Comparison of Kool Smiles Utilization and Medicaid Expenditures Across States using Government-Provided Data

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PREPARED FOR:
The Benevis Foundation

PREPARED BY:
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Presentation Overview

- Study Context and Purpose
- Study Methodology
- Results Across States and Years
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  - Age Distribution
- Summary Results by State and Year
- Potential Annual Savings to the Medicaid Program and Expanded Care to Children with Medicaid
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Study Context and Purpose

• More than 40 percent of U.S. children ages 2 to 11 experience baby tooth decay, and about 25 percent of children ages 6 to 18 suffer from untreated permanent tooth decay\(^1\)

• Oral diseases affect overall health and disproportionately affect the poor, people of color, and children – those without access to resources to enable optimal oral health\(^2\)

• Only 44 percent of Medicaid children in the U.S. receive dental care, compared to 58.1 percent for those who are covered by commercial insurance, despite a dental benefit being required by all Medicaid and Children’s Health Insurance Program (CHIP) programs\(^3\)

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\(^1\) Children and Oral Health: accessing needs, coverage, and access. Kaiser Commission on Medicaid and the Uninsured. 2012.


\(^3\) Nasseh et al. Dental Care Use among Children Varies Widely across States and between Medicaid and Commercial Plans within a State. Health Policy Institute. 2013.
Study Context and Purpose (cont’d)

- Dental Support Organizations (DSOs) enable dentists to practice in some of the most disadvantaged communities, thus, bridging the gap in access to dental services between Medicaid and commercially insured individuals\(^1\)
  - DSOs are largely responsible for the increase in dental visits among Medicaid populations who previously did not receive dental services\(^2\)
- **DSOs provide administrative support to dentists, allowing them to focus on patient care and practice more efficiently**
  - Benevis Practice Service (Benevis) is a DSO that provides non-clinical support services to Kool Smiles, a national children’s dental provider
- **Kool Smiles dentists are led by licensed senior dentists who provide training, professional guidance, clinical protocol, and audits**
- **The Benevis Foundation commissioned Dobson DaVanzo & Associates, LLC (Dobson | DaVanzo) to conduct an analysis to:**
  - Examine the utilization and Medicaid expenditures for Kool Smiles providers vs. non-Kool Smiles providers that operate within the same geographic area

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\(^1\) Winegarden et al. The Benefits Created by Dental Service Organizations. *Pacific Research Institute*. 2012

### Study Methodology

- **Benevis** requested data from all states where there is a Kool Smiles provider (15 states + DC); all data received was analyzed in the study.
- **Benevis** received recent aggregated Medicaid dental claims data for nine states through Freedom of Information Act (FOIA) requests, which were provided to Dobson | DaVanzo for analysis:
  - Contained all Medicaid dental services for all ages provided within the state.
  - Data for seven states were able to be included in the aggregate analysis.
- Data were aggregated by dental provider number and by dental service code (CDT)¹ and contained the following variables:
  - Number of procedures performed
  - Unique number of patients who received the dental service
  - Medicaid payments
- **Kool Smiles providers** were flagged (Yes/No):
  - A single Kool Smiles dental provider can represent multiple dentists practicing within the same dental group.

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¹ Current Dental Terminology (CDT) codes are developed and updated by the American Dental Association (ADA) for reporting dental services and procedures to dental benefits plans.
In order to calculate an annual utilization rate per patient by provider, a proxy was used based on the number of unique patients who received a prophylaxis (cleaning).

- We assume each patient who received any dental service would have received at least one cleaning per year
  - D1110 – Adult cleaning
  - D1120 – Child cleaning
  - D0145 – Texas First Dental Home Program

For select states, the number of dental services provided by dental code needed to be imputed based on the published Medicaid fee schedule for the applicable year and total Medicaid payment provided in the data.

- A third party provided the Medicaid fee schedules by state that included actual Medicaid payments per service
Study Methodology:

**Dental Services Included**

- For each state, Dobson | DaVanzo examined all dental services, and focused the analyses on four specific dental service categories provided to children, including:
  - **Diagnostic services**: x-rays
  - **Extraction services**: simple extractions and coronal remnants
  - **Restorative services**: stainless steel crowns, fillings, pulpotomies, and a pulpotomy-to-crown ratio
  - **All other dental services**: Includes all other CDT codes provided to Medicaid patients across all providers

- Results were presented as the annual number of services provided per unique patient and the average monthly Medicaid expenditure per patient within and across all dental service categories
  - Specific comparisons within restorative and extraction services were also included to reflect different practice patterns between Kool Smiles and non-Kool Smiles providers
Study Methodology:

Geographic, Age Distribution, and State-year Specific Analyses

- Three analyses were conducted in aggregate across all states and years, and by state
  - **Geographic Area analysis:** Compared Kool Smiles and non-Kool Smiles providers who operated within the same geographic area, defined as the market area where 75 percent of the Kool Smiles’ patients reside – on average a 7 mile radius
  - **Age Distribution analysis:** Compared Kool Smiles and non-Kool Smiles providers within the same geographic area
    - Age distribution for each provider was made available by a third-party based on actual utilization for Kool Smiles providers, and the age distribution for the geographic area in which non-Kool Smiles providers operate
  - **State-Year Specific analysis:** Compared annual utilization and monthly Medicaid expenditures per patient across time within and across states to determine the extent to which changes in utilization or Medicaid expenditures were evident
Study Methodology:

Analyses Cover Seven States, about 8,200 Providers, and 2.5 Million Patients

- Data for seven states were included in the aggregate analysis, representing all Medicaid dental services between 2011 and 2015 (years vary by state)
- Across all states (based on the last full year of data available), analyses represent utilization and Medicaid expenditures per patient across 164 Kool Smiles providers and 8,077 non-Kool Smiles providers
  - This represents 491,390 unique patients treated by Kool Smiles and 2,022,336 patients treated by non-Kool Smiles providers

<table>
<thead>
<tr>
<th>States</th>
<th>Years Data Available</th>
<th>Geographic Area Analysis</th>
<th>Age Distribution Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>2011-2012</td>
<td>x*</td>
<td></td>
</tr>
<tr>
<td>Indiana</td>
<td>2011-2014</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Louisiana</td>
<td>2011-2012</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2011-2012</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>South Carolina</td>
<td>2011</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Texas</td>
<td>2011-2014</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Virginia</td>
<td>2013 - 09/2015</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

*Includes the entire state, as a geographic market area was not able to be identified
Data were provided in aggregate by provider number and dental code, therefore limiting our ability to determine the total number of unique patients served by each provider.

- Number of unique patients who received a cleaning was used as a proxy.

Variability was observed in Medicaid expenditures per unit within a dental service code across providers within a state.

- This was possibly attributed to denied payments by Medicaid.

As a result of material variation in Arizona and Kentucky, these states were excluded from the aggregate analyses.

- These states had results directionally consistent with those from all other states.
Across all states and years analyzed, Kool Smiles providers perform 15 percent fewer procedures per patient than non-Kool Smiles providers who operate within the same geographic area.

Kool Smiles patients have an average monthly Medicaid expenditure that is 33 percent lower than non-Kool Smiles patients.

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
Note: All Other Dental Services category included all other CDT codes provided to Medicaid patients across all providers.
**Geographic Area Analysis:**

**For Diagnostic Services, Despite Higher Utilization, Kool Smiles Providers have Lower Monthly Medicaid Expenditures per Patient**

- While Kool Smiles providers perform more x-rays per patient than non-Kool Smiles providers, Kool Smiles has lower monthly Medicaid expenditures per patient
  - This is due to Kool Smiles providers performing a different x-ray service

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**Overall Annual Utilization and Monthly Medicaid Expenditure per Patient of X-Rays Across All States and All Years: Kool Smiles vs. Non-Kool Smiles Providers**

<table>
<thead>
<tr>
<th>Number of X-Rays per Patient</th>
<th>Monthly Medicaid Expenditure per Patient for X-Rays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kool Smiles Providers</td>
<td>Non-Kool Smiles Providers</td>
</tr>
<tr>
<td>1.96</td>
<td>1.85</td>
</tr>
<tr>
<td>14% Lower</td>
<td>$2.33</td>
</tr>
<tr>
<td>$2.72</td>
<td></td>
</tr>
</tbody>
</table>

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
**Geographic Area Analysis:**

**Across All Restorative and Extraction Services, Kool Smiles Providers Have Lower Annual Utilization and Monthly Medicaid Expenditures per Patient**

- Kool Smiles providers have **27 percent lower** annual utilization and monthly Medicaid expenditures per patient across all restorative and extraction services

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**Annual Utilization and Monthly Medicaid Expenditure per Patient for Restorative and Extraction Services Across All States and All Years: Kool Smiles vs. Non-Kool Smiles Providers**

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.

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**Geographic Area Analysis:**

**Kool Smiles Provides Fewer Extractions per Patient than Non-Kool Smiles Providers**

- Kool Smiles provides **42 percent fewer** extractions, including both simple extractions and removal of coronal remnants, than non-Kool Smiles providers.
- Across both services, the monthly Medicaid expenditure per patient for Kool Smiles patients for extractions is **53 percent lower** than that of non-Kool Smiles patients.

**Annual Utilization and Monthly Medicaid Expenditure per Patient for Simple Extractions and Coronal Remnants Across All States and All Years: Kool Smiles vs. Non-Kool Smiles Providers**

<table>
<thead>
<tr>
<th></th>
<th>Kool Smiles Providers</th>
<th>Non-Kool Smiles Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Simple Extractions and Coronal Remnants per Patient</strong></td>
<td>0.05</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>0.23</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>0.15</td>
<td>0.25</td>
</tr>
</tbody>
</table>

**42% Lower**

<table>
<thead>
<tr>
<th></th>
<th>Kool Smiles Providers</th>
<th>Non-Kool Smiles Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monthly Medicaid Expenditure per Patient</strong></td>
<td>$0.00</td>
<td>$0.20</td>
</tr>
<tr>
<td></td>
<td>$0.10</td>
<td>$0.45</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>$0.10</td>
<td>$0.55</td>
</tr>
</tbody>
</table>

**53% Lower**

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.

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Geographic Area Analysis:

Kool Smiles Provides Fewer Pulpotomies than Non-Kool Smiles Providers

- While both groups of providers delivered a similar number of stainless steel crowns per patient across all states and all years, Kool Smiles providers performed 39 percent fewer pulpotomies than non-Kool Smiles providers, which led to a significantly lower pulpotomy-to-crown ratio.
- The monthly Medicaid expenditure per patient for stainless steel crowns and pulpotomies in total is 10 percent lower for Kool Smiles than non-Kool Smiles patients.

Annual Utilization and Monthly Medicaid Expenditure per Patient for Stainless Steel Crowns and Pulpotomies Across All States and All Years: Kool Smiles vs. Non-Kool Smiles Providers

- **Kool Smiles Providers**
  - Stainless Steel Crowns: 0.21
  - Pulpotomies: 0.06
  - Pulp-to-Crown Ratio: 0.35
  - Monthly Medicaid Expenditure: $0.28

- **Non-Kool Smiles Providers**
  - Stainless Steel Crowns: 0.21
  - Pulpotomies: 0.09
  - Pulp-to-Crown Ratio: 0.55
  - Monthly Medicaid Expenditure: $0.57

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
Geographic Area Analysis:

Kool Smiles Patients Also Receive Fewer Fillings than Patients Treated by Non-Kool Smiles Providers

- Stainless steel crowns are sometimes a suitable substitute for multi-surface fillings for children with advanced decay in primary teeth\(^1\)
- Kool Smiles provides a comparable number of stainless steel crowns and fewer fillings per patient than non-Kool Smiles providers
- The monthly Medicaid expenditure per patient for stainless steel crowns and fillings combined is **22 percent lower** for Kool Smiles than non-Kool Smiles patients

Annual Utilization and Monthly Medicaid Expenditure per Patient for Stainless Steel Crowns and Fillings Across All States and All Years: Kool Smiles vs. Non-Kool Smiles Providers

\(^1\) Guideline on Pulp Therapy for Primary and Immature Permanent Teeth. *AAPD*. 37(6):244-252.

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
Age Distribution Analysis:

Controlling for Patient Age Shows that Kool Smiles is a Conservative Dental Provider

- After limiting the analysis to providers within the same geographic area with a comparable proportion of patients aged 4 to 9 years old, Kool Smiles’ patients have annual utilization that is 23 percent lower than non-Kool Smiles patients.

- For all dental services, Kool Smiles patients have a 38 percent lower monthly Medicaid expenditure than non-Kool Smiles patients.
  - Utilization became comparable for diagnostic services, and remained lower for all restorative services, resulting in a lower monthly Medicaid expenditure per patient for all service categories and across all dental services in total.

Overall Age Adjusted Annual Utilization Rates and Monthly Medicaid Expenditure per Patient Across All States and All Years for Providers Contained in the Geographic Area Analysis: Kool Smiles vs. Non-Kool Smiles Providers

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
Age Distribution Analysis:

After Controlling for Age, Kool Smiles Providers have Lower X-Ray Utilization and Expenditures

- After age adjustment, Kool Smiles providers perform 13 percent fewer x-rays per patient than non-Kool Smiles providers.
- This difference in utilization results in a monthly Medicaid expenditure per patient that is 12 percent lower than non-Kool Smiles providers.

Age Adjusted Overall Utilization and Monthly Medicaid Expenditure per Patient for X-Rays Across All States and All Years: Kool Smiles vs. Non-Kool Smiles Providers

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
Summary Results by State and Year:

Monthly Medicaid Expenditures per Patient are Consistently Lower than Non-Kool Smiles Providers

- The difference in the monthly Medicaid expenditures per patient among Kool Smiles and non-Kool Smiles providers within the same geographic area and year across all dental services range from 23 percent (Georgia, 2011 & Texas, 2014) to 62 percent (Mississippi, 2011)

Percent Differences in Monthly Medicaid Expenditure per Patient for All Dental Services: Kool Smiles vs. Non-Kool Smiles Providers By State and Year

<table>
<thead>
<tr>
<th>State</th>
<th>Aggregate</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>-24%</td>
<td>-23%</td>
<td>-25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>-24%</td>
<td>-24%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indiana</td>
<td>-38%</td>
<td>-27%</td>
<td>-36%</td>
<td>-41%</td>
<td>-41%</td>
<td></td>
</tr>
<tr>
<td>Texas</td>
<td>-40%</td>
<td>-49%</td>
<td>-42%</td>
<td>-30%</td>
<td>-23%</td>
<td></td>
</tr>
<tr>
<td>Louisiana</td>
<td>-40%</td>
<td>-35%</td>
<td>-42%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>-41%</td>
<td></td>
<td>-48%</td>
<td>-40%</td>
<td>-33%</td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td>-61%</td>
<td>-62%</td>
<td>-59%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
Shading = Years of data available for analysis
Analyses were conducted to determine the annual potential savings to the Medicaid program if the Kool Smiles care protocol was to be applied to all non-Kool Smiles patients within the same geographic area.

Savings were estimated by calculating the annual Medicaid cost per patient within Kool Smiles and applying that amount to each non-Kool Smiles patient; the difference between actual and extrapolated Medicaid payments for non-Kool Smiles’ patients represents savings.

Estimated Medicaid Savings for Applying Kool Smiles Care Protocol to Non-Kool Smiles Patients within the Same Geographic Area

<table>
<thead>
<tr>
<th>State</th>
<th>Annual Medicaid Savings in Selected Geographic Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia*</td>
<td>$51,167,304</td>
</tr>
<tr>
<td>Indiana</td>
<td>$26,029,926</td>
</tr>
<tr>
<td>Louisiana</td>
<td>$12,998,068</td>
</tr>
<tr>
<td>Mississippi</td>
<td>$11,012,841</td>
</tr>
<tr>
<td>South Carolina</td>
<td>$31,597,694</td>
</tr>
<tr>
<td>Texas</td>
<td>$36,145,897</td>
</tr>
<tr>
<td>Virginia</td>
<td>$24,112,957</td>
</tr>
<tr>
<td>Total</td>
<td>$193,064,687</td>
</tr>
</tbody>
</table>

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
Note: Annual estimates based on last full year of available data for each state.
* Includes the entire state, as a geographic market area was not able to be identified.
Analyses were also conducted to determine the potential savings to the Medicaid program if the Kool Smiles care protocol was to be applied to all non-Kool Smiles patients across the entire state.

Simulation assumes that the demographic and clinical characteristics of non-Kool Smiles patients across the state are consistent with the Kool Smiles population.

### Estimated Medicaid Savings for Applying Kool Smiles Care Protocol to Non-Kool Smiles Patients Across the Entire State

<table>
<thead>
<tr>
<th>State</th>
<th>Annual Medicaid Savings in Entire State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>$51,167,304</td>
</tr>
<tr>
<td>Indiana</td>
<td>$84,390,564</td>
</tr>
<tr>
<td>Louisiana</td>
<td>$23,512,804</td>
</tr>
<tr>
<td>Mississippi</td>
<td>$58,584,802</td>
</tr>
<tr>
<td>South Carolina</td>
<td>$44,444,920</td>
</tr>
<tr>
<td>Texas</td>
<td>$235,499,301</td>
</tr>
<tr>
<td>Virginia</td>
<td>$58,622,869</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$556,222,564</strong></td>
</tr>
</tbody>
</table>

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA
Note: Annual estimates based on last full year of available data for each state.
The estimated annual Medicaid savings could be used to treat Medicaid children who are currently not receiving any dental care.

Based on the estimated savings for applying the Kool Smiles care protocol to non-Kool Smiles patients, approximately 790,000 children with Medicaid in the Kool Smiles geographic area, or **1.9 million children** across the states, could receive dental care for the same total annual Medicaid expenditures.

### Estimated Number of Additional Medicaid Children Who Could be Treated by Kool Smiles due to Annual Medicaid Savings

<table>
<thead>
<tr>
<th>State</th>
<th>Additional Patients in Geographic Area</th>
<th>Additional Patients Across Entire State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>266,581</td>
<td>266,581</td>
</tr>
<tr>
<td>Indiana</td>
<td>78,552</td>
<td>254,670</td>
</tr>
<tr>
<td>Louisiana</td>
<td>72,767</td>
<td>131,632</td>
</tr>
<tr>
<td>Mississippi</td>
<td>40,834</td>
<td>217,226</td>
</tr>
<tr>
<td>South Carolina</td>
<td>143,701</td>
<td>202,128</td>
</tr>
<tr>
<td>Texas</td>
<td>105,694</td>
<td>688,624</td>
</tr>
<tr>
<td>Virginia</td>
<td>82,206</td>
<td>199,857</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>790,335</strong></td>
<td><strong>1,960,717</strong></td>
</tr>
</tbody>
</table>

Source: Dobson | DaVanzo analysis of Medicaid dental claims data received under FOIA.
Note: Annual estimates based on last full year of available data for each state.

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Detailed analyses within and across states over time suggest that Kool Smiles is a low-cost and conservative provider of dental service for Medicaid patients

- Kool Smiles routinely provides a comparable number of diagnostic services but fewer restorative and extraction services than non-Kool Smiles providers

After adjusting for providers with similar age distributions, Kool Smiles providers have an average monthly Medicaid expenditures per patient that is 38 percent lower than non-Kool Smiles providers

If the Kool Smiles care protocol was to be applied to non-Kool Smiles providers for these select states, Medicaid could save about $193 million or treat an additional 790,000 underserved children with Medicaid in the geographic areas where Kool Smiles already operates
Dobson DaVanzo & Associates, LLC (Dobson|DaVanzo) is a health care economics consulting firm based in the Washington, D.C. metropolitan area

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