A School-based Public Health Model to Reduce Oral Health Disparities

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Oral Health Disparities

- There are remarkable disparities in dental disease by income.
- Poor children suffer 2-5 X as many cavities as their more affluent peers, and their disease is more likely to be untreated.
- Poor children spend nearly 12 X as many days suffering with limited ability to study, play, and interact socially, than children from higher-income families.

• Tooth decay disproportionately affects racial/ethnic minority populations such as Latinos and African Americans
• Black and Latino children with Medicaid have dental visits at longer intervals when compared to White and Asian counterparts
• 75% of Medicaid enrolled children did not receive recommended dental services and 1 in 4 did not visit the dentist in 2 years.

Access to Oral Health Services in Los Angeles

• 12% children were unable to afford dental care in 2015
• Ranged from 5%-20% by location

Source: 2015 Los Angeles County Health Survey; Office of Health Assessment and Epidemiology, Los Angeles County Department of Public Health.
Implications for School Performance

- A 2012 study of oral health needs in LAUSD found that students with toothaches are almost 4 X more likely to have a low grade point average.

- 1 in 3 school absences was dental-related which amounts to, on average, 2.2 missed school days each year due to untreated dental disease.

\[
\begin{align*}
588,696 & \text{ students} \\
73\% & \text{ with untreated caries} \\
\times 2.2 & \text{ days}
\end{align*}
\]

\[
\begin{align*}
945,446 & \text{ missed days due to dental illness each year} \\
\text{OVER} & \text{ $70 million lost to the district}
\end{align*}
\]

LAUSD Student Population

- K-12 Enrollment 588,696 students in 1,306 schools
- Early education enrollment 18,681
- 84% qualify for free/reduced priced meals

Race/Ethnicity
- Latino 74%
- Black 8%
- White 10%
- Asian 6%
- Other 2%

Uninsured
- 27%

Medi-Cal
- 49%
The L.A. Trust for Children’s Health

• Supports academic success by improving the health of students of the Los Angeles Unified School District.

• Started in 1991, the nonprofit organization has spearheaded health and wellness programs at LAUSD.
  - Optimize 15 Wellness Centers to provide integrated physical, mental and oral health care services for students, their families and the community.
  - Promote an array of health programs to students.
  - Advocate for health policy change at the school district and at all levels of government.

https://thelatrust.org/
The L.A. Trust & LAUSD Oral Health Initiative

• Developed as a comprehensive public health approach to meet the oral health needs of LAUSD students

• Designed a standardized oral health education, prevention and early intervention program across LAUSD beginning in 2012

• Built on best practices from the model of Anderson Center for Dental Care at Rady Children’s Hospital of San Diego Center for Healthier Communities and formative community engagement work
Oral Health Initiative Goals

- Reduce dental caries in LAUSD students by 25% over 5 years
- Integrate oral health care into LAUSD’s health services programs
- Pilot a test program model to promote oral health for students and families
The L.A. Trust Oral Health Initiative

3 Strategic Public Health Tiers

1. Access to Care
   - Linking Schools to Restorative Care

2. Universal Screening & Preventive Care on School Campuses Including Fluoride Varnish & Sealants

3. Community-wide Oral Health Education Including Brushing/Flossing Methods, Tooth Healthy Foods, Fluoridated Water for Cooking and Drinking, Anti-Tobacco Campaign

Finance

Prevention

Education

Policy
Key Partners

- Eisner Pediatric and Family Medical Center
- Big Smiles
- Center for Oral Health
- South Central Family Health Center
- Smile Wide Clinic
- Queenscare
- Cedars-Sinai
- USC CHAMP
- Hart Health Clinic
- Watts Healthcare Corp
- St. John’s Well Child & Family Center
Steps Taken

- Established an Oral Health Advisory Board
- Partnered with and trained LAUSD District Nursing Services and community partners
- Worked with parents, school staff and community providers to identify:
  - Oral health care barriers
  - Successful strategies for community engagement
  - Program elements necessary to achieve school and student participation
- Researched existing school-based models for oral health care
- Revised LAUSD’s Wellness Policy to emphasize oral health
Key Informant Interviews

• 9 parents, 4 school staff, 3 oral health experts

• Topics
  • Barriers to oral health
  • Education messages
  • Fluoride varnish program
Barriers to oral health

- Barriers to a dental home
  - Cost
  - Insurance
  - Logistics
  - Competing priorities

- Oral health behaviors
  - Knowledge
  - Distrust of tap water
  - Poor diet

"Parents don’t have time to help them clean their teeth; they don’t have insurance and so don’t go to the dentist."

"It’s just because tap water is maybe not healthy so they want the bottled water. But they don’t have that much knowledge that tap water is tested."

"Parents let their children eat lots of sweets. And because they think that the baby teeth are not important because they will fall out."
Education Messages

- Communicate importance
- Specific
- Motivating
- Delivered to parents and children
- From the school

Favorite: “Early care for your children’s teeth will protect their smile and their health.”

“We know that we are supposed to take care of their teeth but we don’t always know how to.”

“Just the concept of dental health is part of general health, that’d be a good message for parents to understand,“
Fluoride Varnish Program

- Enthusiasm for school-based services
- Importance of trust
- Use of licensed professionals
- Limiting time out of class
- Minimizing school cost

“I’m very positive about the program...I think it’s long overdue. I think the more dental health you can provide to low income students, the better.”

“I think it’s [varnishing] a new thing for some parents so I think some parents might want to hear about it beforehand...Because they might think, ‘What does that mean? , What does that entail? Why are they doing it?’”” There would be some distrust.”

“I prefer somebody professional...cause you never know what’s going to happen; if they’re not putting it on right or if they’re putting it on right.”
Key elements for program success

- Free, school-based, preventive dental services
- Information for students and parents
- Education and training for staff and community members
- Oral health care coordination
Community Wide Oral Health Education

- Tailored oral health education for parents, students, teachers, and school administrators. Education should emphasize in a clear and direct manner:
  - Causes, processes and effects of oral diseases
  - Diet and nutrition and their relation to oral health
  - Need for regular dental care
  - Use of preventive dental agents
  - Oral injury prevention
  - Drinking fluoridated water
  - Links to cancer, diabetes, mental health and finances
Universal Screening and Fluoride Varnish Program

• Public health and school-based approach
• Introduced to school staff, parents and students through presentations by District Oral Health Nurses at:
  • professional development meetings
  • parent groups,
  • student assemblies
The Beauty of Active Consent

• The consent form includes items regarding:
  • Student demographics
  • Access to and utilization of dental care
  • Oral health behaviors
  • Reason for non-participation
## Sample Items

Does your child have a dentist?  
☐ Yes  ☐ No

Has your child been to the dentist in the last 6 months?  
☐ Yes  ☐ No

In the last 7 days, how many days did your child drink the following beverages?

<table>
<thead>
<tr>
<th>Beverage</th>
<th>0 days</th>
<th>1-2 days</th>
<th>3-5 days</th>
<th>6-7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap water (drinking or cooking)</td>
<td>☐</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
</tr>
<tr>
<td>Bottled water</td>
<td>☐</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
</tr>
<tr>
<td>Juice</td>
<td>☐</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
</tr>
<tr>
<td>Soda</td>
<td>☐</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
</tr>
<tr>
<td>Sports or energy drinks</td>
<td>☐</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
<td>☐ ▢</td>
</tr>
</tbody>
</table>

How often does your child brush his/her teeth?

☐ Less than once/day  ☐ Once/day  ☐ Twice/day  ☐ More than twice/day  ☐ Unsure

What health insurance does your child have?

☐ Medi-Cal  ☐ Healthy Way LA  ☐ Private  ☐ None  ☐ Not sure
Event Day

- Students return signed consent form
- Parent volunteers dressed in Oral Health costumes escort students from class
- Oral health education & dry brush demo
- Dentist completes screening exam and applies fluoride varnish
- Students take home age appropriate educational materials including:
  - free toothbrush
  - toothpaste
  - dental floss
**Parent Volunteers**
- Escort students to and from class
- Give students Oral Health Goody Bag

**Student Check In**
- Approximate Time: 5 minutes
  - Confirm child name, date of birth, and name of parent

**Total Time Out of Class:** 20 minutes

**Provider Station**
- Approximate Time: 2 minutes
  - Screening exam
  - Apply fluoride varnish
  - Complete report

**Oral Health Education**
- Approximate Time: 7 minutes
  - Brushing & flossing methods
  - Eating healthy foods
  - Drink fluoridated tap water

**Wait Time**
- 6 minutes
Students are Screened and Assigned Treatment

<table>
<thead>
<tr>
<th>Urgency Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No Visible Oral Health Problems</td>
<td>Child’s teeth appear visually healthy, and there is no reason that he/she needs to see a dentist before the next routine checkup.</td>
</tr>
<tr>
<td>2. Evidence of Oral Health Problems</td>
<td>There are early reversible signs of tooth decay (white spots and brown spots or molars that would appear to benefit from sealants) as well small and large cavitated lesions or other acute problems that need therapeutic oral health care.</td>
</tr>
<tr>
<td>3. Needs Urgent Oral Health Care</td>
<td>There are signs or symptoms that include pain, infection, swelling or soft tissue lesions lasting longer than 2 weeks (determined by questioning the child).</td>
</tr>
</tbody>
</table>

Guidelines developed by the Association of State and Territorial Dental Directors in association with the California Dental Association (Adopted from Rady Children’s Manual)
After each child is screened...

- Each child receives:
  - Report on oral health status
  - Recommended follow-up care
  - List of local low-cost dental providers
- Reimbursement for care provided to publically insured children may be submitted by the provider
- All care is delivered at no cost to families.
- Case management by school nurse for urgent issues
Oral Health Report Card – Main St. Elementary School
Principal: Eva Rodriguez-Chavez

<table>
<thead>
<tr>
<th></th>
<th>2017-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of children screened</td>
<td>121</td>
</tr>
<tr>
<td>Had not been to a dentist in last 6 months</td>
<td>35%</td>
</tr>
<tr>
<td>Drank fluoridated tap water last week</td>
<td>15%</td>
</tr>
<tr>
<td>Drank soda last week</td>
<td>32%</td>
</tr>
<tr>
<td>Drank sugar-sweetened beverages last week</td>
<td>81%</td>
</tr>
<tr>
<td>Abnormal exam</td>
<td>79%</td>
</tr>
<tr>
<td>Visible decay</td>
<td>78%</td>
</tr>
<tr>
<td>Potential cavities prevented</td>
<td>90</td>
</tr>
<tr>
<td>Potential school days saved</td>
<td>201</td>
</tr>
</tbody>
</table>
Kindergarten Oral Health Mandate

- AB 1433 signed into law in 2005, funded by California Department of Education
- Requires an “assessment” of the child’s oral health by a licensed dental professional and the completion of the data collection tool by either the school or the school district
- Schools must notify parents who are registering their child in public school for the first time (in either K or 1st grade), collect forms by May 31 of each school year and report collected data by December 31 of that calendar year to County Office of Education
- Law requires waiver on the form; majority of parents elect to opt out of assessment
- LAUSD compliance rate was at 30% for 2016-2017 (18% opt out, 12% return with assessment completed)
Engagement with Healthy Start

- **Healthy Start** provides comprehensive school-integrated services and activities to support:
  - Academics
  - Youth Development
  - Family Support
  - Basic Needs
  - Physical and Mental Health Care

- **Goal** is to ensure that each child receives the physical, emotional, and intellectual support needed.
Healthy Start Role in Oral Health

• All coordinators trained in oral health and important to school function

• Help coordinate and facilitate providers “adopting” a kindergarten class

• Collect consents, educate parents, teachers, and students

• Case management for any child with an abnormal exam to ensure linkage to a dental home

• Coordinators are certified insurance enrollment counsellors and often identify additional needs for families.
Access to Restorative Care

- Annually updated list of appropriate dental providers
  - Student Vetting
- Established 24 oral health “hubs” throughout LAUSD
- Expanding number of on-site dental restorative services
  - Mobile chairs
  - Mobile vans
  - Wellness Centers
- Dental resources on The L.A.Trust website
School-based Dental Clinics
Inside LAUSD

18 “hubs” established

240+ mobile sites
providing oral health care
Participants

- 12,372 screenings across 67 schools
  - 14% Early Education or Primary Care Centers
  - 81% Elementary School
  - 5% Middle or High School
- 1024 students participated multiple times
- 88% Latino, 57% Spanish speaking only; 6% Black
- Age ranges from 2-18 years old
<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Early Ed. Centers</th>
<th>Elem. Schools</th>
<th>Middle/ High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brush teeth less than twice/day</td>
<td>32%</td>
<td>37%</td>
<td>31%</td>
<td>25%</td>
</tr>
<tr>
<td>No dental visit in last 6 months</td>
<td>39%</td>
<td>40%</td>
<td>37%</td>
<td>53%</td>
</tr>
<tr>
<td>Drank fluoridated water, last 7 days</td>
<td>33%</td>
<td>43%</td>
<td>31%</td>
<td>39%</td>
</tr>
<tr>
<td>Drank soda, last 7 days</td>
<td>46%</td>
<td>43%</td>
<td>44%</td>
<td>70%</td>
</tr>
<tr>
<td>Drank sugar-sweetened beverage, last 7 days</td>
<td>88%</td>
<td>93%</td>
<td>88%</td>
<td>92%</td>
</tr>
<tr>
<td>Abnormal exam</td>
<td>73%</td>
<td>66%</td>
<td>73%</td>
<td>91%</td>
</tr>
<tr>
<td>Caries experience</td>
<td>64%</td>
<td>54%</td>
<td>65%</td>
<td>84%</td>
</tr>
<tr>
<td>Visible decay</td>
<td>36%</td>
<td>34%</td>
<td>34%</td>
<td>62%</td>
</tr>
<tr>
<td>Number of visible cavities: mean (range)</td>
<td>1.0 (0-20)</td>
<td>0.9 (0-20)</td>
<td>0.9 (0-20)</td>
<td>3.2 (0-19)</td>
</tr>
</tbody>
</table>
Summary of Screening Results

- **Gingivitis and Periodontal Disease**
  - 40% visible gingivitis
    - 83% among adolescents
  - 34% adolescents report gum bleeding with tooth brushing or flossing

- **Emergent Findings**
  - Abscesses (36%)
  - Severe decay (30%)
  - Other infections (15%)
  - Pain (6%)
  - Broken teeth (5%)
  - Other (15%)
2774 students participated across 6 elementary schools over 2 years
22.7% (631) students participated both years

Baseline and Follow-up Findings Among Repeat Participants

<table>
<thead>
<tr>
<th>Oral Health Outcomes</th>
<th>Baseline</th>
<th>Follow-Up</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Active Disease</td>
<td>36.0%</td>
<td>47.6%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Early reversible disease</td>
<td>33.3%</td>
<td>29.9%</td>
<td>0.18</td>
</tr>
<tr>
<td>Mean white/brown sports</td>
<td>1.7</td>
<td>1.3</td>
<td>0.001</td>
</tr>
<tr>
<td>Visible Decay</td>
<td>27.0%</td>
<td>19.8%</td>
<td>0.003</td>
</tr>
<tr>
<td>Mean Number of Cavities</td>
<td>0.8</td>
<td>0.6</td>
<td>0.002</td>
</tr>
<tr>
<td>Mean Number of Cavities among those with initial decay</td>
<td>2.6</td>
<td>1.2</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Emergent Dental Needs</td>
<td>3.4%</td>
<td>2.7%</td>
<td>0.33</td>
</tr>
</tbody>
</table>
Program Costs

- Program costs and reimbursement data collected from the school district and dental provider

- Although percent of students reporting Medicaid coverage ranged from 66%-77%, the percent of students for whom Medicaid actually reimbursed averaged 29% (range 13%-49%)

- The cost of un-reimbursed care, ranged from $0-$3,944/ school

<table>
<thead>
<tr>
<th>Average Program Costs</th>
<th>Total</th>
<th>Avg. school event cost</th>
<th>Avg. student cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening day expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel</td>
<td>$25,892</td>
<td>$1,726</td>
<td>$9</td>
</tr>
<tr>
<td>Supplies</td>
<td>$6,629</td>
<td>$442</td>
<td>$2</td>
</tr>
<tr>
<td><strong>Year Round Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District Oral Health Nurse Salary</td>
<td>$81,143</td>
<td>$13,524</td>
<td>$59</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td>$113,664</td>
<td>$15,692</td>
<td>$70</td>
</tr>
<tr>
<td><strong>Reimbursement</strong></td>
<td>$86,931</td>
<td>$5,795</td>
<td>$25</td>
</tr>
</tbody>
</table>
Cost-Benefit Analysis

• We estimate that fluoride varnish in this population could prevent 0.74 cavities per child.

• The cost of filling these cavities amounts to $369.60 per child, compared to $70/child to run the program.

• Preventing caries could save 1.6 school days per child per year which amounts to $79.43 per child in ADA funding to the district.
Kindergarten Classroom Behavior Change Program

• We Developed and piloted a kindergarten classroom intervention to increase twice-daily brushing and dental visits

• The program components drew on behavioral change theory, including using tangible incentives and social cognitive influence
Motivation for the Program

• Dental caries can be prevented with positive oral health behaviors such as brushing twice a day and visiting the dentist regularly

• The USFV program has decreased untreated dental disease but has not changed oral health behaviors
  • 32% of participants in the USFVP brush their teeth less than twice a day
  • 39% have not seen the dentist in the last 6 months

• Qualitative interviews with parents suggest that children’s resistance to regular tooth brushing and dental visits are substantial barriers.
The Program

- All students received oral health education and a toothbrush/toothpaste at the beginning of the program.
- Parents received a letter home explaining the program and their role.
- Students completed weekly dental charts tracking morning and evening tooth-brushing. Charts were turned in for small prizes (stickers) and points.
- Students received larger prizes (coloring books/markers) and more points for returning dentist-visit certificates and oral health assessment forms.
- Oral health messages were reinforced weekly when prizes were awarded.
The Program

• Points displayed publicly on a poster.
• The class with the most points after 4 weeks received a prize (e.g. class bubble-party)
• This inter-class competition was designed to encourage positive peer pressure for healthy behaviors.
- Program piloted in 3 schools (15 classrooms)

### Participating students

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Number of charts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>180</td>
</tr>
<tr>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>4</td>
<td>140</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participating students</th>
<th>Student Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total students, N</td>
<td>350</td>
</tr>
<tr>
<td>Total students participated*</td>
<td>263 (75.1%)</td>
</tr>
<tr>
<td>Total brushing charts returned</td>
<td>588</td>
</tr>
<tr>
<td>Average charts returned per participating student</td>
<td>2.2</td>
</tr>
<tr>
<td>Total dental certificates</td>
<td>27</td>
</tr>
</tbody>
</table>

*Students were recorded as having participated if they returned in one or more brushing chart or dental certificate that week. Data from special education classes were not included in the figure.
Program Evaluation

- Semi-structured interviews were conducted with 16 participating teachers
- Focus groups in English and Spanish with parents at all 3 schools (28 participants)
  - Students were excited to brush their teeth and go to the dentist.
  - Suggestions for improvement included integrating the program into the regular classroom practices, beginning earlier in the school year, and greater parent engagement.
  - Most teachers felt they could sustain the program if provided with the materials and a system for accountability.
Teacher & Parent Perspectives

• “The kids see their progress, see the points, see who’s brought it in and who’s, ‘Oh, hey, you don’t have any stars. Uh-oh’…because I don’t want any of my friends telling me, ‘Hey, are you brushing your teeth?’”--Teacher

• “And then the thing was, just the parents all of sudden started taking their kids to the dentist.”--Teacher

• “Well, I know the kids were really motivated by the logs. They were really upset if they left their logs at home. And they seemed to nag their parents about going to the dentist, which is a good thing.” --Teacher

• “I think what also helped was that it didn’t come from me…. When their teachers tell them and all their little friends participate too, that also kind of hypes them up.” -- Parent

• “Yes, [the program] got [my son] excited, he would say to me, “Do not forget to sign, if not, I will not get a prize.” And …he also said, “I do not want the teacher to think I do not like to brush my teeth.”-- Parent
Future Plans

• Institutionalize screening events at schools
  • Goal is for annual screening to be routine
• Refine process for data entry of screening results for kindergarten students
  • Goal is 100% compliance with Kindergarten Oral Health Mandate
• Determine case management success rate and benefits outside oral health
  • Many families receive referrals to other services
• Disseminate & evaluate Kindergarten Classroom Behavior Change Program
Ultimate Goal

- Every child has a healthy mouth so they can come to school ready to learn!
Any Questions?

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