# Final Report on Testing Pediatric Oral Health Care Performance Measures: Tooth Mortality of Primary Teeth and Treatment after Sealant Placement on Permanent Molars

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Dental Quality Alliance

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# Purpose

The purpose of this report is to update the Dental Quality Alliance (DQA) and other key stakeholders on the validation testing for two pediatric oral health care performance measures. This report was approved by the DQA at its meeting on June 10th, 2016.

# Background

In 2012, the DQA approved its first fully tested measure set *Dental Caries in Children: Prevention and Disease Management* ("Starter Set"). The Starter Set includes several process[1] and related health care delivery[2] measures to assess whether children are receiving evidence-based care associated with early detection and prevention of dental caries.

In 2013, a DQA expert workgroup identified **Permanent Molar Extraction** and **Treatment Following Sealant** as potential **outcome** measures. As explained below, the measure related to permanent molar extraction was later modified to a measure of **primary teeth requiring extraction for non-orthodontic reasons or primary teeth requiring pulpal therapy**. Clinical quality measures that fall into the domain of health care outcomes are measures of the health state of a patient resulting from health care. A patient's "health state" may include changes in health status, can be desirable or adverse, and may be identified through health care use as a proxy.[3]

**Conceptually**, advanced treatment for dental caries indicated by pulp therapy and non-orthodontic extractions, was conceived as an outcome measure of the failure to preserve the vitality of primary teeth – i.e. **tooth mortality**. **Treatment following placement of a selant** was thought to be indicative of treatment failure resulting in disease progression. All other contributing factors equal, the *a priori* expectation was that the measure score interpretation for both measures would be "lower is better" – i.e., (1) fewer pulp therapies and extractions are

[1] Process (measure type): "A healthcare service provided to, or on behalf of, a patient. This may include, but is not limited to, measures that may address adherence to recommendations for clinical practice based on evidence or consensus." National Quality Forum. "NQF Glossary." Available at: http://www.qualityforum.org/Measuring_Performance/Measuring_Performance.aspx.

[2] Related health care delivery measures: "Measures used to assess the non-quality aspects of performance of individual, clinicians, clinical delivery teams, delivery organizations, or health insurance plans in the provision of care to their patients or enrollees. These measures are not supported by evidence demonstrating that they indicate better or worse care." National Quality Measures Clearninghouse. Available at: https://www.qualitymeasures.ahrq.gov/tutorial/varieites.aspx.

[3] National Quality Forum. Measure Evaluation Criteria and Guidance for Evaluating Measures for Endorsement. April 2015. Available at: www.qualityforum.org/Show_Content.aspx?id=322.

indicative of fewer instances of untreated/progressive caries that have reached advanced stages, and (2) fewer subsequent restorations and other treatments are indicative of appropriate tooth selection, disease management, or quality of sealant technique. Both measures were designed for reporting **at the program and plan levels** using administrative enrollment and dental claims data.

The original measures developed by the workgroup were:

(1) Tooth Mortality - the percentage of children **under age 10 years who had an extraction of a permanent mola**r within the reporting year, and
(2) Treatment Following Sealant - the percentage of children who received **a restoration, endodontic treatment or extraction within 24 months of fissure sealant placement on the same** tooth.

Testing of these measures was initiated in early 2014 using plan-level administrative data from DentaQuest and Delta Dental of Michigan. Initial plan-level testing of the Tooth Mortality measure based on permanent molar extractions demonstrated a low frequency of occurrence of extractions and very little performance gap between the plans. Following this, the DQA's Measures Development and Maintenance Committee (MDMC) recommended additional testing using program-level data with specific changes to the measure definitions. The changes to the measure definitions were presented at the DQA Meeting on October 24, 2014 and in the Interim Report[4] that was released shortly after. The revised measures used for program-level testing were:

(1) Tooth Mortality - the percentage of children aged **2–10 years** who received **pulp therapy or non-orthodontic extraction** in any of their **primary anterior or primary molar teeth**, and
(2) Treatment Following Sealant - the percentage of children aged **6–20 years** who received an **occlusal** restoration, endodontic treatment or extraction within 24 months of fissure sealant placement on the **same permanent molar** tooth.

Program-level testing was conducted in 2015 and 2016 by the University of Florida (UF) using administrative data from the Texas and Florida Medicaid and CHIP programs. All data in this

[4] Available upon request.

report are based on the more recent testing conducted by UF. The DQA MDMC guides and oversees all measure testing.

## Data Sources

Administrative enrollment and dental claims data from the following programs for Calendar Years (CY) 2011-2014 were used for testing: Texas CHIP, Texas Medicaid, Florida CHIP, and Florida Medicaid. All data sources and testing methodologies were approved by the University of Florida Institutional Review Board.

## Key Testing Findings

A central conclusion from testing is: **without diagnostic codes, treatment experience alone cannot be used as a proxy to measure tooth mortality. This particularly afffected the ability to use primary tooth extraction as an indicator of disease affecting pulpal health. Additionally, any conclusions from testing were confounded by issues related to access.** Program-level measures of dental outcomes are currently severely limited by the lack of sufficient information to determine the population's health state and treatment needs. These deficiencies called into question the interpretability, reliability, and validity of the tested measures as quality of care indicators. Data from the testing results are provided in Appendix 1 (Tooth Mortality) and Appendix 2 (Treatment Following Sealant). The MDMC's overall conclusions and recommendations specific to each measure, based on the testing results, are provided below.

### *Tooth Mortality*

The MDMC noted the following are key findings of measure testing:

1. Initial measure scores presented face validity concerns because they appeared to track with program utilization and access – i.e., a program with lower overall utilization and access had lower measure scores than a program with higher utilization and access.
2. Efforts were made to adjust the denominator to take into account both overall dental service utilization and dental treatment service utilization, but doing so did not improve the interpretability of the measure scores and concerns about the face validity persisted.
3. The lack of diagnostic codes associated with primary tooth extractions in administrative claims data makes it impossible to identify the underlying reason for treatment to distinguish whether the treatment services provided reflect the health state of the population and are adequately meeting the needs for care.

4. The usefulness of chart reviews in allowing meaningful measurement is limited by the inability to identify a specific diagnosis or rationale for extraction of primary teeth in a high number of records reviewed. The chart reviews did not include screening of related radiographs.

Testing revealed that there currently is insufficient information within adminstrative claims data to (1) identify a patient's underlying reason for treatment related to primary tooth extraction and (2) overcome confounding with access to and use of services. **The challenge is that without knowing which children require which treatment services, it is unclear if a lower measure score reflects (1) better prevention and disease management and, therefore, fewer treatments for advanced disease or (2) less access to treatment services.** These deficiencies resulted in the majority of the MDMC members calling into question the interpretability, reliability, and validity of the measure scores.

During its deliberations, the MDMC determined that "**Tooth Mortality" remains an important measurement concept in dentistry.** Examination of the percentage of children who receive specific treatment services that are more likely to be indicative of advanced disease (e.g., pulp therapy) could provide greater insight into the nature and extent of treatment that children are receiving when used consistently over time and in the context of other utilization measures. However, in order to achieve such a measure, the DQA would need to initiate additional testing. One possibility for additional testing that the MDMC recommends is to explore potential stratification of the Dental Treatment Services measure by specific treatment service sub-sets to provide more insight into the mix of treatment services received with a particular focus on those services more likely to be indicative of advanced disease. For example, there would need to be an evaluation of whether to stratify using general groupings of CDT codes (e.g., 2XXX series, 3XXX series, etc.) or creation of specific code sets designed to represent more "meaningful" categories of services. Feasibility, burden of implementation, impact on reported utilization rates, and interpretability would need to be weighed in making such determinations. Consequently, evaluating this potential stratification was determined to be outside of the scope of the current project and may be considered during annual measure review and maintenance.

For the purposes of this project, the majority of the MDMC members **were not satisfied** that the current measure of Tooth Mortality met the criteria for reliability, validity and interpretability. This measure has not passed the DQA tests.

### *Treatment Following Sealant - Key Findings*

The MDMC noted the following are key findings of measure testing:

1. Initial measure scores presented face validity concerns because they appeared to track with program utilization and access – i.e., a program with lower overall utilization and access had lower measure scores than a program with higher utilization and access.
2. Efforts were made to adjust the denominator to take into account overall dental service utilization. However, there was little effect on the measure scores, and concerns about face validity and interpretability persisted.
3. The usefulness of this measure as a system-level indicator of quality of care versus a measure of the technical quality of the sealant placement that is better measured at the delivery site level was questioned. Without additional diagnostic and clinical data, this question is unanswerable.

Overall, the MDMC questioned the general interpretability and usefulness of this measure as a *program level measure*. The MDMC does not recommend further evaluation of this measure at the program or plan level.

For the purposes of this project, the MDMC members **were unanimously not satisfied** that the Sealant Following Treatment measure met the critera for reliability, validity, and interpretability. This measure has not passed the DQA tests.

## Conclusions:

Based on the testing results, **the majority of the MDMC agreed** with the following conclusions on the measures **as currently specified**:

1. The measure scores cannot have a "higher is better" or "lower is better" absolute interpretation.
2. The measures cannot measure the health state of a population, and they cannot serve as "outcome" measures.
3. Measure scores should not be used for between-plan or between-program or between-state comparisons.
4. The measures should not be used for accountability purposes.
5. Extensive contextual information would be required to derive a meaningful interpretation of the measure scores even for internal quality improvement purposes.

# Appendix 1

# Measure 1: Tooth Mortality (Pulp Therapy and Non-Orthodontic Extractions)

**Description:** Percentage of enrolled children aged 2–10 years who received pulp therapy or non-orthodontic extraction in any of their primary anterior or primary molar teeth.
**Numerator (NUM):** Unduplicated number of enrolled children aged 2–10 years who received pulp therapy or non-orthodontic extraction of primary anterior or primary molar teeth during the measurement year.
**Denominator (DEN):** Unduplicated number of all children aged 2–10 years enrolled in two consecutive years.
**Rate:** NUM/DEN

## Denominator Considerations

The majority of testing focused on determining the appropriate denominator and the validity of the measure scores. A measure denominator identifies the population that is the focus of the measurement. The following denominators were tested:

- children enrolled at least 180 days continuously in the measurement year;
- children enrolled at least 180 days continuously in each of two consecutive years (the measurement year and the year prior);
- children enrolled at least 180 days continuously in each of two consecutive years who received "any dental service" in the year prior to the measurement year; and
- children enrolled at least 180 days continuously in each of two consecutive years who received "any treatment service" in the year prior to the measurement year.

Below, the rationale for testing each of these denominators is provided with the testing results.

### *One Year versus Two Year Enrollment Requirement*

Because outcome measures are frequently used in accountability applications, concerns were raised about the validity of holding a plan or program accountable with a one-year enrollment requirement. Specifically, plans or programs that are entering a new market or enrolling new beneficiaries with significant oral health needs could experience lower or declining measure

scores. In addition, because measure testing should consider potential negative unintended consequences of the measure, there was consideration that not allowing sufficient time for programs and plans to assess a patient's treatment needs and provide appropriate treatment could potentially disincentivize timely provision of needed pulp therapies and extractions in order to get a lower ("better") measure score. Thus, enrollment in two consecutive years was proposed as a method for addressing this potential unintended consequence by allowing time to get newly enrolled beneficiaries into the care system to get needed or urgent care before performance is measured and reduce the potential disincentives for providing advanced treatment.

We tested the impact of one-year versus two-year enrollment requirements for denominator inclusion on the measure scores for two programs (Table 1): (1) continuous enrollment for at least 180 days in the measurement year (1-year enrollment requirement), and (2) continuous enrollment for at least 180 days in the measurement year and at least 180 days in the year prior to the measurement year (2-year enrollment requirement). The period of 180 days was selected to be consistent with the enrollment requirements in the Starter Set measures. The measure scores were similar for the one-year and two-year enrollment criteria, and the two-year requirement was selected as a more conceptually sound approach for outcomes and accountability applications. The two-year measure scores are provided for all four programs in Table 1.

**Table 1. Percentage of Children who Received Pulp Therapy or Non-Orthodontic Extraction for 1-Year and 2-Year Enrollment Requirements, Measurement Year 2013**

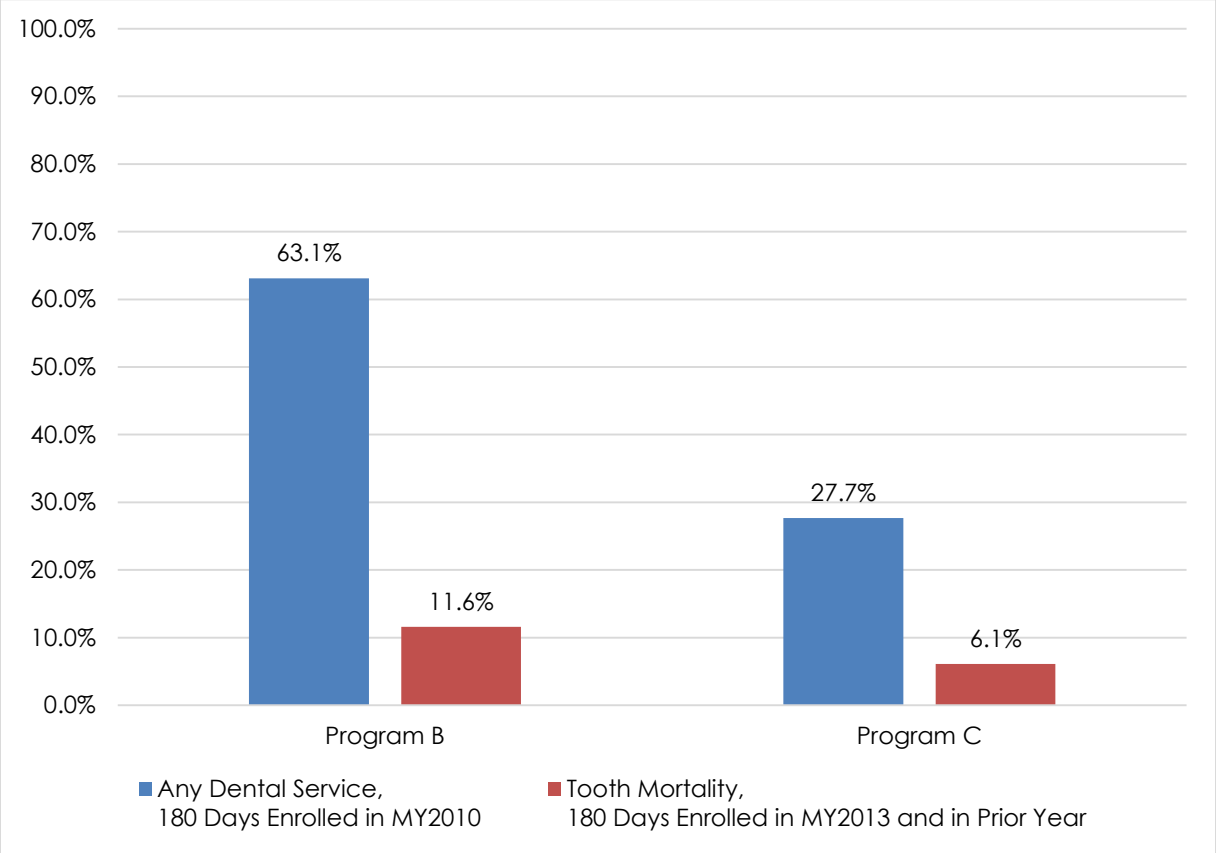
| Program | Age | 1-Year Enrollment Requirement | | | 2-Year Enrollment Requirement | | |
|---|---|---|---|---|---|---|---|
| | | DEN | NUM | RATE | DEN | NUM | RATE |
| **Program A** | 2–10 | 288,561 | 24,429 | **8.5%** | 128,793 | 12,536 | **9.7%** |
| | 2–5 | 85,478 | 3,303 | **3.9%** | 30,585 | 1,464 | **4.8%** |
| | 6–10 | 203,083 | 21,126 | **10.4%** | 98,208 | 11,072 | **11.3%** |
| **Program B** | 2–10 | 1,287,280 | 151,667 | **11.8%** | 1,061,104 | 123,165 | **11.6%** |
| | 2–5 | 622,435 | 48,593 | **7.8%** | 515,154 | 39,476 | **7.7%** |
| | 6–10 | 664,845 | 103,074 | **15.5%** | 545,950 | 83,689 | **15.3%** |
| **Program C** | 2–10 | | | | 924,116 | 56,655 | **6.1%** |
| | 2–5 | | | | 444,761 | 15,563 | **3.5%** |
| | 6–10 | | | | 479,355 | 41,092 | **8.6%** |
| **Program D*** | 6–10 | | | | 47,136 | 4,920 | **10.4%** |

*Program D age eligibility is 5-18 years.

### *Measure Reliability and Validity Concerns and Prior Dental Service Use*

Next, the face validity of the measure scores for Programs B and C were considered. Based on data generated during the testing of the Starter Set, we know that Program B has higher utilization (fewer access issues) than Program C. Data for the two programs from the Starter Set testing are provided in Figure 1 along with Tooth Mortality measure scores from Table 1 above. Program B, which has higher rates of any dental service use compared with Program C, also had higher Tooth Mortality measure scores. This raised concerns about potential confounding of the measure score by access to services – i.e., that the measure score may be reflecting access to services and not the overall quality of care.

**Figure 1. Dental Service Use and Tooth Mortality Measure Score**




Because of the concerns of confounding with access to services, additional testing was done to attempt to address the access issue by further restricting the denominator to only include those children who used dental services in Year 1. The following denominators were tested:

- children enrolled at least 180 days continuously in each of two consecutive years who received "any dental service" (any CDT code) in the year prior to the measurement year, and
- children enrolled at least 180 days continuously in each of two consecutive years who received "any treatment service" (CDT codes D2XXX-D9999) in the year prior to the measurement year.

Figure 2 and Table 2 provide the results. When restricting the denominator to only those who received "any dental service" in Year 1, Program C continued to have lower measure scores compared with Program B in Measurement Year 2013. Additional restriction of the denominator to "any treatment services" reduced the difference in the measure scores between the two programs, but did not improve the interpretability or face validity of the measure scores. Concerns regarding confounding by access to services remained, raising questions about how to interpret higher and lower scores.

**Figure 2. Tooth Mortality Measure Scores by Denominator Criteria**
**Children Ages 2-10 Years, MY 2013**

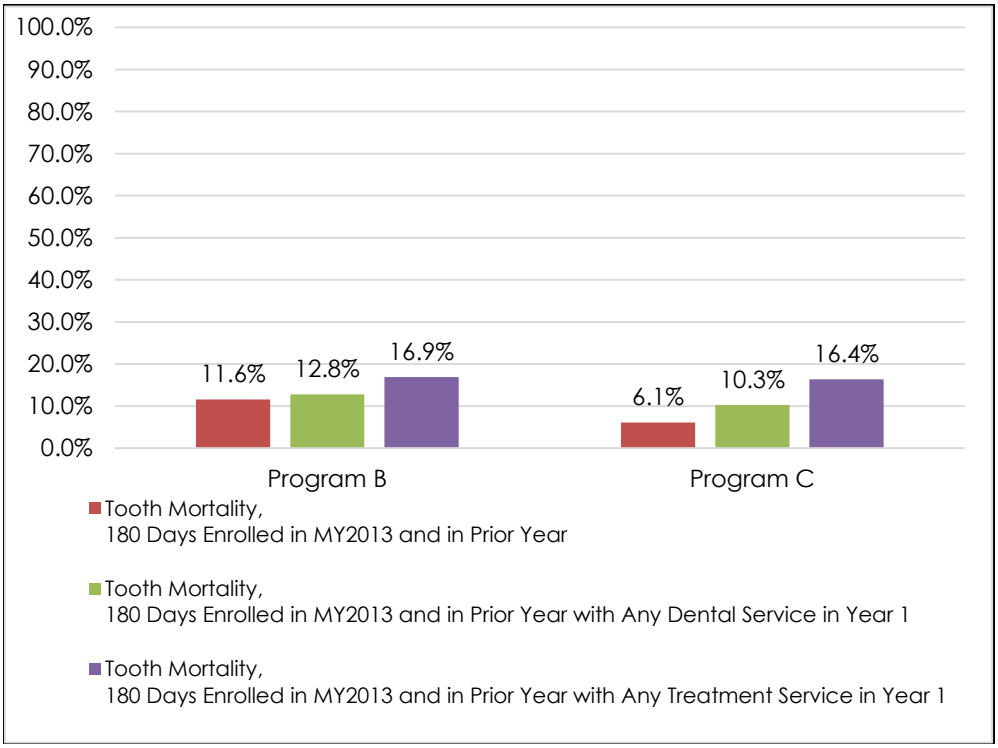


**Table 2. Percentage of Children who Received Pulp Therapy or Non-Orthodontic Extraction: "Any Dental Service" and "Any Treatment Service" Denominator Requirements**

| Program and Year | Age | Enrolled 180 Days in Each of 2 Years | | | Enrolled in 180 Days in Each of Two Years AND Received "Any Dental Service" in Year 1 | | | Enrolled in 180 Days in Each of Two Years AND Received "Any Treatment Service" in Year 1† | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DEN | NUM | RATE | DEN | NUM | RATE | DEN | NUM | RATE |
| **Program A** | | | | | | | | | | |
| **2012** | 2–10 | 116,320 | 12,052 | **10.4%** | 61,202 | 7,500 | **12.3%** | | | |
| | 2–5 | 28,209 | 1,222 | **4.3%** | 13,208 | 689 | **5.2%** | | | |
| | 6–10 | 88,111 | 10,830 | **12.3%** | 47,994 | 6,811 | **14.2%** | | | |
| **2013** | 2–10 | 128,793 | 12,536 | **9.7%** | 58,218 | 6,636 | **11.4%** | | | |
| | 2–5 | 30,585 | 1,464 | **4.8%** | 12,670 | 714 | **5.6%** | | | |
| | 6–10 | 98,208 | 11,072 | **11.3%** | 45,548 | 5,922 | **13.0%** | | | |
| **Program B** | | | | | | | | | | |
| **2012** | 2–10 | 1,217,262 | 126,653 | **10.4%** | 822,476 | 95,176 | **11.6%** | 403,722 | 62,337 | **15.4%** |
| | 2–5 | 610,519 | 40,533 | **6.6%** | 413,651 | 30,706 | **7.4%** | 106,208 | 13,427 | **12.6%** |
| | 6–10 | 606,743 | 86,120 | **14.2%** | 408,825 | 64,470 | **15.8%** | 297,514 | 48,910 | **16.4%** |
| **2013** | 2–10 | 1,061,104 | 12,3165 | **11.6%** | 756,536 | 96,940 | **12.8%** | 328,117 | 55,439 | **16.9%** |
| | 2–5 | 515,154 | 39,476 | **7.7%** | 365,418 | 31,109 | **8.5%** | 81,401 | 11,863 | **14.6%** |
| | 6–10 | 545,950 | 83,689 | **15.3%** | 391,118 | 65,831 | **16.8%** | 246,716 | 43,576 | **17.7%** |
| **Program C** | | | | | | | | | | |
| **2013** | 2–10 | 924,116 | 56,655 | **6.1%** | 364,760 | 37,422 | **10.3%** | 101,853 | 16,734 | **16.4%** |
| | 2–5 | 444,761 | 15,563 | **3.5%** | 163,716 | 10,399 | **6.4%** | 22,926 | 3,517 | **15.3%** |
| | 6–10 | 479,355 | 41,092 | **8.6%** | 201,044 | 27,023 | **13.4%** | 78,927 | 13,217 | **16.7%** |
| **2014** | 2–10 | 1,030,993 | 61,680 | **6.0%** | 246,790 | 28,231 | **11.4%** | 124,064 | 19,152 | **15.4%** |
| | 2–5 | 463,692 | 15,635 | **3.4%** | 98,408 | 7,139 | **7.3%** | 24,626 | 3,552 | **14.4%** |
| | 6–10 | 567,301 | 46,045 | **8.1%** | 148,382 | 21,092 | **14.2%** | 99,438 | 15,600 | **15.7%** |
| **Program D*** | | | | | | | | | | |
| **2012** | 6–10 | 44,535 | 4,526 | **10.2%** | 22,932 | 3,035 | **13.2%** | | | |
| **2013** | 6–10 | 47,136 | 4,920 | **10.4%** | 24,554 | 3,358 | **13.7%** | | | |

† "Any treatment services" denominator was tested only for Programs B and C.

*Program D age elibility starts at 5 years.

# Numerator Considerations

### *Exclusion of Restorations*

Table 3 provides the Code on Dental Procedures and Nomenclature (CDT) codes used to identify pulp therapy and extractions for inclusion in the numerator.

**Table 3. CDT Codes to Identify Pulp Therapy and Extractions**

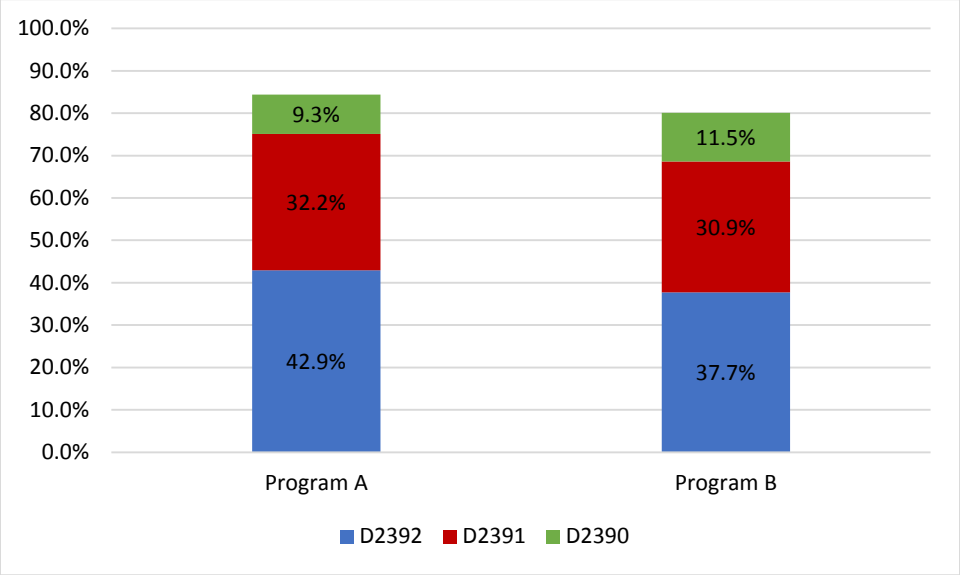
| | | | | |
|---|---|---|---|---|
| D3110 | D3120 | D3220 | D3221 | D3230 |
| D3240 | D3310 | D3330 | D7111 | D7140 |
| D7210 | | | | |

The MDMC evaluated whether restorations should be included in the numerator as a marker for advanced caries. Among children who had pulp therapy, 98% also had restorations. Among children who had extractions, 58%-68% also had restorations. Of particular focus was those children who had restorations but did not have pulp therapy or extractions. Specifically, the following was examined: (1) the percentage of children who had restorations but no pulp therapy or extractions and (2) whether these children appeared to have advanced caries.

In Program A, 17% of enrolled children had restorations but did not have pulp therapy or extractions. In Program B, 21% of enrolled children had restorations but did not have pulp therapy or extractions. Among these children, we evaluated the types and frequency of restorations to evaluate to what extent these children were likely to have advanced caries.

Figure 3 reports the percentage of restorations accounted for by the top three most commonly occurring restoration codes. The frequency distribution for the full set of restoration codes is on file with the DQA. Approximately 69%-75% of restorations were one- or two-surface resin-based composites. Figure 4 indicates that 81%-90% of children had < 3 restorations during the year. Among children who had restorations but not pulp therapy or extractions, the type and frequency of restorations suggest that most of these were not for advanced caries. Consequently, the MDMC determined that there was insufficient evidence to support the inclusion of restoration codes as a marker of advanced caries in the measure numerator.

**Figure 3. Percentages of the 3 Most Frequently Occurring Restoration Codes Among Children 2-10 Years with Restorations but Not Pulp Therapy or Extractions**



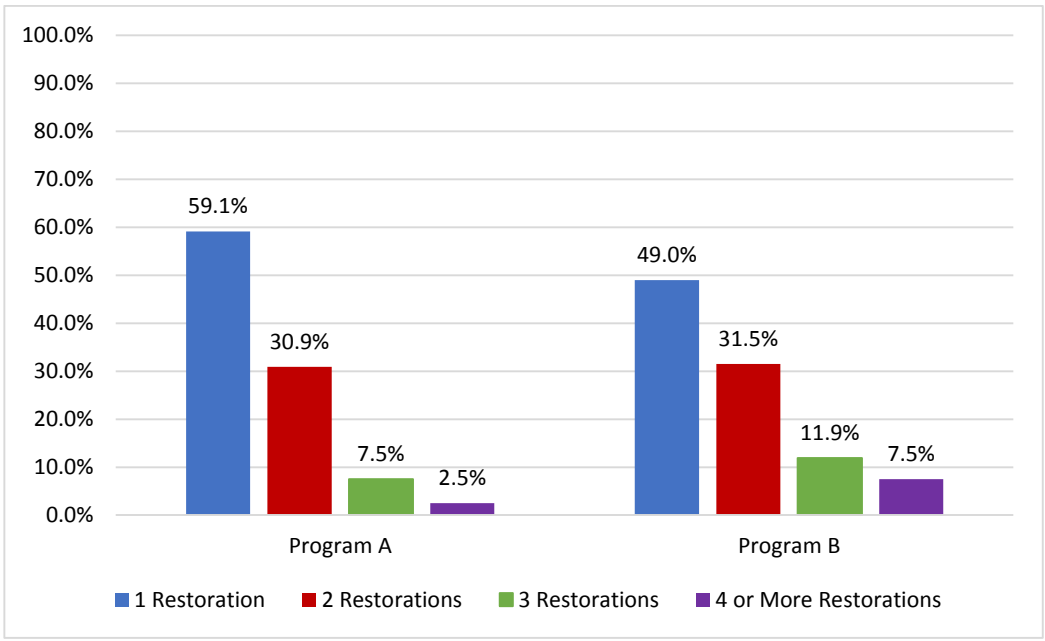

Notes:

D2392: resin-based composite – two surfaces, posterior

D2391: resin-based composite – one surface, posterior

D2390: prefabricated stainless steel crown – primary tooth

**Figure 4. Percentage of Children with Restorations by Number of Restorations Among Children 2-10 Years with Restorations but Not Pulp Therapy or Extractions**



### *Inclusion of Extractions*

Dental records of children 2-10 years were reviewed. Across the four programs, 1,100 records were reviewed. Among these 1,100 records, there were 657 extraction procedures indicated with the dental records. The reasons for these extractions were evaluated by the record reviewers. The record reviewers could not determine the reasons for the extractions in 34-36% of the charts for programs A and B and in 70-75% of the charts for programs C and D. Reviews were limited to information recorded within patient charts. No attempt was made to review accompanying information such as radiographs to make a determination.

# Appendix 2

# Measure 2: Treatment following Sealant

**Description:** Percentage of enrolled children aged 6 – 20 years who received an occlusal restoration, endodontic treatment or extraction within 24 months of fissure sealant placement on the same permanent molar tooth.
**Numerator:** Unduplicated number of children aged 6 – 20 years who received an occlusal restoration, endodontic treatment or extraction within 24 months of fissure sealant placement on the same permanent molar tooth.
**Denominator:** Unduplicated number of all enrolled children aged 6 – 20 years who received a fissure sealant on the occlusal surface of a permanent molar tooth and enrolled for at least 24 months after the sealant placement.
**Rate:** NUM/DEN

## 1. Denominator Considerations

The majority of testing for this measure also focused on determining the appropriate denominator and the validity of the measure scores. The following denominators were tested:

- children with a sealant on a permanent molar tooth enrolled for at least 24 months after the sealant placement; and
- children with a sealant on a permanent molar tooth enrolled for at least 24 months after the sealant placement who received "any dental service" during the 24 months following the sealant placement.

Below, the rationale for testing these denominators is provided with the testing results.

### *Any Dental Service Criterion*

Similar to the Tooth Mortality measure, the initial measure scores for Program B and Program C suggested that the measure scores reflected access to services in each program. In addition, there were greater differences between the two programs that the MDMC found difficult to explain, which raised significant face validity concerns by several MDMC members.

Because of concerns about the potential for confounding of the measure scores by access to services, additional testing was done to further restrict the denominator to include "any dental service" use in any of the 24 months following the sealant placement (Table 4). There was minimal impact as a result of this additional restriction: the measure scores increased by 1-2 percentage points.

As with the Tooth Mortality measure, the incorporation of "any dental service" into the denominator criteria did not address the potential confounding by utilization and access.

**Table 4. Percentage of Children who Received Treatment within 24 Months of Sealant Placement, Measurement Year 2013***

| Program | Age | Children Enrolled 24 Months Following Sealant Placement on a Permanent Molar | | | Children Enrolled 24 Months Following Sealant Placement on a Permanent Molar AND Received "Any Dental Service" During the 24-Month Follow-Up Period | | |
|---|---|---|---|---|---|---|---|
| | | DEN | NUM | RATE | DEN | NUM | RATE |
| **Program A** | 6-20 | 13,802 | 2,119 | **15.4%** | 12,389 | 2,119 | **17.1%** |
| | 6-9 | 6,005 | 984 | **16.4%** | 5,580 | 984 | **17.6%** |
| | 10-14 | 6,180 | 943 | **15.3%** | 5,450 | 943 | **17.3%** |
| | 15-20 | 1,617 | 192 | **11.9%** | 1,359 | 192 | **14.1%** |
| **Program B** | 6-20 | 154,360 | 43,260 | **28.0%** | 145,983 | 43,260 | **29.6%** |
| | 6-9 | 74,254 | 21,809 | **29.4%** | 70,775 | 21,809 | **30.8%** |
| | 10-14 | 65,260 | 18,224 | **27.9%** | 61,482 | 18,224 | **29.6%** |
| | 15-20 | 14,846 | 3,227 | **21.7%** | 13,726 | 3,227 | **23.5%** |
| **Program C** | 6-20 | 17,382 | 752 | **4.3%** | 14,351 | 752 | **5.2%** |
| | 6-9 | 9,474 | 428 | **4.5%** | 8,054 | 428 | **5.3%** |
| | 10-14 | 6,574 | 277 | **4.2%** | 5,320 | 277 | **5.2%** |
| | 15-20 | 1,334 | 47 | **3.5%** | 977 | 47 | **4.8%** |
| **Program D** | 6-20 | 1,243 | 111 | **8.9%** | 1,144 | 111 | **9.7%** |
| | 6-9 | 547 | 56 | **10.2%** | 521 | 56 | **10.8%** |
| | 10-14 | 572 | 51 | **8.9%** | 509 | 51 | **10.0%** |
| | 15-20 | 124 | 4 | **3.2%** | 114 | 4 | **3.5%** |

*Program C Measurement Year is 2014.

### *Other Denominator Considerations*

The MDMC also sought to better understand the use patterns of children who qualified for the denominator (children enrolled for 24 months after the sealant placement) but did not qualify for the numerator (did not have a restoration, endodontic service, or extraction on the same tooth in that 24-month period). The percentage of these children who had "any dental service" and the percentage who had an "oral evaluation" in the 12 months following sealant placement were calculated by the research team (Table 5). In Program B, which had higher measure scores, 82% of children who were in the denominator but not in the numerator had some type of dental service in the year following the sealant placement and 78% had an oral evaluation specifically. In program C, which had lower measure scores, the corresponding percentages were 65% and 58%, respectively. These data provided the MDMC with more information about the utilization and access patterns in each program and helped to inform the decisions about which denominators to test.

**Table 5. Percentage of Children with Any Dental Service and with Oral Evaluation among Those Who Met the Measure Denominator Criteria but Not Numerator Criteria**

| Program | Age | # Children Meeting Denominator Criteria but not Numberator | # had any dental service in 2012 | % had any dental service in 2012 | # had oral evaluation in 2012 | % had oral evaluation in 2012 |
|---|---|---|---|---|---|---|
| **Program A** | 6-20 | 11,683 | 8,929 | 76.43% | 8,639 | 73.95% |
| | 6-9 | 5,021 | 4,081 | 81.28% | 3,969 | 79.05% |
| | 10-14 | 5,237 | 3,865 | 73.80% | 3,729 | 71.20% |
| | 15-20 | 1,425 | 983 | 68.98% | ,941 | 66.04% |
| **Program B** | 6-20 | 111,100 | 91,215 | 82.10% | 86,850 | 78.17% |
| | 6-9 | 52,445 | 43,649 | 83.23% | 42,578 | 81.19% |
| | 10-14 | 47,036 | 38,542 | 81.94% | 36,108 | 76.77% |
| | 15-20 | 11,619 | 9,024 | 77.67% | 8,164 | 70.26% |
| **Program C** | 6-20 | 16,630 | 10,777 | 64.80% | 9,585 | 57.64% |
| | 6-9 | 9,046 | 6,166 | 68.16% | 5,600 | 61.91% |
| | 10-14 | 6,297 | 3,943 | 62.62% | 3,433 | 54.52% |
| | 15-20 | 1,287 | 668 | 51.90% | 552 | 42.89% |
| **Program D** | 6-20 | 1,132 | 925 | 81.71% | 792 | 69.96% |
| | 6-9 | 491 | 425 | 86.56% | 375 | 76.37% |
| | 10-14 | 521 | 412 | 79.08% | 345 | 66.22% |
| | 15-20 | 120 | 88 | 73.33% | 72 | 60.00% |

# Appendix 3: Acknowledgements


## Program Data for Testing

The following agencies supported this project by providing data for testing:

Florida Agency for Health Care Administration
Florida Healthy Kids Corporation
Texas Health and Human Services Commission

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