Emergency Department Visits Involving Dental Conditions, 2018

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Introduction

Oral health contributes to overall wellbeing and improved quality of life. Untreated poor dental health also can lead to negative general health outcomes.[1] Most oral diseases tend to be progressive and cumulative without intervention.[2] Tooth decay and periodontal disease are among the most prevalent chronic diseases worldwide and have been shown to be associated with a number of life-threatening conditions, including sepsis, diabetes, and heart disease.[2,3] Despite the increasing need for dental care, many Americans delay or do not receive it. Failure to receive treatment may make necessary the provision of less definitive and more costly care. Individuals who lack a usual source for dental care may visit hospital emergency departments (EDs) to seek relief for dental pain and related conditions.[4,5] The cost of dental-related visits to the ED is high, totaling more than $2 billion nationally in 2017.[6]

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents statistics on ED visits involving dental conditions using weighted estimates from the 2018 Nationwide Emergency Department Sample (NEDS). Characteristics of dental-related ED visits, including visits that result in discharge from the ED (treat and release) and visits that result in admission to the hospital, are presented. The most common dental conditions are identified by type of ED visit. For ED visits with a dental condition as a secondary diagnosis, the most frequent first-listed or principal nondental conditions are presented. Because of the large sample size of the NEDS 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.

Highlights

- In 2018, there were more than 2 million dental-related emergency department (ED) visits, which represented 615.5 visits per 100,000 population.
- The highest population rates of dental-related ED visits were among non-Hispanic Black individuals, individuals aged 18–44 years, and those residing in the lowest income communities, (rates of 1,362.4, 1,107.4, and 1,069.1 per 100,000 population, respectively).
- A higher proportion of dental-related than non-dental-related ED visits were expected to be paid by Medicaid (42 vs. 32 percent) or to be self-pay/no charge (26 vs. 12 percent).
- Of all dental-related ED visits, nearly 95 percent were treated and released, and 5 percent resulted in admission to the hospital.
- Among treat-and-release ED visits with a principal diagnosis of a dental condition, three groups of dental conditions accounted for 93 percent of visits—loss of teeth and similar disorders, diseases of pulp and periapical tissues, and dental caries.
- Diseases of pulp and periapical tissues was the most common group of dental-related conditions for ED visits resulting in hospital admission, accounting for 85 percent of admitted ED visits with a principal diagnosis of a dental condition.

Findings

Characteristics of ED visits related to dental conditions, 2018
Table 1 presents characteristics of ED visits related to dental conditions by type of ED visit—all ED visits, treat-and-release ED visits, and ED visits resulting in hospital admission—compared with all other non-dental-related ED visits.

Table 1. Characteristics of dental-related ED visits, by type of ED visit, 2018

Characteristic	ED visits related to dental conditions			All other non-dental-related ED visits
	All ED visits	Treat-and-release ED visits	ED visits resulting in hospital admission	
Number	2,009,800	1,899,500	110,300	141,444,600
	Rate per 100,000 population			
Overall	615.5	581.7	33.8	43,317.1
Age group, years				
0–17	290.0	276.8	13.2	38,532.5
18–44	1,107.4	1,073.9	33.5	43,599.2
45–64	473.5	429.9	43.6	39,354.5
65–84	201.7	156.7	45.0	50,529.9
85 and older	197.6	129.7	67.8	94,206.1
Sex				
Male	594.1	556.3	37.8	39,309.7
Female	636.3	606.3	29.9	47,198.8
Race/Ethnicity				
Black, non-Hispanic	1,362.4	1,306.9	55.6	69,407.1
Hispanic	406.3	383.0	23.4	39,186.2
White, non-Hispanic	520.9	489.4	31.4	37,907.0
Other, non-Hispanic	454.6	423.8	30.8	38,749.9
Patient residence				
Large metropolitan	506.3	473.7	32.6	39,983.1
Medium/small metropolitan	680.9	646.1	34.8	44,329.6
Micropolitan	931.0	897.1	33.8	53,398.4
Noncore (rural)	808.3	777.7	30.6	51,216.2
Community-level income				
Quartile 1 (lowest)	1,069.1	1,018.3	50.8	62,982.1
Quartile 2	705.7	670.9	34.8	45,847.4
Quartile 3	412.2	386.5	25.7	34,216.3
Quartile 4 (highest)	245.9	225.3	20.6	27,864.4

Abbreviation: ED, emergency department

Notes: Number of stays is rounded to the nearest hundred. Age, sex, and location of patient residence were each missing for less than 1% of ED visits, race/ethnicity was missing for less than 3% of ED visits, and community-level income was missing for less than 2% of ED visits.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2018

- **Of more than 2 million ED visits involving dental conditions in 2018, 95 percent resulted in discharge from the ED.**

  In 2018, there were 2 million dental-related ED visits in the United States, accounting for 1.4 percent of the 143 million total ED visits. The vast majority of dental-related ED visits were treat and release (94.5 percent), with the remaining ED visits resulting in hospital admission (5.5 percent).

- **The population rate of dental-related ED visits overall was highest among individuals aged 18–44 years, non-Hispanic Black individuals, and those residing in the lowest income communities.**

  Individuals aged 18–44 years had the highest rate of dental-related ED visits overall (1,107.4 per 100,000 population) compared with all other age groups—more than double the rate of those aged 45–64 years (473.5) and approximately four to five times higher than the rate for children and older adults. In contrast, the rate of non-dental-related ED visits was highest for individuals aged 85 years and older, more than double the rate for each of the under 65 age groups.

  The rate of dental-related ED visits was more than 2.5 times higher for non-Hispanic Black individuals than for other race/ethnicity groups (1,362.4 vs. 520.9 or less per 100,000 population). Although Black individuals also had higher rates of non-dental-related ED visits than other race/ethnicity groups, the differential was smaller (about 1.8 times higher).

  Individuals residing in the lowest income communities (quartile 1) had the highest rate of dental-related ED visits (1,069.1 per 100,000 population) compared with those from higher community-level income areas. Although the rate for non-dental-related ED visits also was highest among those living in the lowest income communities, the rate differential between the lowest and highest income communities was greater among dental-related than non-dental-related ED visits (4.3 vs. 2.3 times higher).

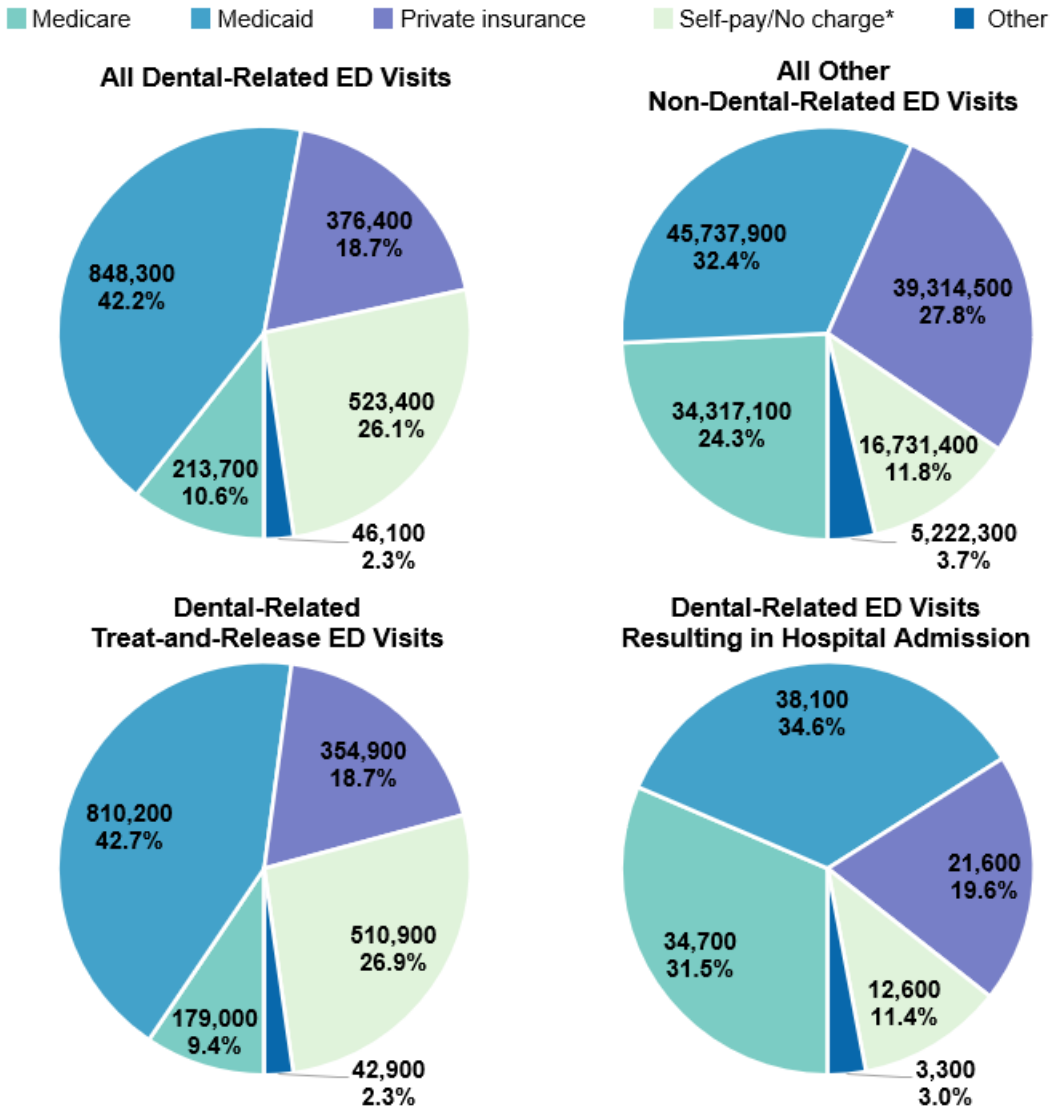
- **The highest and lowest population rates of dental-related ED visits by patient age group and location of residence differed by the type of ED visit.**

  By age group, the population rate of dental-related treat-and-release ED visits was highest among individuals aged 18–44 years and lowest among those aged 85 years and older (1,073.9 vs. 129.7 per 100,000 population). In contrast, the rate of dental-related ED visits resulting in hospital admission increased with age, with the highest rate among those aged 85 years and older (67.8 per 100,000 population vs. 13.2 per 100,000 population among those younger than 18 years).

  By location of patient residence, the population rate of dental-related treat-and-release ED visits was highest among individuals residing in micropolitan areas and lowest among those residing in large metropolitan areas (897.1 vs. 473.7 per 100,000 population). In contrast, there was relatively little difference in the population rate of dental-related ED visits resulting in hospital admission by patient residence location, ranging from 30.6 per 100,000 population in rural areas to 34.8 per 100,000 population in medium and small metropolitan areas.

Figure 1 illustrates the primary expected payer mix of dental-related ED visits compared with all other non-dental-related ED visits. The figure also compares the expected payer source for dental-related treat-and-release ED visits with dental-related ED visits resulting in hospital admission.

Figure 1. Number and percentage of dental-related ED visits for each expected payer, by type of ED visit, 2018



Abbreviation: ED, emergency department

Notes: Number of stays is rounded to the nearest hundred. Percentages are calculated from unrounded values. Excludes 0.1% of ED visits with missing expected payer.

* 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), 2018

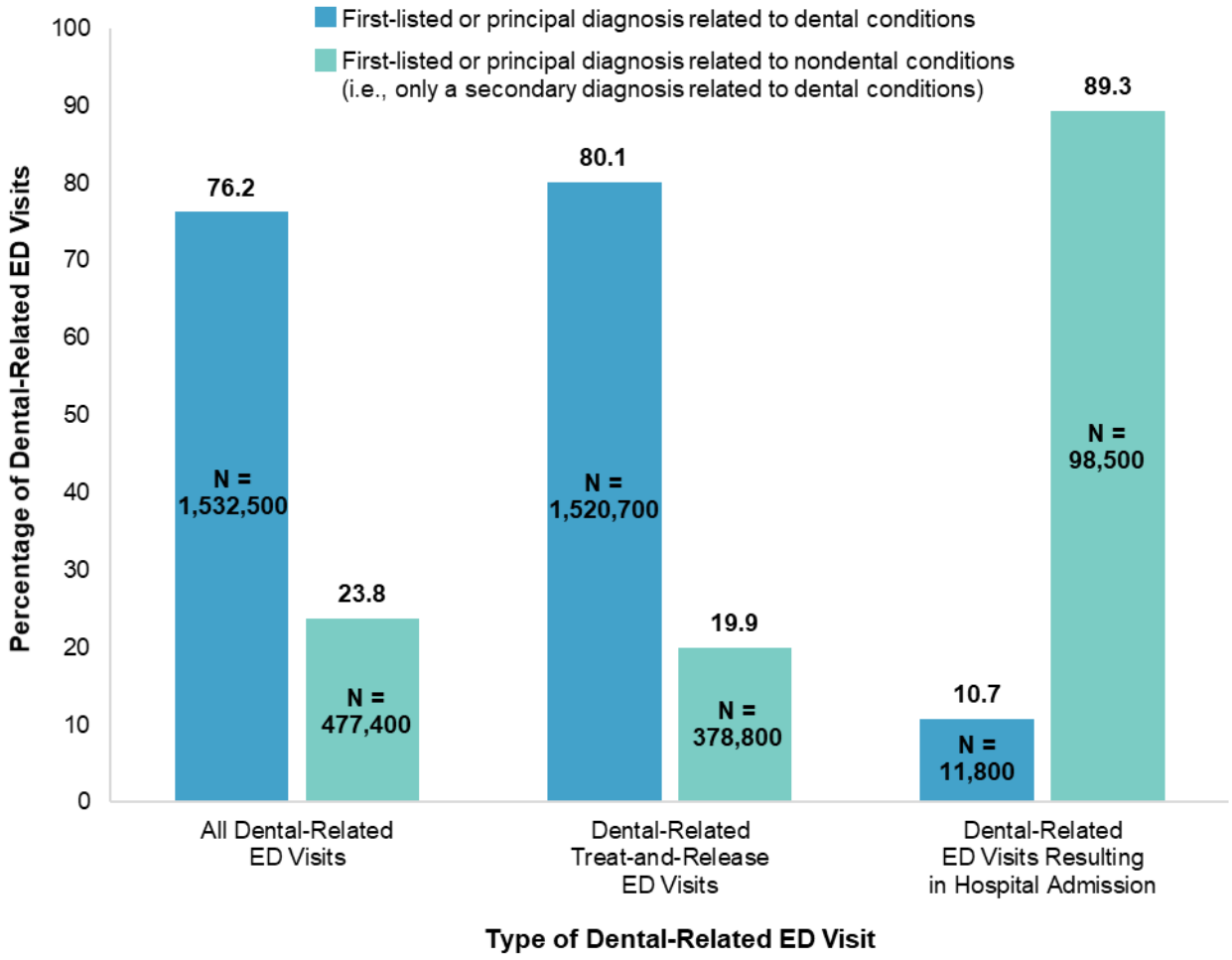
- **More than two-thirds of dental-related ED visits were expected to be billed to Medicaid or were self-pay/no charge.**

  Medicaid was the primary expected payer for more than two in five dental-related ED visits (42.2 percent), compared with less than one-third of non-dental-related ED visits (32.4 percent). Another one-fourth of dental-related ED visits (26.1 percent) were expected to be self-pay/no charge, compared with 11.8 percent of non-dental-related ED visits.

A higher percentage of dental-related treat-and-release ED visits than dental-related ED visits resulting in hospital admission had Medicaid as the expected payer (42.7 vs. 34.6 percent); the opposite was true for Medicare as the expected payer (9.4 percent of treat-and-release ED visits vs. 31.5 percent of ED visits resulting in admission).

First-listed or principal versus secondary diagnoses among ED visits involving dental conditions, 2018
Figure 2 displays the percentage of ED visits specifically for a dental condition (i.e., the dental condition was the first-listed diagnosis for treat-and-release ED visits or the principal diagnosis for ED visits resulting in hospital admission) versus those ED visits primarily for a nondental condition where a dental condition was a secondary diagnosis, by type of ED visit.

Figure 2. Percentage of dental-related ED visits, by first-listed or principal versus secondary diagnosis and type of ED visit, 2018



Abbreviations: ED, emergency department; N, number of ED visits

Notes: Number of stays is rounded to the nearest hundred. Percentages are calculated from unrounded values.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2018

- **The majority of dental-related treat-and-release ED visits were primarily for a dental condition, whereas the majority of dental-related ED visits resulting in hospital admission were principally for a nondental condition.**

  Eighty percent of dental-related treat-and-release ED visits were *primarily* for a dental condition, whereas 20 percent of visits were *primarily* for a nondental condition. In contrast, among dental-related ED visits resulting in hospital admission, only about 10 percent were *principally* for a dental condition and nearly 90 percent were *principally* for a nondental condition.

Table 2 shows the five most common groups of dental conditions among all dental-related ED visits, by type of ED visit and by whether the ED visit was primarily for the dental condition (first-listed or principal diagnosis only), included only secondary dental conditions, or included either principal or secondary dental conditions (any-listed diagnosis).

Table 2. Top five most common groups of dental conditions among ED visits, by type of ED visit, 2018

Diagnosis by dental condition group*	All dental-related ED visits		Dental-related treat-and-release ED visits		Dental-related ED visits resulting in hospital admission	
	Number	Percent	Number	Percent	Number	Percent
First-listed or principal diagnosis	**1,532,500**	**100.0**	**1,520,700**	**100.0**	**11,800**	**100.0**
Loss of teeth and similar disorders of teeth and supporting structures	584,400	38.1	584,300	38.4	100	1.2
Diseases of pulp and periapical tissues	513,900	33.5	503,800	33.1	10,100	85.3
Dental caries	323,300	21.1	322,900	21.2	400	3.1
Gingival disorders	45,400	3.0	44,900	3.0	500	4.2
Cracked tooth and other diseases of hard tissues of teeth	20,300	1.3	20,300	1.3	–	–
Periodontitis	–	–	–	–	700	5.6
Secondary diagnosis only	**477,300**	**100.0**	**378,800**	**100.0**	**98,500**	**100.0**
Loss of teeth and similar disorders of teeth and supporting structures	318,100	66.6	295,400	78.0	22,700	23.1
Diseases of pulp and periapical tissues	150,400	31.5	118,900	31.4	31,500	31.9
Dental caries	292,000	61.2	255,400	67.4	36,600	37.1
Gingival disorders	50,700	10.6	41,600	11.0	9,100	9.2
Cracked tooth and other diseases of hard tissues of teeth	33,100	6.9	31,300	8.3	–	–
Periodontitis	–	–	–	–	7,700	7.8
Any-listed diagnosis	**2,009,800**	**100.0**	**1,899,500**	**100.0**	**110,300**	**100.0**
Loss of teeth and similar disorders of teeth and supporting structures	902,500	44.9	879,600	46.3	22,900	20.7
Diseases of pulp and periapical tissues	664,300	33.1	622,700	32.8	41,600	37.7
Dental caries	615,300	30.6	578,300	30.4	36,900	33.5
Gingival disorders	96,100	4.8	86,500	4.6	9,600	8.7
Cracked tooth and other diseases of hard tissues of teeth	53,400	2.7	51,600	2.7	–	–
Periodontitis	–	–	–	–	8,400	7.6

Abbreviations: ED, emergency department; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Number of stays is rounded to the nearest hundred. Percentages are calculated from unrounded values. Counts of stays with any-listed dental diagnosis include those stays with a first-listed or principal dental diagnosis. Condition groups that were not in the top five for the type of ED visit are denoted with a "–". For secondary diagnosis only and any-listed diagnosis, the sum across dental-related condition groups may exceed 100% because an ED visit may include more than one dental-related condition group.

* See Appendix A for a list of ICD-10-CM diagnoses by dental condition grouping.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2018

- **Among treat-and-release ED visits with a principal diagnosis of a dental condition, 92.7 percent were for one of three groups of conditions: loss of teeth and similar disorders, diseases of pulp and periapical tissues, and dental caries.**

  The three most common groups of dental conditions among dental-related treat-and-release ED visits with a first-listed, secondary only, or any-listed diagnosis of a dental condition were:

  - Loss of teeth and similar disorders (38.4, 78.0, and 46.3 percent of visits, respectively)
  - Diseases of pulp and periapical tissues (33.1, 31.4, and 32.8 percent of visits, respectively)
  - Dental caries (21.2, 67.4, and 30.4 percent of visits, respectively)

- **Among ED visits resulting in hospital admission with a principal diagnosis of a dental condition, 85.3 percent were for diseases of pulp and periapical tissues.**

  The most common group of dental conditions among dental-related ED visits resulting in hospital admission was diseases of pulp and periapical tissues for visits with a principal or any-listed diagnosis of a dental condition (85.3 and 37.7 percent of visits, respectively) and dental caries for visits with only a secondary diagnosis of a dental condition (37.1 percent of visits).

Table 3 presents the five most common nondental conditions among ED visits with a dental condition as a secondary diagnosis only, by type of ED visit.

Table 3. Top five first-listed or principal nondental conditions among ED visits with a dental condition as a secondary diagnosis only, by type of ED visit, 2018

First-listed or principal diagnosis (CCSR)	All dental-related ED visits		Dental-related treat-and-release ED visits		Dental-related ED visits resulting in hospital admission	
	Number	Percent	Number	Percent	Number	Percent
First-listed or principal diagnosis of a nondental condition	**477,400**	**100.0**	**378,800**	**100.0**	**98,500**	**100.0**
Fracture of head and neck, initial encounter (INJ001)	28,300	5.9	24,700	6.5	3,600	3.6
Skin and subcutaneous tissue infections (SKN001)	26,300	5.5	19,500	5.2	6,800	6.9
Other specified complications in pregnancy (PRG028)*	21,800	4.6	21,300	5.6	–	–
Other specified upper respiratory infections (RSP006)†	20,100	4.2	19,400	5.1	–	–
Headache; including migraine (NVS010)	17,800	3.7	17,700	4.7	–	–
Septicemia (INF002)	–	–	–	–	13,000	13.2
Diseases of mouth; excluding dental (DIG003)	–	–	–	–	4,200	4.2
Diabetes mellitus with complication (END003)	–	–	–	–	3,600	3.6

Abbreviations: CCSR, Clinical Classifications Software Refined for ICD-10-CM Diagnoses, v.2021.1; ED, emergency department; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Notes: Diagnoses are grouped using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. First-listed or principal diagnosis is assigned to a single default CCSR category. Number of stays is rounded to the nearest hundred. Percentages are calculated from unrounded values. Diagnoses that were not in the top five for the type of ED visit are denoted with a "–".

* Includes diseases of the digestive system complicating pregnancy and childbirth and other complications of pregnancy.

† Includes acute upper respiratory infection, acute and streptococcal pharyngitis, and acute nasopharyngitis (the common cold).

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2018

- **Fracture of head and neck was the most common first-listed nondental condition among treat-and-release ED visits with a secondary diagnosis of a dental condition.**

  Among dental-related ED visits with only a secondary diagnosis of a dental condition, the most common first-listed nondental diagnosis for treat-and-release ED visits was fracture of head and neck (6.5 percent) and the most common principal nondental diagnosis for ED visits resulting in hospital admission was septicemia (13.2 percent).

Appendix A. ICD-10-CM dental-related diagnosis codes in CCSR DIG002, Disorders of Teeth and Gingiva, by groups of dental conditions

ICD-10-CM code	ICD-10-CM code description	ICD-10-CM code	ICD-10-CM code description
Disorders of tooth development and eruption			
K000	Anodontia	K005	Hereditary disturbances in tooth structure, not elsewhere classified
K001	Supernumerary teeth	K006	Disturbances in tooth eruption
K002	Abnormalities of size and form of teeth	K007	Teething syndrome
K003	Mottled teeth	K008	Other disorders of tooth development
K004	Disturbances in tooth formation	K009	Disorder of tooth development, unspecified
Embedded and impacted teeth			
K010	Embedded teeth	K011	Impacted teeth
Dental caries			
K023	Arrested dental caries	K0262	Dental caries on smooth surface penetrating into dentin
K0251	Dental caries on pit and fissure surface limited to enamel	K0263	Dental caries on smooth surface penetrating into pulp
K0252	Dental caries on pit and fissure surface penetrating into dentin	K027	Dental root caries
K0253	Dental caries on pit and fissure surface penetrating into pulp	K029	Dental caries, unspecified
K0261	Dental caries on smooth surface limited to enamel		
Cracked tooth and other diseases of hard tissues of teeth			
K030	Excessive attrition of teeth	K036	Deposits [accretions] on teeth
K031	Abrasion of teeth	K037	Posteruptive color changes of dental hard tissues
K032	Erosion of teeth	K0381	Cracked tooth
K033	Pathological resorption of teeth	K0389	Other specified diseases of hard tissues of teeth
K034	Hypercementosis	K039	Disease of hard tissues of teeth, unspecified
K035	Ankylosis of teeth		
Dislocation of tooth			
S032XXA	Dislocation of tooth, initial encounter	S032XXS	Dislocation of tooth, sequela
S032XXD	Dislocation of tooth, subsequent encounter		
Diseases of pulp and periapical tissues			
K040	Pulpitis	K045	Chronic apical periodontitis
K0401	Reversible pulpitis	K046	Periapical abscess with sinus
K0402	Irreversible pulpitis	K047	Periapical abscess without sinus
K041	Necrosis of pulp	K048	Radicular cyst
K042	Pulp degeneration	K0490	Unspecified diseases of pulp and periapical tissues
K043	Abnormal hard tissue formation in pulp	K0499	Other diseases of pulp and periapical tissues
K044	Acute apical periodontitis of pulpal origin		

ICD-10-CM code	ICD-10-CM code description	ICD-10-CM code	ICD-10-CM code description
Gingival disorders			
K0500	Acute gingivitis, plaque induced	K06020	Generalized gingival recession, unspecified
K0501	Acute gingivitis, non-plaque induced	K06021	Generalized gingival recession, minimal
K0510	Chronic gingivitis, plaque induced	K06022	Generalized gingival recession, moderate
K0511	Chronic gingivitis, non-plaque induced	K06023	Generalized gingival recession, severe
K060	Gingival recession	K061	Gingival enlargement
K06010	Localized gingival recession, unspecified	K062	Gingival and edentulous alveolar ridge lesions associated with trauma
K06011	Localized gingival recession, minimal	K063	Horizontal alveolar bone loss
K06012	Localized gingival recession, moderate	K068	Other specified disorders of gingiva and edentulous alveolar ridge
K06013	Localized gingival recession, severe	K069	Disorder of gingiva and edentulous alveolar ridge, unspecified
Periodontitis			
K0520	Aggressive periodontitis, unspecified	K05311	Chronic periodontitis, localized, slight
K0521	Aggressive periodontitis, localized	K05312	Chronic periodontitis, localized, moderate
K05211	Aggressive periodontitis, localized, slight	K05313	Chronic periodontitis, localized, severe
K05212	Aggressive periodontitis, localized, moderate	K05319	Chronic periodontitis, localized, unspecified severity
K05213	Aggressive periodontitis, localized, severe	K0532	Chronic periodontitis, generalized
K05219	Aggressive periodontitis, localized, unspecified severity	K05321	Chronic periodontitis, generalized, slight
K0522	Aggressive periodontitis, generalized	K05322	Chronic periodontitis, generalized, moderate
K05221	Aggressive periodontitis, generalized, slight	K05323	Chronic periodontitis, generalized, severe
K05222	Aggressive periodontitis, generalized, moderate	K05329	Chronic periodontitis, generalized, unspecified severity
K05223	Aggressive periodontitis, generalized, severe	K054	Periodontosis
K05229	Aggressive periodontitis, generalized, unspecified severity	K055	Other periodontal diseases
K0530	Chronic periodontitis, unspecified	K056	Periodontal disease, unspecified
K0531	Chronic periodontitis, localized		
Loss of teeth and similar disorders of teeth and supporting structures			
K080	Exfoliation of teeth due to systemic causes	K08404	Partial loss of teeth, unspecified cause, class IV
K08101	Complete loss of teeth, unspecified cause, class I	K08409	Partial loss of teeth, unspecified cause, unspecified class
K08102	Complete loss of teeth, unspecified cause, class II	K08411	Partial loss of teeth due to trauma, class I
K08103	Complete loss of teeth, unspecified cause, class III	K08412	Partial loss of teeth due to trauma, class II
K08104	Complete loss of teeth, unspecified cause, class IV	K08413	Partial loss of teeth due to trauma, class III

ICD-10-CM code	ICD-10-CM code description	ICD-10-CM code	ICD-10-CM code description
K08109	Complete loss of teeth, unspecified cause, unspecified class	K08414	Partial loss of teeth due to trauma, class IV
K08111	Complete loss of teeth due to trauma, class I	K08419	Partial loss of teeth due to trauma, unspecified class
K08112	Complete loss of teeth due to trauma, class II	K08421	Partial loss of teeth due to periodontal diseases, class I
K08113	Complete loss of teeth due to trauma, class III	K08422	Partial loss of teeth due to periodontal diseases, class II
K08114	Complete loss of teeth due to trauma, class IV	K08423	Partial loss of teeth due to periodontal diseases, class III
K08119	Complete loss of teeth due to trauma, unspecified class	K08424	Partial loss of teeth due to periodontal diseases, class IV
K08121	Complete loss of teeth due to periodontal diseases, class I	K08429	Partial loss of teeth due to periodontal diseases, unspecified class
K08122	Complete loss of teeth due to periodontal diseases, class II	K08431	Partial loss of teeth due to caries, class I
K08123	Complete loss of teeth due to periodontal diseases, class III	K08432	Partial loss of teeth due to caries, class II
K08124	Complete loss of teeth due to periodontal diseases, class IV	K08433	Partial loss of teeth due to caries, class III
K08129	Complete loss of teeth due to periodontal diseases, unspecified class	K08434	Partial loss of teeth due to caries, class IV
K08131	Complete loss of teeth due to caries, class I	K08439	Partial loss of teeth due to caries, unspecified class
K08132	Complete loss of teeth due to caries, class II	K08491	Partial loss of teeth due to other specified cause, class I
K08133	Complete loss of teeth due to caries, class III	K08492	Partial loss of teeth due to other specified cause, class II
K08134	Complete loss of teeth due to caries, class IV	K08493	Partial loss of teeth due to other specified cause, class III
K08139	Complete loss of teeth due to caries, unspecified class	K08494	Partial loss of teeth due to other specified cause, class IV
K08191	Complete loss of teeth due to other specified cause, class I	K08499	Partial loss of teeth due to other specified cause, unspecified class
K08192	Complete loss of teeth due to other specified cause, class II	K0850	Unsatisfactory restoration of tooth, unspecified
K08193	Complete loss of teeth due to other specified cause, class III	K0851	Open restoration margins of tooth
K08194	Complete loss of teeth due to other specified cause, class IV	K0852	Unrepairable overhanging of dental restorative materials
K08199	Complete loss of teeth due to other specified cause, unspecified class	K08530	Fractured dental restorative material without loss of material
K0820	Unspecified atrophy of edentulous alveolar ridge	K08531	Fractured dental restorative material with loss of material
K0821	Minimal atrophy of the mandible	K08539	Fractured dental restorative material, unspecified
K0822	Moderate atrophy of the mandible	K0854	Contour of existing restoration of tooth biologically incompatible with oral health
K0823	Severe atrophy of the mandible	K0855	Allergy to existing dental restorative material
K0824	Minimal atrophy of maxilla	K0856	Poor aesthetic of existing restoration of tooth

ICD-10-CM code	ICD-10-CM code description	ICD-10-CM code	ICD-10-CM code description
K0825	Moderate atrophy of the maxilla	K0859	Other unsatisfactory restoration of tooth
K0826	Severe atrophy of the maxilla	K088	Other specified disorders of teeth and supporting structures
K083	Retained dental root	K0881	Primary occlusal trauma
K08401	Partial loss of teeth, unspecified cause, class I	K0882	Secondary occlusal trauma
K08402	Partial loss of teeth, unspecified cause, class II	K0889	Other specified disorders of teeth and supporting structures
K08403	Partial loss of teeth, unspecified cause, class III	K089	Disorder of teeth and supporting structures, unspecified
Cysts of oral region, not elsewhere classified			
K090	Developmental odontogenic cysts	K091	Developmental (nonodontogenic) cysts of oral region
Dentofacial anomalies			
M2600	Unspecified anomaly of jaw size	M2633	Horizontal displacement of fully erupted tooth or teeth
M2601	Maxillary hyperplasia	M2634	Vertical displacement of fully erupted tooth or teeth
M2602	Maxillary hypoplasia	M2635	Rotation of fully erupted tooth or teeth
M2603	Mandibular hyperplasia	M2636	Insufficient interocclusal distance of fully erupted teeth (ridge)
M2604	Mandibular hypoplasia	M2637	Excessive interocclusal distance of fully erupted teeth
M2605	Macrogenia	M2639	Other anomalies of tooth position of fully erupted tooth or teeth
M2606	Microgenia	M264	Malocclusion, unspecified
M2607	Excessive tuberosity of jaw	M2650	Dentofacial functional abnormalities, unspecified
M2609	Other specified anomalies of jaw size	M2651	Abnormal jaw closure
M2610	Unspecified anomaly of jaw-cranial base relationship	M2652	Limited mandibular range of motion
M2611	Maxillary asymmetry	M2653	Deviation in opening and closing of the mandible
M2612	Other jaw asymmetry	M2654	Insufficient anterior guidance
M2619	Other specified anomalies of jaw-cranial base relationship	M2655	Centric occlusion maximum intercuspation discrepancy
M2620	Unspecified anomaly of dental arch relationship	M2656	Non-working side interference
M26211	Malocclusion, Angles class I	M2657	Lack of posterior occlusal support
M26212	Malocclusion, Angles class II	M2659	Other dentofacial functional abnormalities
M26213	Malocclusion, Angles class III	M2670	Unspecified alveolar anomaly
M26219	Malocclusion, Angles class, unspecified	M2671	Alveolar maxillary hyperplasia
M26220	Open anterior occlusal relationship	M2672	Alveolar mandibular hyperplasia
M26221	Open posterior occlusal relationship	M2673	Alveolar maxillary hypoplasia
M2623	Excessive horizontal overlap	M2674	Alveolar mandibular hypoplasia
M2624	Reverse articulation	M2679	Other specified alveolar anomalies
M2625	Anomalies of interarch distance	M2681	Anterior soft tissue impingement

ICD-10-CM code	ICD-10-CM code description	ICD-10-CM code	ICD-10-CM code description
M2629	Other anomalies of dental arch relationship	M2682	Posterior soft tissue impingement
M2630	Unspecified anomaly of tooth position of fully erupted tooth or teeth	M2689	Other dentofacial anomalies
M2631	Crowding of fully erupted teeth	M269	Dentofacial anomaly, unspecified
M2632	Excessive spacing of fully erupted teeth		
Other diseases of jaws			
M273	Alveolitis of jaws	M2761	Osseointegration failure of dental implant
M2751	Perforation of root canal space due to endodontic treatment	M2762	Post-osseointegration biological failure of dental implant
M2752	Endodontic overfill	M2763	Post-osseointegration mechanical failure of dental implant
M2753	Endodontic underfill	M2769	Other endosseous dental implant failure
M2759	Other periradicular pathology associated with previous endodontic treatment		

Abbreviations: CCSR, Clinical Classifications Software Refined for ICD-10-CM Diagnoses, v.2021.1; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

References

[1] Joshipura KJ, Rimm EB, Douglass CW, Trichopoulos D, Ascherio A, Willett WC. Poor oral health and coronary heart disease. Journal of Dental Research. 1996;75(9):1631–6.
[2] National Institute of Dental and Craniofacial Research. Oral Health in America: A Report of the Surgeon General. 2000. Rockville, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Dental and Craniofacial Research. www.nidcr.nih.gov/sites/default/files/2017-10/hck1ocv.%40www.surgeon.fullrpt.pdf. Accessed June 30, 2021.
[3] Eke PI, Dye BA, Wei L, Slade GD, Thornton-Evans GO, Borgnakke WS, et al. Update on prevalence of periodontitis in adults in the United States: NHANES 2009–2012. Journal of Periodontology. 2015;86(5):611–22.
[4] Cohen LA, Manski RJ, Magder LS, Mullins D. A Medicaid population's use of physicians' offices for dental problems. American Journal of Public Health. 2003;93(8):1297–301.
[5] Cohen LA, Manski RJ, Magder LS, Mullins D. Dental visits to hospital emergency departments by adults receiving Medicaid: assessing their use. Journal of the American Dental Association. 2002;133(6):715–24.
[6] American Dental Association Health Policy Institute. Emergency Department Visits for Dental Conditions – A Snapshot. April 2020. www.ada.org/~/media/ADA/Science%20and%20Research/HPI/Files/HPIgraphic_0420_1.pdf?la=en. Accessed June 29, 2021.

About Statistical Briefs

Healthcare Cost and Utilization Project (HCUP) Statistical Briefs provide basic descriptive statistics on a variety of topics using HCUP administrative healthcare data. Topics include hospital inpatient, ambulatory surgery, and emergency department use and costs, quality of care, access to care, medical conditions, procedures, and patient populations, among other topics. The reports are intended to generate hypotheses that can be further explored in other research; the reports are not designed to answer in-depth research questions using multivariate methods.

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP 2018 Nationwide Emergency Department Sample (NEDS).[a] 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.[b]

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. There are over 70,000 ICD-10-CM diagnosis codes.

[a] Note that race/ethnicity data are not included on the publicly available NEDS.
[b] Claritas. Claritas Demographic Profile by ZIP Code. https://claritas360.claritas.com/mybestsegments/. Accessed January 22, 2021.

The CCSR aggregates ICD-10-CM diagnosis codes into a manageable number of clinically meaningful categories.[c] The CCSR is intended to be used analytically to examine patterns of healthcare in terms of cost, utilization, and outcomes; rank utilization by diagnoses; and risk-adjust by clinical condition. The CCSR capitalizes on the specificity of the ICD-10-CM coding scheme and allows ICD-10-CM codes to be classified in more than one category. Approximately 10 percent of diagnosis codes are associated with more than one CCSR category because the diagnosis code documents either multiple conditions or a condition along with a common symptom or manifestation. For this Statistical Brief, the principal diagnosis code is assigned to a single default CCSR based on clinical coding guidelines, etiology and pathology of diseases, and standards set by other Federal agencies. The assignment of the default CCSR for the first-listed diagnosis for outpatient data is available starting with version v2021.1 of the software tool. ICD-10-CM coding definitions for each CCSR category presented in this Statistical Brief can be found in the *CCSR reference file*, available at www.hcup-us.ahrq.gov/toolssoftware/ccsr/ccs_refined.jsp#download. For this Statistical Brief, v2021.1 of the CCSR was used.

Case definition
Dental-related ED visits were defined as those with any ICD-10-CM diagnosis code in CCSR DIG002, Disorders of Teeth and Gingiva. DIG002 includes 229 ICD-10-CM diagnosis codes related to dental caries, cysts in the oral region, dentofacial anomalies, periodontitis, diseases of pulp and periapical tissues, dislocation of a tooth, disorders of tooth development and eruption, embedded or impacted teeth, gingival disorders, cracked tooth and other disease of hard tissues of teeth, other diseases of the jaw, and loss of teeth and similar disorders of teeth and supporting structures (Appendix A).

Types of hospitals included in the HCUP Nationwide Emergency Department Sample
The Nationwide Emergency Department Sample (NEDS) is based on 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 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.

Population rates
Rates of ED visits per 100,000 population were calculated using 2018 ED visit totals in the numerator and Claritas[d] estimates of the 2018 U.S. population in the denominator. Individual patients seen in the ED multiple times are counted more than once in the numerator.

$$\text{Population rate of ED visits related to dental conditions} = \left(\frac{\text{number of dental-related ED visits}}{\text{number of U.S. residents}}\right) \times 100{,}000$$

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 Black, non-Hispanic White, and non-Hispanic Other.

[c] Agency for Healthcare Research and Quality. HCUP Clinical Classifications Software Refined (CCSR) for ICD-10-CM Diagnoses. Healthcare Cost and Utilization Project (HCUP). Agency for Healthcare Research and Quality. Updated March 2021. www.hcup-us.ahrq.gov/toolssoftware/ccsr/dxccsr.jsp. Accessed June 14, 2021.
[d] Claritas. Claritas Demographic Profile by ZIP Code. https://claritas360.claritas.com/mybestsegments/. Accessed January 22, 2021.

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

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

For this Statistical Brief, we combined the large central and large fringe metropolitan categories and the medium and small metropolitan categories.

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 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.

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

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

services, medical practice patterns, access to healthcare programs, and outcomes of treatments at the national, State, and local market levels.

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Alaska Department of Health and Social Services
Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
Delaware Division of Public Health
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Laulima Data Alliance
Hawaii University of Hawai'i at Hilo
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi State Department of Health
Missouri Hospital Industry Data Institute
Montana Hospital Association
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Office of Health Analytics
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Revenue and Fiscal Affairs Office
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Department of Health and Human Resources, West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About the 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 2018 NEDS is 35,807,950 (weighted, this represents 143,454,430 ED visits).

For More Information

For previous information on ED visits related to dental conditions, refer to the HCUP Statistical Brief located at www.hcup-us.ahrq.gov/reports/statbriefs/sb143.pdf.

For additional HCUP statistics, visit:

- HCUP Fast Stats at www.hcup-us.ahrq.gov/faststats/landing.jsp for easy access to the latest HCUP-based statistics for healthcare information topics
- HCUPnet, HCUP's interactive query system, at www.hcupnet.ahrq.gov/
- HCUP Summary Trend Tables at www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp for monthly information on hospital utilization

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

For a detailed description of HCUP and more information on the design of the 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 November 2020. www.hcup-us.ahrq.gov/nedsoverview.jsp. Accessed January 22, 2021.

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

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