First Preventive Dental Exam: Disparities in Need Cost + Behavioral Insights

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- Elizabeth Momany
- Michael Jones
- George Wehby
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- Adveta Joshi
- Golnaz Kavand

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Oral Health Disparities in Children in Medicaid

- Recent NIH funded Challenge grant
- Studying factors related to the First Preventive Dental Visit (FPDV)
  - AAPD guidelines for first dental visit by age one
  - Became first dental exam to emphasize comprehensive care

Oral Health Disparities in Children in Medicaid: Comprehensive perspective

4 components
1. Determinants of age at FPDE
   - WCV emphasis
2. AFPDE and successful Tx completion (CHCs)
3. Maternal decision-making and AFPDE
4. Effectiveness of AFPDE on subsequent dental costs
### Data sources
- Iowa Medicaid administrative data
  - Enrollment
  - Claims
- EHRs at Community Health Centers
- Cognitive interviews and Surveys with Mothers of Medicaid enrolled children

### Mini-tour of Milwaukee
- Solly's Grill

### Care for Young Children at CHCs: Age at First Dental Visit and Comprehensiveness of Care

**Raymond Kuthy**  
University of Iowa  
Public Policy Center and  
College of Dentistry

### Background
- AAPD and ADA, among others, have called for early childhood dental visits  
- Iowa has adopted an EPSDT periodicity schedule that conforms to much of the AAPD recommendations (e.g., first visit by 12 months)  
- Community health centers (CHC) serve a disproportionate number of lower income families  
- Little information is available concerning the age and services provided at CHCs

### Care for Young Children at CHCs: Age at First Dental Visit and Comprehensiveness of Care

- Raymond Kuthy  
- Bhagysharee Pendharkar  
- Golnaz Kavand  
- Elizabeth Momany  
- Michael Jones  
- Donald Chi  
- Natoshia Askelson  
- George Wehby  
- Peter Damiano

**NIDCR 5RC DE020303**

### Purpose
- To determine when children first use dental services at community health centers (CHC), patient needs (i.e., treatment plans), and treatment provided  
- To determine which child and family characteristics, if any, best explain age at first dental visit (FDV)
Methods - Criteria

Centers
- Member of Iowa Primary Care Association
- Provided dental care to children prior to 2007

Individual
- Medicaid-enrolled within 2 months of birth
- Continuously Medicaid-enrolled
- Less than 6-years-old as of December 2006
- Not seen elsewhere for an initial comprehensive dental examination (CDT = 0145 or 0150)

Selection of Individuals

Iowa Department of Human Services
- Enrollment files
- Selected individuals from each CHC who met criteria

Community Health Center
- Random sample drawn for each center
- First 40 children whose dental charts matched the date of the first dental visit billed to Medicaid

Data Collected from Charts

- Birth date, race, sex
- Translation services required
- Date of initial examination
- Treatment plan recorded
- Number of restorations and extractions planned
- Dental services rendered (with dates)
- Date of last visit during episode
- Number of visits in episode
- Was treatment plan completed? If not, why?
- Was patient placed on recall?

Other Relevant Information

- Transition from paper to electronic dental charts (Dentrix)
- No clinical examinations performed
- No radiographs interpreted
- University of Iowa IRB approval

Addendum Methods

Child
- Well child visits from Medicaid medical claims data
- Birth certificate data
- Collected all other Medicaid dental claims data for same time period (i.e., non-CHC providers)

Household
- Enrollment data
- Medical and dental claims for 12 months prior to FDV

Results
FDV Background Information
5 Community Health Centers (N=200)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Sex</td>
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</tr>
<tr>
<td>Female</td>
<td>98</td>
<td>49.0</td>
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<tr>
<td>Male</td>
<td>102</td>
<td>51.0</td>
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<tr>
<td>Race</td>
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<tr>
<td>White, Non-Hispanic</td>
<td>78</td>
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<tr>
<td>White, Hispanic</td>
<td>72</td>
<td>36.0</td>
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<tr>
<td>African-American</td>
<td>38</td>
<td>19.0</td>
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<tr>
<td>Mixed/Other</td>
<td>12</td>
<td>6.0</td>
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<tr>
<td>Required Translator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>52</td>
<td>26.0</td>
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<tr>
<td>Documentary Treatment Plan</td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>195</td>
<td>97.5</td>
</tr>
<tr>
<td>Treatment Plan Quality (age appropriate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor/Non-existent</td>
<td>19</td>
<td>9.5</td>
</tr>
<tr>
<td>Fair</td>
<td>72</td>
<td>36.0</td>
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<tr>
<td>Good</td>
<td>108</td>
<td>54.0</td>
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</table>

Recorded preventive dental services and number of children with dental caries at first dental visit, by age (months)

<table>
<thead>
<tr>
<th>Age at first dental visit (months)</th>
<th>n</th>
<th>Preventive</th>
<th>Protective</th>
<th>Dietary counseling</th>
<th>Fluoride</th>
<th>Prevention of decay</th>
<th>Reduction of decay</th>
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<tbody>
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<td>0-6</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>9</td>
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<tr>
<td>7-12</td>
<td>29</td>
<td>9</td>
<td>10</td>
<td>3</td>
<td>17</td>
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<td>6</td>
</tr>
<tr>
<td>13-18</td>
<td>37</td>
<td>11</td>
<td>10</td>
<td>3</td>
<td>10</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>19-24</td>
<td>37</td>
<td>19</td>
<td>24</td>
<td>6</td>
<td>23</td>
<td>11</td>
<td>1</td>
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<tr>
<td>25-34</td>
<td>23</td>
<td>16</td>
<td>13</td>
<td>3</td>
<td>10</td>
<td>4</td>
<td>1</td>
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<td>35-44</td>
<td>15</td>
<td>12</td>
<td>16</td>
<td>3</td>
<td>11</td>
<td>4</td>
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<td>45-54</td>
<td>24</td>
<td>21</td>
<td>24</td>
<td>7</td>
<td>9</td>
<td>3</td>
<td>1</td>
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<tr>
<td>55-64</td>
<td>15</td>
<td>10</td>
<td>16</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>1</td>
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<tr>
<td>65-74</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>75-84</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>111</td>
<td>132</td>
<td>22</td>
<td>112</td>
<td>46</td>
<td>28</td>
</tr>
</tbody>
</table>

Age (months) for first dental visit at 5 Iowa community health centers, 2002-6 (N=200)

Mean 25.6 (s.d., 12.9)
Median 23
Mode 14

Age at first dental visit, by community health center

Treatment Plan Completed: Episode 1

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
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<tr>
<td>Not completed</td>
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<tr>
<td>Referred for care</td>
<td>10</td>
<td>5.0</td>
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<tr>
<td>Not referred</td>
<td>9</td>
<td>4.5</td>
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<tr>
<td>Completed</td>
<td>181</td>
<td>90.5</td>
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</table>

8 of 10 referred patients sought care from specialist
3 broken appointments;
3 behavior management;
1 refused treatment (parent);
2 unknown
CHC Dental Visits and Treatment Completed, Episode 1*

<table>
<thead>
<tr>
<th>Episode</th>
<th>N</th>
<th>% with only 1 visit this episode</th>
<th>% treatment plan completed</th>
<th>% placed on recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200</td>
<td>95%</td>
<td>91%</td>
<td>92%</td>
</tr>
</tbody>
</table>

* Includes patients who should have returned for 2 or more visits during this episode, but who decided not to return (e.g., broken appointment)

Primary Teeth, Caries Experience Episode 1 (N=200)

| Variable               | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| Untreated Caries       | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Minor Restorative      | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Extensive Restorative  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Extraction             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Multivariable linear regression model predicting logarithmic age at first dental visit

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable Estimate</th>
<th>s.e.</th>
<th>X.</th>
<th>P-Value</th>
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<tr>
<td>African American</td>
<td>0.022</td>
<td>0.085</td>
<td>0.796</td>
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<td>White-Hispanic</td>
<td>0.022</td>
<td>0.085</td>
<td>0.580</td>
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<td>Mixed or other minorities</td>
<td>0.405</td>
<td>0.133</td>
<td>0.003</td>
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<tr>
<td>White-non Hispanic (Ref)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Marital status</td>
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<tr>
<td>Married</td>
<td>-0.215</td>
<td>0.071</td>
<td>0.003</td>
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<tr>
<td>Single (Ref)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Center</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>0.073</td>
<td>0.110</td>
<td>0.509</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>0.327</td>
<td>0.113</td>
<td>0.051</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.619</td>
<td>0.120</td>
<td>&lt;0.001</td>
<td></td>
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<tr>
<td>D</td>
<td>0.383</td>
<td>0.102</td>
<td>0.0005</td>
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</tr>
<tr>
<td>E (Ref)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of subject's well child visits at FQHC before first dental visit (Incremental 0-6)</td>
<td>0.113</td>
<td>0.053</td>
<td>&lt;.0001</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Questions ???

Mini-tour of Milwaukee

Kopp’s Drive-In Restaurant-Happy Days
Medical well baby visits and first dental checkups

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American Academy of Pediatrics WBV schedule

- 1 month
- 2 months
- 4 months
- 6 months
- 9 months
- 12 months

WBV Frequency

<table>
<thead>
<tr>
<th>WBV Frequency</th>
<th>AAP WBV Schedule</th>
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<tbody>
<tr>
<td>WBV by age 1</td>
<td>1 month 2 4 6 9</td>
</tr>
<tr>
<td>WBV between age 1-2</td>
<td>12 15 18</td>
</tr>
<tr>
<td>WBV between age 2-3</td>
<td>24 36</td>
</tr>
</tbody>
</table>

Population (N=6,322)

- Born in 2000
- Iowa Medicaid from birth to age 41 months
- Saw private practice dentists
- No restorative care before first dental checkup

...15m, 18m, 24m, 36m

10 by 3 hypotheses

1. WBV Frequency
2. Timing of WBV
Data Analyses

Survival Analysis
Accounts for censoring (after age 41m)
Outcome: Age at first dental checkup
D0120 or D0150

Study Population Characteristics
- 50% male
- 75% White
- 33% at risk for developing chronic condition
- 15% mom saw a dentist prenatally

% WBV in Period 1

% WBV in Period 2

% WBV in Period 3

Distribution of first WBV
### Using theory to guide research examining maternal factors related to children’s first dental exam

Natoshia Askelson  
University of Iowa  
Public Policy Center and College of Public Health

<table>
<thead>
<tr>
<th>Main Predictor Variables</th>
<th>HR</th>
<th>95% CI</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>WBV Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Period 1</td>
<td>0.97</td>
<td>0.93, 1.02</td>
<td>0.203</td>
</tr>
<tr>
<td>Period 2</td>
<td>2.96</td>
<td>1.41, 6.15</td>
<td>0.004</td>
</tr>
<tr>
<td>Period 3</td>
<td>1.25</td>
<td>1.14, 1.36</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Age at First WBV</td>
<td>8.07</td>
<td>0.79, 46.65</td>
<td>0.083</td>
</tr>
<tr>
<td>Rate of the first WBV</td>
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Number of WBV before age 12m not related to first dental checkups

**More WBV age 12m to 36m are related to earlier first dental checkups**

Age at first WBV not related to first dental checkups

### Factors related to dental care for children

- Socio-demographic, knowledge, barriers
- Gaps
  - What motivates parents?
  - What influences behavior?
  - Preschool-aged children and first preventive dental visits?
  - Children enrolled in Medicaid?

### Challenge

- What psycho-social factors could be related to parents’ decision-making about preventive dental care for preschool-aged children enrolled in Medicaid?

### Overview

- Factors related to dental care for children
- Health behavior theories
- Study 1: Qualitative formative research, focus groups
- Study 2: Quantitative formative research, survey
- Discussion
- Implications

### Mini-tour of Milwaukee

*Miller Park-home of the Brewers*
A tool for tackling the challenge: Behavioral health theories

- Behavioral health theories:
  - Are a set of interrelated concepts, definitions, and propositions
  - Are a systematic view of a behavior
  - Specify relationships among variables in order to explain and predict
  - Generalizable, measurable, testable (Glanz, Lewis, Rimer, 1997)

- Behavioral health theories can:
  - Determine relationships
  - Explain what influences behavior
  - Indicates where we can target an intervention

Extended Parallel Process Model (Witte, 1992)

Study 1: Qualitative formative research, focus groups

- Purpose: To elicit the breadth of possible responses
- Sample: Parents of children enrolled in Medicaid (N = 41)
- Focus group protocol: knowledge, Health Belief Model, Extended Parallel Process Model
- Implications for Study 2

Study 2: Quantitative formative research, survey

- Purpose: To determine factors related to preventive dental care using EPPM as framework
- Sample: Children enrolled in Medicaid since birth, born between 10/2007-12/2009, income eligible, N = 4000
- Protocol: Survey mailed to parents, reminder postcard, second survey, non-respondents follow up with telephone survey (n = 1317)
- H: Children of parents with higher efficacy and higher perceived threat will have more preventive visits (checkups) than children of parents with lower efficacy and threat.
- Measures: EPPM, norms, knowledge, …
- Analysis: univariate, bivariate and linear regression

Results (n = 1317)

- Demographics
  - Child
    o Age, M = 1.92 (SD .67), range 1-4
    o 51.8% male
    o 13.8% Hispanic/Latino
    o 85.8% white
    o 12.5% black/African American
    o 53.4% reported to have received a preventative dental visit
  - Parent/legal guardian
    o 95.0% female
    o 47.3% had some education after high school
Results (continued): Categorizing parents into threat and efficacy groups

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<thead>
<tr>
<th>Efficacy</th>
<th>Threat</th>
<th>Low</th>
<th>High</th>
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<tbody>
<tr>
<td>Low</td>
<td>295</td>
<td>322</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>329</td>
<td>307</td>
<td></td>
</tr>
</tbody>
</table>

Results (continued): Linear regression

- DV: Number of ‘checkups’ (range 0 – 6 or more; M = 1.92, SD = 1.27; 46.5% had no visit, 26.0% had 1 visit)
- Block 1: child’s age (range 1-4; M = 1.92, SD = .67)
- Block 2: EPPM categories (low threat/low efficacy as comparison group)
- Block 3: Normative perceptions (range 0 – 100; M = 49.13, SD = 33.06)
- Block 4: Oral health assessment (range 1 (poor) – 5 (excellent); M = 4.21, SD = .87)

Results (continued)

<table>
<thead>
<tr>
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<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<td>Child’s age</td>
<td>.361***</td>
<td>.360***</td>
<td>.368***</td>
<td>.358***</td>
</tr>
<tr>
<td>Normative perceptions</td>
<td>.099***</td>
<td>.088**</td>
<td>.065*</td>
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<tr>
<td>Oral health assessment</td>
<td>-.109***</td>
<td>-.066*</td>
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<tr>
<td>Low threat/high efficacy</td>
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<td>.190***</td>
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<td>High threat/low efficacy</td>
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<tr>
<td>High threat/high efficacy</td>
<td></td>
<td></td>
<td>.161***</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

- Efficacy trumps all
  - What can we do to increase efficacy?
    - Messages?
    - Remove barriers?
- Threat consistent with EPPM
- Norms and oral health assessment – very small
- Age

Limitations

- Self report
  - Not know difference between preventive dental visit/exam and a screening and treatment
  - Social desirable answer
- Cross sectional data

Implications

- Importance of health behavior theories and models
- Use of qualitative data collections to inform quantitative studies
  - Which questions need to be asked
  - What is the universe of responses
References


Questions for the Panel?