs, and 0.4 percent had a SUD alone.

  One-fifth of stays among 19-year-old patients included at least one MD or SUD diagnosis: 12.2 percent had an MD alone (less than half the percentage for 13-year-olds), 5.9 percent had co-occurring M/SUDs (more than twice the percentage for 13-year-olds), and 2.4 percent had a SUD alone (more than five times the percentage for 13-year-olds).

Figure 2 presents the rate of stays per 100,000 population including MD alone, SUD alone, and co-occurring M/SUDs by each year of age.

Figure 2. Rates of hospital stays including M/SUDs per 100,000 teenage population, by age, 2012



Abbreviations: MD, mental disorder; M/SUD, mental and substance use disorder; SUD, substance use disorder

Note: MD and SUD diagnoses are based on any principal or secondary (all-listed) diagnosis or external cause of injury or poisoning. Teenagers are defined as ages 13 to 19 years (inclusive).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Kids' Inpatient Database (KID), 2012

- **Hospital stays including MDs and SUDs among teenagers generally increase with age.**

  The rate of stays including MD alone (without a co-occurring SUD) was 71 percent higher among 19-year-olds than among 13-year-olds (915 stays per 100,000 population among 19-year-olds vs. 536 stays per 100,000 population among 13-year-olds).

  Stays including SUD alone (without a co-occurring MD) were more than 25 times higher among 19-year-olds than among 13-year-olds (182 stays per 100,000 population for 19-year-olds vs. 6 stays per 100,000 population for 13-year-olds).

  Stays including co-occurring M/SUDs were more than 10 times higher among 19-year-olds than among 13-year-olds (446 stays per 100,000 population for 19-year-olds vs. 40 stays per 100,000 population for 13-year-olds).

Top three MD diagnoses and top three SUD diagnoses among teenagers, 2012
Table 3 presents the number of stays for the three most common MD diagnoses and the three most common SUD diagnoses among teenagers. The rate of stays per 100,000 teenage population including each diagnosis is presented separately for males and females.

Table 3. Most common M/SUD diagnoses among hospitalized teenagers and rate of hospital stays among male and female teenagers by diagnosis, 2012

Diagnosis	Number of stays (both sexes)	Stays per 100,000 male teenage population	Stays per 100,000 female teenage population
Top three MDs			
Mood disorders	199,200	492.2	861.8
Anxiety disorders	85,800	188.2	396.2
Attention-deficit and conduct disorders	81,700	304.6	245.4
Top three SUDs			
Cannabis use disorders	54,100	200.9	163.5
Alcohol use disorders	27,500	101.4	84.0
Opioid use disorders	14,500	50.3	47.3

Abbreviations: MD, mental disorder; SUD, substance use disorder; M/SUD, mental and substance use disorder

Note: MD and SUD diagnoses are based on any principal or secondary (all-listed) diagnosis or external cause of injury or poisoning. Teenagers are defined as ages 13 to 19 years (inclusive).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Kids' Inpatient Database (KID), 2012

- **Mood disorders were the most common MD diagnosis among hospitalized teenagers, and cannabis use disorders were the most common SUD diagnosis.**

  The frequency of hospitalizations including mood disorders (199,200 stays) was over two times greater than any other MD diagnosis. Cannabis use disorders were the most common SUD diagnosis in this population, with a frequency that was nearly twice as high as that of alcohol use disorders, the second most common SUD diagnosis (54,100 cannabis use disorders vs. 27,500 alcohol use disorders).

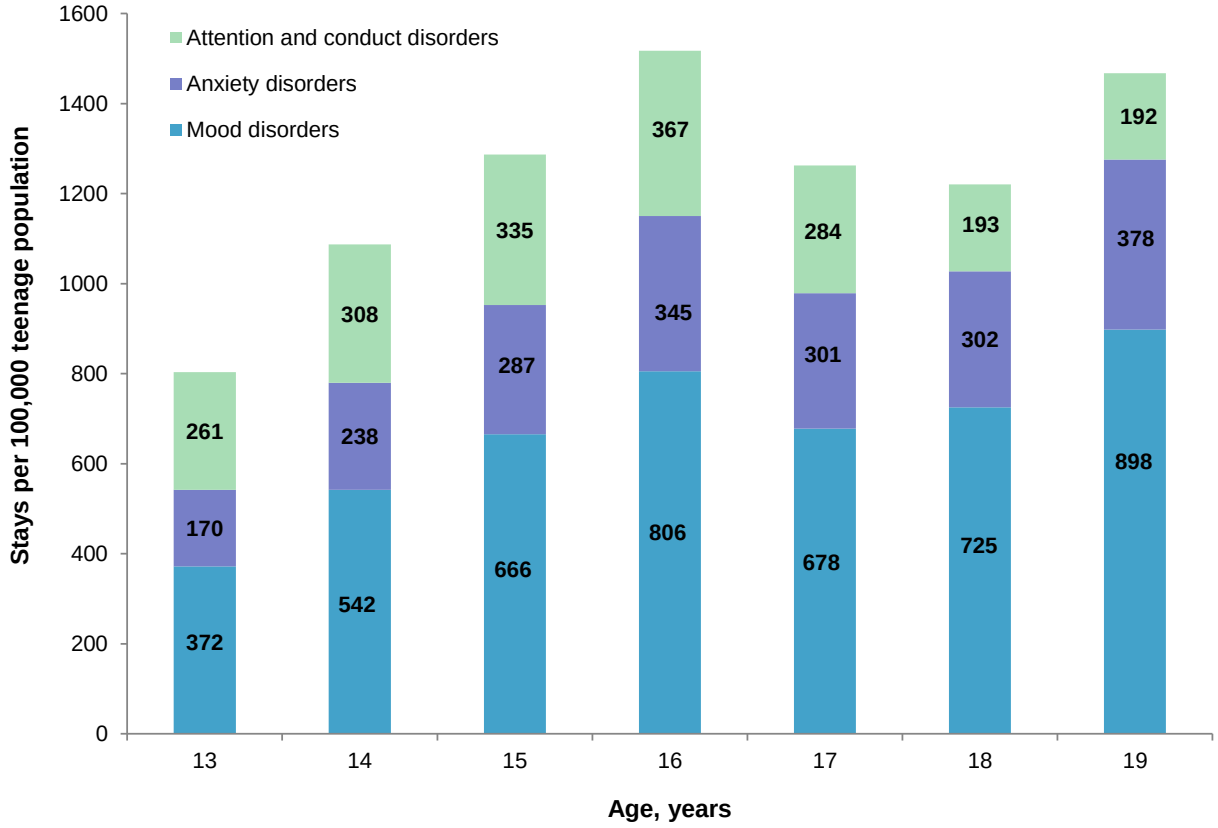
- **Hospitalized females had higher rates of mood and anxiety disorders, whereas hospitalized males had higher rates of attention and conduct disorders, cannabis use disorders, and alcohol use disorders.**

  The rate of mood disorders was approximately 75 percent greater among hospitalized females than among hospitalized males (females: 861.8 stays per 100,000 population; males: 492.2 stays per 100,000 population). Similarly, compared with males, females had more than twice the rate of stays including anxiety disorders (females: 396.2 stays per 100,000 population; males: 188.2 stays per 100,000 population).

  Compared with females, males had a 25 percent higher rate of stays including attention and conduct disorders (males: 304.6 stays per 100,000 population; females: 245.4 stays per 100,000 population). The rate of cannabis use disorders was more than 20 percent greater among males than among females (males: 200.9 stays per 100,000 population; females: 163.5 stays per 100,000 population). Similarly, the rate of alcohol use disorders was approximately 20 percent greater among males than among females (males: 101.4 stays per 100,000 population; females: 84.0 stays per 100,000 population).

Top three MD and SUD diagnoses per 100,000 teenage population by age, 2012
Figure 3 presents rates of hospital stays for teenagers including the top three MD diagnoses by age.

Figure 3. Rates of hospital stays including the top three MD diagnoses per 100,000 teenage population, by age, 2012



Abbreviation: MD, mental disorder

Note: MD diagnoses are based on any principal or secondary (all-listed) diagnosis or external cause of injury or poisoning. Teenagers are defined as ages 13 to 19 (inclusive).

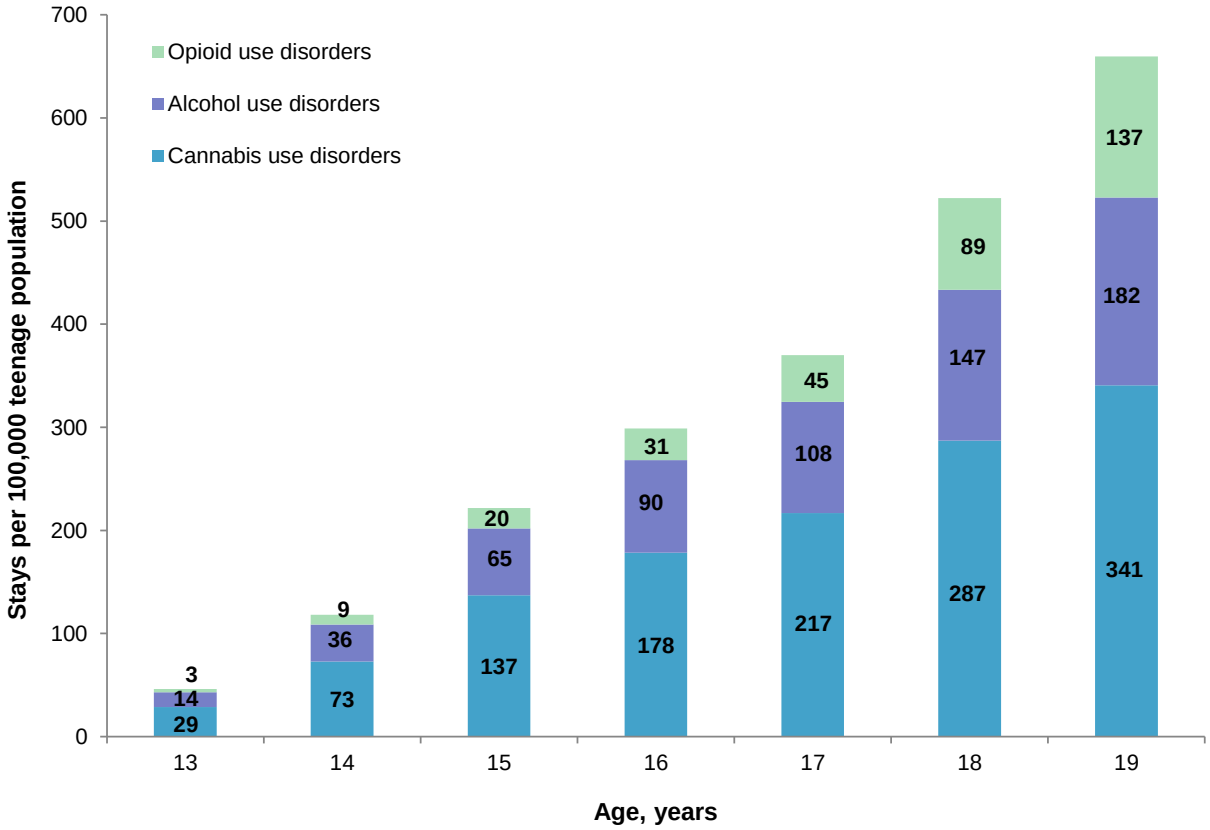
Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Kids' Inpatient Database (KID), 2012

- **Compared with 13-year-olds, 19-year-olds had higher rates of hospital stays including mood and anxiety disorders but lower rates including attention and conduct disorders.**

  Hospital stays including mood disorders were more than twice as high among 19-year-olds as among 13-year-olds (19-year-olds: 898 stays per 100,000 population; 13-year-olds: 372 stays per 100,000 population). Similarly, stays including anxiety were more than twice as high among 19-year-olds as among 13-year-olds (19-year-olds: 378 stays per 100,000 population; 13-year-olds: 170 stays per 100,000 population). By contrast, stays including attention and conduct disorders were more than 25 percent lower among 19-year-olds than among 13-year-olds (19-year-olds: 192 stays per 100,000 population; 13-year-olds: 261 stays per 100,000 population).

Figure 4 presents rates of hospital stays for teenagers including the top three SUD diagnoses by age.

Figure 4. Rates of hospital stays including the top three SUD diagnoses per 100,000 teenage population, by age, 2012



Abbreviation: SUD, substance use disorder

Note: SUD diagnoses are based on any principal or secondary (all-listed) diagnosis or external cause of injury or poisoning. Teenagers are defined as ages 13 to 19 (inclusive).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Kids' Inpatient Database (KID), 2012

- **Between the ages of 13 and 19 years, hospitalization rates including each of the top three SUD diagnoses increased by a magnitude of more than 10—with the greatest increase being for opioid use disorders.**

  Hospital stays including cannabis use disorders were more than 10 times higher among 19-year-olds than among 13-year-olds (19-year-olds: 341 stays per 100,000 population; 13-year-olds: 29 stays per 100,000 population). Similarly, stays including alcohol use disorders were more than 10 times higher among 19-year-olds than among 13-year-olds (19-year-olds: 182 stays per 100,000 population; 13-year-olds: 14 stays per 100,000 population).

  Hospital stays including opioid use disorders were more than 40 times higher among 19-year-olds than among 13-year-olds (19-year-olds: 137 stays per 100,000 population; 13-year-olds: 3 stays per 100,000 population).

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2012 Kids' Inpatient Database (KID).

Many hypothesis tests were conducted for this Statistical Brief. Thus, to decrease the number of false-positive results, we reduced the significance level to .01 for individual tests.

Definitions

Diagnoses, ICD-9-CM, Clinical Classifications Software (CCS), 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 concomitant conditions that coexist at the time of admission or develop during the stay. *All-listed diagnoses* include the principal diagnosis plus these additional secondary conditions. In this Statistical Brief, a *discharge* is demarcated as including a mental or substance use disorder diagnosis if a relevant ICD-9-CM code appeared either as a principal or secondary diagnosis or as any external cause for injury or poisoning ("E code") on the patient's record.

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.

CCS categorizes ICD-9-CM diagnosis codes into a manageable number of clinically meaningful categories.[9] This clinical grouper makes it easier to quickly understand patterns of diagnoses. CCS categories identified as Other typically are not reported; these categories include miscellaneous, otherwise unclassifiable diagnoses that may be difficult to interpret as a group.

MDCs assign ICD-9-CM principal diagnosis codes to one of 25 general diagnosis categories

Case definition for substance use disorder conditions
The ICD-9-CM codes defining substance use disorders are listed in Table 4.

Table 4. ICD-9-CM diagnosis codes defining substance use disorders

ICD-9-CM diagnosis codes	Description
Alcohol	
291.0	Alcohol withdrawal delirium
291.1	Alcohol-induced persisting amnestic disorder
291.2	Alcohol-induced persisting dementia
291.3	Alcohol-induced psychotic disorder with hallucinations
291.4	Idiosyncratic alcohol intoxication
291.5	Alcohol-induced psychotic disorder with delusions
291.8	Other specified alcohol-induced mental disorders
291.81	Alcohol withdrawal
291.82	Alcohol-induced sleep disorders
291.89	Other alcohol-induced disorders
291.9	Unspecified alcohol-induced mental disorders
303.00–303.03	Acute alcohol intoxication
303.90–303.93	Other and unspecified alcohol dependence
305.00–305.03	Alcohol abuse
357.5	Alcoholic polyneuropathy
425.5	Alcoholic cardiomyopathy
535.30, 535.31	Alcoholic gastritis
571.0	Alcoholic fatty liver
ICD-9-CM diagnosis codes	**Description**

[9] Agency for Healthcare Research and Quality. HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). Updated June 2015. Rockville, MD: Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed February 17, 2016.

571.1	Acute alcoholic hepatitis
571.2	Alcoholic cirrhosis of liver
571.3	Alcoholic liver damage, unspecified
E860.0	Alcoholic beverages poisoning
Amphetamines	
304.40–304.43	Amphetamines dependence
305.70–305.73	Nondependent amphetamine abuse
Cannabis	
304.30–304.33	Cannabis dependence
305.20–305.23	Nondependent cannabis abuse
Cocaine	
304.20–304.23	Cocaine dependence
305.60–305.63	Nondependent cocaine abuse
968.5	Poisoning by cocaine
E938.5	Cocaine, adverse effects
Drug-induced mental disorders	
292.0	Drug withdrawal
292.11	Drug-induced psychotic disorder with delusions
292.12	Drug-induced psychotic disorder with hallucinations
292.2	Pathological drug intoxication
292.81	Drug-induced delirium
292.82	Drug-induced persistent dementia
292.83	Drug-induced persistent amnestic disorder
292.84	Drug-induced mood disorder
292.85	Drug-induced sleep disorders
292.89	Other drug-induced mental disorder
292.9	Unspecified drug-induced mental disorder
Hallucinogens	
304.50–304.53	Hallucinogen dependence
305.30–305.33	Nondependent hallucinogen abuse
969.6	Poisoning by hallucinogens (psychodysleptics)
E854.1	Accidental poisoning by hallucinogens (psychodysleptics)
E939.6	Hallucinogens, adverse effects
Opioids	
304.00–304.03	Opioid type dependence
304.70–304.73	Combinations of opioids with any other
305.50–305.53	Nondependent opioid abuse
965.00	Poisoning by opium
965.01	Poisoning by heroin
965.02	Poisoning by methadone
965.09	Poisoning by other opiates and related narcotics
E850.0	Heroin poisoning
E935.0	Heroin, adverse effects
Sedatives, hypnotics, anxiolytics, tranquilizers, barbituates	
304.10–304.13	Sedatives, hypnotics, or anxiolytic dependence
305.40–305.43	Nondependent sedative, hypnotic, or anxiolytic abuse
Other	
304.60–304.63	Other, specified drug dependence
304.80–304.83	Combinations excluding opioids
304.90–304.93	Unspecified drug dependence
305.90–305.93	Other, mixed or unspecified drug abuse
648.30–648.34	Diabetes related to drug dependence
V654.2	Counseling, substance use

Case definition for mental disorders

The CCS categories defining mental disorders are listed in Table 5.

Table 5. CCS codes defining mental disorders

CCS code	Description
650	Adjustment disorders
651	Anxiety disorders
652	Attention-deficit, conduct, and disruptive behavior disorders
655	Disorders usually diagnosed in infancy, childhood, or adolescence
656	Impulse control disorders
657	Mood disorders
658	Personality disorders
659	Schizophrenia and other psychotic disorders
662	Suicide and intentional self-inflicted injury
663	Screening and history of mental health and substance abuse codes
670	Miscellaneous disorders

Although dementia (CCS=653) and intellectual disability/developmental disorders (CCS=654) are listed in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition,* these diagnoses, which frequently are characterized by the development of multiple cognitive impairments related to medical conditions, often require more medical than psychiatric treatment and thus were excluded from the analysis.

Types of hospitals included in the HCUP Kids' Inpatient Database
The Kids' Inpatient Database (KID) 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 KID includes obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Excluded 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 will be included in the KID.

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).[10] *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.

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.[11] The largest source of difference comes from the HCUP coverage of inpatient treatment only in contrast to the NHEA inclusion of outpatient costs associated with emergency departments and other hospital-based outpatient clinics and departments as well. The outpatient portion of hospitals' activities has been

[10] Agency for Healthcare Research and Quality. HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2001–2013. Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2015. https://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed February 17, 2016.
[11] For additional information about the NHEA, see Centers for Medicare & Medicaid Services (CMS). National Health Expenditure Data. CMS Web site May 2014. http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/index.html?redirect=/NationalHealthExpendData/. Accessed February 17, 2016.

growing steadily and may exceed half of all hospital revenue in recent years. On the basis of the American Hospital Association Annual Survey, 2012 outpatient gross revenues (or charges) were about 44 percent of total hospital gross revenues.[12]

Smaller sources of differences come from the inclusion in the NHEA of hospitals that are excluded from HCUP. These include Federal hospitals (Department of Defense, Veterans Administration, Indian Health Services, and Department of Justice [prison] hospitals) as well as psychiatric, substance abuse, and long-term care hospitals. A third source of difference lies in the HCUP reliance on billed charges from hospitals to payers, adjusted to provide estimates of costs using hospital-wide cost-to-charge ratios, in contrast to the NHEA measurement of spending or revenue. HCUP costs estimate the amount of money required to produce hospital services, including expenses for wages, salaries, and benefits paid to staff as well as utilities, maintenance, and other similar expenses required to run a hospital. NHEA spending or revenue measures the amount of income received by the hospital for treatment and other services provided, including payments by insurers, patients, or government programs. The difference between revenues and costs include profit for for-profit hospitals or surpluses for nonprofit hospitals.

Payer
Payer is the expected payer for the hospital stay. To make coding uniform across all HCUP data sources, payer combines detailed categories into general groups:

- Medicare: includes patients covered by fee-for-service and managed care Medicare
- Medicaid: includes patients covered by fee-for-service and managed care Medicaid
- Private Insurance: includes Blue Cross, commercial carriers, and private health maintenance organizations (HMOs) and preferred provider organizations (PPOs)
- Uninsured: includes an insurance status of *self-pay* and *no charge*
- Other: includes Worker's Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs

Hospital stays billed to the State Children's Health Insurance Program (SCHIP) may be classified as Medicaid, Private Insurance, or Other, depending on the structure of the State program. Because most State data do not identify patients in SCHIP specifically, it is not possible to present this information separately.

When more than one payer is listed for a hospital discharge, the first-listed payer is used. For the purposes of this Statistical Brief, Medicare and Medicaid coverage were combined into a public coverage category.

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of health care 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, private data organizations (HCUP Partners), and the Federal government to create a national information resource of encounter-level health care 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 health care 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 State Hospital and Nursing Home Association

[12] American Hospital Association. TrendWatch Chartbook, 2014. Table 4.2. Distribution of Inpatient vs. Outpatient Revenues, 1992–2012. http://www.aha.org/research/reports/tw/chartbook/2014/table4-2.pdf. Accessed February 17, 2016.

Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
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 and Hospitals
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 Department of Health
Missouri Hospital Industry Data Institute
Montana MHA - An Association of Montana Health Care Providers
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 Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About Statistical Briefs

HCUP Statistical Briefs are descriptive summary reports presenting statistics on hospital inpatient and emergency department use and costs, quality of care, access to care, medical conditions, procedures, patient populations, and other topics. The reports use HCUP administrative health care data.

About the KID

The HCUP Kids' Inpatient Database (KID) is a nationwide database of hospital inpatient stays. The KID is the only dataset on hospital use, outcomes, and charges designed to study children's use of hospital services in the United States. The KID is a sample of discharges from all community, nonrehabilitation hospitals in States participating in HCUP. Pediatric discharges are defined as all discharges where the patient was aged 20 years or younger at admission. [For the 1997 KID, hospital discharges for patients aged 18 years or younger were included in the database.] The KID's large sample size enables analyses of rare conditions (such as congenital anomalies) and uncommon treatments (such as organ transplantation). It can be used to study a wide range of topics including the economic burden of pediatric conditions, access to services, quality of care and patient safety, and the impact of health policy changes. The KID is produced every 3 years; prior databases are available for 1997, 2000, 2003, 2006, 2009, and 2012. Over time, the sampling frame for the KID has changed; thus, the number of States contributing to the KID varies from year to year. The KID is intended for national estimates only; no State-level estimates can be produced.

For More Information

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

For additional HCUP statistics, visit HCUP Fast Stats at http://www.hcup-us.ahrq.gov/faststats/landing.jsp for easy access to the latest HCUP-based statistics for health information topics, or visit HCUPnet, our interactive query system, at http://hcupnet.ahrq.gov/.

For information on other M/SUD hospitalizations in the United States, refer to the following HCUP Statistical Briefs located at http://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp:

- Statistical Brief #177, Hospital Inpatient Utilization Related to Opioid Overuse Among Adults, 1993–2012
- Statistical Brief #191, Hospitalizations Involving Mental and Substance Use Disorders Among Adults, 2012

For a detailed description of HCUP and more information on the design of the Kids' Inpatient Database (KID), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the Kids' Inpatient Database (KID). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2014. http://www.hcup-us.ahrq.gov/kidoverview.jsp. Accessed February 17, 2016.

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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 health care 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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