

Emergency Department Visits for Tooth Disorders: United States, 2020–2022

Susan M. Schappert, M.A., and Loredana Santo, M.D., M.P.H.

Key findings

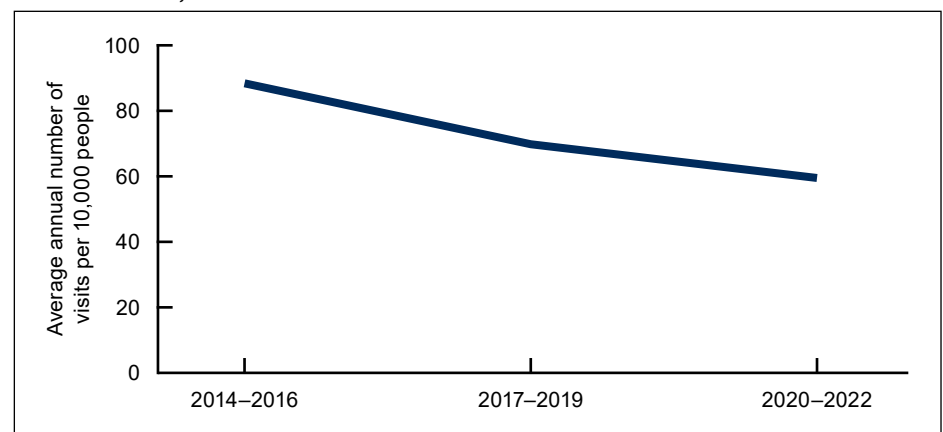
Data from the National Hospital Ambulatory Medical Care Survey

- Tooth disorders accounted for an annual average of 1,944,000 emergency department (ED) visits during 2020–2022, or 59.4 visits per 10,000 people.
- The largest percentage of ED visits for tooth disorders was made by adults ages 25–34 (29.2%).
- White non-Hispanic people accounted for the largest percentage of ED tooth disorder visits, followed by Black non-Hispanic and Hispanic people.
- The majority of visits for tooth disorders had Medicaid as the primary expected source of payment.
- Opioids as the sole pain-relief drug given or prescribed at ED tooth disorder visits decreased from 38.1% in 2014–2016 to 16.5% in 2020–2022.

While oral health is a key component of overall health and quality of life, it is estimated that 1 in 5 adults ages 20–64 has at least one untreated cavity (1,2). On average, 34 million school hours are lost each year because of unplanned (emergency) dental care (3), and over \$45 billion in U.S. productivity is lost each year due to untreated dental disease (4). Oral disease can cause pain and infection, which lead to unplanned visits for emergency care, especially among those who lack access to routine dental care (5,6). This report uses data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) to study emergency department (ED) visits with either a reason for visit or diagnosis of a tooth disorder in 2020–2022.

The rate of ED visits for tooth disorders decreased between 2014 and 2022.

Figure 1. Emergency department visit rates for tooth disorders: United States, 2014–2022



NOTES: Significant decreasing linear trend between 2014 and 2022 ($p < 0.05$). Based on a sample of 167,945 emergency department visits, including 2,780 with a tooth-related reason for visit or diagnosis. The estimated annual average number of visits for tooth disorders was 2,794,000 in 2014–2016, 2,247,000 in 2017–2019, and 1,944,000 in 2020–2022. Reason for visit is based on A Reason for Visit Classification for Ambulatory Care (7) codes 1500.0–1500.3, 2675.1, and 2675.2. Diagnosis is based on the International Classification of Diseases, Ninth Revision, Clinical Modification (8) codes 520–525, 526.6, and 873.63 for 2014 and 2015, and International Classification of Diseases, 10th Revision, Clinical Modification (9) codes K00–K08, M27.5, M27.6, and S02.5 for 2016–2022. Rates were calculated by dividing the number of emergency department visits for tooth disorders in each 3-year period by the corresponding sets of estimates of the U.S. civilian noninstitutionalized population, developed by the U.S. Census Bureau for July 1, 2014–July 1, 2022.

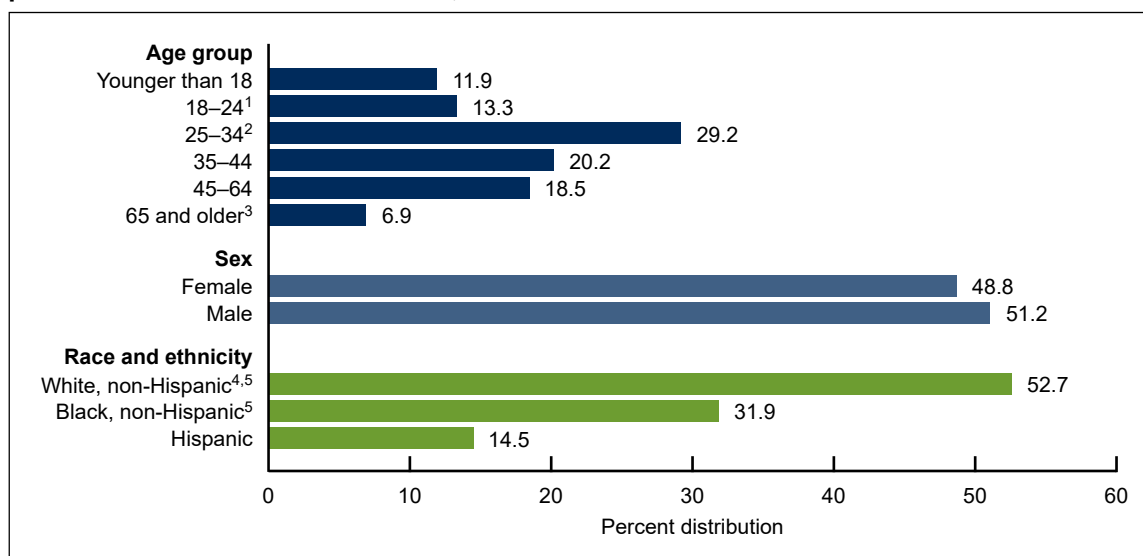
SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2014–2022.

- The average annual rate of ED visits for tooth disorders was 59.4 visits per 10,000 people in 2020–2022 and decreased from 88.4 visits in 2014–2016 and 69.8 visits in 2017–2019 (Figure 1, Table 1).

The percent distribution of ED visits for tooth disorders varied by age and by race and ethnicity in 2020–2022.

- In 2020–2022, adults ages 25–34 accounted for the largest percentage of ED visits for tooth disorders (29.2%). Adults age 65 and older accounted for the smallest percentage (6.9%) (Figure 2, Table 2).
- Among ED visits for tooth disorders, the percentage of visits by males (51.2%) and by females (48.8%) was similar.
- The majority of ED visits for tooth disorders were made by White non-Hispanic (subsequently, White) people (52.7%), followed by Black non-Hispanic (subsequently, Black) (31.9%) and Hispanic people (14.5%).

Figure 2. Percent distribution of emergency department visits for tooth disorders, by selected patient characteristics: United States, 2020–2022



¹Significantly lower than those ages 35–44 and 45–64 ($p < 0.05$).

²Significantly higher than all other age groups ($p < 0.05$).

³Significantly lower than all other age groups ($p < 0.05$).

⁴Significantly higher than Black non-Hispanic people ($p < 0.05$).

⁵Significantly higher than Hispanic people ($p < 0.05$).

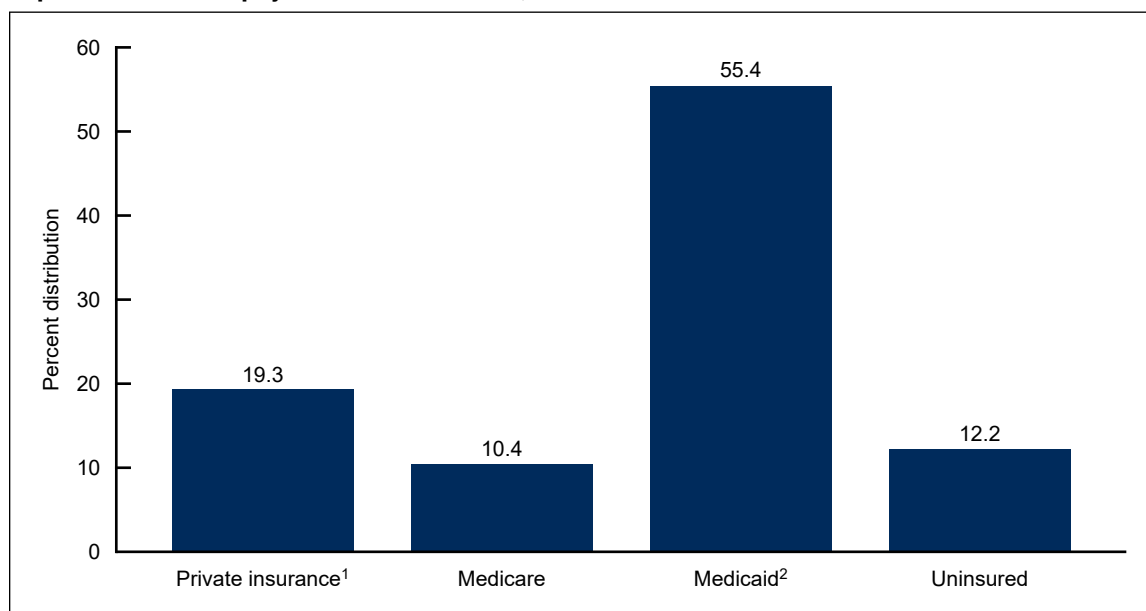
NOTES: Based on a sample of 47,092 emergency department visits, including 676 with a tooth-related reason for visit or diagnosis, yielding an estimated annual average of 1,944,000 visits for tooth disorders. Reason for visit is based on *A Reason for Visit Classification for Ambulatory Care* (7) codes 1500.0–1500.3, 2675.1, and 2675.2. Diagnosis is based on the *International Classification of Diseases, 10th Revision, Clinical Modification* (9) codes K00–K08, M27.5, M27.6, and S02.5. People of Hispanic origin may be of any race. Estimates for non-Hispanic people of other races, which includes Asian, Native Hawaiian or Other Pacific Islander, and American Indian and Alaska Native people, are not shown, but those data are included in the denominator. In 2020–2022, race was missing for 14.2% (weighted) and ethnicity was missing for 11.6% (weighted) of visits for tooth disorders.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2020–2022.

Medicaid was the most frequent primary expected source of payment at ED visits for tooth disorders in 2020–2022.

- The majority of ED visits for tooth disorders had a primary expected payment source of Medicaid (55.4%), followed by private insurance (19.3%). Visits categorized as “uninsured” accounted for 12.2%, Medicare accounted for 10.4%, and 2.6% had other primary expected sources of payment (Figure 3, Table 3).

Figure 3. Percent distribution of emergency department visits for tooth disorders, by primary expected source of payment: United States, 2020–2022



¹Significantly higher than Medicare and uninsured ($p < 0.05$).

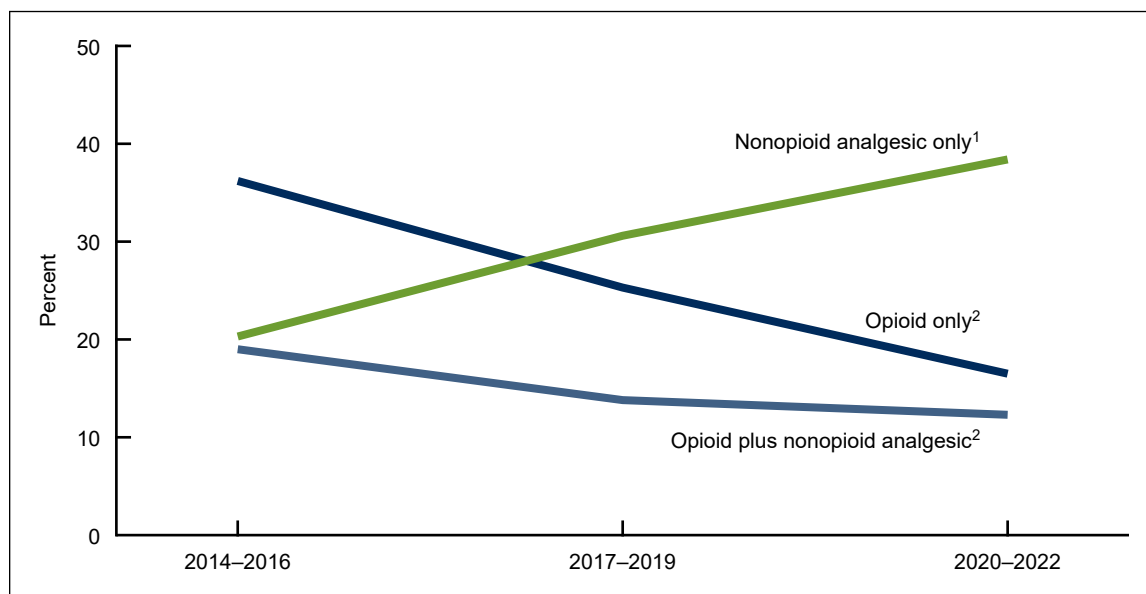
²Significantly higher than all other categories ($p < 0.05$).

NOTES: Based on a sample of 47,092 emergency department visits, including 676 with a tooth-related reason for visit or diagnosis, yielding an estimated annual average of 1,944,000 visits for tooth disorders. Reason for visit is based on *A Reason for Visit Classification for Ambulatory Care* (7) codes 1500.0–1500.3, 2675.1, and 2675.2. Diagnosis is based on the *International Classification of Diseases, 10th Revision, Clinical Modification* (9) codes K00–K08, M27.5, M27.6, and S02.5. Other primary expected sources of payment accounted for 2.6% of visits for tooth disorders and are not shown in the figure but have been included in the denominator. Data on primary expected source of payment were missing for 9.8% (weighted) of visits for tooth disorders; missing data have been excluded from the denominator.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2020–2022.

Nonopioid analgesics were the pain-relief drugs most frequently given or prescribed at ED visits for tooth disorders in 2020–2022.

- Nonopioid analgesic drugs, excluding those prescribed in combination with an opioid, were the pain-relief drugs most frequently given in the ED or prescribed at discharge at ED visits for tooth disorders. The percentage increased between 2014–2016 (20.0%) and 2020–2022 (38.4%) (Figure 4, Table 4).
- Opioids only (not in combination with a nonopioid analgesic) given or prescribed at ED visits for tooth disorders decreased from 38.1% in 2014–2016 to 16.5% in 2020–2022.
- Opioids plus nonopioid analgesics given or prescribed at ED visits for tooth disorders decreased from 18.6% in 2014–2016 to 12.3% in 2020–2022.

Figure 4. Percentage of emergency department visits for tooth disorders, by pain relief drugs given or prescribed: United States, 2014–2022

¹Significant increasing linear trend ($p < 0.05$).

²Significant decreasing linear trend ($p < 0.05$).

NOTES: Based on a sample of 167,945 emergency department visits, including 2,780 with a tooth-related reason for visit or diagnosis. Reason for visit is based on *A Reason for Visit Classification for Ambulatory Care* (7) codes 1500.0–1500.3, 2675.1, and 2675.2. Diagnosis is based on the *International Classification of Diseases, Ninth Revision, Clinical Modification* (8) codes 520–525, 526.6, and 873.63 for 2014 and 2015, and *International Classification of Diseases, 10th Revision, Clinical Modification* (9) codes K00–K08, M27.5, M27.6, and S02.5 for 2016–2022. Data were collected on up to 30 medications that were either given in the emergency department or prescribed at discharge. Drugs were classified using the UpToDate Lexidrug second-level therapeutic drug category (available from: <https://www.wolterskluwer.com/en/solutions/uptodate/pro/lexidrug>). Opioids include drug categories 060 and 191 and nonopioid analgesics include categories 059, 061, 062, and 063.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2014–2022.

Summary

During 2020–2022, tooth disorders, as a reason for visit or a diagnosis, accounted for about 1.9 million ED visits per year, or about 1.4% of all ED visits, with a rate of 59.4 visits per 10,000 people. The percent distribution of ED visits for tooth disorders varied by patient age and by patient race and ethnicity, but not by patient sex. The largest percentage of ED visits for tooth disorders was made by adults ages 25–34 (29.2%). The majority of ED visits for tooth disorders were made by White people, followed by Black and Hispanic people. The primary expected source of payment at ED visits for tooth disorders was most frequently Medicaid, followed by private insurance, uninsured, and Medicare. The use of opioids for pain relief at ED visits for tooth disorders decreased in 2020–2022 compared with 2014–2016 and 2017–2019. At the same time, a corresponding increase in the use of nonopioid analgesics was seen. Nonopioid analgesics, excluding those used in combination with an opioid, were prescribed most often in 2020–2022, followed by opioids alone and opioids in combination with a nonopioid analgesic.

Definitions

Visits for tooth disorders: Patients' medical records were reviewed by NHAMCS data collection agents who recorded up to five reasons for making the sampled ED visit and up to five diagnoses. Visits shown in this report were based on either reason for visit or diagnoses related to tooth disorders. Verbatim text was used to describe both the patient's expressed symptoms, complaint, or other reason for making the ED visit as well as the provider's diagnosis. Reason

for visit text entries were later coded by National Center for Health Statistics medical coders using *A Reason for Visit Classification for Ambulatory Care* developed by the National Center for Health Statistics for use with NHAMCS data (7). Reason for visit codes used in this report are 1500.0–1500.3, 2675.1, and 2675.2. For 2014–2015, diagnoses were coded using the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD–9–CM) (8). Diagnosis codes used to define tooth disorders for 2014 and 2015 include ICD–9–CM codes 520–525, 526.6, and 873.63. For 2016–2022, diagnoses were coded using the *International Classification of Diseases, 10th Revision, Clinical Modification* (ICD–10–CM) (9). Diagnosis codes used to define tooth disorders for 2016–2022 include ICD–10–CM codes K00–K08, M27.5, M27.6, and S02.5. Any ED visit with either a reason for visit or a diagnosis of at least one of the codes listed above was included in this analysis.

Rate of visits for tooth disorders: Visit rates were calculated for three sets of years: 2014–2016, 2017–2019, and 2020–2022. The number of ED visits by people with tooth disorders for each 3-year period was divided by the corresponding sets of estimates of the U.S. civilian noninstitutionalized population, developed by the U.S. Census Bureau’s Population Division for July 1, 2014–July 1, 2022.

Primary expected source of payment: During data collection, all sources of payment were collected. For patients with more than one source of payment, the following hierarchy was used (with Medicare counted first and self-pay and no charge counted last) to combine payments into one mutually exclusive variable (primary expected source of payment):

- Medicare: Partial or full payment by a Medicare plan includes payments made directly to the hospital and payments reimbursed to the patient. Charges covered under a Medicare-sponsored prepaid plan are included.
- Medicaid: Partial or full payment by a Medicaid plan includes payments made directly to the hospital or reimbursed to the patient. Charges covered under a Medicaid-sponsored prepaid plan (health maintenance organization, for example), managed Medicaid, or the Children’s Health Insurance Program (CHIP) and other state-based programs are included.
- Private: Partial or full payment by a private insurer (such as BlueCross BlueShield) includes payments made directly to the hospital or reimbursed to the patient. Charges covered under a private insurance-sponsored prepaid plan are included.
- Uninsured: Includes self-pay and no charge or charity. Self-pay includes charges paid by the patient or patient’s family that will not be reimbursed by a third party. Self-pay includes visits for which the patient is expected to be ultimately responsible for most of the bill, even if the patient never actually pays it. This does not include copayments or deductibles. No charge or charity are visits for which no fee is charged (such as charity, special research, or teaching).
- Other: Includes worker’s compensation and other sources of payment not covered by the preceding categories, such as TRICARE, state and local governments, private charitable organizations, and other liability insurance (such as automobile collision policy coverage).

Race and ethnicity: Race and Hispanic ethnicity were collected separately, imputed, and converted into a single combined variable that includes Hispanic, Black non-Hispanic, White non-Hispanic, and other non-Hispanic races. Other races includes American Indian and Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander, and people of two or more races. For 2020–2022, 14.2% of weighted race data and 11.6% of weighted ethnicity data were missing for ED visits for tooth disorders; race and ethnicity were imputed for these missing records.

Data source and methods

This report analyzed data from NHAMCS, a nationally representative annual survey of nonfederal general and short-stay hospitals in the United States. NHAMCS uses a multistage probability design with samples of geographic primary sampling units, hospitals within primary sampling units, and patient visits within EDs. Analyses for this report were conducted using data from restricted-use data files. Public-use versions of these files are available from: <https://www.cdc.gov/nchs/nhamcs/documentation/index.html>. Count estimates and measures of variance could differ between the restricted-use and public-use files. Information for accessing the restricted-use data file is available from: <https://www.cdc.gov/rdc/index.html>. Additional information on NHAMCS's methodology is available online (10–18). This report includes data from the 2014–2022 survey years.

Data analyses were performed using the statistical packages SAS version 9.4 (SAS Institute, Cary, N.C.) and SAS-callable SUDAAN version 11.0 (RTI International, Research Triangle Park, N.C.). Differences among groups were evaluated using two-sided significance tests at the $p < 0.05$ level. To test for linear and quadratic trends over time, the null hypothesis of nonlinear or quadratic trends was examined using the POLY option in SUDAAN. Linear regression was used to test the significance of slope according to NCHS trend analysis guidelines (19). All estimates meet NCHS presentation standards for proportions unless otherwise noted (20).

About the authors

Susan M. Schappert and Loredana Santo are with the National Center for Health Statistics, Division of Health Care Statistics.

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Figure tables

Data table for Figure 1. Emergency department visit rates for tooth disorders: United States, 2014–2022

| Years | Average annual number of visits per 10,000 people | Standard error | 95% confidence interval |
|--------------------|---|----------------|-------------------------|
| 2014–2016. | 88.4 | 6.6 | 76.3–102.4 |
| 2017–2019. | 69.8 | 4.8 | 60.9–80.0 |
| 2020–2022. | 59.4 | 4.3 | 51.5–68.4 |

NOTES: Significant decreasing linear trend between 2014 and 2022 ($p < 0.05$). Based on a sample of 167,945 emergency department visits, including 2,780 with a tooth-related reason for visit or diagnosis. The estimated annual average number of visits for tooth disorders was 2,794,000 in 2014–2016, 2,247,000 in 2017–2019, and 1,944,000 in 2020–2022. Reason for visit is based on *A Reason for Visit Classification for Ambulatory Care* (7) codes 1500.0–1500.3, 2675.1, and 2675.2. Diagnosis is based on the *International Classification of Diseases, Ninth Revision, Clinical Modification* (8) codes 520–525, 526.6, and 873.63 for 2014 and 2015, and *International Classification of Diseases, 10th Revision, Clinical Modification* (9) codes K00–K08, M27.5, M27.6, and S02.5 for 2016–2022. Rates were calculated by dividing the number of emergency department visits for tooth disorders in each 3-year period by the corresponding sets of estimates of the U.S. civilian noninstitutionalized population, developed by the U.S. Census Bureau for July 1, 2014–July 1, 2022.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2014–2022.

Data table for Figure 2. Percent distribution of emergency department visits for tooth disorders, by selected patient characteristics: United States, 2020–2022

| Characteristic | Percent distribution | Standard error | 95% confidence interval |
|--|----------------------|----------------|-------------------------|
| Age group | | | |
| Younger than 18 | 11.9 | 1.9 | 8.4–16.3 |
| 18–24 ¹ | 13.3 | 1.6 | 10.2–16.8 |
| 25–34 ² | 29.2 | 2.3 | 24.7–34.0 |
| 35–44 | 20.2 | 1.8 | 16.7–24.0 |
| 45–64 | 18.5 | 1.9 | 14.9–22.6 |
| 65 and older ³ | 6.9 | 1.7 | 3.9–11.1 |
| Sex | | | |
| Female | 48.8 | 2.8 | 43.3–54.4 |
| Male | 51.2 | 2.8 | 45.6–56.7 |
| Race and ethnicity | | | |
| White, non-Hispanic ^{4,5} | 52.7 | 2.6 | 47.5–57.9 |
| Black, non-Hispanic ⁵ | 31.9 | 2.8 | 26.5–37.7 |
| Hispanic | 14.5 | 2.2 | 10.5–19.4 |

¹Significantly lower than those ages 35–44 and 45–64 ($p < 0.05$).

²Significantly higher than all other age groups ($p < 0.05$).

³Significantly lower than all other age groups ($p < 0.05$).

⁴Significantly higher than Black non-Hispanic people ($p < 0.05$).

⁵Significantly higher than Hispanic people ($p < 0.05$).

NOTES: Based on a sample of 47,092 emergency department visits, including 676 with a tooth-related reason for visit or diagnosis, yielding an estimated annual average of 1,944,000 visits for tooth disorders. Reason for visit is based on *A Reason for Visit Classification for Ambulatory Care* (7) codes 1500.0–1500.3, 2675.1, and 2675.2. Diagnosis is based on the *International Classification of Diseases, 10th Revision, Clinical Modification* (9) codes K00–K08, M27.5, M27.6, and S02.5. People of Hispanic origin may be of any race. Estimates for non-Hispanic people of other races, which includes Asian, Native Hawaiian or Other Pacific Islander, and American Indian and Alaska Native people, are not shown, but those data are included in the denominator. In 2020–2022, race was missing for 14.2% (weighted) and ethnicity was missing for 11.6% (weighted) of visits for tooth disorders.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2020–2022.

Data table for Figure 3. Percent distribution of emergency department visits for tooth disorders, by primary expected source of payment: United States, 2020–2022

| Primary expected source of payment | Percent distribution | Standard error | 95% confidence interval |
|--|----------------------|----------------|-------------------------|
| Private insurance ¹ | 19.3 | 2.3 | 14.9–24.3 |
| Medicare | 10.4 | 2.2 | 6.6–15.6 |
| Medicaid ² | 55.4 | 3.5 | 48.2–62.5 |
| Uninsured | 12.2 | 1.9 | 8.7–16.6 |

¹Significantly higher than Medicare and uninsured ($p < 0.05$).

²Significantly higher than all other categories ($p < 0.05$).

NOTES: Based on a sample of 47,092 emergency department visits, including 676 with a tooth-related reason for visit or diagnosis, yielding an estimated annual average of 1,944,000 visits for tooth disorders. Reason for visit is based on *A Reason for Visit Classification for Ambulatory Care* (7) codes 1500.0–1500.3, 2675.1, and 2675.2. Diagnosis is based on the *International Classification of Diseases, 10th Revision, Clinical Modification* (9) codes K00–K08, M27.5, M27.6, and S02.5. Other primary expected sources of payment accounted for 2.6% of visits for tooth disorders and are not shown in the figure but have been included in the denominator. Data on primary expected source of payment were missing for 9.8% (weighted) of visits for tooth disorders; missing data have been excluded from the denominator.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2020–2022.

Data table for Figure 4. Percentage of emergency department visits for tooth disorders, by pain relief drugs given or prescribed: United States, 2014–2022

| Drug category | 2014–2016 | | | 2017–2019 | | | 2020–2022 | | |
|---|-----------|----------------|-------------------------|-----------|----------------|-------------------------|-----------|----------------|-------------------------|
| | Percent | Standard error | 95% confidence interval | Percent | Standard error | 95% confidence interval | Percent | Standard error | 95% confidence interval |
| Opioid only ¹ | 38.1 | 2.2 | 33.7–42.7 | 25.3 | 1.9 | 21.6–29.4 | 16.5 | 1.8 | 13.1–20.4 |
| Opioid and nonopioid analgesic ¹ | 18.6 | 1.8 | 15.1–22.5 | 13.8 | 1.6 | 10.7–17.4 | 12.3 | 1.7 | 9.2–16.1 |
| Nonopioid analgesic only ² | 20.0 | 1.7 | 16.7–23.6 | 30.6 | 2.2 | 26.3–35.1 | 38.4 | 2.5 | 33.6–43.5 |

¹Significant decreasing linear trend ($p < 0.05$).

²Significant increasing linear trend ($p < 0.05$).

NOTES: Based on a sample of 167,945 emergency department visits, including 2,780 with a tooth-related reason for visit or diagnosis. Reason for visit is based on *A Reason for Visit Classification for Ambulatory Care* (7) codes 1500.0–1500.3, 2675.1, and 2675.2. Diagnosis is based on the *International Classification of Diseases, Ninth Revision, Clinical Modification* (8) codes 520–525, 526.6, and 873.63 for 2014 and 2015, and *International Classification of Diseases, 10th Revision, Clinical Modification* (9) codes K00–K08, M27.5, M27.6, and S02.5 for 2016–2022. Data were collected on up to 30 medications that were either given in the emergency department or prescribed at discharge. Drugs were classified using the UpToDate Lexidrug second-level therapeutic drug category (available from: <https://www.wolterskluwer.com/en/solutions/uptodate/pro/lexidrug>). Opioids include drug categories 060 and 191 and nonopioid analgesics include categories 059, 061, 062, and 063.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2014–2022.

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