The Detroit Dental Health Project

On behalf of community organizations, investigators, and staff
Question

- Why do some African-American children (<6 years old) and their main caregivers have better oral health than others who live in the same community and share similar social, economic, and cultural characteristics?
Families Included in the DDHP

- African-American children under 6 years of age.
- Caregiver of child – primary decision maker about:
  - Feeding, taking care of mouth and teeth, visiting the doctor or dentist.
  - Majority are maternal caregivers.
- Household income below 250% of the 2000 poverty level.
- 39 Census tracts within Detroit were identified - 35,000 households of which approximately 17% were expected to have eligible children.
Interactions with the DDHP families

- 5-year follow-up of a representative sample of 1,021 low-income African-American families in Detroit

Social and behavioral determinants of health

Wave I

Diet, nutrition & Blood lead (trace elements) level

Access and use of dental care services

Multi-dimensional intervention

Main outcome: Dental caries (ICDAS)

Wave II

Wave III
Detroit and Suburbs: 2005
Projected Household Income by Census Tract

Push pins represent dentists in private practice.
Sampling

- **Two-stage selection** of African-American families in the poorest 39 Census Tracts in Detroit

**Stage 1**
- Selected **118 blocks** out of 1,526 blocks in 39 Census Tracts
- Adjacent blocks were linked to the 118 blocks to create segments of a minimum size (100 housing units)
- A total of 565 blocks formed the 118 segments

**Stage 2**
- Listed 17,269 buildings of which 14,406 were housing units -> 12,655 housing units randomly selected
- Screening visit by trained staff
  - 10,695 were occupied (84.5% occupancy rate)
  - 9,781 were successfully contacted and screened (91.5% contact rate)
- Of the 9,781 contacted housing units, 1,386 (14.2%) had an eligible African-American child under 6 years of age
- **1,021 families** completed the first (Wave 1) interview/examination
Wave I (2002–03)

- Questionnaire/interview
  - Psychosocial and Behavioral Determinants of Health
  - Lead Exposure: blood & saliva (adults only)
  - Nutrition: adults & children (Block FFQ®)

- Dental and Oral Health Assessment
  - Caries: adults & children
  - Periodontal health: adults
Social and Behavioral Factors

- Parenting stress
- Caregiver oral health beliefs and attitudes
- Self-efficacy
- Quality of life
- Depressive symptoms
- Everyday discrimination
- Religiosity
- Social support (family, neighborhood)

- Access to dental care and dental visits
- Rating of availability of dental services
- Dental insurance
- Trust in medical and dental providers
- Oral health behaviors and practices for child and caregiver
Early Carious Lesions

Early lesions
Early Carious Lesions: Occluding Tooth Surfaces
Early Carious Lesions
Cavitated Lesions
Cavitated Lesions

Early tooth decay

Early tooth decay

Cavitated tooth decay
Diet, Nutrition & Lead Exposure

- Questionnaire: caregiver and index child
- Nutrition:
  - Block FFQ® for adults and children 3-5 years
  - New questionnaire was designed and tested for 0-2 year old children
- Food sufficiency
- Height and weight measurements
- Blood and saliva samples (adult only)
  - For lead and other metal assay
Dental and Oral Health Assessment

- Main Outcome (caries)
  - Caregiver and child

- Periodontal disease
  - Pocket depth & gingival bleeding

- Oral Hygiene status
Tracking Families (1,021)

- **Mobility is high**
  - Disconnected telephone numbers
  - Families may temporarily live with neighbors, friends, or relatives

- 654 (64%) completed Wave III (2007).
Families moved an average of 2 times in the past 5 years
Wave II (2004–05)

- 791 families (77%) returned for interviews and examinations
- **Questionnaire/interview**
  - Psychosocial and behavioral factors
  - Lead Exposure – child only
  - Nutrition – child only
- **Dental and Oral Health Assessment**
- **Tailored Educational Intervention**
  - Motivational Interviewing with DVD
Wave III (March – September 2007)

- 654 families (64%) returned for interviews and examinations

- Questionnaire/interview
  - Psychosocial and behavioral factors
  - Nutrition – child only

- Dental and Oral Health Assessment

- Evaluation of Educational Intervention
  - Motivational Interviewing with DVD
What have we learned from the DDHP? …So far
Families
Characteristics

Caregivers:
- Age: 14-70 years (avg = 29.3)
- Females (95.5%)
- Relationship:
  - 86% mothers
  - 4% fathers
  - 6% grandmothers
  - 4% other caregivers
- 53% unemployed at baseline (2002-03)

Children:
- Age: 0-5 years (avg = 2.6)
- Females (52.2%)
Dental Caries
Early Childhood Caries (ECC) and Severe ECC Status by Child's Age (Baseline 2002-03, weighted %)
Percentage of Children with New Non-cavitated and Cavitated Lesions in Primary Teeth
Mean Number of New Non-cavitated and Cavitated Lesions in Children’s Primary Teeth
Percentage of Children with **New** Non-cavitated and Cavitated Lesions in Permanent Teeth
Mean Number of New Non-cavitated and Cavitated Lesions in Children’s Permanent Teeth

<table>
<thead>
<tr>
<th>Number of Lesions</th>
<th>Non-cavitated (ICDAS 1)</th>
<th>Non-cavitated (ICDAS 2)</th>
<th>Cavitated (ICDAS 3-6)</th>
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<tbody>
<tr>
<td></td>
<td>W1-W2</td>
<td>W1-W3</td>
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<tr>
<td>0</td>
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<td>0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>1</td>
<td>1.3</td>
<td>1.6</td>
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</tr>
<tr>
<td>2</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
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</table>
Periodontal Disease
Gingivitis: Bleeding and Inflammation
Early Periodontitis (Gum Disease)
Gum Diseases in Adults at Baseline (2002-03)

- None: 10.8%
- Bleeding: 8.6%
- Bleeding + Mild Gum Disease: 51.8%
- Bleeding + Severe Gum Disease: 16.3%
- Moderate Gum Disease: 5.1%
- Severe Gum Disease: 1.0%
Conclusion: Dental Diseases

- While the children and caregivers have advanced dental caries; early or mild forms of dental caries and periodontal disease are more common.

- Hence, preventive or minimal interventions are indicated.
Food Intake and Tooth Decay
More severe dental caries is related to more frequent consumption of soft drinks ($p=0.02$)

Mean DMFS scores were significantly related to the proportion of energy from sugars

<table>
<thead>
<tr>
<th>Sugar Intake Category</th>
<th>DMFS</th>
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</thead>
<tbody>
<tr>
<td>Lowest tertile (≤9.6% of energy from sugar)</td>
<td>44.4</td>
</tr>
<tr>
<td>Middle (9.6-17.8% of energy from sugar)</td>
<td>49.7</td>
</tr>
<tr>
<td>Highest (17.8% of energy from sugar)</td>
<td>52.4</td>
</tr>
</tbody>
</table>

$p=0.001$

**Diet and Dental Caries: Children**

- **Higher** levels of decay were associated with higher consumption of **soda and powdered/sugared sports drinks** (e.g. Gatorade)

- 54% of all sugar consumed came from sugared beverages (soda, sports drinks)
  

- Children who consumed more **soft drinks** as they aged, were more likely to have after 2 years:
  - greater number of new lesions (IRR=1.75)
  - new filled surfaces (IRR=2.67)

- Children who were consistently high consumers of **soft drinks** were also more likely to have a greater number of new filled surfaces (IRR=2.68) after 2 years

Dental Caries and Consumption of Soft Drinks, Milk and 100% Fruit Juice

![Bar Chart]

- Consistently High Milk and Juice: 5.6
- Decreased Soft Drinks: 5.2
- Increased Soft Drinks: 6.5
- Consistently High Soft Drinks: 8.1

Legend: New decayed, missing, filled
Obesity in Detroit
Diet and Obesity: Caregivers

- Most frequently consumed foods:
  - Tap water
  - Sugared soda
  - Potato chips

- 7.4% eat 2 or more servings of vegetables per day
- 7.8% eat 2 or more servings of fruits per day
- Average daily intake = 2,090 kcals
- 15% of energy came from sugars

Most frequently consumed foods:
- Cold cereal
- Potato chips
- Sliced cheese
- Bread
- Bologna
- Ketchup

No vegetables were in the top 18 most frequently consumed foods (although several fruits appeared)

54% of sugar intake came from sweetened beverages

Diet and Obesity: Children

- The assumption is that most children “grow out” of their obesity

- That is what you see with a national sample of African-American children in the U.S.

- Unfortunately that is **not** what we see with the DDHP cohort…
Change in Weight-for-Age from Baseline (2002-03) to Wave 3 (2007)
Transition Probabilities of Weight Class among African-American children in NLSY (3-5 year olds)

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<th>20.0</th>
<th>30.0</th>
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<th>70.0</th>
<th>80.0</th>
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<td>Normal</td>
<td>69.1</td>
<td>67.0</td>
<td>50.1</td>
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<td></td>
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<tr>
<td>Overweight</td>
<td>9.1</td>
<td>10.9</td>
<td>23.4</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Obese</td>
<td>21.8</td>
<td>22.1</td>
<td>26.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
Transition Probabilities of Weight Class among DDHP children

<table>
<thead>
<tr>
<th>Weight Class</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal weight</td>
<td>61.7</td>
<td>5.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Overweight</td>
<td>19.6</td>
<td>22.2</td>
<td>3.4</td>
</tr>
<tr>
<td>Obese</td>
<td>18.7</td>
<td>72.6</td>
<td>95.4</td>
</tr>
</tbody>
</table>
Diet and Obesity: Children

- This suggests that we need to act very early in life to prevent obesity in our children as they grow older
Determinants of Caries Development and Progression

Social & Behavioral Factors
Psychosocial factors: Depression

- Depressive symptoms are highly prevalent among caregivers
  - 35% scored 16 or above on CES-D
  - 16% scored 26 or above
- Protective Factors:
  - financial support (OR=0.59)
  - childcare support (OR=0.40)
  - emotional support (OR=0.32)
- Risk Factors: experience of everyday discrimination (OR=2.7)

Depressive Symptoms in Caregivers at Baseline (2002-03) and Wave 3 (2007)

- No Symptoms Both Waves: 74.6%
- Symptoms Both Waves: 4.4%
- Increase in Symptoms: 14.9%
- Decrease in Symptoms: 6.1%
Social Support and Depressive Symptoms

![Bar chart showing CES-D scores across different types of support.](chart)

- **Errands**: Yes - 12.9, No - 18.5
- **Financial**: Yes - 12.8, No - 19.4
- **Transportation**: Yes - 12.8, No - 20.3
- **Childcare**: Yes - 13.0, No - 22.7
- **Emotional**: Yes - 13.2, No - 23.2

*Significance level: *** p<.001*
Discrimination and Depressive Symptoms

Areas include: being treated with less courtesy, less respect, receiving poorer service, people acting as if I am not smart, as if they are afraid of me, as if I am dishonest, as if they are better than me, called names, threatened or harassed, unfairly stopped by police, unfairly discouraged by a teacher.

***Differences within wave are statistically significant (p<.001)
Stressors and Depressive Symptoms

** p<.01  *** p<.001
Psychosocial factors: Fatalism

- 79% of caregivers endorsed a fatalistic health belief

Children of Fatalistic Caregivers:

- Brushed less frequently
  (8.5 v. 10.6 times per week, \( p<0.01 \))


- Experienced more severe disease at baseline – 2.7 times that of children of non-fatalistic caregivers


- Experienced more new disease over a 2-year period
  (OR=1.3 for new \( d_1 \)mfs; OR=1.4 for new \( d_2 \)mfs)
Caregiver Fatalism and New Tooth Decay in Children Between Baseline (2002-03) and Wave 3 (2007)

Number of Lesions

- Fatal-Fatal: 4.0
- Not Fatal-Not Fatal: 3.1
- Became Not Fatal: 3.5
- Became Fatal: 3.9

Legend:
- Cavitated
- Non-cavitated
Psychosocial factors: Self-efficacy

- If mothers were **confident** in their ability to make sure their child’s teeth were brushed, children brushed more frequently \((r=0.18, p<0.0001)\)


- Being tired, busy or depressed were most common situations in which mothers were not confident that they could take care of their children’s oral health needs
Psychosocial factors: Parenting Stress

- Parenting stress scores are fairly normally distributed; most report “sometimes” feeling stressed.

- Parenting stress is inversely related to early childhood caries.
  - 1-3 year olds: odds of having ECC is reduced by about one-third for every unit increase in parenting stress (OR=0.62, \( p<0.05 \))
  - 4-5 year olds: odds of having ECC is reduced by about one-fourth (OR=0.72, \( p<0.10 \))

Religiosity and Tooth Decay

- Children of caregivers who reported being “Very/fairly religious” were less likely to develop tooth decay than children of less religious caregivers.
Use of Health Services and Caries
Type of Dental Insurance and Caries in Children at Baseline (2002-03)

<table>
<thead>
<tr>
<th>Insurance Type</th>
<th>Cavitated</th>
<th>Non-cavitated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>1.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Medicaid</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>None</td>
<td>2.7</td>
<td>2.2</td>
</tr>
</tbody>
</table>
Type of Dental Insurance and New Non-cavitated and Cavitated Lesions in Children between Baseline (2002-03) and Wave 3 (2007)
Dental Health of Children Receiving Dental Care Under Medicaid
DDHP-Medicaid data analysis

Caries Transition Matrix between W1 and W2

Wave 1
Baseline Exam
(n = 698)

Visited dentists
(n = 350)

Did not visit dentists
(n = 348)

Prevention-only visit
(n = 216)

Treatment visit
(n = 134)

Wave 2
Exam
(n = 698)

Medicaid claims data
## Type of Dental Visit and Caries Status

<table>
<thead>
<tr>
<th>Type of Visit</th>
<th>N (%)</th>
<th>Children with untreated cavities at baseline</th>
<th>% of cavities at baseline that were left untreated at Wave 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>No dental visit</td>
<td>348 (50.9%)</td>
<td>20.4%</td>
<td>74.9%</td>
</tr>
<tr>
<td>Preventive-only visit</td>
<td>216 (30.4%)</td>
<td>25.8%</td>
<td>75.2%</td>
</tr>
<tr>
<td>Treatment visit</td>
<td>134 (18.7%)</td>
<td>55.8%</td>
<td>28.6%</td>
</tr>
<tr>
<td>Total</td>
<td>698</td>
<td>28.7%</td>
<td>55.5%</td>
</tr>
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</table>
Summary: Children’s Caries Status

- Child’s age
- Caregiver’s age
- Caregiver’s tooth decay
- Child’s soda consumption
- Caregiver having a fatalistic belief (“most children eventually develop dental cavities”)
- Parental stress
- Religiosity
- Social support
- (SES, WIC participation, child insurance – weak)
Lead Levels in Children and Adults
Lead Levels

- **Adults:**
  - 5 with high blood lead levels (0.5%) at baseline
  - Re-tested at Wave 3 – none with high lead

- **Children:**
  - 35 with high blood lead levels (5.0%) in 2004-05
  - Re-tested in 2007 – 1 with high lead, but lower than baseline
Policy Implications
Policy Implications

- Dental Caries
  - We need comprehensive, integrated, and sustainable models to combat the problem of tooth decay in children and adults
  - Medicaid policy should change: all care should be provided, not only preventive care
  - Collaboration among the different programs in Detroit should be the basis for forming solutions
  - Engagement of families and organizations in developing solutions is essential
Prevalence and severity of tooth decay is high among low-income children in Detroit

Development of caries is fast:
- By the age of 2:
  - 20% have at least one cavity
  - 30% have severe early tooth decay (including non-cavitated lesions)

Access to dental care is a major problem
- Providing ONLY preventive care is ineffective

Caregivers’ tooth decay experience is a significant predictor of infant tooth decay development and progression

Children’s soda drinking pattern over time increases the development and progression of tooth decay

Psychosocial factors (fatalistic belief, parenting stress, social support, preventive orientation) play important roles in tooth decay development
Next Steps

- Community-based interventions to eliminate disparities
  - Dental anxiety
  - Social support
  - Motivational education
    - Diet and nutritional literacy
  - Management and coordination of dental care
  - Best clinical care focusing on prevention
  - Community/home follow-up
  - Starts in 2010
Thank you!
### Transition of Disease: Children

<table>
<thead>
<tr>
<th>Increment</th>
<th>w1-&gt;w2</th>
<th>w1-&gt;w3</th>
<th>w2-&gt;w3</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
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<tr>
<td><strong>Primary Teeth</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>d1</td>
<td>599</td>
<td>3.68</td>
<td>3.44</td>
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<tr>
<td>d2</td>
<td>329</td>
<td>5.14</td>
<td>5.44</td>
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<tr>
<td>f</td>
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<td>fd1</td>
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<tr>
<td>fd2</td>
<td>32</td>
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<td>1.48</td>
</tr>
<tr>
<td>c</td>
<td>24</td>
<td>3.44</td>
<td>3.95</td>
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<tr>
<td>m(97)</td>
<td>55</td>
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<td>3.05</td>
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<tr>
<td>D12mfs</td>
<td>790</td>
<td>5.03</td>
<td>7.14</td>
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<td>D2mfs</td>
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<td>2.71</td>
<td>4.97</td>
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<td><strong>Permanent Teeth</strong></td>
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<tr>
<td>d1</td>
<td>143</td>
<td>4.18</td>
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<tr>
<td>d2</td>
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<tr>
<td>f</td>
<td>12</td>
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<td>1.71</td>
</tr>
<tr>
<td>fd1</td>
<td>2</td>
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<tr>
<td>fd2</td>
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<tr>
<td>c</td>
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## Transition of Disease: Adults

<table>
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<tr>
<th>Increment</th>
<th>w1→w2</th>
<th>w1→w3</th>
<th>w2→w3</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
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<td>SD</td>
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<tr>
<td>d1</td>
<td>760</td>
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<tr>
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## Disease Transitions Between Baseline (2002-03) and Wave 3 (2007)

<table>
<thead>
<tr>
<th>Baseline Age</th>
<th>New $d_2$ mfs Incidence</th>
<th>New $d_1$ mfs Incidence</th>
<th>New Non-Cavitated Incidence</th>
<th>New Cavitated Incidence</th>
<th>New Filled$_0$ Incidence</th>
<th>New Filled$_1$ Incidence</th>
<th>New Filled$_2$ Incidence</th>
<th>New Missing due to caries Incidence</th>
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<tbody>
<tr>
<td>Children</td>
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<td>3-6</td>
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<td>78.9</td>
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<td>73.7</td>
<td>2.5</td>
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<td>6.4</td>
<td>84.7</td>
<td>18.9</td>
<td>93.4</td>
<td>13.9</td>
<td>75.1</td>
<td>4.7</td>
</tr>
<tr>
<td>35-54</td>
<td>67.4</td>
<td>6.2</td>
<td>77.2</td>
<td>18.5</td>
<td>88.2</td>
<td>11.6</td>
<td>75.3</td>
<td>4.7</td>
</tr>
<tr>
<td>55+</td>
<td>53.4</td>
<td>8.1</td>
<td>67.2</td>
<td>13.5</td>
<td>67.2</td>
<td>5.5</td>
<td>31.8</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Red indicates significant difference between age groups ($p<0.05$)
Motivational Intervention (Wave 2)

- Motivational Interviewing (MI)
  - Individual-centered, directive
  - Aid caregiver in making informed decisions and adopt behaviors that will prevent child from developing disease

- Randomly assigned children into two groups
  - DVD-only
    - Caregiver shown 18 minute video focusing on how to keep a child free from tooth decay
    - Received brochure with child’s picture and standard recipe of goals for preventing tooth decay
  - DVD + MI
    - Showed video
    - Developed personal goals for preventing tooth decay
    - Discussed barriers to reaching goals
    - Received brochure with child’s picture and personalized goals for preventing tooth decay
Motivational Intervention: Evaluation

- Wave 2 Evaluation Questionnaire
  - Oral health behaviors (e.g. brushing frequency)
  - Oral health practices (e.g. providing health snacks, taking child to the dentist)
  - Oral Health Self-efficacy
  - Oral Health Knowledge
  - Oral Health Related Fatalism

- Wave 2 Follow-up (6 months post-intervention)
  - Oral health behaviors (e.g. brushing frequency)
  - Oral health practices (e.g. providing health snacks, taking child to the dentist)

- Wave 3 Evaluation Questionnaire
  - Oral health behaviors (e.g. brushing frequency)
  - Oral health practices (e.g. providing health snacks, taking child to the dentist)
  - Oral Health Self-efficacy
  - Oral Health Knowledge
  - Oral Health Related Fatalism
  - Treatment Self-Regulation Questionnaire
Motivational Intervention: 6-month Results

- Wave 2 Follow-up - differences
- Same caregiver in both waves (n=582)

<table>
<thead>
<tr>
<th>Behaviors</th>
<th>DVD+MI</th>
<th>DVD-Only</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times child brushes per day</td>
<td>2.0</td>
<td>1.8</td>
<td>**</td>
</tr>
<tr>
<td>Days child brushes at bedtime</td>
<td>4.9</td>
<td>4.5</td>
<td>*</td>
</tr>
<tr>
<td>Caregiver reports checking for pre-cavities</td>
<td>76.9</td>
<td>66.9</td>
<td>**</td>
</tr>
<tr>
<td>Caregiver reports making sure child brushes at bedtime</td>
<td>80.1</td>
<td>73.6</td>
<td>*</td>
</tr>
<tr>
<td>Caregiver reports making sure child brushes 2x per day</td>
<td>78.3</td>
<td>70.8</td>
<td>*</td>
</tr>
</tbody>
</table>

* p<.05; ** p<.01; *** p<.001
**Motivational Intervention: 2-Year Results**

- **Wave 3 Evaluation**
- **Same caregiver in both waves (n=582)**

<table>
<thead>
<tr>
<th>Behaviors (Differences only)</th>
<th>DVD+MI</th>
<th>DVD-Only</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregivers reporting making sure child brushes at bedtime</td>
<td>74.3%</td>
<td>68.0%</td>
<td>*</td>
</tr>
<tr>
<td>Caregivers reporting making sure child brushes 2x per day</td>
<td>77.4%</td>
<td>71.8%</td>
<td>*</td>
</tr>
<tr>
<td>I don’t think about my child’s teeth or overall oral health</td>
<td>1.18</td>
<td>1.45</td>
<td>*</td>
</tr>
</tbody>
</table>

(1=Not at all true – 10=Very true)

* p<.05; ** p<.01; *** p<.001

Significant differences in times child brushes per day, days per week child brushes at bedtime, and proportion of caregivers reporting checking for pre-cavities disappear; however, results are in expected direction.
Motivational Intervention: 2-Year Results

- Wave 3 Evaluation
- Same caregiver in both waves (n=582)

<table>
<thead>
<tr>
<th>Child Dental Outcomes (W2-W3)</th>
<th>DVD+MI</th>
<th>DVD-Only</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary teeth</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New non-cavitaled</td>
<td>2.76</td>
<td>2.71</td>
<td></td>
</tr>
<tr>
<td>New cavitated</td>
<td>4.47</td>
<td>4.51</td>
<td></td>
</tr>
<tr>
<td>New dtmfs</td>
<td>4.46</td>
<td>4.43</td>
<td></td>
</tr>
<tr>
<td>New d2mfs</td>
<td>2.85</td>
<td>2.61</td>
<td></td>
</tr>
<tr>
<td><strong>Permanent teeth</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New non-cavitaled</td>
<td>2.23</td>
<td>2.17</td>
<td></td>
</tr>
<tr>
<td>New cavitated</td>
<td>1.57</td>
<td>1.33</td>
<td></td>
</tr>
<tr>
<td>New dtmfs</td>
<td>1.54</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td>New d2mfs</td>
<td>0.33</td>
<td>0.38</td>
<td></td>
</tr>
</tbody>
</table>
Motivational Intervention: Results

- 6-month follow-up: brief MI intervention appears to have impact on:
  - Behavioral outcomes:
    - More MI Caregivers report:
      - Greater brushing frequency for the children
      - Checking for pre-cavities

- 2-year follow-up:
  - Behavioral outcomes:
    - More MI caregivers report:
      - Ensuring child brushes at bedtime
      - Ensuring child brushes 2x per day
  - Clinical outcomes: no differences (preliminary)
    - Continuing to examine clinical outcomes with zero-inflated negative binomial models accounting for sampling and weighting