



Measure Information

This document contains the information submitted by measure developers/stewards, but is organized according to NQF's measure evaluation criteria and process. The item numbers refer to those in the submission form but may be in a slightly different order here. In general, the item numbers also reference the related criteria (e.g., item 1b.1 relates to sub criterion 1b).

Brief Measure Information

NQF #: 2689

Corresponding Measures:

Measure Title: Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children

Measure Steward: American Dental Association

sp.02. Brief Description of Measure: Number of emergency department visits for caries-related reasons per 100,000 member months for children

1b.01. Developer Rationale:

NOTE: This section will be updated prior to full submission; not required for intent to submit.

The proposed measure, Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children, measures the rate of caries-related ED visits during the reporting year. This system-level measure specifically focuses on dental caries-related ED visits because: (1) dental caries (tooth decay) plays a central role in dental disease among children, (2) dental caries incidence can be reduced through routine and preventive dental care, and (3) dental caries, once present, can be effectively managed in outpatient settings with early identification and treatment. Consequently ED visits for caries-related reasons by children is a system-level outcome representing an avoidable deterioration in oral health and overall health due to untreated dental caries. This outcome can be positively impacted by evidenced-based processes of care delivered in outpatient dental settings.

Dental caries is the most common chronic disease in children in the United States (CDC 2013). In 2009–2010, 14% of children aged 3–5 years had untreated dental caries. Among children aged 6–9 years, 17% had untreated dental caries, and among adolescents aged 13–15, 11% had untreated dental caries (Dye, Li, and Thornton-Evans 2012). Untreated dental caries occurs among 25% of children living in poverty compared with 10.5% of children living above poverty (Dye, Li, and Thornton-Evans 2012). Untreated dental decay among children has significant short- and long-term adverse consequences (Tinanoff and Reisine 2009). Among the more significant of these outcomes is emergency department visits for dental caries-related problems (e.g., tooth pain, abscesses).

ED care for dental caries-related problems is generally not definitive compared to that provided in primary care dental settings and often results in referral to primary care dental sites (Cohen et al. 2011; Hocker et al. 2012). However, these ED visits could be significantly reduced through routine clinical oral evaluations, receipt of evidence-based preventive services, and adoption of good oral health habits by children and their caregivers (American Academy of Pediatric Dentistry 2013; Ahovuo-Saloranta et al. 2013; Beauchamp et al. 2008; NICE 2004; Tinanoff & Reisine 2009; Weyant et al. 2013). A recent policy brief concluded that 41%–79% of dental-related ED visits among the general population could be diverted to outpatient dental offices where patients can receive definitive care (Wall, Nasseh, Vujcic 2013).

Dental conditions, primarily from untreated dental caries (tooth decay), are responsible for the majority of non-traumatic dental-related ED visits among children. The most recent nationally-reported data on non-traumatic dental-related ED visits are from the Nationwide Emergency Department Samples (NEDS), which is the largest all-payer ED visits database in the U.S. and is comprised of a twenty percent stratified sample of hospital-based EDs in the U.S. (AHRQ 2014). The most recent analyses of the NEDS indicate that among individuals 21 years of age and younger, there were 215,072 non-traumatic dental-related ED visits in 2008, 107,663 (50%) of which had an ICD-9-CM diagnosis code of dental caries. The next most frequently occurring diagnosis code (71,087 visits; 33% of all dental-related ED visits) was periapical abscess without sinus, infections that arise from untreated dental caries. Because the authors included all-listed diagnoses, the percentages are not mutually exclusive (some children could have both diagnoses). However, another study that used national data from 2009, including both adults and children, and focused on first-listed diagnoses for dental-related ED visits found that 42.1% had a dental caries diagnosis and an additional 37.4% had a dental abscess diagnosis; thus, approximately 80% of ED visits could be attributed to dental caries (Seu et al. 2012).

Non-traumatic dental-related ED visits have been increasing over time. An analysis of the trends in ED visits with non-traumatic dental-related ICD-9-CM diagnosis codes for the overall population using the National Hospital Ambulatory Medical Care Survey data found that non-traumatic dental-related ED visits increased by 4% annually on average over the period 1997-2007, exceeding the rate of growth both for ED visits in general and for ED visits for non-dental ambulatory care sensitive conditions (Okunseri et al. 2012). The same study found that over the period 1997-2007, non-traumatic dental-related visits accounted for 1.4% of all ED visits in the United States and 7% of all ambulatory care sensitive condition ED visits.

Medicaid-enrolled children accounted for the largest share (43%) of non-traumatic dental-related ED visits among children (Allareddy et al. 2014), consistent with earlier research indicating that Medicaid is the primary payer for dental-related ED visits among children (Nalliah et al. 2010). Thus, the proposed measure, Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children, represents an important systems-level outcome for Medicaid programs.

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sp.12. Numerator Statement: Number of ED visits with caries-related diagnosis code among children 0 through 20 years

sp.14. Denominator Statement:

All member months for enrollees 0 through 20 years during the reporting year divided by 100,000.

NOTES:

1. Age range is 0 through 20 years (<21 years) to coincide with Medicaid Early and Periodic Screening, Diagnostic, and Treatment eligibility. (<https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/index.html>).
2. 100,000 member months of enrollment was selected instead of a per population approach due to enrollment variation. This is consistent with the approach that the Centers for Medicare and Medicaid Services has taken for the Medicaid Adult Health Care Quality measures of potentially preventable hospitalizations, which measures rates per 100,000 member months (<https://www.medicaid.gov/medicaid/quality-of-care/performance-measurement/adult-and-child-health-care-quality-measures/adult-health-care-quality-measures/index.html>)

sp.16. Denominator Exclusions: There are no measure-specific exclusions.

Measure Type: Outcome

sp.28. Data Source:

Claims

sp.07. Level of Analysis:

Integrated Delivery System

Other

IF Endorsement Maintenance – Original Endorsement Date: 2015-09-02 04:59 PM

Most Recent Endorsement Date: 9/2/2015 4:59:56 PM

IF this measure is included in a composite, NQF Composite#/title:

IF this measure is paired/grouped, NQF#/title:

sp.03. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results?:

1. Importance to Measure and Report

Extent to which the specific measure focus is evidence-based, important to making significant gains in healthcare quality, and improving health outcomes for a specific high-priority (high-impact) aspect of healthcare where there is variation in or overall less-than-optimal performance. Measures must be judged to meet all sub criteria to pass this criterion and be evaluated against the remaining criteria

1ma.01. Indicate whether there is new evidence about the measure since the most recent maintenance evaluation. If yes, please briefly summarize the new evidence, and ensure you have updated entries in the Evidence section as needed.

[Response Begins]

[Response Ends]

Please separate added or updated information from the most recent measure evaluation within each question response in the Importance to Measure and Report: Evidence section. For example:

Current Submission:

Updated evidence information here.

Previous (Year) Submission:

Evidence from the previous submission here.

1a.01. Provide a logic model.

Briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient's health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

[Response Begins]

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[Response Ends]

1a.02. Provide evidence that the target population values the measured outcome, process, or structure and finds it meaningful.

Describe how and from whom input was obtained.

[Response Begins]

[Response Ends]

1a.03. Provide empirical data demonstrating the relationship between the outcome (or PRO) and at least one healthcare structure, process, intervention, or service.

[Response Begins]

[Response Ends]

1b.01. Briefly explain the rationale for this measure.

Explain how the measure will improve the quality of care, and list the benefits or improvements in quality envisioned by use of this measure.

[Response Begins]

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[Response Ends]

1b.02. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis.

Include mean, std dev, min, max, interquartile range, and scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include. This information also will be used to address the sub-criterion on improvement (4b) under Usability and Use.

[Response Begins]

This is a new measure designed to be reported at the program level (e.g., Medicaid, CHIP). Comprehensive testing was done with multiple data sources.

Data Sources:

We used data from four program-level data sources. We included data for publicly insured children in the Texas Medicaid, Texas CHIP, Florida CHIP, and Florida Medicaid programs. Florida and Texas represent two of the largest and most diverse states. The two states also represent the upper and lower bounds of dental utilization based on dental utilization data available from the Centers for Medicare and Medicaid Services (Steinmetz et al. 2014). The programs collectively represent different delivery system models. The Texas Medicaid data represented dental fee-for-service, and Texas CHIP data reflected a single dental benefits administrator (DBA). The Florida CHIP data included data from two DBAs. The Florida Medicaid data include dental fee-for-service and prepaid dental data. Data from calendar year (CY) 2011 was used for all programs.

The numbers of children ages 0-20 years enrolled at least one month in each program were as follows:

Texas Medicaid, 2011: 3,578,302
Texas CHIP, 2011: 870,433
Florida CHIP, 2011: 329,707
Florida Medicaid, 2011: 2,229,323

Data 1b.2 Performance Scores for Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children, CY 2011

Program, Measure Score – Visits/100,000 MM (SE, Lower 95% CI, Upper 95% CI)

Program 1: 13.06 (0.22 , 12.63 , 13.49)

Program 2: 6.9 (0.36 , 6.2 , 7.6)

Program 3: 9.87 (0.68 , 8.54 , 11.2)

Program 4: 30.68 (0.44 , 29.83 , 31.54)

There was more than four-fold variation between the program with the lowest caries-related ED visit rate (6.90/100,000 MM) and the program with the highest rate (30.68/100,000 MM), indicating significant variation in performance between programs and opportunities for improvement.

References

Steinmetz E, Bruen B, Ku L. Children's use of dental care in Medicaid: federal fiscal years 2000-2012. Prepared for the Centers for Medicare and Medicaid Services by George Washington University. 2014. Available at: <http://www.medicaid.gov/medicaid-chip-program-information/by-topics/benefits/downloads/dental-trends-2000-to-2012.pdf>. Accessed January 11th, 2015.

[Response Ends]

1b.03. If no or limited performance data on the measure as specified is reported above, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement. Include citations.

[Response Begins]

The measure testing findings are consistent with other data regarding dental caries-related ED use among children. As noted above, dental conditions, primarily from untreated dental caries (tooth decay), are responsible for the majority of non-traumatic dental-related ED visits among both children and the overall population (Allareddy et al. 2014; Seu et al. 2009). A study using data from the Nationwide Emergency Department Sample of the Healthcare Cost and Utilization Project for 2008, found that there were 215,072 non-traumatic dental-related ED visits in 2008, 107,663 (50%) of which had an ICD-9-CM diagnosis code of dental caries and 71,087 visits (33%) of which had a diagnosis code of periapical abscess without sinus, infections that arise from untreated dental caries (Allareddy et al. 2014). Medicaid enrolled children accounted for the largest share (43%) of non-traumatic dental-related ED visits (Allareddy et al. 2014).

The mean charge per dental-related visit was \$564, and total ED charges were approximately \$104 million. Of the 215,072 dental-related ED visits, 7,195 (3%) resulted in inpatient hospitalizations; among the subset of children hospitalized following dental-related ED visits, 37% of which had a dental caries diagnosis and 44% of which had a diagnosis of periapical abscess without sinus. The mean hospitalization charge was \$22,865, and total hospitalization charges were \$162 million (Allareddy et al. 2014).

Non-traumatic dental-related ED visits have been increasing over time. An analysis of the trends in ED visits with non-traumatic dental-related ICD-9-CM diagnosis codes for the overall population using the National Hospital Ambulatory Medical Care Survey data found that non-traumatic dental-related ED visits increased by 4% annually on average over the period 1997-2007, exceeding the rate of growth both for ED visits in general and for ED visits for non-dental ambulatory care sensitive conditions (Okunseri et al. 2012). The same study found that over the period 1997-2007, non-traumatic dental-related visits accounted for 1.4% of all ED visits in the United States and 7% of all ambulatory care sensitive condition ED visits.

Our testing data indicating significant variation in caries-related ED visits between programs, combined with national and state findings regarding the prevalence and high cost of caries-related ED visits, indicates less than optimal performance and opportunities for improving both health outcomes and allocation of health system resources.

REFERENCES

Allareddy V, Nalliah RP, Haque M, Johnson BS, Rampa SB, Lee MK. Hospital-based emergency department visits with dental conditions among children in the United States: nationwide epidemiological data. *Pediatr Dent* 2014;37(5):393-9.

Okunseri C, Okunseri E, Thorpe JM, Xiang Q, Szabo A. Patient characteristics and trends in nontraumatic dental condition visits to emergency departments in the United States. *Clin Cosmet Investig Dent*. 2012;4:1-7.

Seu K, Hall KK, Moy E. Emergency Department Visits for Dental-Related Conditions, 2009: Statistical Brief #143. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs. Rockville (MD); 2012.

[Response Ends]

1b.04. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability.

Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included. Include mean, std dev, min, max, interquartile range, and scores by decile.

For measures that show high levels of performance, i.e., “topped out”, disparities data may demonstrate an opportunity for improvement/gap in care for certain sub-populations. This information also will be used to address the sub-criterion on improvement (4b) under Usability and Use.

[Response Begins]

The same data sources were used as described in 1b.2. The data below summarizes performance data by age, geographic location, and race/ethnicity for CY 2011 with 95% confidence intervals. Non-overlapping confidence intervals between two subgroups indicate statistically significant differences. However, the converse is not necessarily true: differences in measure scores can be statistically significant when confidence intervals overlap. Thus, for overlapping confidence intervals, we calculated the t-statistic to evaluate whether there were statistically significant differences between subgroups where significance at the 0.05 level is attained if the t-statistic > 2.00. We additionally verified by evaluating whether the following condition held: $2\sqrt{SEA^2 + SEB^2} < \text{meanB} - \text{meanA} < 2\sqrt{SEA^2 + SEB^2}$ (Wolfe & Hanley 2002). The results demonstrate that there are disparities by age, geographic location, and race/ethnicity.

Data1b.4. Disparities in Performance by Child Age, Geographic Location and Race/Ethnicity

-Non-overlapping 95% CIs indicate statistically significant differences (at 0.05 level) between categories

-t-statistic reported for statistically significant differences (at 0.05 level) despite overlapping CIs

PROGRAM 1

Overall performance score: 13.06 (12.63 , 13.49)

Scores by Age

<1 year: 2.06 (1.53 , 2.59)

1-2 years: 5.67 (4.97 , 6.36)

3-5 years: 13.42 (12.49 , 14.34)

6-7 years: 14.03 (12.77 , 15.30)

8-9 years: 11.11 (9.89 , 12.34)

10-11 years: + 7.77 (6.73 , 8.80)

12-14 years: + 9.69 (8.61 , 10.77)

15-18 years: 26.05 (24.30 , 27.80)

19-20 years: 65.29 (58.00 , 72.58)

t-statistic for 10-11&12-14 age cohort comparisons: 2.53

Scores by Geographic Location

Urban core: 11.63 (11.16 , 12.09)

Suburban: + 16.25 (14.65 , 17.84)

Rural: + 18.57 (17.22 , 19.92)

t-statistic for suburban-rural comparison: 2.18

Scores by Race

Non-Hispanic White: + 20.31 (18.92 , 21.70)

Non-Hispanic Black: + 17.83 (16.60 , 19.07)

Hispanic: 9.86 (9.38 , 10.34)

t-statistic for NHW-NHB comparison: 2.61

PROGRAM 2

Overall performance score: 6.90 (6.20 , 7.60)

Scores by Age

<1 year: 0.00 (0.00 , 0.00)
1-2 years: 3.64 (1.74 , 5.55)
3-5 years: 6.26 (4.29 , 8.23)
6-7 years: 7.86 (5.82 , 9.91)
8-9 years: 6.69 (4.95 , 8.44)
10-11 years: 4.70 (3.14 , 6.26)
12-14 years: 4.38 (3.21 , 5.55)
15-18 years: 11.36 (9.33 , 13.39)
19-20 years: N/A

Scores by Geographic Location

Urban core: + 6.58 (5.77 , 7.40)
Suburban: 6.40 (4.47 , 8.33)
Rural: + 9.24 (7.18 , 11.31)
t-statistic for Rural-Urban comparison: 2.35

Scores by Race

Non-Hispanic White: N/A
Non-Hispanic Black: N/A
Hispanic: N/A

PROGRAM 3

Overall performance score: 9.87 (8.54 , 11.20)

Scores by Age

<1 year: N/A
1-2 years: N/A
3-5 years: 14.75 (7.34 , 22.16)
6-7 years: 8.90 (5.67 , 12.13)
8-9 years: 8.03 (5.11 , 10.94)
10-11 years: 7.80 (5.02 , 10.58)
12-14 years: 6.85 (4.62 , 9.08)
15-18 years: 14.32 (11.11 , 17.54)
19-20 years: N/A

Scores by Geographic Location

Urban core: 9.32 (7.94 , 10.70)
Suburban: 12.76 (6.94 , 18.58)
Rural: 11.05 (5.26 , 16.84)

Scores by Race

Non-Hispanic White: N/A
Non-Hispanic Black: N/A
Hispanic: N/A

PROGRAM 4

Overall performance score: 30.68 (29.83 , 31.54)

Scores by Age

<1 year: 2.72 (1.92 , 3.52)
1-2 years: 10.07 (8.87 , 11.27)

3-5 years: 24.66 (23.10 , 26.21)
6-7 years: 32.26 (29.77 , 34.75)
8-9 years: 26.10 (23.71 , 28.49)
10-11 years: 20.24 (18.06 , 22.41)
12-14 years: 22.77 (20.72 , 24.83)
15-18 years: 62.54 (59.02 , 66.06)
19-20 years: 136.31 (126.00 , 146.62)

Scores by Geographic Location

Urban core: 28.95 (28.02 , 29.87)
Suburban: 36.47 (33.60 , 39.34)
Rural: 44.08 (40.15 , 48.02)

Scores by Race

Non-Hispanic White: + 38.36 (36.43 , 40.29)
Non-Hispanic Black: + 35.03 (33.43 , 36.63)
Hispanic: 19.94 (18.77 , 21.12)
t-statistic for NHW-NHB comparison: 2.61

Notes:

1. + indicates that for these categories, there are statistically significant differences even though the confidence intervals overlap. Significance was verified through the methods described in Wolfe and Hanley (2002).
2. N/A for age indicates that those ages are not within the program's age eligibility.
3. N/A for race/ethnicity indicates that those had high rates of missing data.

REFERENCES

Wolfe R, Hanley J. If we're so different, why do we keep overlapping? When 1 plus 1 doesn't make 2. CMAJ. 2002; 166(1):65-66.

[Response Ends]

1b.05. If no or limited data on disparities from the measure as specified is reported above, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations. Not necessary if performance data provided in above.

[Response Begins]

0.26) and Black (RR

[Response Ends]

2. Scientific Acceptability of Measure Properties

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. Measures must be judged to meet the sub criteria for both reliability and validity to pass this criterion and be evaluated against the remaining criteria.

spma.01. Indicate whether there are changes to the specifications since the last updates/submission. If yes, update the specifications in the Measure Specifications section of the Measure Submission Form, and explain your reasoning for the changes below.

[Response Begins]

Yes

[Yes Please Explain]

Additional diagnosis codes to identify caries-related ED visits were added as part of the Annual Measure Review during which we review and update all code sets.

[Response Ends]

spma.02. Briefly describe any important changes to the measure specifications since the last measure update and provide a rationale.

For annual updates, please explain how the change in specifications affects the measure results. If a material change in specification is identified, data from re-testing of the measure with the new specifications is required for early maintenance review.

For example, specifications may have been updated based on suggestions from a previous NQF CDP review.

[Response Begins]

Additional diagnosis codes to identify caries-related ED visits were added as part of the Annual Measure Review during which we review and update all code sets. We ran the measures with the previous and updated code sets for a sample of states, and there were no impacts on the measure scores.

[Response Ends]

sp.01. Provide the measure title.

Measure titles should be concise yet convey who and what is being measured (see [What Good Looks Like](#)).

[Response Begins]

Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children

[Response Ends]

sp.02. Provide a brief description of the measure.

Including type of score, measure focus, target population, timeframe, (e.g., Percentage of adult patients aged 18-75 years receiving one or more HbA1c tests per year).

[Response Begins]

Number of emergency department visits for caries-related reasons per 100,000 member months for children

[Response Ends]

sp.04. Check all the clinical condition/topic areas that apply to your measure, below.

Please refrain from selecting the following answer option(s). We are in the process of phasing out these answer options and request that you instead select one of the other answer options as they apply to your measure.

Please do not select:

- *Surgery: General*

[Response Begins]

Dental

Dental: Caries

[Response Ends]

sp.05. Check all the non-condition specific measure domain areas that apply to your measure, below.

[Response Begins]

Disparities Sensitive

Health and Functional Status: Total Health

[Response Ends]

sp.06. Select one or more target population categories.

Select only those target populations which can be stratified in the reporting of the measure's result.

Please refrain from selecting the following answer option(s). We are in the process of phasing out these answer options and request that you instead select one of the other answer options as they apply to your measure.

Please do not select:

- *Populations at Risk: Populations at Risk*

[Response Begins]

Children (Age < 18)

[Response Ends]

sp.07. Select the levels of analysis that apply to your measure.

Check ONLY the levels of analysis for which the measure is SPECIFIED and TESTED.

Please refrain from selecting the following answer option(s). We are in the process of phasing out these answer options and request that you instead select one of the other answer options as they apply to your measure.

Please do not select:

- *Clinician: Clinician*
- *Population: Population*

[Response Begins]

Integrated Delivery System

Other

[Response Ends]

sp.08. Indicate the care settings that apply to your measure.

Check ONLY the settings for which the measure is SPECIFIED and TESTED.

[Response Begins]

Ambulatory Care

[Response Ends]

sp.09. Provide a URL link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials.

Do not enter a URL linking to a home page or to general information. If no URL is available, indicate "none available".

[Response Begins]

https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/research/dqa/dental-quality-measures/2022-measures/2022_ambulatory_care_sensitive_ed_visits.pdf?rev=fb42687b74034e2e871ab99f01863044&hash=0E85774A36BABFCCD519887B731F1B52

[Response Ends]

sp.12. Attach the data dictionary, code table, or value sets (and risk model codes and coefficients when applicable). Excel formats (.xlsx or .csv) are preferred.

Attach an excel or csv file; if this poses an issue, [contact staff](#). Provide descriptors for any codes. Use one file with multiple worksheets, if needed.

[Response Begins]

No data dictionary/code table – all information provided in the submission form

[Response Ends]

For the question below: state the outcome being measured. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.13. State the numerator.

Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome).

DO NOT include the rationale for the measure.

[Response Begins]

Number of ED visits with caries-related diagnosis code among children 0 through 20 years

[Response Ends]

For the question below: describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.14. Provide details needed to calculate the numerator.

All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, time period for data collection, specific data collection items/responses, code/value sets.

Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

[Response Begins]

Please see section sp 22.

[Response Ends]

For the question below: state the target population for the outcome. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.15. State the denominator.

Brief, narrative description of the target population being measured.

[Response Begins]

All member months for enrollees 0 through 20 years during the reporting year divided by 100,000.

NOTES:

1. Age range is 0 through 20 years (<21 years) to coincide with Medicaid Early and Periodic Screening, Diagnostic, and Treatment eligibility. (<https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/index.html>).
2. 100,000 member months of enrollment was selected instead of a per population approach due to enrollment variation. This is consistent with the approach that the Centers for Medicare and Medicaid Services has taken for the Medicaid Adult Health Care Quality measures of potentially preventable hospitalizations, which measures rates per 100,000 member months (<https://www.medicaid.gov/medicaid/quality-of-care/performance-measurement/adult-and-child-health-care-quality-measures/adult-health-care-quality-measures/index.html>)

[Response Ends]

For the question below: describe how the target population is identified. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.16. Provide details needed to calculate the denominator.

All information required to identify and calculate the target population/denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets.

Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

[Response Begins]

Please see section sp 22.

[Response Ends]

sp.17. Describe the denominator exclusions.

Brief narrative description of exclusions from the target population.

[Response Begins]

There are no measure-specific exclusions.

[Response Ends]

sp.18. Provide details needed to calculate the denominator exclusions.

All information required to identify and calculate exclusions from the denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

[Response Begins]

There are no measure-specific exclusions.

[Response Ends]

sp.19. Provide all information required to stratify the measure results, if necessary.

Include the stratification variables, definitions, specific data collection items/responses, code/value sets, and the risk-model covariates and coefficients for the clinically-adjusted version of the measure when appropriate. Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format in the Data Dictionary field.

[Response Begins]

There are two stratifications:

1. Age Stratification.

This measure will be stratified by age (in years) using the following categories:

<1; 1-2; 3-5; 6-7; 8-9; 10-11; 12-14; 15-18; 19-20

No new data are needed for this stratification. Please see sp. 22 and attached specifications for complete measure details.

These stratification categories are consistent with other NQF-endorsed dental measures (NQF#2511; NQF#2517). Collapsed categories were considered; however, expert consensus concluded that given the different patterns between programs, a more refined approach would be more informative to measure implementers.

2. ED Disposition Stratification.

This measure will be stratified by ED disposition using the following categories: discharged from ED and inpatient admission. Please see sp. 22 and attached specifications for complete measure details.

[Response Ends]

sp.20. Is this measure adjusted for socioeconomic status (SES)?

[Response Begins]

[Response Ends]

sp.21. Select the risk adjustment type.

Select type. Provide specifications for risk stratification and/or risk models in the Scientific Acceptability section.

[Response Begins]

Stratification by risk category/subgroup (specify number of risk factors)

[Response Ends]

sp.22. Select the most relevant type of score.

Attachment: If available, please provide a sample report.

[Response Begins]

Ratio

[Response Ends]

sp.23. Select the appropriate interpretation of the measure score.

Classifies interpretation of score according to whether better quality or resource use is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score

[Response Begins]

Better quality = Lower score

[Response Ends]

sp.24. Diagram or describe the calculation of the measure score as an ordered sequence of steps.

Identify the target population; exclusions; cases meeting the target process, condition, event, or outcome; time period of data, aggregating data; risk adjustment; etc.

[Response Begins]

Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children calculation:

1. Calculate total eligible member months as the sum of all member months for enrollees age 0 through 20 years (<21 years) as of the 15th or 30th day of the month as appropriate for when eligibility determinations are made. Either the 15th or the 30th should be selected and used consistently across all member months during the reporting period.

Reporting note for age stratifications:

- Member months will be attributed to each age stratum based on the member's age as of the 15th or 30th day of the month. Either the 15th or the 30th should be selected and used consistently across all member months during the reporting period.
- One member can contribute member months to more than one age stratum.

YOU NOW HAVE DENOMINATOR (DEN) COUNT: Total member months

2. Identify all emergency department visits for caries-related reasons occurring during eligible member months:

a. Identify a health care encounter as an ED visit if any of the following are met:

- i. CPT codes 99281-99285 (ED visit for patient evaluation/management); OR
- ii. Revenue code 0450-0459 (Emergency Room) or 0981 (professional fees for ER services); OR
- iii. CMS place of service code for professional claims - 23 (Emergency Room)

b. Child must be <21 years on date of visit

c. Identify an ED visit as being caries related if:

i. any of the ICD-10-CM diagnosis codes in Table 1 is listed as a FIRST-LISTED diagnosis code associated with the visit

OR

ii. (a) any of the ICD-10-CM diagnosis codes in Table 2 is listed as a FIRST-LISTED diagnosis AND (b) any of the ICD-10-CM diagnosis codes in Table 1 is listed as an ADDITIONAL LISTED diagnosis. (Codes from Table 2 must be accompanied by a code from Table 1 to qualify.)

d. Count only one visit per member per day

e. Sum the number of ED visits for caries-related reasons.

Reporting note for age stratifications: Numerator cases are stratified based on age on date of ED visit.

YOU NOW HAVE NUMERATOR (NUM) COUNT: Number of ED visits for caries-related reasons

4. Stratify the numerator by whether visit resulted in an inpatient admission or did not result in an inpatient admission:

a. Identify a caries-related ED visit as resulting in an inpatient admission if:

(i) the patient has an inpatient admission defined by UB Type of Bill = 11x OR 12x OR 41x

AND

(ii) that admission occurred within 48 hours:

[inpatient admit date] – [ED admit date] >= 0 days AND <= 2 days

b. Sum the number of caries-related ED visits that resulted in an inpatient admission.

You now have the numerator stratum: caries-related ED visits that resulted in an inpatient stay.

c. Identify caries-related ED visits not resulting in an inpatient admission:

[total caries-related ED visits] – [caries-related ED visits resulting in inpatient admission]

You have the numerator stratum: caries-related ED visits that did not result in an inpatient stay.

5. Report

a. Unduplicated number of ED visits in the numerator

b. Unduplicated number of member months in denominator

c. Rate per 100,000 member months: (NUM/DEN) x 100,000

d. Rates for ED visits resulting in an inpatient stay and those not resulting in an inpatient stay

Table 1. Caries-Related ICD-10-CM Diagnosis Codes

(NOTE: Please reference the User Guide for ICD-9 CM and ICD-10 CM cross-mapping)

ICD-10 CODE	DESCRIPTION
K02.3	Arrested dental caries
K02.51	Dental caries on pit and fissure surface limited to enamel
K02.52	Dental caries on pit and fissure surface penetrating into dentin
K02.53	Dental caries on pit and fissure surface penetrating into pulp
K02.61	Dental caries on smooth surface limited to enamel
K02.62	Dental caries on smooth surface penetrating into dentin
K02.63	Dental caries on smooth surface penetrating into pulp
K02.7	Dental root caries
K02.9	Dental caries, unspecified
K03.89	Other specified diseases of hard tissues of teeth
K04.0	Pulpitis
K04.01	Reversible Pulpitis
K04.02	Irreversible pulpitis
K04.1	Necrosis of pulp
K04.2	Pulp degeneration
K04.3	Abnormal hard tissue formation in pulp
K04.4	Acute apical periodontitis of pulpal origin
K04.5	Chronic apical periodontitis
K04.6	Periapical abscess with sinus
K04.7	Periapical abscess without sinus
K04.8	Radicular cyst
K04.90	Unspecified diseases of pulp and periapical tissues
K04.99	Other diseases of pulp and periapical tissues
K08.131	Complete loss of teeth due to caries, class I
K08.132	Complete loss of teeth due to caries, class II
K08.133	Complete loss of teeth due to caries, class III
K08.134	Complete loss of teeth due to caries, class IV
K08.139	Complete loss of teeth due to caries, unspecified class
K08.3	Retained dental root
K08.431	Partial loss of teeth due to caries, class I
K08.432	Partial loss of teeth due to caries, class II
K08.433	Partial loss of teeth due to caries, class III
K08.434	Partial loss of teeth due to caries, class IV
K08.439	Partial loss of teeth due to caries, unspecified class
K08.50	Unsatisfactory restoration of tooth, unspecified
K08.51	Open restoration margins of tooth
K08.530	Fractured dental restorative material without loss of material

KØ8.531	Fractured dental restorative material with loss of material
KØ8.539	Fracture dental restorative material, unspecified
KØ8.8	Other specified disorders of teeth and supporting structures
KØ8.89	Other specified disorders of teeth and supporting structures
KØ8.9	Disorder of teeth and supporting structures, unspecified
K12.2	Cellulitis and abscess of mouth
M26.79	Other specified alveolar anomalies
M27.2	Inflammatory conditions of jaws
M27.3	Alveolitis of jaws
M27.51	Perforation of root canal space due to endodontic treatment
M27.52	Endodontic overfill
M27.53	Endodontic underfill
M27.59	Other periradicular pathology associated with previous endodontic treatment

Alt-Text: Table showing the caries-related ICD-10-CM diagnosis codes

Table 2. Additional First-Listed ICD-10-CM Diagnosis Codes to Identify Caries-Related Visits when Paired with an Additional Listed Diagnosis Code from the Caries-Related ICD-10-CM Codes in Table 1

(NOTE: Please reference the User Guide for ICD-9 CM and ICD-10 CM cross-mapping)

ICD-10 CODE	DESCRIPTION
LØ3.211	Cellulitis of face
LØ3.212	Acute lymphangitis of face
LØ3.213	Periorbital cellulitis
LØ3.221	Cellulitis of neck
LØ3.222	Acute lymphangitis of neck
LØ3.9Ø	Cellulitis, unspecified
LØ3.91	Acute lymphangitis, unspecified
R22.Ø	Localized swelling, mass and lump, head
R22.1	Localized swelling, mass and lump, neck
R6Ø.Ø	Localized edema
R6Ø.1	Generalized edema
R6Ø.9	Edema, unspecified

Alt-Text: Table showing the additional first-listed ICD-10-CM diagnosis codes to identify caries-related visits when paired with an additional listed diagnosis code from the Caries-Related ICD-10-CM Codes in Table 1

[Response Ends]

sp.27. If measure testing is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.

Examples of samples used for testing:

- *Testing may be conducted on a sample of the accountable entities (e.g., hospital, physician). The analytic unit specified for the particular measure (e.g., physician, hospital, home health agency) determines the sampling strategy for scientific acceptability testing.*
- *The sample should represent the variety of entities whose performance will be measured. The [2010 Measure Testing Task Force](#) recognized that the samples used for reliability and validity testing often have limited generalizability because measured entities volunteer to participate. Ideally, however, all types of entities whose performance will be measured should be included in reliability and validity testing.*
- *The sample should include adequate numbers of units of measurement and adequate numbers of patients to answer the specific reliability or validity question with the chosen statistical method.*
- *When possible, units of measurement and patients within units should be randomly selected.*

[Response Begins]

Not Applicable

[Response Ends]

sp.30. Select only the data sources for which the measure is specified.

[Response Begins]

Claims

[Response Ends]

sp.31. Identify the specific data source or data collection instrument.

For example, provide the name of the database, clinical registry, collection instrument, etc., and describe how data are collected.

[Response Begins]

Not applicable

[Response Ends]

sp.32. Provide the data collection instrument.

[Response Begins]

No data collection instrument provided

[Response Ends]

2ma.01. Indicate whether additional empirical reliability testing at the accountable entity level has been conducted. If yes, please provide results in the following section, Scientific Acceptability: Reliability - Testing. Include information on all testing conducted (prior testing as well as any new testing).

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For example:

Current Submission:

Updated testing information here.

Previous Submission:

Testing from the previous submission here.

[Response Begins]

Yes

[Response Ends]

2ma.02. Indicate whether additional empirical validity testing at the accountable entity level has been conducted. If yes, please provide results in the following section, Scientific Acceptability: Validity - Testing. Include information on all testing conducted (prior testing as well as any new testing).

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For example:

Current Submission:

Updated testing information here.

Previous Submission:

Testing from the previous submission here.

[Response Begins]

Yes

[Response Ends]

2ma.03. For outcome, patient-reported outcome, resource use, cost, and some process measures, risk adjustment/stratification may be conducted. Did you perform a risk adjustment or stratification analysis?

[Response Begins]

Yes

[Response Ends]

2ma.04. For maintenance measures in which risk adjustment/stratification has been performed, indicate whether additional risk adjustment testing has been conducted since the most recent maintenance evaluation. This may include updates to the risk adjustment analysis with additional clinical, demographic, and social risk factors.

Please update the Scientific Acceptability: Validity - Other Threats to Validity section.

Note: This section must be updated even if social risk factors are not included in the risk adjustment strategy.

[Response Begins]

No additional risk adjustment analysis included

[Response Ends]

Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. Testing information and results should be entered in the appropriate fields in the Scientific Acceptability sections of the Measure Submission Form.

- Measures must be tested for all the data sources and levels of analyses that are specified. If there is more than one set of data specifications or more than one level of analysis, contact NQF staff about how to present all the testing information in one form.
- All required sections must be completed.
- For composites with outcome and resource use measures, Questions 2b.23-2b.37 (Risk Adjustment) also must be completed.
- If specified for multiple data sources/sets of specifications (e.g., claims and EHRs), Questions 2b.11-2b.13 also must be completed.
- An appendix for supplemental materials may be submitted (see Question 1 in the Additional section), but there is no guarantee it will be reviewed.
- Contact NQF staff with any questions. Check for resources at the [Submitting Standards webpage](#).
- For information on the most updated guidance on how to address social risk factors variables and testing in this form refer to the release notes for the [2021 Measure Evaluation Criteria and Guidance](#).

Note: The information provided in this form is intended to aid the Standing Committee and other stakeholders in understanding to what degree the testing results for this measure meet NQF's evaluation criteria for testing.

2a. Reliability testing demonstrates the measure data elements are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period and/or that the measure score is precise. For instrument-based measures (including PRO-PMs) and composite performance measures, reliability should be demonstrated for the computed performance score.

2b1. Validity testing demonstrates that the measure data elements are correct and/or the measure score correctly reflects the quality of care provided, adequately identifying differences in quality. For instrument based measures (including PRO-PMs) and composite performance measures, validity should be demonstrated for the computed performance score.

2b2. Exclusions are supported by the clinical evidence and are of sufficient frequency to warrant inclusion in the specifications of the measure;

AND

If patient preference (e.g., informed decision-making) is a basis for exclusion, there must be evidence that the exclusion impacts performance on the measure; in such cases, the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately).

2b3. For outcome measures and other measures when indicated (e.g., resource use):

- an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified; is based on patient factors (including clinical and social risk factors) that influence the measured outcome and are present at start of care; 14,15 and has demonstrated adequate discrimination and calibration

OR

- rationale/data support no risk adjustment/ stratification.

2b4. Data analysis of computed measure scores demonstrates that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful 16 differences in performance;

OR

there is evidence of overall less-than-optimal performance.

2b5. If multiple data sources/methods are specified, there is demonstration they produce comparable results.

2b6. Analyses identify the extent and distribution of missing data (or nonresponse) and demonstrate that performance results are not biased due to systematic missing data (or differences between responders and non-responders) and how the specified handling of missing data minimizes bias.

2c. For composite performance measures, empirical analyses support the composite construction approach and demonstrate that:

2c1. the component measures fit the quality construct and add value to the overall composite while achieving the related objective of parsimony to the extent possible; and

2c2. the aggregation and weighting rules are consistent with the quality construct and rationale while achieving the related objective of simplicity to the extent possible.

(if not conducted or results not adequate, justification must be submitted and accepted)

Definitions

Reliability testing applies to both the data elements and computed measure score. Examples of reliability testing for data elements include, but are not limited to: inter-rater/abstractor or intra-rater/abstractor studies; internal consistency for multi-item scales; test-retest for survey items. Reliability testing of the measure score addresses precision of measurement (e.g., signal-to-noise).

Validity testing applies to both the data elements and computed measure score. Validity testing of data elements typically analyzes agreement with another authoritative source of the same information. Examples of validity testing of the measure score include, but are not limited to: testing hypotheses that the measure scores indicate quality of care, e.g., measure scores are different for groups known to have differences in quality assessed by another valid quality measure or method; correlation of measure scores with another valid indicator of quality for the specific topic; or relationship to conceptually related measures (e.g., scores on process measures to scores on outcome measures). Face validity of the measure score as a quality indicator may be adequate if accomplished through a systematic and transparent process, by identified experts, and explicitly addresses whether performance scores resulting from the measure as specified can be used to distinguish good from poor quality. The degree of consensus and any areas of disagreement must be provided/discussed.

Examples of evidence that an exclusion distorts measure results include, but are not limited to: frequency of occurrence, variability of exclusions across providers, and sensitivity analyses with and without the exclusion.

Patient preference is not a clinical exception to eligibility and can be influenced by provider interventions.

Risk factors that influence outcomes should not be specified as exclusions.

With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74 percent v. 75 percent) is clinically meaningful; or whether a statistically significant difference of \$25 in cost for an episode of care (e.g., \$5,000 v. \$5,025) is practically meaningful. Measures with overall less-than-optimal performance may not demonstrate much variability across providers.

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For example:

Current Submission:

Updated testing information here.

Previous (Year) Submission:

Testing from the previous submission here.

2a.01. Select only the data sources for which the measure is tested.

[Response Begins]

Claims

[Response Ends]

2a.02. If an existing dataset was used, identify the specific dataset.

The dataset used for testing must be consistent with the measure specifications for target population and healthcare entities being measured; e.g., Medicare Part A claims, Medicaid claims, other commercial insurance, nursing home MDS, home health OASIS, clinical registry).

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

Since the original testing was conducted, there have been no changes in the data source, level of analysis, or setting. Additional testing focused on three main areas:

- (1) Assessing reliability at the measure score level (versus data element level)
- (2) Empirically assessing validity at the measure score level
- (3) Evaluating the conversion from ICD-9 diagnostic codes to ICD-10 diagnostic codes and validating the updated ICD-10 diagnostic code set used to identify caries-related ED visits

Data Sources Used to Assess Measure Score Reliability and Validity

We used Medicaid enrollment and claims data contained within the Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAFs) available from the Centers for Medicare & Medicaid Services (<https://www.medicaid.gov/medicaid/data-systems/macbis/transformed-medicaid-statistical-information-system-t-msis/index.html>).

We selected a sample of 14 states: Alaska, Arizona, Delaware, Idaho, Michigan, Mississippi, Nevada, New Mexico, North Carolina, Oklahoma, Oregon, South Carolina, Washington, and Wyoming. These states were selected based both on the quality of their data submissions to CMS and because they represent diversity in geographic location, population size, population demographic characteristics, and Medicaid dental delivery system.

Data Sources Used to Evaluate ICD-9 to ICD-10 Conversion

One change that has occurred with the potential to affect the measure was the conversion from ICD-9 diagnostic codes to ICD-10 diagnostic codes. Consequently, our updated testing included verifying that the conversion did not materially affect the measure and relied on the following data sources:

1. We used patient records for January 2018 through August 2020 from HealthPartners Regions Hospital, an acute care hospital emergency department in Minnesota, for data element validation of the ICD-10 diagnosis code set used to identify caries-related ED visits. This activity complements the data element validation of ICD-9 diagnostic code set conducted as part of the original testing.
2. Program and system level performance scores were calculated using administrative claims and enrollment data from time periods before and after the conversion from ICD-9 to ICD-10 with 95% confidence intervals, from the following programs, using publicly reported program data (<https://thlcportal.com/home>):
 - Texas Children's Medicaid Program, CY 2016-CY 2018
 - Texas CHIP Program, CY 2016-2018

Texas Medicaid and CHIP were included in the original testing and are used to assess performance scores before and after the conversion from ICD-9 codes to ICD-10 codes.

Additional Data Sources Used to Evaluate Variations in Performance and Performance Gaps

In addition to the above data sources, we have included information on performance scores provided by measure users for a more comprehensive evaluation of variations in performance and performance gaps. These data are from a commercial carrier (both medical and dental benefits), CY 2018.

PRIOR TESTING

The testing datasets were consistent with the measure specifications for the target populations and reporting entities. This measure was specified for administrative enrollment and claims data for children. These measures are intended for reporting at the program level (e.g., Medicaid and CHIP). We used data from four sources: Texas Medicaid, Texas CHIP, Florida CHIP, and Florida Medicaid. Florida and Texas represent two of the largest and most diverse states. The two states also represent the upper and lower bounds of dental utilization based on dental utilization data available from the Centers for Medicare and Medicaid Services (CMS). The four programs collectively represent different delivery system models. The Texas Medicaid data represented dental fee-for-service. Texas CHIP data reflected a single dental benefits administrator (DBA). The Florida CHIP data included data from two DBAs. The Florida Medicaid data include dental fee-for-service and prepaid dental data.

[Response Ends]

2a.03. Provide the dates of the data used in testing.

Use the following format: "MM-DD-YYYY - MM-DD-YYYY"

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

T-MSIS Claims Data: 01-01-2016 through 12-31-2018

Chart Validation: 01-01-2018 through 08-31-2020

PRIOR TESTING

We used data from calendar year 2011.

[Response Ends]

2a.04. Select the levels of analysis for which the measure is tested.

Testing must be provided for all the levels specified and intended for measure implementation, e.g., individual clinician, hospital, health plan.

Please refrain from selecting the following answer option(s). We are in the process of phasing out these answer options and request that you instead select one of the other answer options as they apply to your measure.

Please do not select:

- *Clinician: Clinician*
- *Population: Population*

[Response Begins]

Integrated Delivery System

Other (specify)

[Other (specify) Please Explain]

State Medicaid Programs

[Response Ends]

2a.05. List the measured entities included in the testing and analysis (by level of analysis and data source).

Identify the number and descriptive characteristics of measured entities included in the analysis (e.g., size, location, type); if a sample was used, describe how entities were selected for inclusion in the sample.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

Measured Entities used for Testing Measure Score Reliability

14 State Medicaid Programs: Alaska, Arizona, Delaware, Idaho, Michigan, Mississippi, Nevada, New Mexico, North Carolina, Oklahoma, Oregon, South Carolina, Washington, and Wyoming

Total enrollees 0-20 years across all 14 programs:

2018: 7,720,412

2017: 7,854,440

2016: 7,850,885

In all cases, statewide program data are used (i.e., location is statewide).

	# Members, 0-20 Years Enrolled at Least 1 Month		
Medicaid Program	Dates	# Mem	Dental Delivery
Alaska	CY 2018	101,273	FFS
	CY 2017	99,296	FFS
	CY 2016	94,550	FFS
Arizona	CY 2018	974,161	Managed care carve in
	CY 2017	994,391	Managed care carve in
	CY 2016	981,695	Managed care carve in
Delaware	CY 2018	118,646	FFS
	CY 2017	118,295	FFS
	CY 2016	120,348	FFS
Idaho	CY 2018	214,879	Dental only PAHP
	CY 2017	220,084	Dental only PAHP
	CY 2016	201,253	Dental only PAHP
Michigan	CY 2018	1,163,658	Dental only PAHP
	CY 2017	1,182,388	Dental only PAHP
	CY 2016	1,182,388	Dental only PAHP
Mississippi	CY 2018	444,432	Managed care carve in
	CY 2017	456,123	Managed care carve in
	CY 2016	492,813	Managed care carve in
Nevada	CY 2018	379,289	Dental only PAHP & FFS

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	CY 2017	378,460	FFS
	CY 2016	370,394	Managed care carve in & FFS
New Mexico	CY 2018	376,379	Managed care carve in
	CY 2017	387,255	Managed care carve in
	CY 2016	383,056	Managed care carve in
North Carolina	CY 2018	1,231,829	FFS
	CY 2017	1,259,699	FFS
	CY 2016	1,241,882	FFS
Oklahoma	CY 2018	531,222	PCCM/FFS
	CY 2017	553,905	PCCM/FFS
	CY 2016	557,138	PCCM/FFS
Oregon	CY 2018	435,074	Dental only PAHP
	CY 2017	463,301	Dental only PAHP
	CY 2016	479,469	Dental only PAHP
South Carolina	CY 2018	767,719	FFS
	CY 2017	762,747	FFS
	CY 2016	752,206	FFS
Washington	CY 2018	932,270	FFS
	CY 2017	945,583	FFS
	CY 2016	939,142	FFS
Wyoming	CY 2018	49,581	FFS
	CY 2017	52,127	FFS
	CY 2016	54,551	FFS

Alt-Text: Table showing program enrollment and dental delivery system type for 14 state Medicaid programs in each year 2016 through 2018.

Measured Entities used for Testing ICD-9 to ICD-10 Conversion

(1) We used claims and encounter data from the Texas Medicaid and CHIP programs to evaluate performance scores before and after the conversion to ICD-10 diagnosis codes.

	# Members, 0-20 Years			
Program	Dates	# Mem	Location	Dental Delivery
Texas Medicaid	December 2018	2,884,937	Texas - statewide	DBA
	December 2017	2,982,219		
	December 2016	3,002,170		
Texas CHIP	December 2018	384,737	Texas - statewide	DBA
	December 2017	422,402		

DBA: Dental Benefits Administrator

Alt-Text: Table showing program enrollment and dental delivery system type for Texas Medicaid and CHIP programs in each year 2016 through 2018.

(2) We additionally used patient record data from an integrated delivery system with medical and dental benefits (HealthPartners Regions Hospital, an acute care hospital emergency department in Minnesota) to conduct data element validation of the diagnosis code set using ICD-10 diagnosis codes.

Measured Entities used for Testing Performance Differences

- (1) State Medicaid programs using T-MSIS data (see above)
- (2) Commercial Carrier with Medical and Dental Benefits
 - (a) Size # Member 0-20 years, December 2018 enrollment: 3,248,628
- (b) Location: National – 24 states
- (c) Delivery Type: HMO

PRIOR TESTING

4 Measured Entities

- 1. Texas Medicaid
 - A. Size: # Members 0-20 years, CY 2011: 3,578,302
 - B. Location: Texas – Statewide
 - C. Delivery Type – FFS
- 2. Texas CHIP
 - A. Size: # Members 0-20 years, CY 2011: 870,433
 - B. Location: Texas – Statewide
 - C. Delivery Type – 1 Dental Benefit Administrator
- 3. Florida CHIP
 - A. Size: # Members 0-20 years, CY 2011: 329,707
 - B. Location: Florida – Statewide
 - C. Delivery Type – 2 Dental Benefit Administrators
- 4. Florida Medicaid
 - A. Size: # Members 0-20 years, CY 2011: 2,229,323
 - B. Location: Florida – Statewide
 - C. Delivery Type – FFS and Prepaid Dental

[Response Ends]

2a.06. Identify the number and descriptive characteristics of patients included in the analysis (e.g., age, sex, race, diagnosis), separated by level of analysis and data source; if a sample was used, describe how patients were selected for inclusion in the sample.

If there is a minimum case count used for testing, that minimum must be reflected in the specifications.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

Patient Characteristics: Measure Score Reliability and Validity Testing

Table 2a.06)A-C below provides the patient characteristics for children included in the administrative data analyses of a sample of 14 Medicaid programs contained within the T-MSIS analytic files for each year CY 2016 through CY 2018. In CY 2018, program enrollment ranged from 49,581 in Wyoming Medicaid to 1,231,829 in North Carolina

Medicaid. Age and biological sex distributions were similar across programs. There was substantial variation in the geographic location and race/ethnicity distributions between states. Four states were excluded from testing analysis in CY2016 due to data quality issues (see 2b.08 regarding analysis of missing data).

Table 2a.06-A, State Medicaid Program Patient Characteristics, <21 Years Old, CY2018 (T-MSIS Data)							
	Descriptive Characteristics of Patients						
	Enrolled at Least One Month with Comprehensive Benefits, CY 2018						
	Alaska	Arizona	Delaware	Idaho	Michigan	Mississippi	Nevada
Total # Patients	101,273	974,161	118,646	214,879	1,163,658	444,432	379,289
Age Group							
<1 yr	5.35%	5.08%	5.29%	5.12%	5.48%	6.02%	5.69%
1-2 yrs	12.07%	10.75%	11.09%	11.49%	11.12%	11.80%	11.95%
3-5 yrs	16.76%	15.36%	15.49%	16.87%	15.51%	16.42%	16.63%
6-7 yrs	10.23%	9.70%	10.03%	10.33%	9.88%	9.98%	10.21%
8-9 yrs	9.90%	9.78%	10.20%	10.18%	9.81%	9.93%	9.97%
10-11 yrs	9.41%	10.32%	10.28%	10.48%	9.72%	10.42%	10.09%
12-14 yrs	12.94%	14.47%	13.87%	14.51%	13.72%	14.17%	13.62%
15-18 yrs	15.79%	17.06%	16.23%	16.63%	16.52%	16.55%	15.36%
19-20 yrs	7.53%	7.49%	7.51%	4.40%	8.23%	4.71%	6.48%
Missing	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Geographic Location							
Rural	44.49%	13.36%	18.44%	33.46%	19.27%	57.16%	5.86%
Urban	55.34%	84.19%	81.56%	66.20%	80.72%	42.84%	94.07%
Missing	<1%	2.45%	<1%	<1%	<1%	<1%	<1%
Race/ Ethnicity							
White, non- Hispanic	32.50%	44.05%	34.56%	97.48%	0.00%	29.61%	24.94%
Black, non- Hispanic	3.62%	9.15%	41.42%	<1%	0.00%	53.53%	21.42%

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Asian, non-Hispanic	5.37%	1.59%	1.97%	<1%	0.00%	<1%	2.86%
AIAN, non-Hispanic	36.17%	9.22%	<1%	2.15%	0.00%	<1%	1.31%
Hawaiian/Pacific Islander	4.86%	<1%	<1%	0.00%	0.00%	<1%	1.46%
Multiracial, non-Hispanic	8.11%	0.00%	0.00%	0.00%	0.00%	0.00%	<1%
Hispanic, all races	2.94%	<1%	21.73%	<1%	8.99%	<1%	43.90%
non-Hispanic, race unspecified	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Missing	6.43%	34.93%	<1%	<1%	91.01%	14.75%	4.09%
Sex							
Female	48.77%	49.19%	49.41%	48.98%	49.20%	49.68%	49.27%
Male	51.23%	50.81%	50.59%	51.02%	50.80%	50.32%	50.73%
Missing	0.00%	0.00%	<1%	0.00%	0.00%	<1%	0.00%
	New Mexico	North Carolina	Oklahoma	Oregon	South Carolina	Washington	Wyoming
Total # Patients	376,379	1,231,829	531,222	435,074	767,719	932,270	49,581
Age Group							
<1 yr	4.68%	5.80%	6.42%	5.42%	4.90%	4.79%	5.80%
1-2 yrs	10.02%	11.68%	13.00%	11.19%	10.86%	10.49%	12.37%
3-5 yrs	15.55%	16.29%	17.85%	15.13%	16.42%	15.76%	16.54%
6-7 yrs	9.91%	10.01%	10.69%	9.64%	10.30%	10.21%	10.44%
8-9 yrs	9.75%	9.73%	10.31%	9.67%	10.40%	10.27%	10.27%
10-11 yrs	10.27%	9.96%	10.43%	9.91%	10.65%	10.36%	10.50%
12-14 yrs	14.33%	13.52%	13.99%	13.60%	14.36%	14.11%	13.92%
15-18 yrs	17.24%	16.11%	13.15%	16.81%	16.62%	16.83%	15.80%
19-20 yrs	8.24%	6.90%	4.17%	8.63%	5.48%	7.19%	4.34%
Missing	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Geographic Location							
Rural	33.89%	26.30%	38.40%	25.39%	22.78%	15.50%	65.44%
Urban	66.06%	72.91%	61.58%	72.78%	76.71%	84.49%	34.56%
Missing	<1%	<1%	<1%	1.84%	<1%	<1%	<1%
Race/ Ethnicity							
White, non-Hispanic	20.83%	37.88%	39.65%	32.07%	24.71%	40.01%	54.43%

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Black, non-Hispanic	1.93%	35.24%	13.79%	2.50%	27.71%	6.91%	2.20%
Asian, non-Hispanic	<1%	1.66%	1.70%	1.46%	<1%	3.43%	<1%
AIAN, non-Hispanic	15.25%	1.29%	17.07%	1.79%	<1%	3.06%	8.92%
Hawaiian/Pacific Islander	0.00%	<1%	<1%	<1%	<1%	3.01%	<1%
Multiracial, non-Hispanic	0.00%	3.98%	0.00%	<1%	0.00%	2.18%	0.00%
Hispanic, all races	60.05%	19.10%	21.79%	39.72%	5.07%	29.04%	11.46%
non-Hispanic, race unspecified	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Missing	1.32%	<1%	5.54%	21.79%	41.60%	12.36%	22.42%
Sex							
Female	49.42%	49.39%	49.59%	49.23%	49.25%	49.21%	48.91%
Male	50.58%	50.61%	50.41%	50.77%	50.74%	50.79%	51.09%
Missing	0.00%	0.00%	0.00%	<1%	<1%	0.00%	0.00%

Alt-Text: Table showing data of descriptive characteristics of patients within state Medicaid programs, under age twenty-one for coverage year 2018 (T-MSIS data)

Table 2a06-B, State Medicaid Program Patient Characteristics, <21 Years Old, CY2017 (T-MSIS Data)							
	Descriptive Characteristics of Patients						
	Enrolled at Least One Month, CY 2017						
	Alaska	Arizona	Delaware	Idaho	Michigan	Mississippi	Nevada
Total # Patients	99,296	994,391	118,295	220,084	1,163,174	456,123	378,460
Age Group							
<1 yr	5.72%	5.16%	5.49%	5.46%	5.34%	5.99%	5.88%
1-2 yrs	12.66%	11.04%	11.33%	11.92%	11.39%	11.77%	12.14%
3-5 yrs	16.46%	15.43%	15.29%	17.02%	15.45%	16.33%	16.57%
6-7 yrs	10.29%	9.68%	10.39%	10.34%	9.95%	10.22%	10.32%

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8-9 yrs	9.86%	10.27%	10.53%	10.45%	9.95%	10.43%	10.30%
10-11 yrs	9.30%	10.32%	10.02%	10.34%	9.72%	10.62%	10.16%
12-14 yrs	12.54%	14.00%	13.56%	14.02%	13.44%	13.46%	13.17%
15-18 yrs	15.74%	16.63%	15.83%	16.07%	16.54%	16.42%	14.94%
19-20 yrs	7.45%	7.46%	7.56%	4.37%	8.22%	4.77%	6.51%
Missing	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Geographic Location							
Rural	44.74%	12.99%	18.45%	33.61%	19.31%	57.00%	6.02%
Urban	55.06%	81.41%	81.55%	66.00%	80.67%	42.99%	93.91%
Missing	<1%	5.61%	<1%	<1%	<1%	<1%	<1%
Race/ Ethnicity							
White, non-Hispanic	32.60%	44.14%	35.10%	97.51%	0.00%	30.83%	25.33%
Black, non-Hispanic	3.66%	8.92%	41.31%	<1%	0.00%	55.30%	20.85%
Asian, non-Hispanic	5.47%	1.61%	1.93%	<1%	0.00%	<1%	2.82%
AIAN, non-Hispanic	36.14%	9.24%	<1%	2.06%	0.00%	<1%	1.35%
Hawaiian/Pacific Islander	4.83%	<1%	<1%	0.00%	0.00%	<1%	1.23%
Multiracial, non-Hispanic	8.21%	0.00%	0.00%	0.00%	0.00%	0.00%	<1%
Hispanic, all races	2.94%	2.03%	21.35%	<1%	8.95%	<1%	44.03%
non-Hispanic, race unspecified	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Missing	6.14%	33.72%	<1%	<1%	91.05%	11.78%	4.37%
Sex							
Female	48.92%	49.17%	49.47%	49.01%	49.19%	49.75%	49.28%
Male	51.08%	50.83%	50.53%	50.99%	50.81%	50.25%	50.72%
Missing	0.00%	0.00%	<1%	0.00%	0.00%	<1%	0.00%
	New Mexico	North Carolina	Oklahoma	Oregon	South Carolina	Washington	Wyoming
Total # Patients	387,255	1,259,699	553,905	463,301	762,747	945,583	52,127
Age Group							
<1 yr	4.74%	5.82%	6.27%	5.41%	5.07%	4.94%	5.83%
1-2 yrs	10.37%	11.67%	13.08%	11.50%	11.32%	10.74%	12.68%
3-5 yrs	15.72%	16.30%	17.68%	15.08%	16.28%	15.78%	16.68%

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6-7 yrs	9.98%	10.20%	10.76%	9.75%	10.41%	10.27%	10.66%
8-9 yrs	10.26%	10.15%	10.70%	10.07%	10.82%	10.58%	10.54%
10-11 yrs	10.22%	9.90%	10.39%	9.78%	10.64%	10.23%	10.35%
12-14 yrs	13.83%	13.07%	13.62%	13.24%	13.65%	13.66%	13.46%
15-18 yrs	16.87%	16.00%	13.25%	16.68%	16.60%	16.68%	15.30%
19-20 yrs	8.00%	6.88%	4.26%	8.49%	5.21%	7.12%	4.49%
Missing	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Geographic Location							
Rural	33.71%	26.47%	38.71%	24.60%	22.87%	15.45%	65.42%
Urban	66.25%	72.71%	61.25%	71.97%	76.62%	84.55%	34.58%
Missing	<1%	<1%	<1%	3.43%	<1%	<1%	0.00%
Race/ Ethnicity							
White, non-Hispanic	20.82%	38.41%	40.18%	33.66%	26.23%	40.37%	56.33%
Black, non-Hispanic	1.94%	35.12%	13.51%	2.46%	29.24%	6.66%	2.12%
Asian, non-Hispanic	<1%	1.68%	1.67%	1.46%	<1%	3.46%	<1%
AIAN, non-Hispanic	15.04%	1.28%	17.07%	1.76%	<1%	2.88%	8.63%
Hawaiian/Pacific Islander	0.00%	<1%	<1%	<1%	<1%	2.89%	<1%
Multiracial, non-Hispanic	0.00%	3.91%	0.00%	<1%	0.00%	1.78%	0.00%
Hispanic, all races	60.22%	18.69%	21.45%	36.70%	5.42%	28.38%	11.87%
non-Hispanic, race unspecified	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Missing	1.34%	<1%	5.66%	23.21%	38.17%	13.59%	20.37%
Sex							
Female	49.37%	49.43%	49.54%	49.19%	49.33%	49.18%	48.93%
Male	50.63%	50.57%	50.46%	50.81%	50.67%	50.82%	51.07%
Missing	0.00%	0.00%	0.00%	<1%	<1%	0.00%	0.00%

Alt-Text: Table showing data of descriptive characteristics of patients within state Medicaid programs, under age twenty-one for coverage year 2017 (T-MSIS data)

Table 2a06-C, State Medicaid Program Patient Characteristics, <21 Years Old, CY2016 (T-MSIS Data)							
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	Descriptive Characteristics of Patients						
	Enrolled at Least One Month, CY 2016						
	Alaska	Arizona	Delaware	Idaho	Michigan	Mississippi	Nevada
Total # Patients	94,550	981,695	120,348	201,253	1,182,388	492,813	370,394
Age Group							
<1 yr	6.43%	5.47%	5.32%	5.27%	5.38%	5.60%	5.97%
1-2 yrs	12.42%	11.59%	11.12%	12.65%	11.33%	11.20%	12.18%
3-5 yrs	16.26%	15.02%	15.68%	17.15%	15.33%	15.61%	16.60%
6-7 yrs	10.56%	10.06%	10.63%	10.98%	10.01%	10.64%	10.70%
8-9 yrs	9.87%	10.57%	10.60%	11.23%	9.94%	11.12%	10.63%
10-11 yrs	9.11%	10.03%	9.92%	10.42%	9.50%	10.35%	9.76%
12-14 yrs	12.50%	13.64%	13.34%	13.93%	13.28%	13.71%	12.90%
15-18 yrs	15.85%	16.34%	15.84%	14.44%	17.07%	17.08%	14.76%
19-20 yrs	7.00%	7.28%	7.56%	3.93%	8.16%	4.69%	6.51%
Missing	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Geographic Location							
Rural	45.02%	12.88%	18.31%	33.63%	18.03%	56.69%	<1%
Urban	54.77%	80.34%	81.69%	66.36%	75.62%	43.30%	7.87%
Missing	<1%	6.78%	<1%	<1%	6.34%	<1%	91.70%
Race/ Ethnicity							
White, non-Hispanic	32.49%	43.12%	35.80%	98.02%	53.04%	5.63%	25.99%
Black, non-Hispanic	3.80%	8.69%	41.11%	<1%	27.90%	7.05%	20.23%
Asian, non-Hispanic	5.52%	1.61%	1.96%	<1%	<1%	<1%	2.78%
AIAN, non-Hispanic	36.49%	9.39%	<1%	1.95%	<1%	<1%	1.45%
Hawaiian/Pacific Islander	4.84%	<1%	<1%	0.00%	<1%	<1%	1.01%
Multiracial, non-Hispanic	8.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hispanic, all races	3.07%	3.88%	20.83%	<1%	8.19%	<1%	43.93%
non-Hispanic, race unspecified	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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Missing	5.64%	32.99%	<1%	<1%	9.43%	86.63%	4.61%
Sex							
Female	48.95%	49.25%	49.54%	48.50%	49.22%	49.67%	49.34%
Male	51.05%	50.75%	50.45%	51.50%	50.78%	50.32%	50.66%
Missing	0.00%	0.00%	<1%	0.00%	0.00%	<1%	0.00%
	New Mexico	North Carolina	Oklahoma	Oregon	South Carolina	Washington	Wyoming
Total # Patients	383,056	1,241,882	557,138	479,469	752,206	939,142	54,551
Age Group							
<1 yr	4.94%	5.58%	6.52%	5.53%	5.12%	5.20%	6.11%
1-2 yrs	10.76%	11.91%	13.06%	11.70%	11.52%	10.84%	12.52%
3-5 yrs	15.78%	16.42%	17.58%	15.17%	16.15%	15.77%	16.93%
6-7 yrs	10.17%	10.65%	11.14%	10.02%	10.69%	10.55%	10.97%
8-9 yrs	10.55%	10.41%	10.85%	10.28%	10.98%	10.70%	11.04%
10-11 yrs	9.91%	9.62%	10.04%	9.59%	10.13%	9.90%	9.86%
12-14 yrs	13.65%	12.94%	13.41%	13.02%	13.35%	13.35%	13.03%
15-18 yrs	16.58%	15.91%	13.26%	16.61%	16.59%	16.61%	14.96%
19-20 yrs	7.67%	6.57%	4.14%	8.07%	5.45%	7.09%	4.58%
Missing	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Geographic Location							
Rural	33.89%	26.58%	38.85%	22.21%	23.14%	15.40%	0.00%
Urban	66.06%	72.95%	61.12%	67.14%	76.37%	84.60%	0.00%
Missing	<1%	<1%	<1%	10.65%	<1%	<1%	100.00%
Race/ Ethnicity							
White, non-Hispanic	20.97%	38.76%	40.55%	36.46%	28.36%	41.07%	59.76%
Black, non-Hispanic	1.93%	35.36%	13.44%	2.55%	31.64%	6.54%	2.23%
Asian, non-Hispanic	<1%	1.68%	1.68%	1.35%	<1%	3.50%	<1%
AIAN, non-Hispanic	15.13%	1.28%	16.73%	1.76%	<1%	2.56%	8.23%
Hawaiian/Pacific Islander	0.00%	<1%	<1%	<1%	<1%	2.81%	<1%
Multiracial, non-Hispanic	0.00%	3.76%	0.00%	<1%	0.00%	1.49%	0.00%
Hispanic, all races	59.94%	18.34%	21.26%	33.92%	5.82%	27.92%	0.00%

non-Hispanic, race unspecified	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Missing	1.38%	<1%	5.91%	23.08%	33.22%	14.11%	29.08%
Sex							
Female	49.40%	49.46%	49.55%	49.20%	49.39%	49.24%	48.79%
Male	50.60%	50.54%	50.45%	50.79%	50.61%	50.76%	51.21%
Missing	0.00%	0.00%	0.00%	<1%	<1%	0.00%	0.00%

Alt-Text: Table showing data of descriptive characteristics of patients within state Medicaid programs, under age twenty-one for coverage year 2016 (T-MSIS data)

Patient Characteristics: ICD-9 to ICD-10 Conversion Data Element Validation

Table 2a06-D below provides the patient characteristics for the 359 children included in the record review sample for ICD-10 critical data element validation. Details regarding the sample selection process and rationale are provided in Section 2b1.2 Validity Testing – under the section “Critical Data Element Validity.”

Table 2a06-D, Patient Characteristics, ICD-10 Chart Validation Sample	
Total Number	359
Age Group Distribution	
<1 years	2.9%
1-2 years	3.6%
3-5 years	7.5%
6-7 years	4.7%
8-9 years	2.5%
10-11 years	3.3%
12-14 years	8.1%
15- 18 years	29.5%
19- 20 years	37.9%

Alt-Text: Table showing age group distribution for 359 patients included in chart validation sample.

PRIOR TESTING

(1) Claims-based analyses. The table below provides the patient characteristics for children included in the administrative data analyses.

	Descriptive Characteristics of Individuals 0-20 Years Enrolled at Least One Month, CY 2011			
	Program 1	Program 2	Program 3	Program 4
Total Number Patients	3,578,302	870,433	329,707	2,229,323
Age Group Distribution				
Age <1 years	7.90%	0.17%	N/A	6.50%

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Age 1-2 years	13.77%	5.94%	N/A	13.00%
Age 3-5 years	19.25%	11.28%	4.68%	19.13%
Age 6-7 years	11.00%	12.56%	12.98%	10.62%
Age 8-9 years	9.71%	13.84%	14.46%	9.06%
Age 10-11 years	8.90%	13.53%	15.08%	8.73%
Age 12-14 years	11.46%	18.83%	22.76%	11.94%
Age 15-18 years	13.66%	23.84%	30.04%	14.85%
Age 19-20 years	4.36%	N/A	N/A	6.18%
Geographic Location				
Urban	73.95%	73.61%	82.19%	81.15%
Suburban	9.86%	11.05%	10.00%	10.66%
Rural	14.91%	14.28%	4.84%	6.93%
Missing	1.29%	1.06%	2.97%	1.26%
Race and Ethnicity				
Non-Hispanic White	17.46%	N/A	N/A	29.91%
Non-Hispanic Black	15.17%	N/A	N/A	29.10%
Hispanic	58.07%	N/A	N/A	29.78%
Other & Unknown	9.30%	N/A	N/A	11.22%

Alt-Text: Table showing data of descriptive characteristics of patients within tested programs and plans, age zero to twenty for coverage year 2011

(2) Chart reviews - data element validation. The table below provides the patient characteristics for the 300 children included in the record review sample for critical data element validation. These patients were a randomly selected sample of patients 0-20 years old, with Florida Medicaid payer type, who had a non-traumatic ED visit related to the oral cavity. Additional details regarding the sample selection process and rationale are provided in Section 2b2.2 Validity Testing – under the section “Critical Data Element Validity.”

Descriptive Characteristics of Individuals in Chart Validation Sample	
	Program 4
Total Number Patients	300
Age Group Distribution	
Age <1 years	8.67%
Age 1-2 years	20.00%
Age 3-5 years	16.67%
Age 6-7 years	7.67%
Age 8-9 years	6.67%
Age 10-11 years	7.33%
Age 12-14 years	6.33%
Age 15-18 years	13.67%
Age 19-20 years	13.00%

Geographic Location	
Urban	61.00%
Suburban	21.00%
Rural	17.67%
Missing	0.33%
Race & Ethnicity	
Non-Hispanic White	30.00%
Non-Hispanic Black	47.67%
Hispanic	7.00%
Other & Unknown	15.33%

Alt-Text: Table showing demographic characteristics for 300 individuals included in chart validation sample in Program 4.

[Response Ends]

2a.07. If there are differences in the data or sample used for different aspects of testing (e.g., reliability, validity, exclusions, risk adjustment), identify how the data or sample are different for each aspect of testing.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

1. Measure score reliability testing was conducted using Medicaid claims and enrollment data contained within the T-MSIS analytic files from 14 state programs.
2. Data element validation of ICD-10 diagnosis codes was conducted using emergency department records for patients seen in an acute care hospital in Minnesota.

PRIOR TESTING

These data [administrative claims] were used for all testing aspects except two:

1. The face validity assessments involved expert consensus processes. Please see section 2b on validity testing for a complete description.
2. Data element validation of ICD-9 diagnosis codes was conducted using emergency department record reviews of patients enrolled in Florida Medicaid. Due to the cost of these activities and challenges in obtaining records from hospital emergency departments, record reviews were conducted using records from a tertiary-care, academic health center hospital emergency department in Florida that allowed for data linkages with the Florida Medicaid program administrative data. The hospital has a 13-county catchment area (out of 67 counties in Florida). The hospital serves a moderately-sized community of 250,000, a college campus, and surrounding rural counties. The ED treats approximately 90,000 patients per year.

[Response Ends]

2a.08. List the social risk factors that were available and analyzed.

For example, patient-reported data (e.g., income, education, language), proxy variables when social risk data are not collected from each patient (e.g. census tract), or patient community characteristics (e.g. percent vacant housing, crime rate) which do not have to be a proxy for patient-level data.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

The measure scores were stratified by the following patient characteristics (when sufficient data were available): age, geographic location (rural or urban), race and ethnicity, and biological sex. These will be reported in section 1b: Importance to Measure and Report: Gap in Care/Disparities.

[Response Ends]

Note: If accuracy/correctness (validity) of data elements was empirically tested, separate reliability testing of data elements is not required – in 2a.09 check patient or encounter-level data; in 2a.010 enter “see validity testing section of data elements”; and enter “N/A” for 2a.11 and 2a.12.

2a.09. Select the level of reliability testing conducted.

Choose one or both levels.

[Response Begins]

Patient or Encounter-Level (e.g., inter-abtractor reliability; data element reliability must address ALL critical data elements)

Accountable Entity Level (e.g., signal-to-noise analysis)

[Response Ends]

2a.10. For each level of reliability testing checked above, describe the method of reliability testing and what it tests.

Describe the steps—do not just name a method; what type of error does it test; what statistical analysis was used.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

(1) Accountable Entity Measure Score Reliability Testing using a random split-sample methodology:

Reliability indicates the extent to which repeated measurements yield consistent results. We conducted accountable entity measure score level reliability testing using a random split-sample methodology and calculated the intraclass correlation coefficient (ICC) of the measure scores. For each of the 14 state Medicaid programs, we randomly split the population of children aged <21 years present in the T-MSIS demographic and eligibility file. The denominator, numerator, and measure score were calculated for each sample. Thus, the measure score is calculated twice for each state Medicaid program among two distinct and randomly selected sets of children contained within the analytic files. We used the ICC to calculate the agreement between the randomly selected samples (Koo & Li 2016; McGraw & Wong 1996; Shrout & Fleiss 1979). A higher ICC value indicates greater agreement and, therefore, greater reliability. We follow the guidance in Koo and Li (2016) regarding the interpretation of reliability using the 95% confidence interval of the ICC: <0.5 = poor; 0.5–0.75 = moderate; 0.75–0.9 = good; and > 0.9 = excellent.

(2) Evaluation of Relative Rankings: Between Years

We compared the relative rankings of the overall measure scores between 2017 and 2018 and between 2016 and 2017 to evaluate whether there were any dramatic changes that could suggest a threat to reliability. Using the measure scores for the 14 state Medicaid programs in 2017 and 2018 and 13 state Medicaid programs in 2016 and 2017, we calculated Kendall's Tau-b, which is a rank correlation coefficient that measures association based on the number of concordant and discordant pairs. For reference, we also report the more commonly reported Spearman's rank correlation coefficients. Although the strength of these associations is stronger, we felt Kendall's tau was the more appropriate test to report given the relatively small sample size.

(3) Data Element Reliability/Validity of ICD-10 Diagnosis Codes

We updated our earlier data element reliability/validity testing of the diagnosis codes used to identify caries-related ED visits using ICD-10 codes by conducting chart audits as described in the section Validity Testing of Data Elements below.

References

Koo TK, Li MY. A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. J Chiropr Med. 2016 Jun;15(2):155-63. doi: 10.1016/j.jcm.2016.02.012. Epub 2016 Mar 31.

McGraw KO, Wong SP. Forming inferences about some intraclass correlation coefficients. Psychol Methods. 1996;1:30-46.

Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing rater reliability. Psychol Bull. 1979;86:420-428.

PRIOR TESTING

Clarification note: Following NQF guidance at the time of original testing, reliability for original endorsement was established through:

1. Data element reliability was demonstrated through data element validation using chart audits as described in the section below on Validity Testing of Data Elements.
2. Evaluation and refinement of measure specifications to ensure that they were detailed, clear, and complete.
3. Voting by the DQA membership on whether reliability criterion was met.

Data Elements:

- See the section below on Validity Testing of Data Elements.

Note: Unlike measures that rely on medical record data for which issues such as inter-rater reliability are likely to introduce measurement concerns or measures that rely on survey data for which issues such as internal consistency may be a concern, this measure relies on standard data fields commonly used in administrative data for a wide range of billing and reporting purposes.

Evaluation of Clarity and Completeness of Measure Specifications

An important component of assessing reliability is assessing, testing, and addressing threats to measure reliability.

1. Evaluation of Clarity and Completeness of Measure Specifications

For a measure to be reliable – to allow for meaningful comparisons across entities – the measure specifications must be unambiguous: the denominator criteria, numerator criteria, exclusions, and scoring need to be clearly specified. The initial measure specifications were developed by the Dental Quality Alliance (DQA). The Dental Quality Alliance includes 34 member organizations, representing a broad range of stakeholders, including federal agencies involved with oral health services, dental professional associations, medical professional associations, dental and medical health insurance commercial plans, state Medicaid and CHIP programs, quality accrediting bodies, and the general public. The DQA's Measure Development and Maintenance Committee (MDMC) oversees all scientific aspects of measure

development and testing. The MDMC is comprised of individuals with recognized and appropriate expertise in oral health to lead quality measure development. The members of the MDMC are listed in Section Ad.1. (Workgroup/Expert Panel Involved in Measure Development).

The specifications developed by the DQA were contained in the competitive Request for Proposals to conduct measure testing; a research team from the University of Florida was selected to conduct testing. The research team independently then carefully evaluated whether the measure specifications identified all necessary data elements to calculate the numerators and denominators for each measure. In addition, the research team carefully reviewed the logic flow and made revision recommendations intended to improve the reliability of the resulting calculations. The DQA also solicited public comment on an Interim Report, which included the revised, detailed measure specifications. The report was disseminated by email to a wide range of stakeholders and posted online for a one-month public comment period. The research team worked with the DQA to evaluate and address all comments provided. Throughout the eight-month testing period, there were numerous reviews and revisions of the specifications conducted jointly by the research team and the DQA to ensure clear and detailed measure specifications.

A final presentation of the final and fully specified measures, testing methodology, and results was made to the DQA membership on October 24, 2014. The presentation addressed the NQF criteria for scientific acceptability of measures. Using the NQF criteria, the DQA membership voted by secret ballot on the level of confidence for each criterion as well as whether to approve the measure overall. For the Reliability criterion – *The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allow for comparability.* – a total of 23 votes were cast: 100% of votes indicated high or moderate confidence that the criterion was met. Specifically there were 15 votes of “high” confidence and 8 votes of “moderate” confidence; there were no votes of low confidence or insufficient information.

2. Other Threats to Reliability - Sample Size

Our measured entities include very large numbers of patients; therefore, small sample size is not a concern.

[Response Ends]

2a.11. For each level of reliability testing checked above, what were the statistical results from reliability testing?

For example, provide the percent agreement and kappa for the critical data elements, or distribution of reliability statistics from a signal-to-noise analysis. For score-level reliability testing, when using a signal-to-noise analysis, more than just one overall statistic should be reported (i.e., to demonstrate variation in reliability across providers). If a particular method yields only one statistic, this should be explained. In addition, reporting of results stratified by sample size is preferred (pg. 18, [NQF Measure Evaluation Criteria](#)).

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

(1) Measure Score Reliability Testing: Split-Half

(A) Performance Scores with 95% CI

Tables 2a.11)A-C below provides the performance scores for the split samples with their 95% confidence intervals.

Table									
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2a .1 1) A, Sp lit Sa m pl e Ca rie s- Re lat ed E D Vi sit s, M ea su re Sc or es an d 95 % CI, CY 20 18 (T - M SI S D at a)									
Pr og ra m	S a m p l e	S c o r e		S D		9 5 % CI			
AK ,	1	1 9		1 .		1 5.		2 3.	

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20 18		. 4 5		9 3 4 8		6 5 4 2		2 3 8 7	
	2	1 4 .8 6		1 .6 9 3 3		1 1. 5 4 0 9		1 8. 1 7 8 6	
AZ , 20 18	1	1 4 .4 6		0 .5 4 7 6		1 3. 3 8 5 0		1 5. 5 3 1 6	
	2	1 4 .8 7		0 .5 5 4 9		1 3. 7 8 3 1		1 5. 9 5 8 5	
DE , 20 18	1	2 7 .3 2		2 .2 0 1 3		2 3. 0 0 6 2		3 1. 6 3 5 1	
	2	2 5 .7 5		2 .1 3 8 5		2 1. 5 6 3 1		2 9. 9 4 6 2	
ID , 20 18	1	1 4 .5 9		1 .1 7 9 7		1 2. 2 8 1 2		1 6. 9 0 5 7	
	2	1 7 .7 9		1 .3 0 4 1		1 5. 2 3 1 0		2 0. 3 4 3 0	
M I,	1	3 0 .		0 .7 2		2 9. 2 9		3 2. 1 3	

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20 18		7 1		2 8		6 7		0 1	
	2	3 2 . 2 6		0 . 7 4 0 5		3 0. 8 1 3 2		3 3. 7 1 5 9	
M S, 20 18	1	2 1 . 9 2		1 . 0 2 0 7		1 9. 9 1 7 4		2 3. 9 1 8 6	
	2	2 2 . 5 0		1 . 0 3 5 4		2 0. 4 6 7 4		2 4. 5 2 6 1	
N V, 20 18	1	2 4 . 2 0		1 . 1 8 1 9		2 1. 8 7 9 3		2 6. 5 1 2 3	
	2	2 4 . 2 1		1 . 1 8 2 7		2 1. 8 9 4 2		2 6. 5 3 0 3	
N M, 20 18	1	1 4 . 0 2		0 . 8 6 2 8		1 2. 3 2 8 2		1 5. 7 1 0 3	
	2	1 5 . 6 1		0 . 9 1 0 4		1 3. 8 2 6 5		1 7. 3 9 5 2	
N C, 20 18	1	2 4 . 1 5		0 . 6 3		2 2. 9 1		2 5. 3 9	

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				2 0		3 2		0 7	
	2	2 5 . 0 9		0 . 6 4 4 2		2 3. 8 3 0 8		2 6. 3 5 6 0	
O K, 20 18	1	1 5 . 9 3		0 . 8 5 6 2		1 4. 2 4 9 0		1 7. 6 0 5 2	
	2	1 5 . 1 2		0 . 8 3 3 8		1 3. 4 9 0 4		1 6. 7 5 8 8	
O R, 20 18	1	3 0 . 8 1		1 . 2 3 3 2		2 8. 3 9 3 5		3 3. 2 2 7 7	
	2	2 9 . 5 8		1 . 2 0 6 2		2 7. 2 1 1 3		3 1. 9 3 9 7	
SC , 20 18	1	1 6 . 2 4		0 . 6 3 8 5		1 4. 9 9 0 3		1 7. 4 9 3 1	
	2	1 7 . 2 9		0 . 6 5 8 6		1 5. 9 9 9 3		1 8. 5 8 1 2	
W A, 20 18	1	1 8 . 3 0		0 . 6 2		1 7. 0 8		1 9. 5 2	

				2 6		2 4		3 1	
	2	1 7 . 1 6		0 . 6 0 2 6		1 5. 9 8 1 8		1 8. 3 4 4 1	
W Y, 20 18	1	1 8 . 6 1		2 . 8 7 1 2		1 2. 9 8 1 7		2 4. 2 3 6 8	
	2	2 1 . 4 3		3 . 0 9 2 4		1 5. 3 6 5 7		2 7. 4 8 7 8	

Alt-Text: Table showing split sample performance scores with standard deviation and 95% confidence intervals for 14 state Medicaid programs in 2018.

Ta bl e 2a .1 1) B, Sp lit Sa m pl e Ca rie s- Re lat ed E D Vi sit s, M ea su re Sc									
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or es and 95 % CI, CY 20 17 (T - M SI S D at a)									
Pr og ra m	S a m p l e	S c o r e		S D		9 5 % CI			
AK , 20 17	1	2 1 . 6 6		2 . 0 7 4 5		1 7. 5 9 4 5		2 5. 7 2 6 5	
	2	2 0 . 7 0		2 . 0 2 9 7		1 6. 7 2 2 9		1 8. 8 3 8 0	
AZ , 20 17	1	1 5 . 7 3		0 . 5 5 7 6		1 4. 6 3 9 3		1 6. 8 2 4 9	
	2	1 6 . 4 1		0 . 5 6 9 6		1 5. 2 9 5 5		1 7. 5 2 8 5	
DE ,	1	2 7		2 .		2 2.		3 1.	

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20 17		. 0 3		1 9 2 1		7 3 2 8		3 2 5 7	
	2	2 6 .4 9		2 .1 6 9 8		2 2 2 3 6 4		3 0. 7 4 2 0	
ID , 20 17	1	1 9 .2 5		1 .2 9 7 5		1 6. 7 0 3 9		2 1. 7 9 0 1	
	2	1 5 .4 0		1 .1 6 1 0		1 3. 1 2 7 6		1 7. 6 7 8 6	
M I, 20 17	1	3 3 .4 6		0 .5 2 5 7		3 2. 0 5 5 4		3 4. 1 1 6 3	
	2	3 2 .4 6		0 .7 4 2 8		3 1. 0 0 3 5		3 3. 9 1 5 3	
M S, 20 17	1	2 2 .9 6		1 .0 0 9 6		2 0. 9 7 9 7		2 4. 9 3 7 3	
	2	2 5 .4 2		1 .0 6 2 0		2 3. 3 4 2 4		2 7. 5 0 5 3	
N V,	1	2 3 .		1 .1 7		2 1. 6 6		2 6. 2 8	

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20 17		9 7		9 5		1 1		4 7	
	2	2 2 . 2 1		1 . 1 3 6 1		1 9. 9 8 1 1		2 4. 4 3 4 8	
N M, 20 17	1	1 5 . 1 9		0 . 8 7 6 9		1 3. 4 7 0 3		1 6. 9 0 7 6	
	2	1 3 . 6 0		0 . 8 2 9 3		1 1. 9 7 6 7		1 5. 2 2 7 5	
N C, 20 17	1	2 5 . 5 9		0 . 6 4 1 9		2 4. 3 3 2 6		2 6. 8 4 8 8	
	2	2 6 . 1 5		0 . 6 5 7 6		2 4. 8 6 3 4		2 7. 4 4 1 3	
O K, 20 17	1	2 0 . 4 7		0 . 9 4 9 1		1 8. 6 0 7 5		2 2. 3 2 7 9	
	2	1 7 . 9 4		0 . 8 8 8 3		1 6. 2 0 3 6		1 9. 6 8 5 8	
O R, 20 17	1	2 9 . 7 9		1 . 1 9		2 7. 4 5		3 2. 1 2	

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				1 6		8 1		9 1	
	2	3 2 . 3 1		1 . 2 3 9 9		2 9. 8 8 3 0		3 4. 7 4 3 2	
SC , 20 17	1	1 8 . 5 6		0 . 6 8 3 7		1 7. 2 2 3 3		1 9. 9 0 3 5	
	2	1 9 . 4 5		0 . 6 9 9 8		1 8. 0 7 5 1		2 0. 8 1 8 5	
W A, 20 17	1	1 8 . 9 1		0 . 6 2 5 1		1 7. 6 8 5 7		2 0. 1 3 6 1	
	2	1 8 . 0 6		0 . 6 1 1 1		1 6. 8 5 8 6		1 9. 2 5 4 0	
W Y, 20 17	1	2 2 . 0 1		3 . 0 8 1 4		1 5. 9 6 8 5		2 8. 0 4 7 5	
	2	2 5 . 4 8		3 . 3 1 6 8		1 8. 9 7 9 3		3 1. 9 8 1 2	

Alt-Text: Table showing split sample performance scores with standard deviation and 95% confidence intervals for 14 state Medicaid programs in 2017.

Table									
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2a .1 1) C, Sp lit Sa m pl e Ca rie s- Re lat ed E D Vi sit s, M ea su re Sc or es an d 95 % CI, CY 20 16 (T - M SI S D at a)									
Pr og ra m	S a m p l e	S c o r e		S D		9 5 % CI			
AK ,	1	2 1		2 .		1 7.		2 5.	

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20 16		. 3 5		1 5 6 1		1 2 0 2		5 7 2 0	
	2	2 4 .3 8		2 .0 2 9 7		1 6. 7 2 2 9		2 4. 6 7 9 4	
AZ , 20 16	1	1 5 .6 2		0 .5 5 5 4		1 4. 5 3 2 1		1 6. 7 0 9 1	
	2	1 5 .2 0		0 .5 4 7 9		1 4. 1 3 1 1		1 6. 2 7 8 9	
DE , 20 16	1	2 3 .4 3		2 .0 7 8 8		1 9. 3 5 4 7		2 7. 5 0 3 5	
	2	2 6 .9 7		2 .2 2 4 1		2 2. 6 1 0 6		3 1. 3 2 9 2	
ID , 20 16	1	1 5 .0 6		1 .2 2 1 2		1 2. 6 6 3 2		1 7. 4 5 0 2	
	2	1 6 .7 6		1 .2 8 5 6		1 4. 2 4 4 0		1 9. 2 8 3 6	
M I,	1	3 3 .		0 .7 6		3 2. 1 9		3 5. 1 8	

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20 16		6 9		4 2		3 0		8 6	
	2	3 4 . 2 3		0 . 7 7 0 8		3 2. 7 1 6 6		3 5. 7 3 8 2	
N V, 20 16	1	2 3 . 1 0		1 . 1 7 1 2		2 0. 8 0 7 1		2 5. 3 9 8 3	
	2	2 1 . 8 3		1 . 1 3 7 8		1 9. 5 9 9 7		2 4. 0 6 0 0	
N M, 20 16	1	1 5 . 5 8		0 . 8 8 3 3		1 3. 8 4 6 6		1 7. 3 0 9 0	
	2	1 4 . 9 7		0 . 8 6 5 7		1 3. 2 7 3 7		1 6. 6 6 7 2	
N C, 20 16	1	2 6 . 7 3		0 . 6 5 6 4		2 5. 4 4 4 8		2 8. 0 1 7 9	
	2	2 7 . 7 1		0 . 6 6 8 2		2 6. 3 9 9 0		2 9. 0 1 8 5	
O K, 20 16	1	1 8 . 5 2		0 . 8 9		1 6. 7 6		2 0. 2 6	

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				1 8		8 5		4 5	
	2	1 8 . 1 8		0 . 8 8 3 9		1 6. 4 4 8 2		1 9. 9 1 3 1	
O R, 20 16	1	3 2 . 5 8		1 . 2 1 5 6		3 0. 1 9 6 1		3 4. 9 6 1 4	
	2	3 4 . 0 2		1 . 2 4 0 4		3 1. 5 9 0 5		3 6. 4 5 2 9	
SC , 20 16	1	1 6 . 0 0		0 . 6 3 2 8		1 4. 7 5 7 3		1 7. 2 3 7 9	
	2	1 6 . 6 8		0 . 6 4 6 1		1 5. 4 0 9 2		1 7. 9 4 1 9	
W A, 20 16	1	1 9 . 8 5		0 . 6 4 0 0		1 8. 5 9 8 3		2 1. 1 0 7 1	
	2	2 0 . 2 7		0 . 6 4 7 0		1 8. 9 9 8 5		2 1. 5 3 4 7	
W Y, 20 16	1	2 7 . 6 3		3 . 3 4		2 1. 0 6		3 4. 1 9	

				9 9		2 2		3 9	
	2	3 1 . 4 8		3 . 5 6 3 8		2 4. 4 9 4 4		3 8. 4 6 4 4	

Alt-Text: Table showing split sample performance scores with standard deviation and 95% confidence intervals for 13 state Medicaid programs in 2016.

(B) Intraclass Correlation Coefficient Results

The ICC estimates and their 95% CIs for each year are shown in the table below:

Intraclass Correlation Coefficients							
Year	ICC	9 5 % C I					p- value
2018 (n=14)	0.9 44 3	(	0.8 41 1		0.9 81 6		<0.0 001
2017 (n=14)	0.9 36 0	(	0.8 18 8		0.9 78 8		<0.0 001
2016 (n=13)	0.9 61 2	(	0.8 82 7		0.9 87 9		<0.0 001

Alt-Text: Table showing intraclass correlation coefficient results for split sample measure scores in each year, 2016 through 2018.

Following the guidance in Koo and Li (2016), these values indicate a range of "good" (lower bound of 95% CI is greater than 0.75) to "excellent" (upper bound of 95% CI is greater than 0.90) reliability.

(2) Relative Rankings: Between Years

The results of the correlation analysis are in the table below:

Year-to-Year Comparisons	Kendall's tau	p-value	Spearman's rank correlation coefficient	p-value
2017 & 2018 (n=14)	0.8901	<0.0001	0.9736	<0.0001
2016 & 2017 (n=13)	0.8718	<0.0001	0.967	<0.0001

Alt-Text: Table showing the relative rankings between years using both Kendall's tau and Spearman's rank correlation coefficient

The Kendall tau-b results indicate "strong" association in the state measure scores between years.

(3) Data Element Reliability/Validity of ICD-10 Diagnosis Codes

We updated our earlier data element reliability/validity testing of the diagnosis codes used to identify caries-related ED visits using ICD-10 codes by conducting chart audits. For the results, please see section 2b on validity testing below.

PRIOR TESTING

Data element reliability: see section 2b for validity testing of data elements, which also establishes data element reliability.

[Response Ends]

2a.12. Interpret the results, in terms of how they demonstrate reliability.

(In other words, what do the results mean and what are the norms for the test conducted?)

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

The testing results indicate that the accountable entity measure scores are reliable:

- The measure scores between the split samples for each state are similar and have overlapping 95% CIs.
- The ICC of the split sample measure scores is >0.90, with the lower bound of the 95% CIs >0.75. Following the guidance of Koo and Li (2016), this indicates "good" to "excellent" reliability.
- The relative rankings based on measure scores are stable between years. The Kendall's tau values of 0.8462 (2016-2017 comparisons) and 0.8901 (2017-2018 comparisons) indicate a "strong" degree of association. We have not located a definitive source regarding absolute cut points for what constitutes "weak", "moderate", or "strong" association. But based on what we have found in the literature collectively (e.g., Akoglu, 2018), we consider it is a fair characterization to classify the association as strong.

Our original testing demonstrated the reliability of the data elements used to calculate the measures (by establishing data element validity). This updated testing demonstrates the reliability of the performance measure scores at the accountable entity (i.e., Medicaid program) level.

References

Akoglu H. User's guide to correlation coefficients. Turk J Emerg Med. 2018;18(3):91-93. Published 2018 Aug 7. doi:10.1016/j.tjem.2018.08.001

Koo TK, Li MY. A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. J Chiropr Med. 2016 Jun;15(2):155-63. doi: 10.1016/j.jcm.2016.02.012. Epub 2016 Mar 31.

(3) Data Element Reliability/Validity of ICD-10 Diagnosis Codes

Please see section 2b for discussion of our updated data element validity testing of the ICD-10 diagnosis code set.

PRIOR TESTING

Data element reliability: See section 2b for validity testing of data elements, which also establishes data element reliability.

[Response Ends]

2b.01. Select the level of validity testing that was conducted.

[Response Begins]

Patient or Encounter-Level (data element validity must address ALL critical data elements)

Accountable Entity Level (e.g. hospitals, clinicians)

Empirical validity testing

Systematic assessment of face validity of performance measure score as an indicator of quality or resource use (i.e., is an accurate reflection of performance on quality or resource use and can distinguish good from poor performance)

[Response Ends]

2b.02. For each level of testing checked above, describe the method of validity testing and what it tests.

Describe the steps—do not just name a method; what was tested, e.g., accuracy of data elements compared to authoritative source, relationship to another measure as expected; what statistical analysis was used.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

1. Critical Data Element Validity: Conversion of ICD-9 Code Set to ICD-10 Code Set

(A) Crosswalk Development and Validation

When the measure was originally developed, ICD-9 codes were still in use. However, it was recognized that there would be a transition to ICD-10 diagnosis codes. Consequently, from the inception of the measure, there has been a crosswalk between ICD-9 to ICD-10 diagnosis codes developed with input from clinical and coding experts. During the DQA's annual measure review, a comprehensive review of the ICD-9 to ICD-10 crosswalk, using the general equivalence mapping, was conducted to re-affirm and update the ICD-10 diagnosis codes. Both forward and backward mappings were conducted.

Expert review of the clinical comparability of the two code systems found no concerns. A comparison of the code descriptions between the two code systems found that the main difference between the ICD-9 and ICD-10 codes specified for this measure is that the ICD-10 codes provide more granularity. For example, "Dental Caries of Smooth Surface" has a single ICD-9 code which maps to 3 more detailed ICD-10 codes: "dental caries on smooth surface limited to enamel;" "dental caries on smooth surface penetrating into dentin;" and "dental caries on smooth surface penetrating into pulp." Because there is a collective set of codes used to identify caries-related visits, which rely on the same code descriptions in both the ICD-9 and ICD-10 code systems, the update to the ICD-10 codes did not meaningfully impact the measure scores. Pre and post ICD-10 conversion performance scores from two of the programs included in the original measure testing support this conclusion that the conversion did not impact the measure scores (see 2b.03-B below).

The mappings have been included in the measure specifications or User Guide since the measure was first endorsed. In addition, the mappings have undergone ongoing face validity evaluation, including the following:

1. Annual review by the DQA's Measures Development and Maintenance Committee
2. Inclusion in measure specifications/user guide that are subject to annual public comment
3. Review and reaffirmation by the full membership of the DQA during annual measure review

No concerns have been raised regarding threats to reliability or validity associated with the transition from ICD-9 to ICD-10 codes during these ongoing review processes.

As described below, a separate ICD-10 diagnosis codeset validation was conducted to confirm that there were no material impacts on the measure due to the transition from ICD-9 to ICD-10.

Reference: Centers for Medicare and Medicaid Services. (2017). 2018 ICD-10 CM and GEMs. Available at: <https://www.cms.gov/Medicare/Coding/ICD10/2018-ICD-10-CM-and-GEMs.html>.

(A) ICD-Code Set Chart Review Validation

Sample Selection

To validate the caries-diagnosis code set using ICD-10 codes mapped from the original ICD-9 code set, we used a similar chart validation process. A similar sample selection process was (see details in Prior Testing below). The caries-related diagnosis code set is a subset of all non-traumatic oral cavity related ED visits. Because we wanted to evaluate sensitivity and specificity as well as overall agreement, we included ED visits related to the oral cavity more broadly to ensure that the sample would capture both caries and non-caries related visits. A sample of 359 charts were selected for patients 0-20 years old with ED visits related to the oral cavity. Approximately one-half of records represented all patients who had a first-listed diagnosis code in the caries-related diagnosis code set (182 records) and approximately one-half were randomly selected from patients with an ED visit for mouth and jaw problems but without a diagnosis code in the caries-related code set (177 records).

Review Process

For the updated validation, a practicing dentist with prior record review experience, reviewed the charts. The reviewer used a streamlined version of the standardized abstraction form used during original testing and was blinded to the diagnosis codes associated with the visits during the chart abstraction process.

Statistical Analyses

To assess validity, we calculated simple agreement as well as the kappa statistic. The kappa statistic takes into account agreement observed by chance and provides a more conservative estimate of agreement (Quan et al. 2004). A kappa statistic value of 0 reflects the amount of agreement that would be expected to be observed by chance. A kappa statistic value of 1 indicates perfect agreement. Guidance on interpreting the kappa statistic is: <0 (poor/less chance of agreement); 0.00-0.20 (slight agreement); 0.21-0.40 (fair agreement); 0.41-0.60 (moderate agreement); 0.61-0.80 (substantial agreement); 0.81-0.99 (almost perfect agreement) (Landis & Koch 1977).

We also calculated sensitivity (accuracy of administrative diagnosis codeset to identify a caries-related ED visit when it is documented in the patient's medical record), specificity (accuracy of administrative diagnosis codeset to accurately exclude an ED visit as not caries-related when a caries-related ED visit is not documented in the patient's medical record), positive predictive value (extent to which an indication of a caries-related ED visit identified by the administrative diagnosis codeset is also supported by the patient's medical record), and negative predictive value (extent to which an ED visit is identified as being not caries-related by the administrative diagnosis codes is supported by the patient's medical record).

(B) Performance Score Evaluation

Two of the entities (Texas Medicaid and Texas CHIP) that provided data for the original testing (using CY 2011 data with ICD-9 codes) provided updated measure scores for CY 2016 – CY 2018 (using ICD-10 codes). We calculated the 95% confidence intervals to compare the measure scores before and after the conversion to ICD-10 to assess measure score stability pre and post conversion.

2. Accountable Entity Level Measure Score Validation

We are challenged to conduct empirical validity testing at the accountable entity measure score level as there are no "gold standard" comparators available to use for meaningful assessments. The DQA was formed at the request of CMS precisely because there was a lack of validated dental quality measures. Moreover, dental claims data do not contain diagnosis codes, which significantly limits the ability to develop outcome measures, and the field of dentistry is in nascent stages of developing PRO-PMs.

Consequently, at the measure score level, we rely on the original systematic face validity testing that was conducted.

3. Updated Evaluation of ED Visits Resulting in Inpatient Admissions

We updated our prior testing evaluating the inclusion of inpatient admissions. As before, measure rates were calculated overall and stratified by disposition: discharged or inpatient admissions. We compared our findings of the relative proportion of discharged versus inpatient admissions with our earlier findings, which were validated against published research. Additionally, as before, we examined the diagnosis codes associated with inpatient admissions to evaluate the extent to which the admission may have been attributable to comorbid conditions instead of a dental condition.

PRIOR TESTING

We assessed (1) critical data element validity, (2) validity of including inpatient admissions, (3) measure score validity, and (4) potential threats to validity.

1. CRITICAL DATA ELEMENT VALIDITY

Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children measures the number of dental caries related ED visits by children per 100,000 member months. The critical data elements for this measure include: (1) member ID (to link between claims and enrollment data), (2) date of birth, (3) monthly enrollment indicator, (4) date of service, (5) place of service (identified through CMS place of service and revenue codes) and (6) ICD-9 diagnosis codes. The first five items are standard data elements used routinely for reporting or billing purposes. Thus, it was determined that these fields have established reliability and validity. Although diagnosis codes are used routinely for reporting and billing, their application to the identification of caries-related ED visits required validation. Thus, critical data element validity testing focused on assessing the accuracy of the proposed diagnosis codeset to identify caries-related ED visits as the data elements that contribute most to the measure score. Validation of clinical codes in administrative claims data are most often conducted using manual abstraction from the patient's health record as the authoritative source. As described in detail below, we evaluated agreement between the claims data and emergency department records by calculating the sensitivity, specificity, positive predictive value, and negative predictive value as well as the kappa statistic.

(A) Development of Diagnosis Codeset

To identify the caries-related diagnosis codeset, a PubMed search including the terms “emergency” and “ICD” and “dent*” was conducted to identify specific International Classification of Diseases (ICD) diagnosis codes used in the peer-reviewed literature. Additional state reports and studies also were obtained. An Excel file was created to map the diagnosis codes to the articles and reports to evaluate variation by study purpose and to identify the diagnosis codes most frequently used in studies examining dental-related ED use.

The research team used a consensus review process to develop the proposed code set. A pediatric dentist, public health dentist and emergency medicine physician independently evaluated each diagnosis code (among all codes identified through the literature search) for whether the code was indicative of an emergency department visit associated with dental caries. A consensus process was used for codes for which there was not unanimous agreement among the individual ratings. The code set was then presented to the MDMC along with administrative data summaries of the frequency distributions of all of the listed diagnoses for non-traumatic dental-related ED visits broadly defined and for the subset of caries-related ED visits. The codeset was further refined based on MDMC review. The resulting codeset was included in two presentations (interim and final) to the full DQA membership and in the Interim Report which was widely disseminated to a broad range of stakeholders and posted online for a one-month public comment period. No additional modifications to the codeset were recommended during these multiple reviews.

There also was significant consideration about whether to restrict the diagnoses to first-listed diagnosis or all-listed diagnoses. For inpatient care, the principal diagnosis is defined in the CMS ICD-9-CM Official Guidelines (2011) as “that condition established after study to be chiefly responsible for occasioning the

admission of the patient to the hospital for care.” Secondary diagnoses, or other diagnoses, are defined as “all conditions that coexist at the time of admission, that develop subsequently, or that affect the treatment received and/or the length of stay.” However, there is not similar guidance for emergency department visit diagnosis coding. The Guidelines indicate that outpatient services generally should use the term first-listed diagnosis rather than principal diagnosis. The Guidelines further note that for outpatient services: [i]n some cases the first-listed diagnosis may be a symptom when a diagnosis has not been established (confirmed) by the physicians” (CMS 2011). The published literature on dental-related ED visits variably uses first-listed and any-listed diagnoses. **Therefore, in addition to evaluating the codeset through the record reviews, we also used the record reviews to evaluate whether to base inclusion on first-listed diagnosis or any-listed diagnosis.**

Note: The existing peer-reviewed literature and original data sources all used ICD-9 diagnosis codes. Corresponding ICD-10 codes were subsequently researched and record reviews were conducted and are available in the attached Data Dictionary codeset (corresponding to S.2b. of this application).

(B) Validation of Diagnosis Codeset

Manual record reviews were used to validate the caries-related diagnosis codeset and whether visits should be identified using only the first-listed diagnosis or any-listed diagnosis.

Sample Selection

The caries-related diagnosis codeset is a subset of all non-traumatic oral cavity related ED visits. Because we wanted to evaluate sensitivity and specificity as well as overall agreement, we included non-traumatic oral cavity visits broadly to ensure that the sample would capture both caries and non-caries related visits. Specifically, 320 records were randomly selected for abstraction for patients 0-20 years old, with Medicaid payer type, who had a non-traumatic ED visit related to the oral cavity (identified using ICD-9 codes 520.0-529.9, excluding 525.11 which is a trauma-related code): 160 were randomly selected from those identified with an any-listed ICD diagnosis codes in the caries-related codeset and 160 were randomly selected from those with a non-traumatic oral cavity related ED visit and not in the caries-related codeset.

Review Process

The records were reviewed by two emergency medicine physicians (one of whom was also trained as a pediatrician) with prior record review experience. The record reviewers used a standardized record abstraction form and followed a standardized abstraction protocol. The record reviewers were provided only with the patient’s medical record identifier and ED date of service; they were not given any information about the assigned ICD-9 diagnosis codes in order to avoid potential reviewer bias. Twenty of the 320 sampled records were used for the abstractors to test the testing protocol and abstraction form. A meeting was held to discuss and clarify issues that occurred during the test abstraction process; modifications were then made to the abstraction form or review process to improve the clarity of the abstraction process and the accuracy, consistency, and reliability of the recorded data. These 20 records were not included in the final results analysis. For the 300 records used in the final analyses, 50 (17%) were reviewed by both reviewers to assess inter-rater reliability and the remaining 250 records were split equally (125 per reviewer). Inter-rater reliability was assessed using the kappa statistic.

For each record, the reviewers recorded an anonymous identifier, the patient’s ED visit date(s), and patient age. For each date of service, the record reviewers documented whether the patient’s main reason for the visit:

- a. was related to the oral cavity
- b. if related to the oral cavity, was it trauma related
- c. if related to the oral cavity, was it caries related
- d. if not caries-related, were caries documented in the chart as an incidental finding

Independently, the programming team produced a report that included the anonymous patient identifier, ED date of service, patient age, and all-listed diagnosis codes listed in the order in which they appeared in the claims data.

We also compared the agreement between the Medicaid program claims data and the local hospital billing data since some Medicaid programs truncate the number of diagnosis codes included in their stored administrative claims data. Thus, the hospital's information systems specialist independently produced a report that included an anonymous patient identifier, ED date of service, patient age, and all-listed diagnosis codes listed in their ordered positions.

Statistical Analyses

To assess validity, we calculated simple agreement as well as the kappa statistic. The kappa statistic takes into account agreement observed by chance and provides a more conservative estimate of agreement (Quan et al. 2004). A kappa statistic value of 0 reflects the amount of agreement that would be expected to be observed by chance. A kappa statistic value of 1 indicates perfect agreement. Guidance on interpreting the kappa statistic is: <0 (poor/less chance of agreement); 0.00-0.20 (slight agreement); 0.21-0.40 (fair agreement); 0.41-0.60 (moderate agreement); 0.61-0.80 (substantial agreement); 0.81-0.99 (almost perfect agreement) (Landis & Koch 1977).

We also calculated sensitivity (accuracy of administrative diagnosis codeset to identify a caries-related ED visit when it is documented in the patient's medical record), specificity (accuracy of administrative diagnosis codeset to accurately exclude an ED visit as not caries-related when a caries-related ED visit is not documented in the patient's medical record), positive predictive value (extent to which an indication of a caries-related ED visit identified by the administrative diagnosis codeset is also supported by the patient's medical record), and negative predictive value (extent to which an ED visit is identified as being not caries-related by the administrative diagnosis codeset is supported by the patient's medical record). Positive and negative predictive values are influenced by sensitivity and specificity as well as the prevalence of caries-related ER visits. Thus, interpretation of "high" and "low" values for PPV and NPV may not be straightforward.

The manual abstraction report and the reports from Medicaid program and local information systems specialist were provided to the research team PI. The kappa statistic, sensitivity, specificity, positive predictive value, and negative predictive value were used to assess the ability of the ICD-9-CM diagnosis codeset to accurately identify caries-related ED visits using first-listed diagnosis only and any-listed diagnosis. Identified discrepancies were reviewed by both of the record reviewers to better understand the sources of the discrepancies.

References

Landis JR, Koch GG. An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*. Jun 1977;33(2):363-374.

Quan H, Parsons GA, Ghali WA. Validity of procedure codes in International Classification of Diseases, 9th revision, clinical modification administrative data, *Med Care*, 2004;42(8):801-809.

2. VALIDITY OF INCLUDING INPATIENT ADMISSIONS

Measure rates were calculated overall and stratified by disposition: discharged or inpatient admissions. We compared our findings of the relative proportion of discharged versus inpatient admissions to those in other studies. Additionally, we examined the diagnosis codes associated with inpatient admissions to evaluate the extent to which the admission may have been attributable to comorbid conditions instead of a dental condition.

3. SYSTEMATIC FACE VALIDITY ASSESSMENT

The Dental Quality Alliance (DQA) was formed at the request of the Centers of Medicare and Medicaid Services (CMS) specifically for the purpose of bringing together recognized expertise in oral health to develop quality measures through consensus processes. The membership of the DQA is comprised of experts from 34 stakeholder organizations, including clinical professional organizations representing the various dental clinical specialties, public and private payers, professional medical organizations,

community health centers, federal agencies, and a member representing the public. The list of experts is included in the attached appendix.

During the measurement development process, the DQA Measure Development and Maintenance Committee (MDMC), purposely comprised of individuals with recognized and appropriate expertise in oral health to lead quality measure development, undertook a comprehensive environmental scan of existing pediatric oral health performance measure concepts in 2012 (Dental Quality Alliance. Pediatric Oral Health Quality and Performance Measures: Environmental Scan. 2012; Dental Quality Alliance. Pediatric Oral Health Quality & Performance Measure Concept Set: Achieving Standardization & Alignment. 2012. Both reports available at: [Dental Quality Alliance | American Dental Association \(ada.org\)](http://DentalQualityAlliance.org).) This scan was further updated in 2013. A work group focused on "Advanced Caries Management" ranked measure concepts and identified measurement gaps to identify a short list of 13 measures as candidates for measure development and testing. Ambulatory Care Sensitive ED Visits for Dental Caries in Children was among this short list. Draft specifications were prepared and sent out for public comment. The MDMC reviewed and addressed the public comments, which were used to refine the proposed measure specifications. Based on the public comments and MDMC recommendation, the DQA Executive Committee determined there were sufficient measure importance, feasibility and face validity to move forward with formal feasibility, reliability and validity testing and released the competitive Request for Proposals to conduct the measure testing.

The research team and the DQA MDMC assessed face validity throughout the testing process. In August 2014, an Interim Report that included the detailed measure specifications and described the measure, testing process, and preliminary results was sent to a broad range of stakeholders, including representatives of federal agencies, dental professionals/professional associations, state Medicaid and CHIP programs, community health centers, and pediatric medical professionals/professional associations. Each comment received was carefully reviewed and addressed by the research team and DQA, which entailed additional sensitivity testing and refinement of the measure specifications.

The final face validity assessment was conducted at the October 24, 2014 Dental Alliance Quality meeting in Chicago, Illinois. A final presentation of the final and fully specified measure, testing methodology, and results was made to the DQA membership expert group. The presentation addressed the NQF criteria for scientific acceptability of measures. Using the NQF criteria, the 24 representatives of the DQA membership who attended the face-to-face meeting voted by secret ballot on a total of 15 criteria that address the measure's importance, feasibility, reliability, validity, and usability as well as overall approval of the measure. Specifically each individual voted on:

1. the level of confidence for each criterion using the categories of:

- **High:** Based on the information submitted, there is high confidence (or certainty) that the criterion is met
- **Moderate:** Based on the information submitted, there is moderate confidence (or certainty) that the criterion is met
- **Low:** Based on the information submitted, there is low confidence (or certainty) that the criterion is met
- **Insufficient:** There is insufficient information submitted to evaluate whether the criterion is met (e.g., blank, incomplete, or not relevant, responsive, or specific to the particular question)

and

2. an overall vote of whether to (a) **approve** or (b) **disapprove** the measure as specified.

The complete form used for voting is included in the appendix. (Additional measures were presented and reviewed so the voting form includes more than the measure presented in this application.)

4. ADDITIONAL VALIDITY EVALUATION – ASSESSMENT OF THREATS TO VALIDITY

A. Exclusions

As described in 2b3 of this form, there are no exclusions for this measure.

B. Missing Data

As described in measure evaluation criteria 3c1, this measure relies on standard data elements in claims data that are already collected and widely used for a range of reporting and billing purposes with very low rates of missing or invalid data (which we empirically assessed and reported in 3c1).

C. Multiple Sets of Specifications

This does not apply to the proposed measure.

D. Ability to Identify Statistically Significant and Meaningful Differences in Performance

As described in 2b5 of this form, this measure is able to identify statistically significant and meaningful differences in performance. We also demonstrate with empirical data and statistical testing the ability of this measure to detect disparities in 1b4 (Importance).

References

Centers for Medicare and Medicaid Services. (2011). ICD-9-CM official guidelines for coding and reporting. Baltimore, MD: CMS and NCHS. Available at:
http://www.cdc.gov/nchs/data/icd/icd9cm_guidelines_2011.pdf.

[Response Ends]

2b.03. Provide the statistical results from validity testing.

Examples may include correlations or t-test results.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

1. Conversion of ICD-9 Code Set to ICD-10 Code Set

(A) ICD-Code Set Chart Review Validation

Similar to the approach used to validate the ICD-9 code set for initial measure testing, a separate ICD-10 data element validation was conducted using 359 records from an acute care hospital emergency department. Table 2b.03-A below summarizes the agreement between the ED records and the administrative diagnosis codes using the first-listed diagnosis. The Kappa statistic value remains within the “substantial agreement” range. Sensitivity, specificity, positive predictive value, and negative predictive value were all above 80%. These findings support the reliability and validity of the ICD-10 diagnosis codeset in identifying caries-related ED visits.

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e e m e n t b e t w e e n E D R e c o r d a n d A d m i n i s t r a t i v e D a t a : I C D - 1 0 C o d e s										
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et Caries - Related EDV visits , First - Listed Diagnoses											
Agreement between				Agreement		Prevalence	Sensitivity	Specificity	Follow-up		

t w e e n M a n u a l A b s t r a c t i o n a n d A u t o m a t e d R e p o r t							t y	t y	d i c t i o n a r y v a l u e	d i c t i o n a r y v a l u e
Y / Y							(9 5 % 0 1)	(9 5 % 0 1)	(9 5 % 0 1)	(9 5 % 0 1)
1 4 7				8 1 . 3		5 0 %	8 2 . 1	8 0 . 5	8 0 . 7	8 1 . 9

				4%			2%	6%	7%	2%
							(7.5% - 7.8%)	(7.3% - 7.8%)	(7.4% - 7.8%)	(7.5% - 7.8%)

Alt-Text: Table showing results of statistical tests of agreement between diagnosis codes in claims data and chart reviews.

(B) Comparison of Performance Scores using ICD-9 (original testing) versus ICD-10 Diagnosis Codes (updated performance scores)

Two of the entities that provided data for the original testing (using ICD-9 codes in CY 2011) provided updated measure scores for CY 2016 – CY 2018 (using ICD-10 codes).

Table 2b.03-B Performance Scores Before and After Conversion to ICD-10 Codes

Program, Measure Score – Visits/100,000 MM (Lower 95% CI, Upper 95% CI)

Program 1, 2011: 13.06 (12.63 , 13.49)

Program 1, 2016: 12.59 (12.22 , 12.96)

Program 1, 2017: 12.66 (12.29 , 13.03)

Program 1, 2018: 12.32 (11.95 , 12.69)

Program 2, 2011: 6.90 (6.20 , 7.60)

Program 2, 2016: 5.87 (5.16 , 6.59)

Program 2, 2017: 5.70 (5.02 , 6.37)

Program 2, 2018: 6.50 (5.78 , 7.22)

The performance scores between the two ICD code systems are consistent, lending support that the transition from ICD-9 to ICD-10 did not have a meaningful impact on the measure scores.

2. Evaluation of Inpatient Admissions

Table 2b.03-C summarizes caries-related ED visits by children by discharge status: discharged and inpatient admissions. (Mississippi was excluded due to low quality data for identifying inpatient admissions. Please see the critical data element analysis below.)

Table 2b.03-C Caries-Related ED Visits per 100,000 Member Months by Discharge Status, CY 2018	
Denominator: 100,000 MM (Total Enrollment Months of All Members/100,000)	Rate
Alaska	
Overall	18.00
Visits Discharged	17.72

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Visits Result in Inpatient Admissions	0.28
Arizona	
Overall	15.38
Visits Discharged	14.53
Visits Result in Inpatient Admissions	0.85
Delaware	
Overall	27.99
Visits Discharged	27.12
Visits Result in Inpatient Admissions	0.87
Idaho	
Overall	16.83
Visits Discharged	16.17
Visits Result in Inpatient Admissions	0.67
Michigan	
Overall	33.09
Visits Discharged	32.02
Visits Result in Inpatient Admissions	1.06
Mississippi	
Overall	22.86
Visits Discharged	22.55
Visits Result in Inpatient Admissions	0.31
Nevada	
Overall	25.38
Visits Discharged	24.01
Visits Result in Inpatient Admissions	1.37
New Mexico	
Overall	15.29
Visits Discharged	14.61
Visits Result in Inpatient Admissions	0.68
North Carolina	
Overall	25.90
Visits Discharged	25.27
Visits Result in Inpatient Admissions	0.63
Oklahoma	
Overall	16.35
Visits Discharged	15.74
Visits Result in Inpatient Admissions	0.62
Oregon	

Overall	31.69
Visits Discharged	31.16
Visits Result in Inpatient Admissions	0.53
Washington	
Overall	18.98
Visits Discharged	18.53
Visits Result in Inpatient Admissions	0.46
Wyoming	
Overall	21.23
Visits Discharged	20.57
Visits Result in Inpatient Admissions	0.66

Alt-Text: Table showing the measure scores for caries-related ED visits, overall and by disposition of discharged or inpatient admission, CY 2018.

The percentage of caries-related ED visits that resulted in an inpatient stay ranged from 1.4%-5.5%, with an average of 3.23%. This is consistent with published analyses of national data that found that approximately 3% of non-traumatic dental-related ED visits by children resulted in an inpatient admission (Allareddy et al. 2014; Seu et al. 2012). Unanimous expert consensus during measure development supported the inclusion of visits that resulted in inpatient admissions based on expert opinion that these visits represented the more serious consequences of untreated dental decay (e.g., abscesses). During testing, the discharge diagnoses associated with the inpatient admissions were examined to evaluate whether these admissions may instead have been attributable to patients with comorbidities. Periapical abscess, which is an infection that results from untreated dental decay, was the most frequently occurring diagnosis for all programs. Our updated analyses, which were based on ICD-10 diagnosis codes, also found that periapical abscess is the most frequently occurring diagnosis.

PRIOR TESTING

1. CRITICAL DATA ELEMENT VALIDITY

Critical Data Element Validation – Diagnosis Codes to Identify Caries-Related ED Visits

To assess whether caries-related ED visits are accurately identified by the administrative diagnosis codes in the measure specifications, the 300 randomly selected ED records were reviewed. Table 2b03-D below summarizes the agreement between the ED records and the administrative diagnosis codes using the first-listed diagnosis. Two results are reported:

(1) Initial: Results of the independent reviews.

(2) After discrepancy review: Each discrepancy between the manual record review assessing whether the visit was caries-related and the administrative diagnosis codeset was re-reviewed by both record reviewers. The record review determination was changed for four records: one case was changed due to data miscoding during abstraction (e.g., data entered in wrong column) and the other three cases were changed due to the reviewers reversing the original decision after an additional review of the record. For the remaining discrepancies, the reviewers re-confirmed their original determination. The overall effect on the reliability/validity statistics was minimal. Overall agreement did not change, and the kappa statistic changed by only 0.004.

Overall agreement was 87.7%, indicating high overall concordance between the administrative claims and ED records. As noted above, the kappa statistic extends a comparison of simple agreement by taking into account agreement occurring by chance, thereby providing a more rigorous and conservative measure of agreement between the two data sources. The kappa statistic was 0.71, which is in the middle of the “substantial agreement” range. Sensitivity was 82%, and specificity was 90%. The positive predictive value

was 79%, and negative predictive value was 92%. Collectively, these findings support the reliability and validity of the diagnosis codeset in identifying caries-related visits.

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i v e D a t a C a r i e s - R e l a t e d E D V i s i t s , F i r s t - L i s t e d D i a g n o s e s											
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A f t e r D i s c r e p a n c y R e v i e w											

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Alt-Text: Table showing results of statistical tests of agreement between diagnosis codes in claims data and chart reviews.

Sensitivity Testing

We also compared the caries-related diagnosis codeset using any-listed diagnosis. The reliability and validity were lower when using any-listed diagnosis: the kappa statistic was 0.61 (instead of 0.71). Specificity was lower (72% instead of 90%) and sensitivity was higher (99% instead of 82%). The decreased reliability/validity was due to the inclusion of a significantly greater number of non-caries related visits being classified as caries-related (58 instead of 20). In addition, feedback from key stakeholders indicated that some state Medicaid programs truncate the number of listed diagnosis codes in their stored claims data used for reporting purposes. Differences in the number of listed diagnoses permitted across databases could potentially threaten the reliability of cross-state comparisons when using any-listed diagnosis.

Inter-rater Agreement

Inter-rater agreement between the two record reviewers on the identification of caries-related visits was high (prior to doing any discrepancy analyses) at 93% with kappa=0.857 (95% CI: 0.668-1.000) or “almost perfect” agreement.

Agreement between Medicaid Program Administrative Data & ED Information Systems Data

There was 100% agreement between the hospital’s local EHR/billing data and the Medicaid program administrative claims data for identifying caries-related ED visits.

2. VALIDITY OF INCLUDING INPATIENT ADMISSIONS

Table 2b.03-E summarizes caries-related ED visits by children by discharge status: discharged and inpatient admissions.

Table 2b.03-E Caries-Related ED Visits per 100,000 Member Months by Discharge Status, CY 2011	
Denominator: 100,000 MM	Rate
(Total Enrollment Months of All Members/100,000)	
Program 1	
Overall	13.06
Visits Discharged	12.43
Visits Resulting in Inpatient Admissions	0.63
Program 2	
Overall	6.90

Visits Discharged	6.56
Visits Resulting in Inpatient Admissions	0.34
Program 3	
Overall	9.87
Visits Discharged	9.30
Visits Resulting in Inpatient Admissions	0.57
Program 4	
Overall	30.68
Visits Discharged	29.72
Visits Resulting in Inpatient Admissions	0.96

Alt-Text: Table showing the measure scores for caries-related ED visits, overall and by disposition of discharged or inpatient admission, CY2011.

The percentage of caries-related ER visits that resulted in an inpatient stay ranged from 3%-6% among the four programs. This is consistent with recent analyses of national data that found that approximately 3% of non-traumatic dental-related ED visits by children resulted in an inpatient admission (Allareddy et al. 2014; Seu et al. 2012). Unanimous expert consensus during measure development supported the inclusion of visits that resulted in inpatient admissions based on expert opinion that these visits represented the more serious consequences of untreated dental decay (e.g., abscesses). During testing, the discharge diagnoses associated with the inpatient admissions were examined to evaluate whether these admissions may instead have been attributable to patients with comorbidities. Periapical abscess, which is an infection that results from untreated dental decay, was the most frequently occurring discharge diagnosis for all programs. An analysis of national data that found that 80% of dental-related ED visits by children that resulted in an inpatient admission were among children with no comorbid conditions (Allareddy et al. 2014), providing additional evidence that the inpatient admissions were due to conditions stemming from dental problems and supporting their inclusion in the measure. Stakeholder feedback during measure development and testing consistently supported the inclusion of ED visits that resulted in an inpatient admission.

References

Allareddy V, Nalliah RP, Haque M, Johnson BS, Rampa SB, Lee MK. Hospital-based emergency department visits with dental conditions among children in the United States: nationwide epidemiological data. *Pediatr Dent* 2014;37(5):393-9.

Seu K, Hall KK, Moy E. Emergency Department Visits for Dental-Related Conditions, 2009: Statistical Brief #143. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs. Rockville MD: Agency for Healthcare Research and Quality; 2012.

3. FACE VALIDITY OF MEASURES AND RESULTING PERFORMANCE SCORES OF FULLY-SPECIFIED FINAL MEASURES BASED ON PRESENTATION OF TESTING RESULTS

Table 2b.03-F provides the results of the systematic face validity assessment. The results demonstrate that the expert group had moderate or high confidence in the measure's importance, feasibility, reliability, validity and usability: 14 of the 15 criteria were rated as being met with high or moderate confidence by 100% of the 23 voting members (1 individual did not complete the ballot for all criteria), and the remaining two measures were voted as being met with high or moderate confidence by 96% of the voting members. 100% voted to approve the measure as specified.

Table 2b.03-F System atic Face Validity Results							
			M o d e r a t e		In s u f f i c i e n t		% R e s p o n d i n g "H i g h " o r " M o d e r a t e "
Import ance to Measur e and Report							
1. High Priority /Impac t	Measure addresses specific national health goal or priority; OR data demonstr ate a high priority aspect of health care in terms of the numbers of individual s affected, resource use, or		2		0	2	10 0. 00 %

	severity in consequences of poor quality care.						
2. Evidence to Support Measure Focus	Health outcome measures: Rationale supports the relationship of the health outcome to processes or structures of care.		6		0	2 .7	10 0. 00 %
3. Performance Gap	Demonstration of the opportunity for improvement: data demonstrate considerable variation across providers OR overall less than optimal performance across providers OR disparities across the population groups.		8		0	2 .7	10 0. 00 %
Scientific Acceptability of							

Measure Properties							
1. Reliability	The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allow for comparability.		8		0	2	100.00%
	Reliability testing demonstrates the measure data elements are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period and/or that the measure score is		12		0	2	100.00%

	precise. NOTE: Data element reliability can be establishe d through <u>validation</u> of the critical data elements.						
2. Validity	The measure specificati ons are consistent with the evidence presented to support the focus of measure ment.		7		0	2 .7	10 0. 00 %
	The measure is specified to capture the most inclusive target populatio n indicated by the evidence, and exclusions are supported by the evidence (supporte d by clinical evidence or by evidence of		1 0		0	2 .6	10 0. 00 %

	sufficient frequency of occurrence so that results are distorted without the exclusion)						
	Validity testing demonstrates that the measure data elements are correct and/or the measure score correctly reflects the quality of care provided, adequately identifying differences in quality.		1 1		0	2 .5	10 0. 00 %
	Analysis of the computed measure scores demonstrate that methods for scoring and analysis of the specified measure		1 1		0	2 .5	10 0. 00 %

	allow for identification of statistically significant and practically/clinically meaningful differences in performance OR there is evidence of overall less-than-optimal performance.						
	Evidence-based risk adjustment strategy is specified based on patient factors that influence the measured outcome (but not factors related to disparities in care or the quality of care) and are present at start of care; and has demonstrated adequate		1 1		0	2 .4	95 .6 5%

	discrimination and calibration OR rationale/data support no risk adjustment/stratification.						
Feasibility							
Extent to which the required data are readily available or could be captured without undue burden and can be implemented for performance measurement.	For clinical measures, the required data elements are routinely generated and used during care delivery.		1 1		0	2 .7	10 0. 00 %
	The required data elements are available in electronic health records or other		1 0		0	2 .6	95 .8 3%

	electronic sources. If the required data are not in electronic health records or existing electronic sources, a credible, near-term path to electronic collection is specified.						
	Demonstration that the data collection strategy (e.g., source, timing, frequency etc.) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use).		1 3		0	2 . 6	10 0. 00 %
Usability and Use							
Extent to which intended audience	Performance results are used in at least one accountable		N / A		N/ A	N / A	N/ A

ces (e.g., consu mers, purcha sers, provide rs, policy makers) can underst and the results of the measur e and find them useful for decisio n making .	ility applicatio n within three years after initial endorsem ent and are publicly reported within six years after initial endorsem ent. OR there is a credible plan for implemen tation within the specified timeframe s.						
	If not in use for performa nce improvem ent at the time of initial endorsem ent, then a credible rationale describes how the performa nce results could be used to further the goal of high- quality, efficient healthcar		1 0		0	2 . 7	10 0. 00 %

	e for individual s or populatio ns.						
	Benefits of the measure in facilitating progress toward achieving high- quality, efficient healthcar e for individual s or populatio ns outweigh evidence of unintende d negative consequ nces to individual s or populatio ns (if such evidence exists).		6		0	2 .5	10 0. 00 %
OVERA LL RECOM MEND ATION							% Ap pr ov al
Approv al of the measur e as current ly specifie d			N o : 0				10 0. 00 %

Alt-Text: Table showing the results of the systematic face validity assessment by the expert group with the level of confidence in the measure's importance, feasibility, reliability, validity and usability.

[Response Ends]

2b.04. Provide your interpretation of the results in terms of demonstrating validity. (i.e., what do the results mean and what are the norms for the test conducted?)

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

1. Critical Data Element Validity: ICD-10 Diagnosis Codes

The overall agreement between the diagnosis codes in the administrative data to identify caries-related ED visits by children with manual record reviews was 81% and the kappa statistic was 0.63, supporting the reliability and validity of the ICD-10 diagnosis code set.

2. Conversion from ICD-9 to ICD-10

A. Data Element

As noted above, chart validation affirmed the reliability and validity of the ICD-10 diagnosis code set.

B. Performance Scores

Evaluation of pre and post conversion performance scores for two programs used in the original testing indicated consistency over time, lending support that there were no material impacts of the conversion from ICD-9 to ICD-10 diagnosis codes.

Collectively, our findings provide strong support for data element validity and the continued validity of the measure after the conversion to ICD-10 codes. Our prior testing established face validity of the performance scores at the accountable entity level.

PRIOR TESTING

Critical Data Element Validation

The overall agreement between the diagnosis codes in the administrative data to identify caries-related ED visits by children with manual record reviews was 88% and the kappa statistic was 0.71, supporting the reliability and validity of the diagnosis code set.

Face Validity

The expert ratings of 15 criteria regarding the measure's importance, feasibility, reliability, validity, and usability received were voted as being met with moderate to high confidence by 96-100% of the participants. Specifically, 100% of participants indicated moderate to high confidence that: (1) "Validity testing demonstrates that the measure data elements are correct and/or the measure score correctly reflects the quality of care provided, adequately identifying differences in quality" and (2) "Analysis of the computed measure scores demonstrate that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful differences in performance OR there is evidence of overall less-than-optimal performance."

100% of participants voted to approve the measure as specified based on the testing results.

Thus, the measure score has strong face validity.

[Response Ends]

2b.05. Describe the method for determining if statistically significant and clinically/practically meaningful differences in performance measure scores among the measured entities can be identified.

Describe the steps—do not just name a method; what statistical analysis was used? Do not just repeat the information provided in Importance to Measure and Report: Gap in Care/Disparities.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

(1) We evaluated performance score data with 95% confidence intervals to assess whether there were statistically significant differences in the measure scores using T-MSIS data for 14 state Medicaid programs. We also examined updated performance scores reported by two programs that were part of our original testing.

(2) We used descriptive statistics to examine the distribution of the scores for the 14 state Medicaid programs.

PRIOR TESTING

The 95% confidence intervals for the performance scores were calculated. Non-overlapping CIs indicate statistically significant differences in the performance scores. Clinically/practically meaningful differences were assessed through the systematic face validity process described above.

[Response Ends]

2b.06. Describe the statistical results from testing the ability to identify statistically significant and/or clinically/practically meaningful differences in performance measure scores across measured entities.

Examples may include number and percentage of entities with scores that were statistically significantly different from mean or some benchmark, different from expected; how was meaningful difference defined.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

(1) Performance Scores (Visits per 100,000 member months) with 95% CIs: TMSIS Data, 14 State Medicaid Programs

CY 2018

Pro gra m	S c o re		SD		95 % CI			
NM, 201 8	1 5. 2 9		0. 63 15		14. 050 9		16. 526 5	
AZ, 201 8	1 5. 3 8		0. 39 60		14. 604 7		16. 157 2	
OK, 201 8	1 6. 3 5		0. 61 15		15. 155 1		17. 552 4	
ID, 201 8	1 6.		0. 89 45		15. 078 7		18. 585 2	

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	8 3							
SC, 201 8	1 7. 2 3		0. 46 34		16. 326 2		18. 142 7	
AK, 201 8	1 8. 0 0		1. 30 57		15. 440 7		20. 559 2	
WA, 201 8	1 8. 9 8		0. 44 48		18. 112 7		19. 856 5	
WY, 201 8	2 1. 2 3		2. 16 67		16. 984 9		25. 478 5	
MS, 201 8	2 2. 8 6		0. 73 57		21. 414 4		24. 298 3	
NV, 201 8	2 5. 3 8		0. 85 01		23. 713 3		27. 045 9	
NC, 201 8	2 5. 9 0		0. 45 97		24. 998 5		26. 800 7	
DE, 201 8	2 7. 9 9		1. 56 21		24. 929 3		31. 052 7	
OR, 201 8	3 1. 6 9		0. 87 51		29. 975 5		33. 405 9	
MI, 201 8	3 3. 0 9		0. 52 57		32. 055 4		34. 116 3	

Alt-Text: Table showing performance scores for each program in 2018, including measure score, standard deviation, and 95% confidence intervals.

CY 2017

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Pro gra m	S c o re		SD		95 % CI			
NM, 201 8	1 4. 6 8		0. 60 38		13. 496 3		15. 863 2	
AZ, 201 8	1 6. 9 9		0. 40 64		16. 195 8		17. 788 9	
ID, 201 8	1 7. 6 0		0. 87 54		15. 880 8		19. 312 3	
OK, 201 8	1 9. 4 5		0. 65 24		18. 175 9		20. 733 4	
SC, 201 8	1 9. 8 9		0. 49 88		18. 908 3		20. 863 7	
WA, 201 8	2 0. 0 0		0. 45 11		19. 120 2		20. 888 6	
AK, 201 8	2 1. 3 3		1. 44 45		18. 498 7		24. 161 2	
NV, 201 8	2 4. 1 4		0. 83 14		22. 513 8		25. 773 0	
MS, 201 8	2 4. 8 2		0. 74 02		23. 368 3		26. 269 9	
WY, 201 8	2 4. 8 9		2. 31 07		20. 361 3		29. 419 3	
NC, 201 8	2 7. 4 4		0. 46 67		26. 524 2		28. 353 6	

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DE, 2018	28.74	1.5843	25.6349	31.8452
OR, 2018	33.07	0.8786	31.3448	34.7890
MI, 2018	35.08	0.5412	34.0232	36.1447

Alt-Text: Table showing performance scores for each program in 2017, including measure score, standard deviation, and 95% confidence intervals.

CY 2016

Pro gra m	S c o re	SD	95 % CI	
NM, 2018	15.81	0.6236	14.5924	17.0370
ID, 2018	16.53	0.9017	14.7630	18.2978
AZ, 2018	16.81	0.4042	16.0204	17.6048
SC, 2018	17.29	0.4635	16.3809	18.1980
OK, 2018	19.20	0.6406	17.9417	20.4527
WA, 2018	21.69	0.4695	20.7692	22.6095
AK, 2018	23.21	1.5789	20.1134	26.3028

NV, 2018	2 3. 7 3		0. 83 31		22. 095 3		25. 361 1	
DE, 2018	2 8. 2 4		1. 59 87		25. 109 6		31. 376 6	
NC, 2018	2 9. 4 4		0. 48 44		28. 494 3		30. 393 1	
WY, 2018	3 0. 5 7		2. 47 93		25. 712 0		35. 430 8	
MI, 2018	3 5. 0 8		0. 54 12		34. 023 2		36. 144 7	
OR, 2018	3 5. 3 2		0. 88 54		33. 585 7		37. 056 3	

Alt-Text: Table showing performance scores for each program in 2016, including measure score, standard deviation, and 95% confidence intervals.

These data demonstrate significant variation in performance between programs.

(2) Performance Scores with 95% CIs: Updated Scores Reported by Two Programs in Original Testing

Updated Performance Scores

Program, Year, Measure Score – Visits/100,000 MM (SD, Lower 95% CI, Upper 95% CI)

Program 1, 2016, 12.59 (0.19 , 12.22 , 12.96)

Program 2, 2016, 5.87 (0.36 , 5.16 , 6.59)

Program 1, 2017, 12.66 (0.19 , 12.29 , 13.03)

Program 2, 2017, 5.70 (0.34 , 5.02 , 6.37)

Program 1, 2018 12.32 (0.19 , 11.95 , 12.69)

Program 2, 2018 6.50 (0.37 , 5.78 , 7.22)

Program 3, 2018 11.78 (0.17 , 11.44 , 12.12)

These data demonstrate significant variation in performance between programs.

(3) Performance Scores with 95% CIs: Reported by Commercial Carrier, 2018

Measure Score – Visits/100,000 MM (SD, Lower 95% CI, Upper 95% CI)

11.78 (0.17, 11.44, 12.12)

(4) Descriptive Statistics, T-MSIS Data, State Medicaid Programs

	M e a n	S D	Min imu m	25t h Per cen tile	M ed ia n	75t h Per cen tile	Ma xim um
2 0 1 8 (n = 1 4)	2 0 .4 6	5 .7 1	14. 27	15. 79	18 .3 9	24. 10	30.9 7
2 0 1 7 (n = 1 4)	2 2 .0 1	5 .6 7	13. 76	18. 23	21 .3 7	25. 85	32.7 2
2 0 1 6 (n = 1 3)	2 4 .1 8	7 .2 0	15. 81	17. 29	23 .2 1	29. 44	36.4 3

Alt-Text: Table showing the measure score descriptive statistics (mean, SD, min, max, percentiles) for each year, 2016-2018.

PRIOR TESTING

The table below provides the performance scores with 95% confidence intervals. There were statistically significant differences (non-overlapping CIs) in the measures scores between the four programs included in the testing.

Performance Scores for Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children, CY 2011

Program, Measure Score – Visits/100,000 MM (SE, Lower 95% CI, Upper 95% CI)

Program 1: 13.06 (0.22 , 12.63 , 13.49)

Program 2: 6.90 (0.36 , 6.20 , 7.60)

Program 3: 9.87 (0.68 , 8.54 , 11.20)

Program 4: 30.68 (0.44 , 29.83 , 31.54)

These data demonstrate significant variation in performance between programs.

[Response Ends]

2b.07. Provide your interpretation of the results in terms of demonstrating the ability to identify statistically significant and/or clinically/practically meaningful differences in performance across measured entities.

In other words, what do the results mean in terms of statistical and meaningful differences?

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

For both the updated testing and the original testing, the performance scores with 95% confidence intervals demonstrate the ability of the measure to detect statistically significant differences in performance between measured entities. In each year, 2016-2018, there is practically significant variation in performance between states, with a more than two-fold difference between the highest and lowest performing states. Original testing also established face validity of the measure scores.

PRIOR TESTING

There was more than four-fold variation between the program with the lowest caries-related ED visit rate (6.90/100,000 MM) and the program with the highest rate (30.68/100,000 MM), indicating significant variation in performance between programs.

The face validity assessment described above with the unanimous approval of the measure as specified also indicates high confidence in the measure. 100% of the experts indicated moderate to high confidence that “Analysis of the computed measure scores demonstrate that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful differences in performance OR there is evidence of overall less-than-optimal performance.”

[Response Ends]

2b.08. Describe the method of testing conducted to identify the extent and distribution of missing data (or non-response) and demonstrate that performance results are not biased due to systematic missing data (or differences between responders and non-responders). Include how the specified handling of missing data minimizes bias.

Describe the steps—do not just name a method; what statistical analysis was used.

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

Updated testing used data from 14 Medicaid programs using data submitted by the states to the Centers for Medicaid and Medicare Services contained within the Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAFs). We assessed data quality and missing/invalid data through two methods.

1. CMS T-MSIS Data Quality Atlas. The Medicaid and CHIP Business Information Solutions (MACBIS) conducted data quality assessments of T-MSIS enrollment, claims, expenditures and service use for each state and for each year/release. (Centers for Medicare & Medicaid Services. *DQ Atlas*. Available at <https://www.medicaid.gov/dq-atlas/> as of November 2021.) There is a background and methodology report for each topic assessed.

For each state, the Atlas assigns one of the values listed below to indicate the extent to which a state's TAF data are usable, reliable, and accurate for analyzing a particular topic.

- **Low concern:** No major problems were identified that would affect the usability of the TAF data for analyzing a given topic.
- **Medium concern:** Some problems were identified that may affect the usability of the TAF data for analyzing a topic.
- **High concern:** Major problems in the completeness or reliability of the TAF data are likely to impede an analysis of a topic.
- **Unusable:** Extreme problems in the completeness or reliability of the TAF data will prevent a topic from being analyzed.
- **Unclassified:** The topic is either not applicable to a state, or there were not enough TAF or benchmark data for a reliable analysis, or a methodological issue prevented a state's data from being classified into one of the four categories above.

We reviewed the results of these assessments for the following topics (with their descriptions contained within the Quality Atlas) that are relevant to the calculation of this measure:

- **Age.** This analysis examines the completeness and distribution of beneficiary age information in the TAF.
- **Medicaid enrollment.** This analysis examines how well the TAF data on the number of total Medicaid beneficiaries align with an external benchmark, the Performance Indicators data set.
- **Claims file completeness: Claims Volume - other services (includes outpatient).** Examining the volume of service use records adjusted for program size can identify outlier states that may have incomplete claims, encounter records, or eligibility data in the TAF. This analysis examines the volume of OT header records, the volume of OT line records, and the average number of lines per header.
- **Claims file completeness: Claims Volume - inpatient.** Examining the volume of service use records adjusted for program size can identify outlier states that may have incomplete claims, encounter records, or eligibility data in the TAF. This analysis examines the volume of IP header records, the volume of IP line records, and the average number of lines per header.
- **Claims file completeness: Service Users - other services (includes outpatient).** Examining the overall percentage of beneficiaries with any service use can identify outlier states that may have incomplete claims, encounter, or eligibility data in the TAF. Low rates of service use may also indicate problems in linking service use and eligibility records. This analysis examines the percentage of beneficiaries in each state with an OT record indicating the receipt of ambulatory, physician, or other medical services during the year.
- **Claims file completeness: Service Users - inpatient.** Examining the overall percentage of beneficiaries with any service use can identify outlier states that may have incomplete claims, encounter, or eligibility data in the TAF. Low rates of service use may also indicate problems in linking service use and eligibility records. This analysis examines the percentage of beneficiaries in each state with an IP record indicating the receipt of inpatient services during the year.
- **Service use – Diagnosis Codes - other services (includes outpatient).** This analysis examines the extent to which OT header records are completely coded with at least one valid diagnosis code.
- **Service use – Diagnosis Codes - inpatient.** This analysis examines the extent to which IP header records are completely coded with at least one valid diagnosis code. The analysis also provides the average number of unique, valid diagnosis codes on IP claims to identify states with potentially incomplete diagnosis code data.

- **Service use - Procedure Codes - other services (includes outpatient).** This analysis examines how often the procedure code is missing on professional claims in the OT file and how often the non-missing values on these claims represent valid national or state-specific codes.
- **Service use - Procedure Codes – inpatient.** This analysis examines how often the primary (first) procedure code is missing on IP records and the percentage of IP records with invalid procedure codes.
- **Service Use – Place of Service.** Different fields are used on different types of claim forms to identify the service setting in which care was delivered. These fields include type of bill, place of service, and revenue center. This analysis examines the extent to which TAF users can identify the place of service in the OT file using these three data elements.
- **Service Use – Type of Bill – other services (includes outpatient).** The type of bill is a data element present on institutional claims submitted by facilities such as hospitals, nursing facilities, intermediate care facilities, and clinics. It can be used to differentiate between key settings and types of institutional care. Many records in the OT file represent professional claims and are expected to have a missing type of bill code. This analysis examines how often the type of bill on OT claims is coded with unexpected or invalid values.
- **Service Use – Type of Bill – inpatient.** The type of bill is a data element present on institutional claims submitted by facilities such as hospitals, nursing facilities, intermediate care facilities, and clinics. It can be used to differentiate between key settings and types of institutional care. This analysis examines how often the type of bill on IP claims is missing or coded with unexpected or invalid values.
- **Service Use – Admissions Date – inpatient.** This analysis examines the extent to which admission dates are missing from the IP file.

2. Additional Evaluations. We conducted our own assessments of the following data fields:

- **Date of Birth.** We evaluated how frequently date of birth was missing.
- **Beneficiary ID.** We evaluated how frequently beneficiary ID was missing among children <21 years.

For consistency with the cut-points used by MACBIS for the Data Quality Atlas, we defined the following categories based on the percentage of missing data:

-**Low concern:** Missing \leq 10%

-**Medium concern:** 10% < Missing \leq 20%

-**High concern:** 20% < Missing \leq 50%

-**Unusable** Missing > 50%

PRIOR TESTING

This measure relies on standard data elements in administrative claims data (e.g., patient ID, patient birthdate, enrollment information, ICD-9 codes, date of service, place of service codes, revenue codes). These data are readily available and can be easily retrieved because they are routinely used for billing and reporting purposes. A key advantage of using administrative claims data is that the time and cost of data collection for performance measurement purposes are relatively low because these data are already collected for other purposes.

We evaluated the extent of missing data by calculating for each critical data element the extent of missing and invalid data. We found that the critical data elements had missing/invalid data of <1% with the exception of two data elements for one of the four programs; missing rates were <3% for those two data elements (Data 2b6.2.), which met or exceeded the guidance from the Centers for Medicare and Medicaid Services regarding acceptable error rates for administrative claims data. Given the very low rates of missing data, no further analyses were conducted as there was no reason to expect any bias, systematic

or otherwise, due to missing data. Please also see detailed measures specifications in the appendix for guidance regarding missing data should that be an issue for a particular program.

Reference: Centers for Medicare & Medicaid Services. Medicaid and CHIP Statistical Information System (MSIS) File Specifications and Data Dictionary. 2010; <http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MSIS/downloads/msisdd2010.pdf>.

[Response Ends]

2b.09. Provide the overall frequency of missing data, the distribution of missing data across providers, and the results from testing related to missing data.

For example, provide results of sensitivity analysis of the effect of various rules for missing data/non-response. If no empirical sensitivity analysis was conducted, identify the approaches for handling missing data that were considered and benefits and drawbacks of each).

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

The tables below provide the results of the assessments of data completeness, missing data, and invalid data. For the data content areas addressed by MACBIS, as reported in the T-MSIS Quality Atlas, most states were assessed as having data of "low concern" for all content areas in all three years. Exceptions are noted as follows:

CY 2018:

- Michigan was identified as having place of service of "medium concern." Examination of the measure scores found that performance was similar between years (2018: 33.1; 2017: 35.1; 2016: 36.4). Consequently, we are comfortable with the data quality for measure reporting purposes.
- Oklahoma had service users (outpatient files) of "high concern." However, outpatient claims volume, another indicator of claims data quality completeness was assessed as "low concern." Examination of the measure scores found that performance was similar between years (2018: 16.4; 2017: 19.5 ; 2016: 19.2). Consequently, we are comfortable with the data quality for measure reporting purposes.
- South Carolina had type of bill for inpatient services as "unusable." This data field is used only to stratify the overall measure score by discharged and inpatient admission. Consequently, it does not impact the overall measure score; it only impacts the characterization of the disposition of the ED visit. Therefore, we kept South Carolina in all analyses involving the overall measure score, but excluded it when reporting the disposition of the ED visit.

CY 2017:

- New Mexico was assessed as having outpatient claims volume and inpatient claims volume of "medium concern" in 2017. However, service users for both inpatient and outpatient claims was "low concern"; Service Users is another indicator of claims data quality completeness and specifically assesses the percentage of beneficiaries with any service use. Examination of the measure scores found that performance was similar between years (2018: 15.3; 2017: 14.7; 2016: 15.8). Consequently, we are comfortable with the data quality for measure reporting purposes.
- Oklahoma had inpatient claims volume of "high concern." However, inpatient service users, another indicator of claims data quality completeness was assessed as "low concern." Moreover, issues with inpatient claims data quality are most likely to impact the reporting of the disposition of the ED visit rather than the overall measure score. Examination of the measure scores found

that performance was similar between years (2018: 16.4; 2017: 19.5 ; 2016: 19.2). Consequently, we are comfortable with the data quality for measure reporting purposes.

- Oregon had inpatient claims volume of “medium concern.” However, inpatient service users, another indicator of claims data quality completeness was assessed as “low concern.” Moreover, issues with inpatient claims data quality are most likely to impact the reporting of the disposition of the ED visit rather than the overall measure score. Examination of the measure scores found that performance was similar between years (2018: 31.7; 2017: 33.1 ; 2016: 35.3). Consequently, we are comfortable with the data quality for measure reporting purposes.
- South Carolina had type of bill for inpatient services as “unusable.” This data field is used only to stratify the overall measure score by discharged and inpatient admission. Consequently, it does not impact the overall measure score; it only impacts the characterization of the disposition of the ED visit. Therefore, we kept South Carolina in all analyses involving the overall measure score, but excluded it when reporting the disposition of the ED visit.

CY 2016

- Idaho had inpatient claims volume of “medium concern.” However, inpatient service users, another indicator of claims data quality completeness was assessed as “low concern.” Moreover, issues with inpatient claims data quality are most likely to impact the reporting of the disposition of the ED visit rather than the overall measure score. Examination of the measure scores found that performance was similar between years (2018: 16.8; 2017: 17.6; 2016: 16.5). Consequently, we are comfortable with the data quality for measure reporting purposes.
- Mississippi was assessed as having outpatient claims volume, inpatient claims volume and inpatient service users of “high concern”; and Medicaid-only enrollment of “medium concern.” Examination of the measure scores indicates that these data deficiencies significantly impact the measure scores (2018: 22.9; 2017: 24.8; 2016: 5.1). Consequently, we excluded 2016 reporting for Mississippi from our testing.
- New Mexico had inpatient claims volume of “medium concern.” However, inpatient service users, another indicator of claims data quality completeness was assessed as “low concern.” Moreover, issues with inpatient claims data quality are most likely to impact the reporting of the disposition of the ED visit rather than the overall measure score. Examination of the measure scores found that performance was similar between years (2018: 15.3; 2017: 14.7; 2016: 15.8). Consequently, we are comfortable with the data quality for measure reporting purposes.
- Oklahoma had inpatient claims volume of “high concern.” However, inpatient service users, another indicator of claims data quality completeness was assessed as “low concern.” Moreover, issues with inpatient claims data quality are most likely to impact the reporting of the disposition of the ED visit rather than the overall measure score. Examination of the measure scores found that performance was similar between years (2018: 16.4; 2017: 19.5 ; 2016: 19.2). Consequently, we are comfortable with the data quality for measure reporting purposes.
- Oregon had inpatient claims volume of “medium concern.” However, inpatient service users, another indicator of claims data quality completeness was assessed as “low concern.” Moreover, issues with inpatient claims data quality are most likely to impact the reporting of the disposition of the ED visit rather than the overall measure score. Examination of the measure scores found that performance was similar between years (2018: 31.7; 2017: 33.1 ; 2016: 35.3). Consequently, we are comfortable with the data quality for measure reporting purposes.
- South Carolina had type of bill for inpatient services as “unusable.” This data field is used only to stratify the overall measure score by discharged and inpatient admission. Consequently, it does not impact the overall measure score; it only impacts the characterization of the disposition of the ED visit. Therefore, we kept South Carolina in all analyses involving the overall measure score, but excluded it when reporting the disposition of the ED visit.

- Washington had place of service as “high concern.” The overall measure score is similar between years (2018: 19.0; 2017: 20.0 ; 2016: 21.7). Consequently, we included Washington’s data in 2016 in our data analyses although we would note that for reporting purposes, the data quality limitation should be noted. Washington also had bill type for inpatient services as “high concern” and inpatient claims volume and service users were of “medium concern.” Issues with inpatient claims data quality are most likely to impact the reporting of the disposition of the ED visit rather than the overall measure score. Therefore, we kept Washington in all analyses involving the overall measure score, but excluded it when reporting the disposition of the ED visit.

Additional Evaluations

For the additional data fields assessed (beneficiary ID and age), the rates of missing and invalid data were <1%.

Because there was generally low concern/low rates of missing/invalid data for the critical data elements used to calculate the measure scores, no rules were developed for handling missing data. In addition, because these are standard data fields contained within administrative claims data, when state Medicaid or CHIP programs are identified as having incomplete or poor quality data, they are encouraged to improve data collection and quality as part of their quality improvement efforts rather than using statistical methods to address missing data.

Percentage of Missing and Invalid Values for Critical Data Elements, State Medicaid Program, <21 Years Old, CY2018, Release 2 (T-MSIS Data)							
	A K	A Z	D E	ID	M I	M S	N V
From T-MSIS Quality Atlas							

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Age	L C	L C	L C	L C	L C	L C	L C
Medic aid- Only Enroll ment	L C	L C	L C	L C	L C	L C	L C
Claims Volum e - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Claims Volum e - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Servic e Users - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Servic e Users - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Proce dure Codes - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Proce dure Codes	L C	L C	L C	L C	L C	L C	L C

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- Inpatient Files							
Diagnosis Codes - Other Services (Outpatient) Files	L C	L C	L C	L C	L C	L C	L C
Diagnosis Codes - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Other Services (Outpatient) Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Place of Service	L C	L C	L C	L C	M C	L C	L C
Admission Date - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Additional Checks							

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Beneficiary ID	0.01%	0.01%	0.01%	0.00%	0.02%	0.01%	0.01%
Date of Birth	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	NM	NC	OK	OR	SC	WA	WY
From T-MSIS Quality Atlas							
Age	LC	LC	LC	LC	LC	LC	LC
Claims Volume - Other Services (Outpatient) Files	LC	LC	LC	LC	LC	LC	LC
Claims Volume - Inpatient Files	LC	LC	HC	LC	LC	LC	LC
Service Users - Other Services (Outpatient) Files	LC	LC	LC	LC	LC	LC	LC
Service Users - Inpatient Files	LC	LC	LC	LC	LC	LC	LC

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Proce dure Codes - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Proce dure Codes - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Diagn osis Codes - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Diagn osis Codes - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Inpati ent Files	L C	L C	L C	L C	U N U	L C	L C
Place of	L C	L C	L C	L C	L C	L C	L C

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Service							
Admission Date - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Admission Date - Inpatient	L C	L C	L C	L C	L C	L C	L C
Additional Checks							
Beneficiary ID	0. 0 0 %	0. 0 1 %	0. 0 1 %	0. 0 1 %	0. 0 2 %	0. 0 1 %	0. 0 4 %
Date of Birth	0. 0 0 %	0. 0 0 %	0. 0 0 %	0. 0 0 %	0. 5 4 %	0. 0 0 %	1. 0 0 %

Alt-Text: Table showing percentage of missing and invalid values for critical data elements for state Medicaid programs for patients under age twenty-one in coverage year 2018

Percentage of Missing and Invalid Values for Critical Data Elements, State Medicaid Program, <21 Years Old, CY2017, Release 2 (T-							
---	--	--	--	--	--	--	--

MSIS Data)							
	A K	A Z	D E	ID	M I	M S	N V
From T- MSIS Qualit y Atlas							
Age	L C	L C	L C	L C	L C	L C	L C
Medic aid- Only Enroll ment	L C	L C	L C	L C	L C	L C	L C
Claims Volum e - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Claims Volum e - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Servic e Users - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Servic e Users - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Proce dure Codes	L C	L C	L C	L C	L C	L C	L C

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- Other Services (Outpatient) Files							
Procedure Codes - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Diagnosis Codes - Other Services (Outpatient) Files	L C	L C	L C	L C	L C	L C	L C
Diagnosis Codes - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Other Services (Outpatient) Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Place of Service	L C	L C	L C	L C	L C	L C	L C
Admission	L C	L C	L C	L C	L C	L C	L C

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Date - Inpatient Files							
Additional Checks							
Beneficiary ID	0.01%	0.01%	0.01%	0.00%	0.02%	0.01%	0.01%
Date of Birth	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	NM	NC	OK	OR	SC	WA	WY
From T-MSIS Quality Atlas							
Age	LC	LC	LC	LC	LC	LC	LC
Medicaid-Only Enrollment	LC	LC	LC	LC	LC	LC	LC
Claims Volume - Other Services (Outpatient) Files	MC	LC	LC	LC	LC	LC	LC
Claims Volume - Inpatient Files	MC	LC	HC	MC	LC	LC	LC
Service	LC	LC	LC	LC	LC	LC	LC

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Users - Other Services (Outpatient) Files							
Service Users - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Procedure Codes - Other Services (Outpatient) Files	L C	L C	L C	L C	L C	L C	L C
Procedure Codes - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Diagnosis Codes - Other Services (Outpatient) Files	L C	L C	L C	L C	L C	L C	L C
Diagnosis Codes - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Other	L C	L C	L C	L C	L C	L C	L C

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Services (Outpatient) Files							
Type of Bill - Inpatient Files	L C	L C	L C	L C	U N U	L C	L C
Place of Service	L C	L C	L C	L C	L C	L C	L C
Admission Date - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Additional Checks							
Beneficiary ID	0. 0 1 %	0. 0 1 %	0. 0 1 %	0. 0 1 %	0. 0 2 %	0. 0 1 %	0. 0 4 %
Date of Birth	0. 0 0 %	0. 0 0 %	0. 0 0 %	0. 0 0 %	0. 0 1 %	0. 0 0 %	1. 3 5 %

Alt-Text: Table showing percentage of missing and invalid values for critical data elements for state Medicaid programs for patients under age twenty-one in coverage year 2017

Percentage of Missing and Invalid Values for Critical Data Elements, State Medicaid							
--	--	--	--	--	--	--	--

aid Progra m, <21 Years Old, CY201 6, Releas e 2 (T- MSIS Data)							
	A K	A Z	D E	ID	M I	M S	N V
From T- MSIS Qualit y Atlas							
Age	L C	L C	L C	L C	L C	L C	L C
Medic aid- Only Enroll ment	L C	L C	L C	L C	L C	M C	L C
Claims Volum e - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	H C	L C
Claims Volum e - Inpati ent Files	L C	L C	L C	M C	L C	H C	L C
Servic e Users - Other Servic es (Outpa	L C	L C	L C	L C	L C	L C	L C

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tient) Files							
Servic e Users - Inpati ent Files	L C	L C	L C	L C	L C	H C	L C
Proce dure Codes - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Proce dure Codes - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Diagn osis Codes - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Diagn osis Codes - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C

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Type of Bill - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Place of Service	L C	L C	L C	L C	L C	L C	L C
Admission Date - Inpatient Files	L C	L C	L C	L C	L C	L C	L C
Additional Checks							
Beneficiary ID	0. 0 0 %	0. 0 1 %	0. 0 2 %	0. 0 0 %	0. 0 5 %	0. 0 1 %	0. 0 1 %
Date of Birth	0. 0 0 %	0. 0 0 %	0. 0 0 %	0. 0 0 %	0. 0 1 %	0. 0 0 %	0. 0 0 %
	N M	N C	O K	O R	S C	W A	W Y
From T-MSIS Quality Atlas							
Age	L C	L C	L C	L C	L C	L C	L C
Medicaid-Only Enrollment	L C	L C	L C	L C	L C	L C	L C
Claims Volume - Other Service	L C	L C	L C	L C	L C	L C	L C

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es (Outpa tient) Files							
Claims Volum e - Inpati ent Files	M C	L C	H C	M C	L C	M C	L C
Servic e Users - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Servic e Users - Inpati ent Files	L C	L C	L C	L C	L C	M C	L C
Proce dure Codes - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	L C	L C
Proce dure Codes - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Diagn osis Codes - Other Servic es (Outpa	L C	L C	L C	L C	L C	L C	L C

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tient) Files							
Diagn osis Codes - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Type of Bill - Other Servic es (Outpa tient) Files	L C	L C	L C	L C	L C	H C	L C
Type of Bill - Inpati ent Files	L C	L C	L C	L C	U N U	L C	L C
Place of Servic e	L C	L C	L C	L C	L C	H C	L C
Admis sion Date - Inpati ent Files	L C	L C	L C	L C	L C	L C	L C
Additi onal Check s							
Benefi ciary ID	0. 0 1 %	0. 0 1 %	0. 0 1 %	0. 0 2 %	0. 0 2 %	0. 0 1 %	0. 5 4 %
Date of Birth	0. 0 0 %	0. 0 0 %	0. 0 0 %	0. 0 1 %	0. 5 3 %	0. 0 0 %	0. 0 0 %

Alt-Text: Table showing percentage of missing and invalid values for critical data elements for state Medicaid programs for patients under age twenty-one in coverage year 2016

PRIOR TESTING

Percentage of Missing and Invalid Values for Critical Data Elements

PROGRAM 1

Member ID: 0.00%

Date of Birth: 0.00%

Monthly Enrollment Indicator: 0.00%

ICD-9 Diagnosis Codes: 0.12%

Date of Service: 0.00%

Place of Service: 0.00%

Revenue or CPT/HCPCS: 0.00%

PROGRAM 2

Member ID: 0.00%

Date of Birth: 0.00%

Monthly Enrollment Indicator: 0.00%

ICD-9 Diagnosis Codes: 0.10%

Date of Service: 0.00%

Place of Service: 0.00%

Revenue or CPT/HCPCS: 0.02%

PROGRAM 3

Member ID: 0.06%

Date of Birth: 0.00%

Monthly Enrollment Indicator: 0.00%

ICD-9 Diagnosis Codes: 0.24%

Date of Service: 0.00%

Place of Service: 0.00%

Revenue or CPT/HCPCS: 0.11%

PROGRAM 4

Member ID: 0.00%

Date of Birth: 0.00%

Monthly Enrollment Indicator: 0.00%

ICD-9 Diagnosis Codes: 2.29%

Date of Service: 0.00%

Place of Service: 2.59%

Revenue or CPT/HCPCS: 0.07%

Given the very low rates of missing data, no further analyses were conducted as there was no reason to expect any bias, systematic or otherwise, due to missing data.

[Response Ends]

2b.10. Provide your interpretation of the results, in terms of demonstrating that performance results are not biased due to systematic missing data (or differences between responders and non-responders), and how the specified handling of missing data minimizes bias.

In other words, what do the results mean in terms of supporting the selected approach for missing data and what are the norms for the test conducted; if no empirical analysis was conducted, justify the selected approach for missing data.

[Response Begins]

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As noted above, this measure relies on standard data elements in administrative claims. These data are readily available and can be easily retrieved because they are routinely used for billing and reporting purposes. Despite the fact that these are routine data elements, we undertook due diligence to ensure the data completeness within the specific databases that we used for measure testing. Overall, there was low concern/low rates of missing/invalid data for the critical data elements used. In certain years, some states would have lower data quality on a particular data element, which typically did not appear to affect the measure score. Because these are routine data elements that are already collected for other important purposes, particularly claims processing, no rules were developed for handling missing data other than not reporting on the performance measure when data quality is poor. As noted above, programs and plans are instead encouraged to improve their data quality rather than developing statistical techniques to overcome poor data quality.

PRIOR TESTING

We found that the critical data elements had missing/invalid data meeting or exceeding the guidance from the Centers for Medicare and Medicaid Services regarding acceptable error rates for administrative claims data. Given the very low rates of missing data, no further analyses were conducted as there was no reason to expect any bias, systematic or otherwise, due to missing data.

[Response Ends]

Note: This item is directed to measures that are risk-adjusted (with or without social risk factors) OR to measures with more than one set of specifications/instructions (e.g., one set of specifications for how to identify and compute the measure from medical record abstraction and a different set of specifications for claims or eQMs). It does not apply to measures that use more than one source of data in one set of specifications/instructions (e.g., claims data to identify the denominator and medical record abstraction for the numerator). Comparability is not required when comparing performance scores with and without social risk factors in the risk adjustment model. However, if comparability is not demonstrated for measures with more than one set of specifications/instructions, the different specifications (e.g., for medical records vs. claims) should be submitted as separate measures.

2b.11. Indicate whether there is more than one set of specifications for this measure.

[Response Begins]

No, there is only one set of specifications for this measure

[Response Ends]

2b.12. Describe the method of testing conducted to compare performance scores for the same entities across the different data sources/specifications.

Describe the steps—do not just name a method. Indicate what statistical analysis was used.

[Response Begins]

[Response Ends]

2b.13. Provide the statistical results from testing comparability of performance scores for the same entities when using different data sources/specifications.

Examples may include correlation, and/or rank order.

[Response Begins]

[Response Ends]

2b.14. Provide your interpretation of the results in terms of the differences in performance measure scores for the same entities across the different data sources/specifications.

In other words, what do the results mean and what are the norms for the test conducted.

[Response Begins]

[Response Ends]

2b.15. Indicate whether the measure uses exclusions.

[Response Begins]

N/A or no exclusions

[Response Ends]

2b.16. Describe the method of testing exclusions and what was tested.

Describe the steps—do not just name a method; what was tested, e.g., whether exclusions affect overall performance scores; what statistical analysis was used?

[Response Begins]

Not applicable.

[Response Ends]

2b.17. Provide the statistical results from testing exclusions.

Include overall number and percentage of individuals excluded, frequency distribution of exclusions across measured entities, and impact on performance measure scores.

[Response Begins]

Not applicable.

[Response Ends]

2b.18. Provide your interpretation of the results, in terms of demonstrating that exclusions are needed to prevent unfair distortion of performance results.

In other words, the value outweighs the burden of increased data collection and analysis. Note: If patient preference is an exclusion, the measure must be specified so that the effect on the performance score is transparent, e.g., scores with and without exclusion.

[Response Begins]

Not applicable.

[Response Ends]

2b.19. Check all methods used to address risk factors.

[Response Begins]

Stratification by risk category (specify number of categories)

[Stratification by risk category (specify number of categories) Please Explain]

One - this measure is stratified by age.

[Response Ends]

2b.20. If using statistical risk models, provide detailed risk model specifications, including the risk model method, risk factors, risk factor data sources, coefficients, equations, codes with descriptors, and definitions.

[Response Begins]

This measure is stratified by age as described in the attachment.

Rationale for lack of risk adjustment and statistical risk models

Question 2b21, which allows for an explanation of why risk adjustment has not been included is not available to us because we noted there is a measure stratification. So we are providing our explanation within this response.

This outcome measure is stratified by age as described below and not risk adjusted for the following reasons:

(1) Practically, the data to appropriately test and implement risk adjustment methodologies are lacking:

Lack of dental diagnosis codes in claims data to account for patient clinical factors. Historically, the most common risk adjusters used in practice are based on age or clinical factors. Our analysis of caries-related emergency department visits indicates significant variation by age, and we have included that as a required stratification. For measures calculated using claims data, patient clinical factors are based on diagnoses and identified using appropriate diagnostic codes. Dental claims databases typically do not contain diagnosis codes. Consequently, clinical risk factors, such as the presence and severity of disease, cannot be captured in dental claims-based measures and included in a risk adjustment model.

Lack of data on most social risk factors. There are a range of social factors that may be considered in risk adjustment models. However, most of these factors are not adequately populated in administrative claims databases. For example, race and ethnicity has significant missing data in approximately half of Medicaid programs. Data on income are frequently missing; however, this measure is primarily used by state Medicaid programs and, therefore, capturing SES is less important due to smaller variations in SES status within Medicaid programs. Computing area-level indices of social vulnerability would present a significant feasibility barrier.

Lack of overall feasibility at the present time. We cannot meaningfully test and validate a risk adjustment model in the absence of data on standard, core risk adjusters. In addition, primary users of this measure, state Medicaid programs, would face significant feasibility issues to implement risk adjustment even if the data were available. There are no measures in the Medicaid Child Core Set of Quality Measures that require risk adjustment.

(2) Use of stratification:

Given the infeasibility of developing a sound risk adjustment model, the DQA has relied on stratification. Stratification offers its own advantages: it avoids masking disparities and enables transparent reporting of differences in performance by population characteristics that supports efforts to improve quality and reduce disparities.

The DQA will continue to advocate for and monitor developments in data collection needed to support quality measurement in dentistry, including those required for risk adjustment.

(3) Rationale for reporting measure in the absence of risk adjustment:

The barriers described above significantly challenge the profession to develop standardized, broadly accepted outcome measures. As a result, there are virtually no standardized, validated outcome measures. This measure offers an option for measure users who seek to go beyond process of care measures. ED visits for caries-related reasons by children is a system-level outcome representing an avoidable deterioration in oral health and overall health due to untreated dental caries. The DQA has a required stratification for age for which there is observed variation in performance both in our testing data and the published literature as well as consistent data availability. The User Guide provides information on how measure users can stratify the measure by race/ethnicity, geographic location, and other factors if data are sufficiently complete to do so. This measure is primarily used by Medicaid programs for public reporting and quality improvement purposes. Risk adjusting for social factors often is focused on adjusting for differences in socioeconomic status, especially when the measure is used in payment programs. When comparing publicly reported measures between Medicaid programs, adjusting for SES is less of a concern than, for example, when hospitals serving patient populations with very different SES are being compared.

[Response Ends]

2b.21. If an outcome or resource use measure is not risk-adjusted or stratified, provide rationale and analyses to demonstrate that controlling for differences in patient characteristics (i.e., case mix) is not needed to achieve fair comparisons across measured entities.

[Response Begins]

[Response Ends]

2b.22. Select all applicable resources and methods used to develop the conceptual model of how social risk impacts this outcome.

[Response Begins]

Published literature

Internal data analysis

[Response Ends]

2b.23. Describe the conceptual and statistical methods and criteria used to test and select patient-level risk factors (e.g., clinical factors, social risk factors) used in the statistical risk model or for stratification by risk.

Please be sure to address the following: potential factors identified in the literature and/or expert panel; regression analysis; statistical significance of $p < 0.10$ or other statistical tests; correlation of x or higher. Patient factors should be present at the start of care, if applicable. Also discuss any “ordering” of risk factor inclusion; note whether social risk factors are added after all clinical factors. Discuss any considerations regarding data sources (e.g., availability, specificity).

[Response Begins]

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As noted above, there are significant data gaps in dentistry to develop and validate any type of statistical risk model. Consequently, our evaluation focused on available stratification. The most consistent indicator of performance disparity in the literature is patient age. Please see the methods in Prior Testing below. We updated this testing using T-MSIS data by calculating the measure scores with stratifications for the 14 state Medicaid programs in CY 2018.

PRIOR TESTING

This measure will be stratified by age using the following categories:

<1; 1-2; 3-5; 6-7; 8-9; 10-11; 12-14; 15-18; 19-20

During testing, the measure scores were stratified by age and the stratified groups were assessed for statistically significant differences between those groups by evaluating the 95% confidence intervals. For CIs that were not overlapping, these differences were considered to be statistically significant. For those that were overlapping, we additionally calculated the t-statistic to test for statistically significant differences (Wolfe & Hanley 2002). The results are reported below.

Collapsed categories were considered; however, expert consensus concluded that given the different patterns between programs observed in the data analyses, a more refined approach would be more informative to measure implementers. In addition, these stratification categories are consistent with other NQF-endorsed dental measures (NQF#2511; NQF#2517).

References

Wolfe R, Hanley J. If we're so different, why do we keep overlapping? When 1 plus 1 doesn't make 2. CMAJ. 2002; 166(1):65-66.

[Response Ends]

2b.24. Detail the statistical results of the analyses used to test and select risk factors for inclusion in or exclusion from the risk model/stratification.

[Response Begins]

Not applicable.

[Response Ends]

2b.25. Describe the analyses and interpretation resulting in the decision to select or not select social risk factors.

Examples may include prevalence of the factor across measured entities, availability of the data source, empirical association with the outcome, contribution of unique variation in the outcome, or assessment of between-unit effects and within-unit effects. Also describe the impact of adjusting for risk (or making no adjustment) on providers at high or low extremes of risk.

[Response Begins]

Not applicable.

[Response Ends]

2b.26. Describe the method of testing/analysis used to develop and validate the adequacy of the statistical model or stratification approach (describe the steps—do not just name a method; what statistical analysis was used). Provide the statistical results from testing the approach to control for differences in patient characteristics (i.e., case mix) below. If stratified ONLY, enter “N/A” for questions about the statistical risk model discrimination and calibration statistics.

Validation testing should be conducted in a data set that is separate from the one used to develop the model.

[Response Begins]

Not applicable.

[Response Ends]

2b.27. Provide risk model discrimination statistics.

For example, provide c-statistics or R-squared values.

[Response Begins]

Not applicable.

[Response Ends]

2b.28. Provide the statistical risk model calibration statistics (e.g., Hosmer-Lemeshow statistic).

[Response Begins]

Not applicable.

[Response Ends]

2b.29. Provide the risk decile plots or calibration curves used in calibrating the statistical risk model.

The preferred file format is .png, but most image formats are acceptable.

[Response Begins]

Not applicable.

[Response Ends]

2b.30. Provide the results of the risk stratification analysis.

[Response Begins]

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Performance Scores Stratified by Age

	Score		95% CI			
AK, 2018						

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Overall performance score:	18.00	(15.44	,	20.56)
Scores by Age						
<1 year:	1.52	(-1.46	,	4.50)
1-2 years:	7.10	(2.46	,	11.74)
3-5 years:	22.79	(	15.82	,	29.77)
6-7 years:	24.42	(	15.03	,	33.80)
8-9 years:	11.45	(	4.97	,	17.93)
10-11 years:	4.02	(	0.08	,	7.97)
12-14 years:	8.14	(	3.33	,	12.95)
15-18 years:	29.89	(	21.52	,	38.26)
19-20 years:	50.42	(	34.18	,	66.66)
AZ, 2018						
Overall performance score:	15.38	(	14.60	,	16.16)
Scores by Age						
<1 year:	1.48	(	0.51	,	2.44)
1-2 years:	7.15	(	5.48	,	8.81)
3-5 years:	18.97	(	16.77	,	21.18)
6-7 years:	20.86	(	17.96	,	23.75)
8-9 years:	12.77	(	10.55	,	14.99)
10-11 years:	9.94	(	8.02	,	11.85)
12-14 years:	7.26	(	5.86	,	8.66)
15-18 years:	18.38	(	16.30	,	20.45)
19-20 years:	47.45	(	42.16	,	52.73)
DE, 2018						
Overall performance score:	27.99	(	24.93	,	31.05)
Scores by Age						
<1 year:	1.35	(-1.30	,	3.99)
1-2 years:	7.37	(2.56	,	12.19)
3-5 years:	27.44	(19.68	,	35.21)
6-7 years:	40.11	(28.64	,	51.57)

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8-9 years:	24.09	(15.32	,	32.85)
10-11 years:	17.76	(10.17	,	25.36)
12-14 years:	18.83	(12.09	,	25.56)
15-18 years:	33.82	(	25.33	,	42.31)
19-20 years:	93.50	(	72.35	,	114.66)
ID, 2018						
Overall performance score:	16.83	(	15.08	,	18.59)
Scores by Age						
<1 year:	2.23	(	-0.29	,	4.75)
1-2 years:	5.28	(	2.41	,	8.15)
3-5 years:	16.20	(	12.07	,	20.34)
6-7 years:	22.74	(	16.43	,	29.04)
8-9 years:	12.17	(	7.58	,	16.77)
10-11 years:	13.75	(	8.91	,	18.58)
12-14 years:	10.68	(	7.03	,	14.32)
15-18 years:	28.62	(	22.98	,	34.26)
19-20 years:	108.15	(	74.22	,	142.07)
MI, 2018						
Overall performance score:	33.09	(	32.06	,	34.12)
Scores by Age						
<1 year:	2.11	(	1.08	,	3.14)
1-2 years:	10.79	(	8.98	,	12.61)
3-5 years:	37.15	(	34.39	,	39.92)
6-7 years:	44.37	(	40.62	,	48.13)
8-9 years:	32.44	(	29.23	,	35.64)
10-11 years:	18.54	(	16.11	,	20.98)
12-14 years:	17.16	(15.18	,	19.15)
15-18 years:	39.88	(37.07	,	42.69)
19-20 years:	105.98	(99.07	,	112.89)

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MS, 2018						
Overall performance score:	22.86	(21.41	,	24.30)
Scores by Age						
<1 year:	0.92	(-0.12	,	1.96)
1-2 years:	8.62	(	6.05	,	11.20)
3-5 years:	21.14	(	17.78	,	24.50)
6-7 years:	22.13	(	17.56	,	26.70)
8-9 years:	22.47	(	18.02	,	26.91)
10-11 years:	16.39	(	12.68	,	20.10)
12-14 years:	17.42	(	14.07	,	20.76)
15-18 years:	40.34	(	35.64	,	45.04)
19-20 years:	147.37	(	120.69	,	174.06)
NV, 2018						
Overall performance score:	25.38	(	23.71	,	27.05)
Scores by Age						
<1 year:	3.63	(	1.26	,	5.99)
1-2 years:	12.24	(	8.84	,	15.63)
3-5 years:	32.38	(	27.79	,	36.97)
6-7 years:	39.84	(	33.24	,	46.44)
8-9 years:	18.20	(	13.78	,	22.63)
10-11 years:	12.19	(	8.59	,	15.79)
12-14 years:	14.47	(	11.06	,	17.89)
15-18 years:	29.13	(	24.50	,	33.76)
19-20 years:	87.26	(	74.19	,	100.33)
NM, 2018						
Overall performance score:	15.29	(14.05	,	16.53)
Scores by Age						
<1 year:	3.26	(0.84	,	5.67)

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1-2 years:	8.23	(5.38	,	11.08)
3-5 years:	19.10	(15.65	,	22.54)
6-7 years:	15.74	(11.69	,	19.79)
8-9 years:	15.55	(11.61	,	19.48)
10-11 years:	6.56	(	4.04	,	9.08)
12-14 years:	8.84	(	6.34	,	11.35)
15-18 years:	19.23	(	15.83	,	22.63)
19-20 years:	41.03	(	33.50	,	48.56)
NC, 2018						
Overall performance score:	25.90	(	25.00	,	26.80)
Scores by Age						
<1 year:	2.92	(	1.79	,	4.04)
1-2 years:	8.05	(	6.57	,	9.54)
3-5 years:	27.82	(	25.55	,	30.10)
6-7 years:	29.07	(	25.98	,	32.17)
8-9 years:	21.09	(	18.51	,	23.68)
10-11 years:	14.29	(	12.17	,	16.40)
12-14 years:	15.16	(	13.28	,	17.05)
15-18 years:	37.00	(	34.31	,	39.69)
19-20 years:	104.20	(	96.57	,	111.84)
OK, 2018						
Overall performance score:	16.35	(	15.16	,	17.55)
Scores by Age						
<1 year:	1.89	(	0.49	,	3.29)
1-2 years:	6.53	(	4.39	,	8.66)
3-5 years:	18.82	(	15.87	,	21.76)
6-7 years:	16.85	(	13.11	,	20.59)
8-9 years:	15.92	(	12.34	,	19.50)
10-11 years:	12.09	(8.98	,	15.21)
12-14 years:	11.34	(8.60	,	14.07)
15-18 years:	31.55	(26.74	,	36.36)

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19-20 years:	79.11	(60.84	,	97.37)
OR, 2018						
Overall performance score:	31.69	(29.98	,	33.41)
Scores by Age						
<1 year:	1.78	(	0.22	,	3.33)
1-2 years:	8.20	(	5.45	,	10.96)
3-5 years:	34.15	(	29.53	,	38.77)
6-7 years:	37.48	(	31.48	,	43.48)
8-9 years:	24.82	(	20.00	,	29.63)
10-11 years:	18.93	(	14.75	,	23.10)
12-14 years:	14.85	(	11.68	,	18.03)
15-18 years:	44.33	(	39.36	,	49.30)
19-20 years:	99.78	(	89.20	,	110.37)
SC, 2018						
Overall performance score:	17.23	(	16.33	,	18.14)
Scores by Age						
<1 year:	1.29	(	0.26	,	2.32)
1-2 years:	5.97	(	4.33	,	7.61)
3-5 years:	17.01	(	14.79	,	19.24)
6-7 years:	20.19	(	17.16	,	23.21)
8-9 years:	14.64	(	12.11	,	17.18)
10-11 years:	9.71	(	7.66	,	11.76)
12-14 years:	10.57	(	8.70	,	12.45)
15-18 years:	28.21	(	25.37	,	31.04)
19-20 years:	77.16	(66.83	,	87.49)
WA, 2018						
Overall performance score:	18.98	(18.11	,	19.86)
Scores by Age						

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<1 year:	1.68	(0.58	,	2.77)
1-2 years:	6.47	(4.90	,	8.04)
3-5 years:	18.84	(16.66	,	21.01)
6-7 years:	17.90	(15.28	,	20.52)
8-9 years:	14.55	(	12.20	,	16.89)
10-11 years:	9.95	(	8.01	,	11.90)
12-14 years:	11.28	(	9.49	,	13.06)
15-18 years:	28.16	(	25.56	,	30.75)
19-20 years:	81.39	(	73.66	,	89.12)
WY, 2018						
Overall performance score:	21.23	(	16.98	,	25.48)
Scores by Age						
<1 year:	5.58	(	-2.15	,	13.30)
1-2 years:	3.90	(	-1.51	,	9.31)
3-5 years:	25.33	(	13.94	,	36.72)
6-7 years:	25.23	(	10.96	,	39.51)
8-9 years:	14.33	(	3.71	,	24.95)
10-11 years:	12.22	(	2.44	,	21.99)
12-14 years:	15.47	(	5.88	,	25.06)
15-18 years:	21.49	(	10.62	,	32.36)
19-20 years:	129.02	(	58.93	,	199.11)

PRIOR TESTING

PROGRAM 1

Overall performance score:

13.06 (12.63 , 13.49)

Scores by Age

<1 year: 2.06 (1.53 , 2.59)

1-2 years: 5.67 (4.97 , 6.36)

3-5 years: 13.42 (12.49 , 14.34)

6-7 years: 14.03 (12.77 , 15.30)

8-9 years: 11.11 (9.89 , 12.34)

10-11 years: 7.77 (6.73 , 8.80)

12-14 years: 9.69 (8.61 , 10.77)

15-18 years: 26.05 (24.30 , 27.80)

19-20 years: 65.29 (58.00 , 72.58)

PROGRAM 2

Overall performance score:

6.90 (6.20 , 7.60)

Scores by Age

<1 year: 0.00 (0.00 , 0.00)

1-2 years: 3.64 (1.74 , 5.55)

3-5 years: 6.26 (4.29 , 8.23)

6-7 years: 7.86 (5.82 , 9.91)

8-9 years: 6.69 (4.95 , 8.44)

10-11 years: 4.70 (3.14 , 6.26)

12-14 years: 4.38 (3.21 , 5.55)

15-18 years: 11.36 (9.33 , 13.39)

19-20 years: N/A

PROGRAM 3

Overall performance score:

9.87 (8.54 , 11.20)

Scores by Age

<1 year: N/A

1-2 years: N/A

3-5 years: 14.75 (7.34 , 22.16)

6-7 years: 8.90 (5.67 , 12.13)

8-9 years: 8.03 (5.11 , 10.94)

10-11 years: 7.80 (5.02 , 10.58)

12-14 years: 6.85 (4.62 , 9.08)

15-18 years: 14.32 (11.11 , 17.54)

19-20 years: N/A

PROGRAM 4

Overall performance score:

30.68 (29.83 , 31.54)

Scores by Age

<1 year: 2.72 (1.92 , 3.52)

1-2 years: 10.07 (8.87 , 11.27)

3-5 years: 24.66 (23.10 , 26.21)

6-7 years: 32.26 (29.77 , 34.75)

8-9 years: 26.10 (23.71 , 28.49)

10-11 years: 20.24 (18.06 , 22.41)

12-14 years: 22.77 (20.72 , 24.83)

15-18 years: 62.54 (59.02 , 66.06)

19-20 years: 136.31 (126.00 , 146.62)

Note 1: Among the overlapping confidence intervals between adjacent age ranges, the measure scores for Texas Medicaid for the 10-11 and 12-14 age cohorts had a statistically significant difference (t-statistic=2.5290).

Note 2: N/A for age indicates that those ages are not within the program's age eligibility.

[Response Ends]

2b.31. Provide your interpretation of the results, in terms of demonstrating adequacy of controlling for differences in patient characteristics (i.e., case mix).

In other words, what do the results mean and what are the norms for the test conducted?

[Response Begins]

TESTING FOR SPRING 2022 MAINTENANCE EVALUATION

The results from both the current and prior testing indicate clear disparities in performance across age groups with the oldest age groups experiencing the highest rates of caries-related ED visits. This is also consistent with what has been reported in the published literature (e.g., Allareddy et al. 2014)

Reference:

Allareddy V, Nalliah RP, Haque M, Johnson BS, Rampa SB, Lee MK. Hospital-based emergency department visits with dental conditions among children in the United States: nationwide epidemiological data. *Pediatr Dent* 2014;37(5):393-9.

PRIOR TESTING

Consideration was given to collapsing the age ranges; however, because there are different patterns between the states, it was determined that keeping the more refined categories provided more insight than collapsing the age ranges. Additionally, these age ranges are the same as other recently endorsed dental measures (NQF#2511; NQF#2517).

[Response Ends]

2b.32. Describe any additional testing conducted to justify the risk adjustment approach used in specifying the measure.

Not required but would provide additional support of adequacy of the risk model, e.g., testing of risk model in another data set; sensitivity analysis for missing data; other methods that were assessed.

[Response Begins]

Not applicable.

[Response Ends]

3. Feasibility

Extent to which the specifications including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement.

3.01. Check all methods below that are used to generate the data elements needed to compute the measure score.

[Response Begins]

Coded by someone other than person obtaining original information (e.g., DRG, ICD-10 codes on claims)

[Response Ends]

3.02. Detail to what extent the specified data elements are available electronically in defined fields.

In other words, indicate whether data elements that are needed to compute the performance measure score are in defined, computer-readable fields.

[Response Begins]

ALL data elements are in defined fields in electronic claims

[Response Ends]

3.03. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using data elements not from electronic sources.

[Response Begins]

[Response Ends]

3.04. Describe any efforts to develop an eCQM.

[Response Begins]

[Response Ends]

3.06. Describe difficulties (as a result of testing and/or operational use of the measure) regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

[Response Begins]

[Response Ends]

Consider implications for both individuals providing data (patients, service recipients, respondents) and those whose performance is being measured.

3.07. Detail any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm),

Attach the fee schedule here, if applicable.

[Response Begins]

This measure is intended to be transparent and available for widespread adoption. As such, it was purposefully designed to avoid using software or other proprietary materials that would require licensing fees. The measure specifications will be accessible through a website and can be used free of charge for non-commercial purposes. The main requirements of users will be to ensure the quality of their source data and expertise to program the measures within their information systems, following the clear and detailed specifications. Technical assistance will be available to users.

[Response Ends]

4. Usability and Use

Extent to which potential audiences (e.g., consumers, purchasers, providers, policy makers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high-quality, efficient healthcare for individuals or populations.

Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.

NQF-endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement, in addition to demonstrating performance improvement.

4a.01. Check all current uses. For each current use checked, please provide:

Name of program and sponsor

URL

Purpose

Geographic area and number and percentage of accountable entities and patients included

Level of measurement and setting

[Response Begins]

[Response Ends]

4a.02. Check all planned uses.

[Response Begins]

Public reporting

Quality Improvement with Benchmarking (external benchmarking to multiple organizations)

[Response Ends]

4a.03. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing), explain why the measure is not in use.

For example, do policies or actions of the developer/steward or accountable entities restrict access to performance results or block implementation?

[Response Begins]

This is a new measure. There are no policies or actions currently in place that the developer is aware of that impede implementation of this measure.

[Response Ends]

4a.04. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes: used in any accountability application within 3 years, and publicly reported within 6 years of initial endorsement.

A credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.

[Response Begins]

This is a new measure that has been developed and tested using four data sources: Texas Medicaid, Texas CHIP, Florida CHIP, and Florida Medicaid programs. Please note that this measure was approved by the membership of the Dental Quality Alliance in October 2014. The Dental Quality Alliance (DQA) was formed at the request of the Centers of Medicare and Medicaid Services (CMS) specifically for the purpose of bringing together recognized expertise in oral health to develop quality measures through consensus processes. DQA pursued NQF endorsement of its measures under the guidance from the CMS. Five DQA measures have since been endorsed (NQF# 2517 Oral Evaluation, Dental Services; NQF# 2509 Prevention: Dental Sealants for 10-14 Year-Old Children at Elevated Caries Risk; NQF# 2508 Prevention: Dental Sealants for 6-9 Year-Old Children at Elevated Caries Risk; NQF# 2528 Prevention: Topical Fluoride for Children at Elevated Caries Risk, Dental Services; and NQF# 2511 Utilization of Services, Dental Services). The CMS recently announced the inclusion of the DQA measure, Dental Sealants in 6-9 year olds (NQF# 2508) into the 2015 CHIPRA Core Set of Children's Health Care Quality Measures.

Included in the Appendix as attachments to this application is a letter from key stakeholder, indicating their support for these measures for performance and quality improvement:

o Ms. Mary Foley, Executive Director, Medicaid and CHIP State Dental Associations

[Response Ends]

4a.05. Describe how performance results, data, and assistance with interpretation have been provided to those being measured or other users during development or implementation.

Detail how many and which types of measured entities and/or others were included. If only a sample of measured entities were included, describe the full population and how the sample was selected.

[Response Begins]

NOTE: This section to be updated for full submission; not required for intent to submit.

Per the annual survey conducted by the Medicare-Medicaid and Children's Health Insurance Program State Dental Association (MSDA), 18 Medicaid agencies are implementing DQA measures.

In an effort to facilitate implementation of the DQA measures, the DQA provides technical assistance to users of DQA measures through webinars, resource document development and one-on-one staff support.

[Response Ends]

4a.06. Describe the process for providing measure results, including when/how often results were provided, what data were provided, what educational/explanatory efforts were made, etc.

[Response Begins]

In order to ensure transparency, establish proper protocols for timely assessment of the evidence and measure properties, and to comply with the NQF's endorsement agreement, the DQA has established an annual measure review and maintenance process. This measure review process is overseen by the DQA's Measures Development and Maintenance Committee (MDMC) which is comprised of six subject matter experts. This annual review process includes: (1) call for public comments, (2) evaluation of the comments, (3) user group feedback, and (4) code set reviews.

DQA provides technical assistance to users of DQA measures through webinars, resource document development and one-on-one staff support.

[Response Ends]

4a.07. Summarize the feedback on measure performance and implementation from the measured entities and others. Describe how feedback was obtained.

[Response Begins]

In 2016, the DQA expanded its scope of review of its measures by convening conference calls for two user groups – one comprised of representatives from 6 state Medicaid programs (Alabama, Florida, Kentucky, Oregon, Nevada, and Pennsylvania) and the other comprised of representatives from 8 dental plans. Participants shared their experiences implementing DQA measures in their respective programs, including any challenges related to the DQA measures specifications and use of these measures in their quality improvement programs. Participants did not have any significant issues related to the clarity or feasibility of implementing the measure specifications.

[Response Ends]

4a.08. Summarize the feedback obtained from those being measured.

[Response Begins]

There have been no significant issues related to the clarity or feasibility of implementing the measure specifications.

[Response Ends]

4a.09. Summarize the feedback obtained from other users.

[Response Begins]

There have been no significant issues related to the clarity or feasibility of implementing the measure specifications.

[Response Ends]

4a.10. Describe how the feedback described has been considered when developing or revising the measure specifications or implementation, including whether the measure was modified and why or why not.

[Response Begins]

N/A

[Response Ends]

4b.01. You may refer to data provided in Importance to Measure and Report: Gap in Care/Disparities, but do not repeat here. Discuss any progress on improvement (trends in performance results, number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included). If no improvement was demonstrated, provide an explanation. If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

[Response Begins]

NOTE: This section to be updated prior to full submission; not require for Intent to Submit

The proposed measure, Ambulatory Care Sensitive Emergency Department Visits for Dental Caries in Children, represents an outcome that can be impacted through health care system quality improvement strategies (increasing access to dental care, including routine visits, preventive care, and timely identification and management of dental caries). ED care for caries-related problems is generally not definitive compared to that provided in primary care dental settings and often results in referral to primary care dental sites (Cohen et al. 2011; Hocker et al. 2012; (Lewis, Lynch and Johnston 2003). This measure can be used to promote performance improvement by allowing programs to track and monitor ED use for caries-related reasons by children over time and to evaluate and inform strategies to promote greater use of outpatient preventive dental services including ED diversion programs.

Cohen LA, Bonito AJ, Eicheldinger C, Manski RJ, Macek MD, Edwards RR, et al. Comparison of patient visits to emergency departments, physician offices, and dental offices for dental problems and injuries. J Public Health Dent. 2011;71(1):13-22. Epub 2010/08/24.

Hocker MB, Villani JJ, Borawski JB, Evans CS, Nelson SM, Gerardo CJ, Limkaken AT. Dental visits to a North Carolina emergency department: a painful problem. N C Med J. 2012; 73(5):346-51.

Lewis C, Lynch H, Johnston B. Dental complaints in emergency departments: a national perspective. Ann Emerg Med. 2003; 42(1):93-9.

[Response Ends]

4b.02. Explain any unexpected findings (positive or negative) during implementation of this measure, including unintended impacts on patients.

[Response Begins]

No unintended or negative consequences have been identified.

[Response Ends]

4b.03. Explain any unexpected benefits realized from implementation of this measure.

[Response Begins]

[Response Ends]

5. Comparison to Related or Competing Measures

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure.

If you are updating a maintenance measure submission for the first time in MIMS, please note that the previous related and competing data appearing in question 5.03 may need to be entered in to 5.01 and 5.02, if the measures are NQF endorsed. Please review and update questions 5.01, 5.02, and 5.03 accordingly.

5.01. Search and select all NQF-endorsed related measures (conceptually, either same measure focus or target population).

(Can search and select measures.)

[Response Begins]

[Response Ends]

5.02. Search and select all NQF-endorsed competing measures (conceptually, the measures have both the same measure focus or target population).

(Can search and select measures.)

[Response Begins]

[Response Ends]

5.03. If there are related or competing measures to this measure, but they are not NQF-endorsed, please indicate the measure title and steward.

[Response Begins]

[Response Ends]

5.04. If this measure conceptually addresses EITHER the same measure focus OR the same target population as NQF-endorsed measure(s), indicate whether the measure specifications are harmonized to the extent possible.

[Response Begins]

No

[Response Ends]

5.05. If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.

[Response Begins]

Not applicable

[Response Ends]

5.06. Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality). Alternatively, justify endorsing an additional measure.

Provide analyses when possible.

[Response Begins]

Not applicable

[Response Ends]

Appendix

Supplemental materials may be provided in an appendix.:

Contact Information

Measure Steward (Intellectual Property Owner): American Dental Association

Measure Steward Point of Contact: Ojha, Diptee, ojhad@ada.org

Colangelo, Erica, colangeloe@ada.org

Alliance, Dental, dqa@ada.org

Measure Developer if different from Measure Steward: American Dental Association

Measure Developer Point(s) of Contact: Ojha, Diptee, ojhad@ada.org

Colangelo, Erica, colangeloe@ada.org

Herndon, Jill, jill.herndon@keyanalyticsconsulting.com

Alliance, Dental, dqa@ada.org

Additional Information

1. Provide any supplemental materials, if needed, as an appendix. All supplemental materials (such as data collection instrument or methodology reports) should be collated one file with a table of contents or bookmarks. If material pertains to a specific criterion, that should be indicated.

[Response Begins]

[Response Ends]

2. List the workgroup/panel members' names and organizations.

Describe the members' role in measure development.

[Response Begins]

This project is headed by the DQA through its Measure Development and Maintenance Committee (formerly Research and Development Committee). The following individuals were responsible for executing and overseeing all scientific aspects of this project.

James J. Crall, DDS, ScD, American Academy of Pediatric Dentistry; Professor & Chair, Division of Public Health & Community Dentistry and Director, National Oral Health Policy Center at UCLA. Dr. Crall serves as chair for the Committee.

Craig W. Amundson, DDS, General Dentist, HealthPartners, National Association of Dental Plans

Rob D. Compton, DDS, Executive Director, DentaQuest Institute

Chris Farrell, RDH, BSDH, MPA, Oral Health Program Director, Michigan Department of Community Health

Jed J. Jacobson, DDS, MS, MPH, Chief Science Officer and Sr. Vice President, Delta Dental of Michigan, Ohio, Indiana, North Carolina

Mark Casey, DDS, MPH, Dental Director, North Carolina Department of Health and Human Services Division of Medical Assistance

JC Shirley, DDS, MS, Children's Healthcare of Atlanta; President, Board of Directors, American Board of Pediatric Dentistry

W. Ken Rich, DMD, Kentucky Medicaid Dental Director, Department of Medicaid Services

Robert Mazzola, DDS, Council on Dental Benefit Programs, American Dental Association

This group oversaw the development and validation of the measure. All work of this Committee was distributed for review and formal vote and approval by the entire Dental Quality Alliance. (<http://ada.org/dqa>) The DQA is made up of representatives from 34 stakeholder organizations. This Committee partnered with the University of Florida (Jill Herndon, PhD, Principal Investigator) to validate the measure. Data for measure testing were provided by the Florida Agency for Health Care Administration (Florida Medicaid), Florida Healthy Kids Corporation (Florida's CHIP program), and Texas Health and Human Services Commission (Texas Medicaid and CHIP programs).

[Response Ends]

3. Indicate the year the measure was first released.

[Response Begins]

[Response Ends]

4. Indicate the month and year of the most recent revision.

[Response Begins]

[Response Ends]

5. Indicate the frequency of review, or an update schedule, for this measure.

[Response Begins]

Annual

[Response Ends]

6. Indicate the next scheduled update or review of this measure.

[Response Begins]

[Response Ends]

7. Provide a copyright statement, if applicable. Otherwise, indicate "N/A".

[Response Begins]

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[Response Ends]

8. State any disclaimers, if applicable. Otherwise, indicate "N/A".

[Response Begins]

Dental Quality Alliance Measures (Measures) and related data specifications, developed by the Dental Quality Alliance (DQA), are intended to facilitate quality improvement activities.

These Measures are intended to assist stakeholders in enhancing quality of care. These performance Measures are not clinical guidelines and do not establish a standard of care. The DQA has not tested its Measures for all potential applications.

Measures are subject to review and may be revised or rescinded at any time by the DQA. The Measures may not be altered without the prior written approval of the DQA. Measures developed by the DQA, while copyrighted, can be reproduced and distributed, without modification, for noncommercial purposes. Commercial use is defined as the sale, license, or distribution of the Measures for commercial gain, or incorporation of the Measures into a product or service that is sold, licensed or distributed for commercial gain. Commercial uses of the Measures require a license agreement between the user and DQA. Neither the DQA nor its members shall be responsible for any use of these Measures.

THE MEASURES ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND

Limited proprietary coding is contained in the Measure specifications for convenience. Users of the proprietary code sets should obtain all necessary licenses from the owners of these code sets. The DQA,

American Dental Association (ADA), and its members disclaim all liability for use or accuracy of any terminologies or other coding contained in the specifications.

THE SPECIFICATIONS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND.

[Response Ends]

9. Provide any additional information or comments, if applicable. Otherwise, indicate "N/A".

[Response Begins]

In 2008, the Centers for Medicare and Medicaid Services (CMS) asked the ADA to lead the development of a broad coalition of organizations that would lead dentistry to improve the oral health of Americans through quality measurement and quality improvement. The ADA subsequently established the DQA. The DQA is a multi-stakeholder alliance comprised of approximately 30 stakeholders (with organizations as members) from across the oral health community, including federal agencies, third-party payers, professional associations, and an individual member from the general public. The DQA's mission is to advance the field of performance measurement to improve oral health, patient care, and safety through a consensus building process

[Response Ends]