



GUIDANCE ON ASSESSING EMERGENCY DEPARTMENT DATA FOR NON-TRAUMATIC DENTAL CONDITIONS JULY 2017 (UPDATED SEPTEMBER 2017)

Due to the technical nature of this topic, this information will be most helpful to dental directors, data analysts, epidemiologists and statisticians.

Does your state want to assess the use of emergency departments for non-traumatic dental conditions?

If yes, then you probably have questions about data sources, indicators of interest, diagnostic codes, analysis methods, target populations and potential predictive factors. The purpose of this document is to provide a standardized framework for how state oral health programs (SOHPs) should evaluate and document the use of emergency departments (EDs) for non-traumatic dental conditions (NTDCs). By following this guidance, SOHPs will be able to compare their ED data to information from other states and have the ability to assess trends in ED use over time. While the focus of this guidance is the generation of state specific estimates using statewide ED discharge databases, the recommended codes and analysis techniques can be used for databases that are specific to a local community (e.g., hospital service area) or target population (e.g., Medicaid). This guidance is an abbreviated version of the ASTDD report, [Recommended Guidelines for Surveillance of Non-Traumatic Dental Care in Emergency Departments](#). If you need more detailed information, including previously published research, please refer to [Recommended Guidelines for Surveillance of Non-Traumatic Dental Care in Emergency Departments](#) and its companion report, [Methods of Assessing Non-Traumatic Dental Care in Emergency Departments](#).

Where do I get state specific ED discharge data?

In general, there are two sources for state specific ED data: (1) the [State Emergency Department Databases \(SEDD\)](#) and (2) other state ED databases.

State Emergency Department Databases

The SEDD are a set of databases and software tools developed for the Agency for Healthcare Research and Quality's [Healthcare Cost and Utilization Project \(HCUP\)](#). The SEDD capture emergency visits at hospital-affiliated EDs that do not result in hospitalization. The SEDD files include all patients, regardless of payer, providing a unique view of ED care in a state over time. As of July 2017, [35 states](#) participate in the SEDD. The SEDD contain a large number of clinical and non-clinical variables included in a hospital discharge abstract, such as:

- All-listed diagnoses and procedures
- Patient demographic characteristics (e.g., sex, age and, for some states, race)
- Expected payment source
- Total charges.

Variables included in the SEDD are not always available for all states; refer to [Availability of Data Elements by Year](#) for additional information on which variables are available for your state. SEDD releases can be purchased through the [HCUP Central Distributor](#). Costs vary by state; for 2014 they ranged from \$50 to \$3,200. Data for earlier years are often available at a lower cost.

Other State ED Databases

If your state does not participate in the SEDD, there may be another source for statewide ED data. ASTDD recommends that SOHPs discuss the issue of use of EDs for NTDCs with your state health officer and determine if SEDD or another state ED discharge database is available for analysis. The recommendations and methods

presented in this document should be generally applicable to both SEDD and non-SEDD state ED discharge databases.

What diagnostic codes should we use?

Based on the ICD-9 and ICD-10 diagnostic codes, ASTDD has created two broad categories for **ED visit due to an oral condition**: (1) non-traumatic dental condition (NTDC) and (2) caries, periodontal or associated preventive procedures (CPP). NTDC includes caries, periodontal disease, erosion, occlusal anomalies, cysts, impacted teeth, teething, and all other non-traumatic conditions associated with the oral cavity. Diagnoses that are deemed due to trauma are excluded from this definition. CPP includes only those conditions directly associated with dental caries, periodontal disease, or preventive procedures associated with these diseases that are routinely provided in a dental clinic setting. CPP would include diagnoses related to dental caries, gingival and periodontal conditions, loss of teeth (not due to trauma), endodontic conditions, and caries and periodontal related preventive procedures. The codes for NTDC are a subset of all oral and facial related codes, and the codes for CPP are a subset of the NTDC codes. Refer to Appendix 1 for a listing of the specific ICD-9 and ICD-10 codes for NTDC and CPP. If you want all oral and facial related codes and codes for NTDC and CPP as an Excel spreadsheet for easier use in data analysis, [click here](#).

To assure comparability between states, ASTDD recommends that all states use the ICD codes listed in Appendix 1.

IMPORTANT NOTE: On October 1, 2015, the United States transitioned from using ICD-9 to ICD-10 code sets. The SEDD databases are annual, calendar-year files. The introduction of ICD-10 on October 1 means that the 2015 databases include a combination of codes: nine months of the data with ICD-9 codes (01-01-2015 to 09-30-2015) and three months of data with ICD-10 codes (10-01-2015 to 12-31-2015). Therefore, for 2015, code sets determining ED oral condition visit outcomes will include both ICD-9 and ICD-10 codes. NOTE: The comparability of estimates across the ICD-9 to ICD-10 transition is uncertain and may potentially over- or under-estimate various indicators. ASTDD recommends keeping your analysis distinct to either ICD-9 or ICD-10, and using caution when comparing across the transition.

Should I use the reason for visit codes or the diagnostic codes?

The SEDD databases contain codes for reason for visit, often referred to as presenting complaint(s), plus codes for ED physician's diagnoses, which may not necessarily match the patient's reason(s) for visit. For example, a patient may have a presenting complaint of "chest pain" while the physician's diagnosis is "hiatal hernia." Since reason for visit and diagnosis provide valuable yet potentially different (patient vs. physician) information on ED use for NTDCs, ASTDD has developed indicators that assess both types of codes (refer to Table 1). Using both types of indicators can be especially important for ED discharge data having an oral related reason for visit without a corresponding oral related diagnostic code (or vice versa). NOTE: Some ED discharge databases may not contain code(s) for reason for visit.

Should I evaluate first listed diagnosis or any listed diagnosis?

An ED record may include multiple diagnostic codes. The first listed diagnosis is often considered to be the "primary" or most important diagnosis by the physician. For example, a patient may have a first listed diagnosis of a non-oral medical condition or a trauma related oral condition such as "dislocation of the jaw" and a second listed diagnosis of "unspecified gingival and periodontal disease." If only the first listed diagnosis is included in the analysis, this patient would not be classified as having an ED visit for a NTDC. If all listed diagnoses are considered, this patient would be classified as having an ED visit for a NTDC. By using all diagnoses, untreated dental conditions presenting at an ED can be tracked, even if the condition was not the primary diagnosis for the ED visit. ASTDD has developed indicators that assess both first listed diagnosis and any listed diagnosis (refer to Table 1).

What oral health indicators should we evaluate?

Analyzing an ED database will allow you to evaluate a multitude of oral health indicators. Because the total number of indicators can be overwhelming, ASTDD has developed a core or foundational set of five indicators to include in a state ED-NTDC surveillance system. We encourage states to expand their ED-NTDC surveillance to include a wider variety of indicators and predictors based on the needs and resources of the individual state. For information on other potential indicators and predictors, refer to [Recommended Guidelines for Surveillance of Non-Traumatic Dental Care in Emergency Department](#). If you are interested in expanding your ED-NTDC surveillance system beyond the core set of five indicators and recommended predictors, Appendix 2 provides information on optional factors/analyses that you may want to consider.

Recommended indicators (refer to Table 1 for additional detail):

1. ED visit for NTDC based on **first listed** diagnosis
2. ED visit for NTDC based on **any listed** diagnosis
3. ED visit for NTDC based on **first listed reason for visit**
4. ED visit for NTDC based on **any listed reason for visit**
5. ED visit for NTDC based on **any listed diagnosis and/or any listed reason for visit (most inclusive)**.

Recommended reporting and stratification variables (refer to Table 2 for additional detail):

- For each of the five recommended indicators, ASTDD suggests that states report, **at a minimum**:
 - Count – number of ED visits associated with specific outcome in a given year
 - Rate per 100,000 population using [Census Bureau population estimates](#)
 - Count divided by population multiplied by 100,000
 - It may not be possible to calculate rate per 100,000 population when data are stratified by primary payer or race/ethnicity
 - Rate per 10,000 ED visits
 - Count divided by total ED visits multiplied by 10,000
 - Total charges associated with each indicator (use SEDD variable – TOTCHG)
- States, **at a minimum**, should report overall estimates plus estimates stratified by:
 - Age (< 20, 20-44, 45-64, 65+)
 - These age groups were selected because population estimates are readily available from the U.S. Census. As part of an expanded ED-NTDC surveillance system, states may opt to generate estimates for smaller age groupings.
 - Primary payer (Medicare, Medicaid, private insurance, uninsured, other)
 - NOTE: Information on the number of individuals with each payer type is not readily available. Because of this, it may not be possible to generate rate per 100,000 population.
 - Race/ethnicity if available (white, black, Hispanic, Asian/Pacific Islander, Native American, other)
 - NOTE: The SEDD coding for race does not align with the U.S. Census coding for race. Because of this, it is not possible to generate rate per 100,000 population.

Table 1: Recommended ED-NTDC indicators and the appropriate SEDD data elements

Indicator	SEDD Data Element, ICD-9	SEDD Data Element, ICD-10	Comments/Notes
1. NTDC 1 st diagnosis	DX1	I10_DX1	Include 1 st listed diagnosis only
2. NTDC any diagnosis	DXn	I10_DXn	Include all listed diagnoses
3. NTDC 1 st reason visit	DX_Visit_Reason1	I10_Visit_Reason1	Include 1 st listed reason only
4. NTDC any reason visit	DX_Visit_Reasonn	I10_Visit_Reasonn	Include all listed reasons
5. NTDC any diagnosis/visit	DXn & DX_Visit_Reasonn	I10_DXn & I10_Visit_Reasonn	Include all listed diagnoses & reasons

Table 2: Recommended ED-NTDC analysis and stratification factors with SEDD data element names

Description	SEDD Data Element	Comments/Notes
Total Charges	TOTCHG	Generally, TOTCHG does not include professional fees and non-covered charges. Refer to SEDD's state specific notes for additional detail.
Age	AGE or AGEGROUP	Most states report age while some may only report by age group.
Primary payer	PAY1	To ensure uniformity across states, PAY1 combines detailed categories into more general groups. Refer to SEDD's state specific notes for additional detail.
Race/ethnicity (if available)	RACE	HCUP coding includes race/ethnicity in one data element (RACE). If the state supplied race and ethnicity in separate data elements, ethnicity takes precedence over race in setting the HCUP value for race. Race is not available for all states. Refer to SEDD's state specific notes .

What statistical software package and program code should I use?

Any statistical software package can be used. If you are using a SEDD database, the HCUP Central Distributor provides load programs for SAS, SPSS and Stata. Refer to Appendix 3 for sample SAS code.

Limitations and general issues to be aware of:

- Some individuals may seek care for NTDCs at urgent care clinics rather than hospital-based EDs. ED discharge databases such as SEDD do not include information from urgent care clinics.
- SEDD ED discharge databases include information on patients that were discharged from the ED, but do not include information on patients that presented at the ED and were subsequently admitted to the hospital. Information about patients initially seen in the ED and then admitted to the hospital is included in the [State Inpatient Databases \(SID\)](#). SID can be used by states interested in assessing the increment of oral condition ED visits resulting in hospital admission.
- Some patients may live in one state but seek ED care in a bordering state; the resident state ED database will not capture information on patients obtaining cross-state care. If a state wants to determine the extent of cross-state care, the ED discharge database for the neighboring state can be evaluated using the SEDD variable for patient state (PSTATE).
- Many ED datasets use unique identifiers associated with an ED visit, not a specific person. Because of this, repeat visits by a person cannot be identified and the extent of repeat visits to EDs for the same oral problem cannot be quantified. Check individual states to determine if linking variables (VisitLink, DaysToEvent –see Appendix 2) are available to assess repeat visits.
- Drug-seeking behavior may result in oral pain given as the reason for visit, skewing the picture of true oral care in EDs.
- Refer to [Recommended Guidelines for Surveillance of Non-Traumatic Dental Care in Emergency Departments](#) for a more complete description of limitations and concerns.

Where can I get additional help?

ASTDD may be able to help you with your analysis process. Please contact us if you have any questions.

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References and additional resources

- [Recommended Guidelines for Surveillance of Non-Traumatic Dental Care in Emergency Departments](#)
- [Methods of Assessing Non-Traumatic Dental Care in Emergency Departments](#)
- [Overview of the State Emergency Department Databases](#)

APPENDIX 1
THE RECOMMENDED ICD-9 AND ICD-10 CODES FOR DEFINING NTDC AND CPP

ICD- 9 Description	ICD-9 Code	ICD-10 Code	ICD-10 Description (if different)	NTDC	CPP
Anodontia	5200	K000		NTDC	
Supernumerary teeth	5201	K001		NTDC	
Abnormalities of size and form of teeth	5202	K002		NTDC	
Mottled teeth	5203	K003		NTDC	
Disturbances of tooth formation	5204	K004		NTDC	
Hereditary disturbances in tooth structure, not elsewhere classified	5205	K005		NTDC	
Disturbances in tooth eruption	5206	K006	Disturbances in tooth eruption	NTDC	
Disturbances in tooth eruption	5206	K010	Embedded teeth	NTDC	
Disturbances in tooth eruption	5206	K011	Impacted teeth	NTDC	
Teething syndrome	5207	K007	Teething syndrome	NTDC	
Other specified disorders of tooth development and eruption	5208	K008	Other specified disorders of tooth development	NTDC	
Unspecified disorder of tooth development and eruption	5209	K009	Disorder of tooth development, unspecified	NTDC	
Dental caries, unspecified	52100	K029	Dental caries, unspecified	NTDC	CPP
Dental caries limited to enamel	52101	K0261	Dental caries on smooth surface limited to enamel	NTDC	CPP
Dental caries extending into dentine	52102	K0262	Dental caries on smooth surface penetrating into dentine	NTDC	CPP
Dental caries extending into pulp	52103	K0263	Dental caries on smooth surface penetrating into pulp	NTDC	CPP
Arrested dental caries	52104	K023	Arrested dental caries	NTDC	CPP
Odontoclasia	52105	K0389	Other specified diseases of hard tissues of teeth	NTDC	CPP
Dental caries pit and fissure	52106	K0251	Dental caries pit and fissure surface limited to enamel	NTDC	CPP
Dental caries of smooth surface	52107	K0261	Dental caries on smooth surface limited to enamel	NTDC	CPP
Dental caries of smooth surface	52107	K0262	Dental caries on smooth surface penetrating into dentine	NTDC	CPP
Dental caries of smooth surface	52107	K0263	Dental caries on smooth surface penetrating into pulp	NTDC	CPP
Dental caries of root surface	52108	K027	Dental root caries	NTDC	CPP
Other dental caries	52109	K029	Dental caries, unspecified	NTDC	CPP
Excessive dental attrition, unspecified	52110	K030	Excessive attrition of teeth	NTDC	
Excessive attrition, limited to enamel	52111	K030	Excessive attrition of teeth	NTDC	
Excessive attrition, extending into dentine	52112	K030	Excessive attrition of teeth	NTDC	
Excessive attrition, extending into pulp	52113	K030	Excessive attrition of teeth	NTDC	
Excessive attrition, localized	52114	K030	Excessive attrition of teeth	NTDC	
Excessive attrition, generalized	52115	K030	Excessive attrition of teeth	NTDC	
Abrasion of teeth, unspecified	52120	K031	Abrasion of teeth	NTDC	
Abrasion, limited to enamel	52121	K031	Abrasion of teeth	NTDC	
Abrasion, extending into dentine	52122	K031	Abrasion of teeth	NTDC	
Abrasion, extending into pulp	52123	K031	Abrasion of teeth	NTDC	
Abrasion, localized	52124	K031	Abrasion of teeth	NTDC	
Abrasion, generalized	52125	K031	Abrasion of teeth	NTDC	
Erosion, unspecified	52130	K032	Erosion of teeth	NTDC	
Erosion, limited to enamel	52131	K032	Erosion of teeth	NTDC	
Erosion, extending into dentine	52132	K032	Erosion of teeth	NTDC	
Erosion, extending into pulp	52133	K032	Erosion of teeth	NTDC	
Erosion, localized	52134	K032	Erosion of teeth	NTDC	
Erosion, generalized	52135	K032	Erosion of teeth	NTDC	
Pathological resorption, unspecified	52140	K033	Pathological resorption of teeth	NTDC	
Pathological resorption, internal	52141	K033	Pathological resorption of teeth	NTDC	
Pathological resorption, external	52142	K033	Pathological resorption of teeth	NTDC	
Other pathological resorption	52149	K033	Pathological resorption of teeth	NTDC	
Hypercementosis	5215	K034		NTDC	
Ankylosis of teeth	5216	K035		NTDC	
Intrinsic posteruptive color changes of teeth	5217	K037	Intrinsic posteruptive color changes of hard tissues of teeth	NTDC	
Cracked tooth	52181	K0381		NTDC	CPP
Other specific diseases of hard tissues of teeth	52189	K0389		NTDC	CPP

ICD- 9 Description	ICD-9 Code	ICD-10 Code	ICD-10 Description (if different)	NTDC	CPP
Unspecified disease of hard tissues of teeth	5219	K039	Disease of hard tissues of teeth, unspecified	NTDC	CPP
Pulpitis	5220	K040		NTDC	CPP
Necrosis of the pulp	5221	K041		NTDC	CPP
Pulp degeneration	5222	K042		NTDC	CPP
Abnormal hard tissue formation in pulp	5223	K043		NTDC	
Acute apical periodontitis of pulpal origin	5224	K044		NTDC	CPP
Periapical abscess without sinus	5225	K047		NTDC	CPP
Chronic apical periodontitis	5226	K045		NTDC	CPP
Periapical abscess with sinus	5227	K046		NTDC	CPP
Radicular cyst	5228	K048		NTDC	
Other and unspecified diseases of pulp and periapical tissues	5229	K0490	Unspecified diseases of pulp and periapical tissues	NTDC	CPP
Other and unspecified diseases of pulp and periapical tissues	5229	K0499	Other diseases of pulp and periapical tissues	NTDC	CPP
Acute gingivitis, plaque induced	52300	K0500		NTDC	CPP
Acute gingivitis, non-plaque induced	52301	K0501		NTDC	CPP
Chronic gingivitis, plaque induced	52310	K0510		NTDC	CPP
Chronic gingivitis, non-plaque induced	52311	K0511		NTDC	CPP
Gingival recession, unspecified	52320	K060	Gingival recession	NTDC	CPP
Gingival recession, minimal	52321	K060	Gingival recession	NTDC	CPP
Gingival recession, moderate	52322	K060	Gingival recession	NTDC	CPP
Gingival recession, severe	52323	K060	Gingival recession	NTDC	CPP
Gingival recession, localized	52324	K060	Gingival recession	NTDC	CPP
Gingival recession, generalized	52325	K060	Gingival recession	NTDC	CPP
Aggressive periodontitis, unspecified	52330	K0520		NTDC	CPP
Aggressive periodontitis, localized	52331	K0521		NTDC	CPP
Aggressive periodontitis, generalized	52332	K0522		NTDC	CPP
Acute periodontitis	52333	K0520		NTDC	CPP
Chronic periodontitis, unspecified	52340	K0530		NTDC	CPP
Chronic periodontitis, localized	52341	K0531		NTDC	CPP
Chronic periodontitis, generalized	52342	K0532		NTDC	CPP
Periodontosis	5235	K0540		NTDC	CPP
Accretions on teeth	5236	K036	Deposits (accretions) on teeth	NTDC	CPP
Other specified periodontal diseases	5238	K055	Other periodontal diseases	NTDC	CPP
Other specified periodontal diseases	5238	K061	Gingival enlargement	NTDC	CPP
Unspecified gingival and periodontal disease	5239	K056	Periodontal disease, unspecified	NTDC	CPP
Major anomalies of jaw size, unspecified anomaly	52400	M2600	Unspecified anomaly of jaw size	NTDC	
Major anomalies of jaw size, maxillary hyperplasia	52401	M2601	Maxillary hyperplasia	NTDC	
Major anomalies of jaw size,	52402	M2603	Mandibular hyperplasia	NTDC	
Major anomalies of jaw size, maxillary hypoplasia	52403	M2602	Maxillary hypoplasia	NTDC	
Major anomalies of jaw size, mandibular hypoplasia	52404	M2604	Mandibular hypoplasia	NTDC	
Major anomalies of jaw size, macrogenia	52405	M2605	Macrogenia	NTDC	
Major anomalies of jaw size, microgenia	52406	M2606	Microgenia	NTDC	
Excessive tuberosity of jaw	52407	M2607		NTDC	
Major anomalies of jaw size, other specified anomaly	52409	M2609	Other specified anomalies of jaw size	NTDC	
Anomalies of relationship of jaw to cranial base, unspecified anomaly	52410	M2610	Unspecified anomaly of relationship of jaw-cranial base relationship	NTDC	
Anomalies of relationship of jaw to cranial base, maxillary asymmetry	52411	M2611	Maxillary asymmetry	NTDC	
Anomalies of relationship of jaw to cranial base, other jaw asymmetry	52412	M2612	Other jaw asymmetry	NTDC	
Anomalies of relationship of jaw to cranial base, other specified anomaly	52419	M2619	Other specified anomalies of jaw-cranial base relationship	NTDC	
Unspecified anomaly of dental arch relationship	52420	M2620		NTDC	
Malocclusion, Angle's class I	52421	M26211		NTDC	
Malocclusion, Angle's class II	52422	M26212		NTDC	
Malocclusion, Angle's class III	52423	M26213		NTDC	
Open anterior occlusal relationship	52424	M26220		NTDC	
Open posterior occlusal relationship	52425	M26221		NTDC	

ICD- 9 Description	ICD-9 Code	ICD-10 Code	ICD-10 Description (if different)	NTDC	CPP
Excessive horizontal overlap	52426	M2623		NTDC	
Reverse articulation	52427	M2624		NTDC	
Anomalies of interarch distance	52428	M2625		NTDC	
Other anomalies of dental arch relationship	52429	M2629		NTDC	
Unspecified anomaly of tooth position of fully erupted teeth	52430	M2630	Unspecified anomaly of tooth position of fully erupted tooth or teeth	NTDC	
Crowding of teeth	52431	M2631	Crowding of fully erupted teeth	NTDC	
Excessive spacing of teeth	52432	M2632	Excessive spacing of fully erupted teeth	NTDC	
Horizontal displacement of teeth	52433	M2633	Horizontal displacement of fully erupted tooth or teeth	NTDC	
Vertical displacement of teeth	52434	M2634	Vertical displacement of fully erupted tooth or teeth	NTDC	
Rotation of tooth/teeth	52435	M2635	Rotation of fully erupted tooth or teeth	NTDC	
Insufficient interocclusal distance of teeth (ridge)	52436	M2636	Insufficient interocclusal distance of fully erupted teeth (ridge)	NTDC	
Excessive interocclusal distance of teeth	52437	M2637	Excessive interocclusal distance of fully erupted teeth	NTDC	
Other anomalies of tooth position	52439	M2639	Other anomalies of tooth position of fully erupted tooth or teeth	NTDC	
Malocclusion, unspecified	5244	M264		NTDC	
Dentofacial functional abnormality, unspecified	52450	M2650	Dentofacial functional abnormalities, unspecified	NTDC	
Abnormal jaw closure	52451	M2651		NTDC	
Limited mandibular range of motion	52452	M2652		NTDC	
Deviation in opening and closing of the mandible	52453	M2653		NTDC	
Insufficient anterior guidance	52454	M2654		NTDC	
Centric occlusion maximum intercuspatation discrepancy	52455	M2655		NTDC	
Non-working side interference	52456	M2656		NTDC	
Lack of posterior occlusal support	52457	M2657		NTDC	
Other dentofacial functional abnormalities	52459	M2659		NTDC	
Temporomandibular joint disorders, unspecified	52460	M2660	Temporomandibular joint disorder, unspecified	NTDC	
Temporomandibular joint disorders, unspecified	52460	M2669	Other specified disorders of temporomandibular joint	NTDC	
Temporomandibular joint disorders, adhesions and ankylosis (bony or fibrous)	52461	M2661	Adhesions and ankylosis of temporomandibular joint	NTDC	
Temporomandibular joint disorders, arthralgia of temporomandibular joint	52462	M2662	Arthralgia of temporomandibular joint	NTDC	
Temporomandibular joint disorders, articular disc disorder (reducing or non-reducing)	52463	M2663	Articular disc disorder of temporomandibular joint	NTDC	
Temporomandibular joint sounds on opening and/or closing the jaw	52464	M2669	Other specified disorders of temporomandibular joint	NTDC	
Other specified temporomandibular joint disorders	52469	M2669	Other specified disorders of temporomandibular joint	NTDC	
Dental alveolar anomalies, unspecified alveolar anomaly	52470	M2670	Unspecified alveolar anomaly	NTDC	
Alveolar maxillary hyperplasia	52471	M2671		NTDC	
Alveolar mandibular hyperplasia	52472	M2672		NTDC	
Alveolar maxillary hypoplasia	52473	M2673		NTDC	
Alveolar mandibular hypoplasia	52474	M2674		NTDC	
Vertical displacement of alveolus and teeth	52475	M2679	Other specified alveolar anomaly	NTDC	
Occlusal plane deviation	52476	M2679	Other specified alveolar anomaly	NTDC	
Other specified alveolar anomaly	52479	M2679	Other specified alveolar anomaly	NTDC	
Anterior soft tissue impingement	52481	M2681		NTDC	
Posterior soft tissue impingement	52482	M2682		NTDC	
Other specified dentofacial anomalies	52489	M264	Malocclusion, unspecified	NTDC	
Other specified dentofacial anomalies	52489	M2689	Other dentofacial anomalies	NTDC	
Unspecified dentofacial anomalies	5249	M269	Dentofacial anomaly, unspecified	NTDC	
Exfoliation of teeth due to systemic causes	5250	K080		NTDC	
Acquired absence of teeth, unspecified	52510	K08109	Complete loss of teeth, unspecified cause, unspecified class	NTDC	
Loss of teeth due to periodontal disease	52512	K08429	Partial loss of teeth due to periodontal diseases, unspecified class	NTDC	CPP
Loss of teeth due to caries	52513	K08439	Partial loss of teeth due to caries unspecified class	NTDC	CPP

ICD- 9 Description	ICD-9 Code	ICD-10 Code	ICD-10 Description (if different)	NTDC	CPP
Other loss of teeth	52519	K08499	Partial loss of teeth due to other unspecified cause, unspecified class	NTDC	CPP
Unspecified atrophy of edentulous alveolar ridge	52520	K0820		NTDC	
Minimal atrophy of the mandible	52521	K0821		NTDC	
Moderate atrophy of the mandible	52522	K0822		NTDC	
Severe atrophy of the mandible	52523	K0823		NTDC	
Minimal atrophy of the maxilla	52524	K0824		NTDC	
Moderate atrophy of the maxilla	52525	K0825		NTDC	
Severe atrophy of the maxilla	52526	K0826		NTDC	
Retained dental root	5253	K083		NTDC	
Complete edentulism, unspecified	52540	K08109	Complete loss of teeth, unspecified cause, unspecified class	NTDC	
Complete edentulism, class I	52541	K08101	Complete loss of teeth, unspecified cause, class I	NTDC	
Complete edentulism, class II	52542	K08102	Complete loss of teeth, unspecified cause, class II	NTDC	
Complete edentulism, class III	52543	K08103	Complete loss of teeth, unspecified cause, class III	NTDC	
Complete edentulism, class IV	52544	K08104	Complete loss of teeth, unspecified cause, class IV	NTDC	
Partial edentulism, unspecified	52550	K08409	Partial loss of teeth, unspecified cause, unspecified class	NTDC	CPP
Partial edentulism, class I	52551	K08401	Partial loss of teeth, unspecified cause, class I	NTDC	CPP
Partial edentulism, class II	52552	K08402	Partial loss of teeth, unspecified cause, class II	NTDC	CPP
Partial edentulism, class III	52553	K08403	Partial loss of teeth, unspecified cause, class III	NTDC	CPP
Partial edentulism, class IV	52554	K08404	Partial loss of teeth, unspecified cause, class IV	NTDC	CPP
Unspecified unsatisfactory restoration of tooth	52560	K0850	Unsatisfactory restoration of tooth, unspecified	NTDC	CPP
Open restoration margins	52561	K0851	Open restoration margins of tooth	NTDC	CPP
Unrepairable overhanging of dental restorative materials	52562	K0852		NTDC	CPP
Fractured dental restorative material without loss of material	52563	K08530		NTDC	CPP
Fractured dental restorative material with loss of material	52564	K08531		NTDC	CPP
Contour of existing restoration of tooth biologically incompatible with oral health	52565	K0854		NTDC	CPP
Allergy to existing dental restorative material	52566	K0855		NTDC	CPP
Poor aesthetics of existing restoration	52567	K0856	Poor aesthetic of existing restoration of tooth	NTDC	CPP
Other unsatisfactory restoration of existing tooth	52569	K0859	Other unsatisfactory restoration of tooth	NTDC	CPP
Osseointegration failure of dental implant	52571	M2761		NTDC	CPP
Post-osseointegration biological failure of dental implant	52572	M2762		NTDC	CPP
Post-osseointegration mechanical failure of dental implant	52573	M2763		NTDC	CPP
Other endosseous dental implant failure	52579	M2769		NTDC	CPP
Other specified disorders of the teeth and supporting structures	5258	K088	Other specified disorders of teeth and supporting structures	NTDC	CPP
Other specified disorders of the teeth and supporting structures		M2679	Other specified alveolar anomalies	NTDC	
Unspecified disorder of the teeth and supporting structures	5259	K089	Disorder of teeth and supporting structures, unspecified	NTDC	CPP
Developmental odontogenic cysts	5260	K090		NTDC	
Fissural cysts of jaw	5261	K091	Developmental (nonodontogenic) cysts of oral region	NTDC	
Other cysts of jaws	5262	M2749		NTDC	
Central giant cell (reparative) granuloma	5263	M271	Giant cell granuloma, central	NTDC	
Inflammatory conditions of jaw	5264	M272		NTDC	
Alveolitis of jaw	5265	M273		NTDC	
Perforation of root canal space	52661	M2751	Perforation of root canal space due to endodontic treatment	NTDC	CPP
Endodontic overfill	52662	M2752		NTDC	CPP
Endodontic underfill	52663	M2753		NTDC	CPP
Other periradicular pathology associated with previous endodontic treatment	52669	M2759		NTDC	CPP
Exostosis of jaw	52681	M278	Other specified diseases of jaws	NTDC	
Other specified diseases of the jaws	52689	M278	Other specified diseases of jaws	NTDC	
Unspecified disease of the jaws	5269	M279	Disease of the jaws, unspecified	NTDC	

ICD- 9 Description	ICD-9 Code	ICD-10 Code	ICD-10 Description (if different)	NTDC	CPP
Atrophy of salivary gland	5270	K110		NTDC	
Hypertrophy of salivary gland	5271	K111		NTDC	
Sialoadenitis	5272	K1120	Sialoadenitis, unspecified	NTDC	
Abscess of salivary gland	5273	K113		NTDC	
Fistula of salivary gland	5274	K114		NTDC	
Sialolithiasis	5275	K115		NTDC	
Mucocele of salivary gland	5276	K116		NTDC	
Disturbance of salivary secretion	5277	K117	Disturbances of salivary secretion	NTDC	
Disturbance of salivary secretion	5277	R682	Dry mouth, unspecified	NTDC	
Other specified diseases of the salivary glands	5278	K118	Other diseases of salivary glands	NTDC	
Unspecified disease of the salivary glands	5279	K119	Disease of the salivary glands, unspecified	NTDC	
Stomatitis and mucositis, unspecified	52800	K122	Cellulitis and abscess of mouth	NTDC	
Stomatitis and mucositis, unspecified	52800	K1230	Oral mucositis (ulcerative), unspecified	NTDC	
Mucositis (ulcerative) due to antineoplastic therapy	52801	K1231	Oral mucositis (ulcerative) due to antineoplastic therapy	NTDC	
Mucositis (ulcerative) due to antineoplastic therapy	52801	K1233	Oral mucositis (ulcerative) due to radiation	NTDC	
Mucositis (ulcerative) due to other drugs	52802	K1232	Oral mucositis (ulcerative) due to other drugs	NTDC	
Other stomatitis and mucositis (ulcerative)	52809	K121	Other forms of stomatitis	NTDC	
Other stomatitis and mucositis (ulcerative)	52809	K1239	Other oral mucositis (ulcerative)	NTDC	
Cancrum oris	5281	A690	Necrotizing ulcerative stomatitis	NTDC	
Oral aphthae	5282	K120	Recurrent oral aphthae	NTDC	
Cellulitis and abscess of oral soft tissues	5283	K122	Cellulitis and abscess of mouth	NTDC	
Cysts of oral soft tissues	5284	K098	Other cysts of oral region, not elsewhere classified	NTDC	
Diseases of lips	5285	K130		NTDC	
Leukoplakia of oral mucosa, including tongue	5286	K1321		NTDC	
Minimal keratinized residual ridge mucosa	52871	K1322		NTDC	
Excessive keratinized residual ridge mucosa	52872	K1323		NTDC	
Other disturbances of oral epithelium, including tongue	52879	K1329		NTDC	
Oral submucosal fibrosis, including of tongue	5288	K135	Oral submucosal fibrosis	NTDC	
Other and unspecified diseases of the oral soft tissues	5289	K1370	Unspecified lesions of oral mucosa	NTDC	
Other and unspecified diseases of the oral soft tissues	5289	K1379	Other lesions of oral mucosa	NTDC	
Glossitis	5290	K140		NTDC	
Geographic tongue	5291	K141		NTDC	
Median rhomboid glossitis	5292	K142		NTDC	
Hypertrophy of tongue papillae	5293	K143		NTDC	
Atrophy of tongue papillae	5294	K144		NTDC	
Plicated tongue	5295	K145		NTDC	
Glossodynia	5296	K146		NTDC	
Other specified conditions of the tongue	5298	K148	Other diseases of the tongue	NTDC	
Unspecified condition of the tongue	5299	K149	Disease of tongue, unspecified	NTDC	
Jaw pain	78492	R6884		NTDC	CPP
Nonspecific abnormal findings in saliva	7924	R859	Unspecified abnormal finding in specimens from digestive organs and abdominal cavity	NTDC	
Fitting and adjustment of dental prosthetic device	V523	Z463	Encounter for fitting and adjustment of dental prosthetic device	NTDC	CPP
Fitting and adjustment of orthodontic devices	V534	Z464	Encounter for fitting and adjustment of orthodontic device	NTDC	CPP
Orthodontics aftercare	V585	Z464	Encounter for fitting and adjustment of orthodontic device	NTDC	CPP
Dental examination	V722	Z0120	Encounter for dental examination and cleaning without abnormal findings	NTDC	CPP
Dental examination	V723	Z0121	Encounter for dental examination and cleaning with abnormal findings	NTDC	CPP

APPENDIX 2

OPTIONAL FACTORS/ANALYSES THAT MAY BE INCLUDED IN AN EXPANDED ED-NTDC SURVEILLANCE SYSTEM

Optional Indicators

1. ED visit for CPP based on ***first listed*** diagnosis
2. ED visit for CPP based on ***any listed*** diagnosis
3. ED visit for CPP based on ***first listed reason for visit***
4. ED visit for CPP based on ***any listed reason for visit***
5. ED visit for CPP based on ***any listed diagnosis and/or any listed reason for visit***
6. ED visit for any oral condition based on ***first listed*** diagnosis
7. ED visit for any oral condition based on ***any listed*** diagnosis
8. ED visit for any oral condition based on ***first listed reason for visit***
9. ED visit for any oral condition based on ***any listed reason for visit***
10. ED visit for any oral condition based on ***any listed diagnosis and/or any listed reason for visit***

Optional Indicator	SEDD Data Element, ICD-9	SEDD Data Element, ICD-10	Comments/Notes
1. CPP 1 st diagnosis	DX1	I10_DX1	Include 1 st listed diagnosis only
2. CPP any diagnosis	DXn	I10_DXn	Include all listed diagnoses
3. CPP 1 st reason visit	DX_Visit_Reason1	I10_Visit_Reason1	Include 1 st listed reason only
4. CPP any reason visit	DX_Visit_Reasonn	I10_Visit_Reasonn	Include all listed reasons
5. CPP any diagnosis/visit	DXn & DX_Visit_Reasonn	I10_DXn & I10_Visit_Reasonn	Include all listed diagnoses & reasons
6. Any oral 1 st diagnosis	DX1	I10_DX1	Include 1 st listed diagnosis only
7. Any oral any diagnosis	DXn	I10_DXn	Include all listed diagnoses
8. Any oral 1 st reason visit	DX_Visit_Reason1	I10_Visit_Reason1	Include 1 st listed reason only
9. Any oral any reason visit	DX_Visit_Reasonn	I10_Visit_Reasonn	Include all listed reasons
10. Any oral any diagnosis/visit	DXn & DX_Visit_Reasonn	I10_DXn & I10_Visit_Reasonn	Include all listed diagnoses & reasons

Optional Stratification Factors and Analyses

Factors/Analyses	SEDD Data Element Name	Notes/Comments
Sex	FEMALE	
Marital status	MARITALSTATUSUB04	
Geographic location	ZIP or ZIP3	Patient zip code can be used to define geographic locations
Homelessness	Homeless	Not available for all states.
Weekend admission	AWEEKEND	
Income	ZIPINC_QRTL	ZIPINC_QRTL provides a quartile classification of the estimated median household income of residents in the patient's ZIP Code. The quartiles are identified by values of 1 to 4, indicating the poorest to wealthiest populations. These values are derived from ZIP Code-demographic data obtained from Claritas. Because these estimates are updated annually, the value ranges for the ZIPINC_QRTL categories vary by year.
Revisit by same patient	VisitLink & DaysToEvent	The VisitLink data element is one of two data elements that are supplemental information created for HCUP States for which there are encrypted person identifiers. The visit linkage variable (VisitLink) can be used in tandem with the timing variable (DaysToEvent) to study multiple hospital visits for the same patient across hospitals and time while adhering to strict privacy regulations. Not available for all states.
Trends over time		Generate indicators for multiple years to determine if ED visits due to NTDC have increased, decreased or remained the same.

APPENDIX 3 SAMPLE SAS CODE

General Information

To assist states with the process of generating the ED-NTDC indicators, ASTDD is providing sample SAS code. If you are using SPSS or Stata you will need to modify the code accordingly. **IMPORTANT: All states should review and revise the sample code to meet their individual needs.** States may have multiple SEDD files for a given year, but the data needed for the recommended ED-NTDC indicators are in the core file. Following are instructions on how to load the core file into your statistical package.

- Go to the HCUP website: <https://www.hcup-us.ahrq.gov/db/state/sedddbdocumentation.jsp>
- Scroll down to “File Specifications and Load Programs”. Click on the load program link for the statistical software package you will be using (SAS, SPSS, Stata). This example uses SAS.
 - Select the state and year you want to download
 - For the database option select SEDD
 - Click “Find”
 - A set of load programs for your state and year will appear at the bottom of the page
 - Select “Core SAS load program” and save to your hard drive
- After saving the load program, insert the correct file address and name for your state “core.asc” file in the code line at the beginning of the Data Step
- Run the load program and the core.asc file will be loaded into SAS

```
*****;  
* Data Step *;  
*****;  
DATA AZ_SEDDOC_2014_CORE;  
INFILE 'AZ_SEDD_2014_CORE.ASC' FIRSTOBS=3 LRECL = 1006;  
*** Variable attribute ***;  
ATTRIB  
AGE LENGTH=3  
LABEL="Age in years at admission"
```

Sample SAS Code

NOTE: Before using this code you should change the “set” file name to match the name and location of your data file. **All states should review and revise the sample code to meet their individual needs.**

Coding for recommended indicator #1, ED visit for NTDC based on **first listed diagnosis. This coding is for **pre-2015** data sets with ICD-9 diagnostic codes. For 2015 datasets, both ICD-9 and ICD-10 codes should be included.*

```
data StateCore; set StateCore;  
NTDC_dx1=0; *set variable to 0 and then change to 1 if first DX variable has an NTDC code;  
if DX1 in ('5200', '5201', '5202', '5203', '5204', '5205', '5206', '5207', '5208', '5209', '52100', '52101', '52102', '52103',  
'52104', '52105', '52106', '52107', '52108', '52109', '52110', '52111', '52112', '52113', '52114', '52115', '52120', '52121',  
'52122', '52123', '52124', '52125', '52130', '52131', '52132', '52133', '52134', '52135', '52140', '52141', '52142', '52149',  
'5215', '5216', '5217', '52181', '52189', '5219', '5220', '5221', '5222', '5223', '5224', '5225', '5226', '5227', '5228', '5229',  
'52300', '52301', '52310', '52311', '52320', '52321', '52322', '52323', '52324', '52325', '52330', '52331', '52332', '52333',  
'52340', '52341', '52342', '5235', '5236', '5238', '5239', '52400', '52401', '52402', '52403', '52404', '52405', '52406', '52407',  
'52409', '52410', '52411', '52412', '52419', '52420', '52421', '52422', '52423', '52424', '52425', '52426', '52427', '52428',  
'52429', '52430', '52431', '52432', '52433', '52434', '52435', '52436', '52437', '52439', '5244', '52450', '52451', '52452',  
'52453', '52454', '52455', '52456', '52457', '52459', '52460', '52461', '52462', '52463', '52464', '52469', '52470', '52471',  
'52472', '52473', '52474', '52475', '52476', '52479', '52481', '52482', '52489', '5249', '5250', '52510', '52512', '52513',  
'52519', '52520', '52521', '52522', '52523', '52524', '52525', '52526', '5253', '52540', '52541', '52542', '52543', '52544',  
'52550', '52551', '52552', '52553', '52554', '52560', '52561', '52562', '52563', '52564', '52565', '52566', '52567', '52569',  
'52571', '52572', '52573', '52579', '5258', '5259', '5260', '5261', '5262', '5263', '5264', '5265', '52661', '52662', '52663',  
'52669', '52681', '52689', '5269', '5270', '5271', '5272', '5273', '5274', '5275', '5276', '5277', '5278', '5279', '52800', '52801',  
'52802', '52809', '5281', '5282', '5283', '5284', '5285', '5286', '52871', '52872', '52879', '5288', '5289', '5290', '5291', '5292',  
'5293', '5294', '5295', '5296', '5298', '5299', '78492', '7924', 'V523', 'V534', 'V585', 'V722', 'V723')  
then NTDC_dx1=1;  
run;
```

Coding for recommended indicator #1, ED visit for NTDC based on **first listed diagnosis. This coding is for **post-2015** data sets with ICD-10 diagnostic codes. For 2015 datasets, both ICD-9 and ICD-10 codes should be included.*

```
data StateCore; set StateCore;
NTDC_dx1=0; *set variable to 0 and then change to 1 if first I10_DX variable has an NTDC code;
If I10_DX1 in ('A690', 'K000', 'K001', 'K002', 'K003', 'K004', 'K005', 'K006', 'K007', 'K008', 'K009', 'K010', 'K011', 'K023', 'K0251',
'K0261', 'K0262', 'K0263', 'K027', 'K029', 'K030', 'K031', 'K032', 'K033', 'K034', 'K035', 'K036', 'K037', 'K0381', 'K0389', 'K039',
'K040', 'K041', 'K042', 'K043', 'K044', 'K045', 'K046', 'K047', 'K048', 'K0490', 'K0499', 'K0500', 'K0501', 'K0510', 'K0511',
'K0520', 'K0521', 'K0522', 'K0530', 'K0531', 'K0532', 'K0540', 'K055', 'K056', 'K060', 'K061', 'K080', 'K08101', 'K08102',
'K08103', 'K08104', 'K08109', 'K0820', 'K0821', 'K0822', 'K0823', 'K0824', 'K0825', 'K0826', 'K083', 'K08401', 'K08402',
'K08403', 'K08404', 'K08409', 'K08429', 'K08439', 'K08499', 'K0850', 'K0851', 'K0852', 'K08530', 'K08531', 'K0854', 'K0855',
'K0856', 'K0859', 'K088', 'K089', 'K090', 'K091', 'K098', 'K110', 'K111', 'K1120', 'K113', 'K114', 'K115', 'K116', 'K117', 'K118',
'K119', 'K120', 'K121', 'K122', 'K1230', 'K1231', 'K1232', 'K1233', 'K1239', 'K130', 'K1321', 'K1322', 'K1323', 'K1329', 'K135',
'K1370', 'K1379', 'K140', 'K141', 'K142', 'K143', 'K144', 'K145', 'K146', 'K148', 'K149', 'M2600', 'M2601', 'M2602', 'M2603',
'M2604', 'M2605', 'M2606', 'M2607', 'M2609', 'M2610', 'M2611', 'M2612', 'M2619', 'M2620', 'M26211', 'M26212',
'M26213', 'M26220', 'M26221', 'M2623', 'M2624', 'M2625', 'M2629', 'M2630', 'M2631', 'M2632', 'M2633', 'M2634',
'M2635', 'M2636', 'M2637', 'M2639', 'M264', 'M2650', 'M2651', 'M2652', 'M2653', 'M2654', 'M2655', 'M2656', 'M2657',
'M2659', 'M2660', 'M2661', 'M2662', 'M2663', 'M2669', 'M2670', 'M2671', 'M2672', 'M2673', 'M2674', 'M2679', 'M2681',
'M2682', 'M2689', 'M269', 'M271', 'M272', 'M273', 'M2749', 'M2751', 'M2752', 'M2753', 'M2759', 'M2761', 'M2762',
'M2763', 'M2769', 'M278', 'M279', 'R682', 'R6884', 'R859', 'Z0120', 'Z0121', 'Z463', 'Z464')
then NTDC_dx1=1;
run;
```

Coding for recommended indicator #2, ED visit for NTDC based on **any listed diagnosis. This coding is for **pre-2015** data sets with ICD-9 diagnostic codes. For 2015 datasets, both ICD-9 and ICD-10 codes should be included. NOTE: SEDD has variables for up to 25 diagnoses.*

```
data StateCore; set StateCore;
array DX{25} DX1--DX25;
NTDC_dx_any=0; *set variable to 0 and then change to 1 if any DX variables have an NTDC code;
Do i=1 to 25;
if DX{i} in (insert ICD-9 codes listed for recommended indicator #1)
then NTDC_dx_any=1;
end;
run;
```

Coding for recommended indicator #2, ED visit for NTDC based on **any listed diagnosis. This coding is for **post-2015** data sets with ICD-10 diagnostic codes. For 2015 datasets, both ICD-9 and ICD-10 codes should be included. NOTE: SEDD has variables for up to 25 diagnoses.*

```
data StateCore; set StateCore;
array DX{25} I10_DX1—I10_DX25;
NTDC_dx_any=0; *set variable to 0 and then change to 1 if any I10_DX variables have an NTDC code;
Do i=1 to 25;
if DX{i} in (insert ICD-10 codes listed for recommended indicator #1)
then NTDC_dx_any=1;
end; run;
```

Coding for recommended indicator #3, ED visit for NTDC based on **first listed reason for visit. This coding is for **pre-2015** data sets with ICD-9 diagnostic codes. For 2015 datasets, both ICD-9 and ICD-10 codes should be included.*

```
data StateCore; set StateCore;
NTDC_RsnVis1=0;
If DX_Visit_Reason1 in (insert ICD-9 codes listed for recommended indicator #1)
then NTDC_RsnVis1=1;
run;
```

Coding for recommended indicator #3, ED visit for NTDC based on **first listed reason for visit. This coding is for **post-2015** data sets with ICD-10 diagnostic codes. For 2015 datasets, both ICD-9 and ICD-10 codes should be included.*

```
data StateCore; set StateCore;
NTDC_RsnVis1=0;
If I10_Visit_Reason1 in (insert ICD-10 codes listed for recommended indicator #1)
then NTDC_RsnVis1=1;
run;
```

Coding for recommended indicator #4, ED visit for NTDC based on **any listed reason for visit. This coding is for **pre-2015** data sets with ICD-9 diagnostic codes. For 2015 datasets, both ICD-9 and ICD-10 codes should be included. NOTE: SEDD has variables for up to 3 reasons for visit.*

```
data StateCore; set StateCore;
array rsn{3} DX_Visit_Reason1--DX_Visit_Reason3;
NTDC_RsnVis_any=0; *set variable to 0 and then change to 1 if any DX_Visit_ReasonN variables have an NTDC code;
Do i=1 to 3;
if rsn{i} in (insert ICD-9 codes listed for recommended indicator #1)
then NTDC_RsnVis_any=1;
end;
run;
```

Coding for recommended indicator #4, ED visit for NTDC based on **any listed reason for visit. This coding is for **post-2015** data sets with ICD-10 diagnostic codes. For 2015 datasets, both ICD-9 and ICD-10 codes should be included. NOTE: SEDD has variables for up to 3 reasons for visit.*

```
data StateCore; set StateCore;
array rsn{3} I10_Visit_Reason1—I10_Visit_Reason3;
NTDC_RsnVis_any=0; *set variable to 0 and then change to 1 if any I10_Visit_ReasonN variables have an NTDC code;
Do i=1 to 3;
if rsn{i} in (insert ICD-10 codes listed for recommended indicator #1)
then NTDC_RsnVis_any=1;
end;
run;
```

Coding for recommended indicator #5, ED visit for NTDC based on **any listed diagnosis and/or any listed reason for visit.*

```
data StateCore; set StateCore;
NTDC_DXorRsn=0;
if NTDC_dx_any=1 or NTDC_RsnVis_any=1 then NTDC_DXorRsn=1;
run;
```

**To generate counts for the five indicators.*

```
proc freq data = StateCore;
tables NTDC_dx1 NTDC_dx_any NTDC_RsnVis1 NTDC_RsnVis_any NTDC_DXorRsn;
run;
```

To generate rate per 100,000 population. NOTE: This is **not SAS code.*

(indicator count/population estimate) * 100,000

Example: First diagnosis NTDC count is 36,188, state population estimate is 4,400,477

Rate of ED NTDC visits per 100,000 population = (36,188 / 4,400,477) * 100,000 = 822.4 per 100,000 population

To generate rate per 10,000 ED visits. NOTE: This is **not SAS code.*

(indicator count / total ED visit count) * 10,000

Example: First diagnosis NTDC count is 36,188, total ED visit count is 2,036,780

rate of ED NTDC per 10,000 ED visits = (36,188 / 2,036,780) * 10,000 = 177.7 per 10,000 ED visits

**To generate total charges, use the following SAS code. The first diagnosis indicator is used in this example.*

```
proc means data=StateCore mean median min max stddev sum;
var totchg;
where NTDC_dx1=1;
run;
```

**For recommended stratified analyses by age group, race/ethnicity, and primary payer, use variables AGE, PAY1, and RACE.*

```
data StateCore; set StateCore;
if age lt 20 then agecat=1;
if age ge 20 and age lt 45 then agecat=2;
if age ge 45 and age lt 65 then agecat=3;
if age ge 65 then agecat=4;
run;
```

```
PROC FORMAT; *to format primary payer, race, and new age category variables;
value agec 1='<20 years' 2='20-44 years' 3='45-64 years' 4='65 or more years';
value pay 1='Medicare' 2='Medicaid' 3='Private' 4='Self Pay' 5='No charge' 6='Other';
value rac 1='white' 2='black' 3='Hispanic' 4='Asian/PacIs' 5='NatAmer' 6='Other';
value yn 0='No' 1='Yes';
run;
```

**Example - stratified analysis for NTDC first diagnosis indicator.*

```
proc freq data=StateCore;
tables agecat pay1 race;
where NTDC_dx1=1;
format agecat agec. pay1 pay. race rac.;
run;
```

**Example - to compare NTDC=yes vs. NTDC=no stratified analysis for NTDC first diagnosis.*

```
proc freq data=StateCore;
tables NTDC_dx1*(agecat pay1 race);
format agecat agec. pay1 pay. race rac. NTDC_dx1 yn.;
run;
```


APPENDIX 4
ACRONYMS USED IN THIS DOCUMENT

ASTDD	Association of State and Territorial Dental Directors
CPP	Conditions associated with caries, periodontal disease or associated preventive procedures
ED	Emergency department
HCUP	Healthcare cost and utilization project (https://www.hcup-us.ahrq.gov/)
ICD-9	International Classification of Diseases, Ninth Revision
ICD-10	International Classification of Diseases, Tenth Revision
NTDC	Non-traumatic dental condition
SEDD	State emergency department databases (https://www.hcup-us.ahrq.gov/seddooverview.jsp)
SID	State inpatient databases (https://www.hcup-us.ahrq.gov/sidoverview.jsp)
SOHP	State oral health program