The primary focus of the Colorado Oral Health Service System Project is on increasing the number of Colorado children with a “dental home” by addressing the following three areas: Increasing the number of dental visits by age one for children at highest risk for disease, improving access to oral health services for Children with Special Health Care Needs through the medical home approach, and expanding access to restorative care by means of school-based sealant programs. The Oral Health Unit (OHU) has partnered with non-profits, foundations, and local health agencies to expand and replicate the Cavity Free at Three Initiative, addressing the need for increasing the number of children who receive a dental visit as infants and toddlers as well as training the providers to see them. The OHU has continued to grow the Be Smart and Seal Them school sealant program, increasing the number of participating schools from 34 schools in 2003 to 222 schools in 2010, providing sealants to over 3,700 second-grade children. Legislation passed in 2006 supporting a Medical Home approach inclusive of mental, oral and physical health services, particularly for children with special health care needs, has fostered the recognition and acceptance of oral health as an integral part of general health and an essential element for positive child development.

**GOAL 1: INCREASE THE NUMBER OF HIGH-RISK SECOND GRADE CHILDREN WHO RECEIVE PIT AND FISSURE SEALANTS ON PERMANENT MOLARS AND RECEIVE FOLLOW-UP RESTORATIVE CARE. (BASELINE: 1900 CHILDREN PER YEAR IN URBAN AREAS RECEIVED SEALANTS IN THE 2006-2007 SCHOOL YEAR.)**

**Objective 1: By September 2011, evaluate progress/performance of previous years’ contractors for renewed contracts and/or reissuing of RFA.**

School sealant program applications are rated on criteria set forth in the application including implementation integrity to the Community Guide, cost per sealant, and proportion of participation from the eligible population. Contractor performance evaluations are conducted quarterly with ratings based on the grantees use of SEALS software, maintenance of retention rates of 85% or above, timely and accurate invoicing, and additional program records. During the final year of the grant, the Oral Health Unit (OHU) sealant program managed a total of 10 contractors and funded two additional planning contacts. One hundred percent of all eligible schools in the Denver Metro area, the most densely populated area of the state representing approximately 80% of the population, are now being served by school sealant programs and two new sealant programs began delivering services in rural
areas of Colorado in the 2011-2012 school year, a direct result of planning grants awarded in the final year of the TOHSS grant.

Considerable progress has been made in expanding the Be Smart and Seal Them school sealant program. In the 2010-2011 school year, the program reached 222 schools, serving 44% of eligible schools, screening 5382 children and placing sealants on 3726 children. This represents considerable progress toward increasing the number of Colorado children receiving preventive services. This progress can be attributed to: 1) the capacity of the Oral Health Unit (OHU), enabling the unit to dedicate staff to oversee and coordinate the sealant program processes and evaluation, 2) additional contracts to local dental providers, and 3) the acquisition of portable dental units providing the OHU the ability to loan expensive dental equipment to new programs, defraying start up costs that might otherwise prove to be an obstacle.

The OHU continues to market the program at the Colorado Dental Hygiene Annual Session, the Rocky Mountain Dental Convention and other venues, such as the Colorado Association of School Nurses and the Colorado Association of School-Based Health Centers. Geographical information systems maps were created in 2006 and in 2009 as part of an overall sealant program evaluation which clearly depict potential areas for expansion. (See attached A)

Quarterly sealant meetings and site visits prove to be the one of the most valuable components of the program, both to the Sealant Coordinator and to the sealant providers. Quarterly sealant meetings enable providers to share personal experiences and offer solutions to barriers identified by peers. Site visits provide the Sealant Coordinator with an enhanced understanding of the obstacles and issues faced by providers in the school setting, leading to timely and relevant delivery of technical assistance.

In addition to quarterly meetings, a meeting of key stakeholders (advisory group) was held to identify barriers hindering the expansion of school sealant programs in Colorado. Members of the advisory group included representation from Medicaid, Child Health Plan Plus, Delta Dental, Colorado School Based Health Centers, Oral Health Colorado (state coalition), school sealant providers, State Dental Director, Sealant Coordinator, and a local health agency. While the focus of the meeting was on the identification of barriers, a number of solutions were also identified and have been provided in an attachment to this document (B). An additional noteworthy development occurred as a direct result of this meeting. Several sealant providers expressed frustration with the reimbursement process for CHP+. This led to the creation and inclusion of a requirement in a RFP being issued for the administration of state SCHP benefits, recognizing independent dental hygienists and public health agencies as reimbursable providers of preventive services delivered in non-traditional treatment settings such as schools and WIC clinics.
Lessons learned:
The variability in the school sealant programs in Colorado (FQHCs, Area Health Education Centers, independent providers, mobile vans, etc.) made it difficult to compare programs for operational cost efficiencies.

**Objective 2: By August 2011, increase the availability of portable sealant units by 2 through direct purchase and/or leveraging additional resources.**

The Oral Health Unit was successful in purchasing a dental unit, operator chair and over-head dental light for loan to the Aspen to Parachute Dental Coalition to defray start-up costs of operating a school sealant program in Garfield County.

**Objective 3: By August 2011, analyze SEALS data for progress toward program goal.**

The OHU embarked on a comprehensive SEALS data clean-up project in the summer of 2010. Five years of SEALS data, provided by sealant contractors, was collected and re-entered into the SEALS software program by OHU staff. This action was necessitated by the unfortunate distribution of two different editions of the SEALS software, one collecting data at the tooth level, the other collecting data at the surface level. Consequently, the data were not comparable.

In addition to the SEALS data clean-up project, the OHU developed and delivered a series of trainings designed to bring all sealant providers in alignment on oral health data collection procedures based on ASTDD guidelines outlined in the Basic Screening Survey. The trainings also provided information on the proper use of the SEALS software and on the CDC’s Beta Cost Analysis Worksheet that offers sealant contractors a simplified way to capture and report costs associated with the operation of school sealant programs. Approximately thirty sealant providers and program staff receiving training during the 2010-2011 school year. (Copies of the training materials are attached C.)

Lessons learned:
Despite considerable effort in providing technical assistance and training in calculating the cost of individual sealant programs, the cost data reported in SEALS continues to be largely unreliable. Administrators of school sealant programs are often clinical dental hygienists with little understanding, or inclination toward understanding, the business side of running a sealant program. The introduction of the CDC’s Beta Cost Analysis Worksheet increased the ease of collection and accuracy of the data but not to a confident level.

Tracking students receiving follow-up restorative care has been difficult due to the mobility of the population and lack of provider cooperation in providing Medicaid provider numbers. The Oral Health Units’ close working relationship with the Health Care Policy and Financing Department has provided valuable data for
monitoring this performance measure. In 2008, Colorado Medicaid data revealed that only 13% of Medicaid children receiving dental sealants in the Colorado sealant program completed a follow-up appointment with a dentist. In 2010, the number of children seen by dental hygienists in the state (not just those participating in the Be Smart and Seal Them sealant program) was 2618. The number of these same children subsequently seen by a dentist who provided restorative care was 697 or 26.6%. By 2011, those numbers increased to 3818 and 1033 respectively, although the percentage completing treatment remained virtually unchanged at 27%.

GOAL 2: INCREASE THE NUMBER OF CHILDREN THAT RECEIVE AN INITIAL DENTAL VISIT BY AGE 1.

Objective 1: By August 2011, evaluate impact of non-dental providers’ participation in Cavity Free by Three initiative via Medicaid utilization information.

Cavity Free at Three (CF3), founded in 2007, is a statewide effort to prevent oral disease in children from infancy to age 3 by educating health professionals about the consequences of early childhood caries and their role in preventing this disease. Since many children will see doctors and nurses earlier and more often than dentists, the CF3 model integrates caries risk assessments, anticipatory guidance, parent counseling and goal setting, establishment of a dental home, and fluoride varnish application into well child care visits. Training sessions lead by dental professionals give medical providers hands on practice with infants and toddlers for oral exams and fluoride varnish applications. The CF3 initiative is currently coordinated by the Colorado Area Health Education Center. CF3 has committed to conducting one “train-the-trainer” session each spring and to training 15 sites in the each funding cycle. It is estimated the number of children receiving CF3 instruction and guidance to be 40,000 statewide. This is based on the number of participants trained and the number of kits distributed through Bayaud Enterprises, supplier of the CF3 kits. The OHU remains a stakeholder with CF3 and two OHU staff are trained and committed to providing a minimum of two trainings annually.

Documented success in Medicaid and SCHIP participation in Colorado:

- Between 2007 and 2009, access to dental care for children enrolled in Medicaid grew by 6 percentage points.
- In 2009, the share of Medicaid-enrolled children receiving dental care in Colorado was 46.6%, better than the national average of 38.1%.
- According to the annual EPSDT Participation Report, the total eligibles receiving preventive dental services age 0-2, increased from:
  - 5,675 in 2005
  - to 7,178 in 2007
  - to 9,035 in 2008
  - to 11,753 in 2010
## Monthly CHIP Enrollment - State Comparison

<table>
<thead>
<tr>
<th></th>
<th>CO #</th>
<th>US #</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2004</td>
<td>37,069</td>
<td>3,941,608</td>
</tr>
<tr>
<td>December 2004</td>
<td>38,189</td>
<td>4,015,676</td>
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<tr>
<td>June 2005</td>
<td>40,696</td>
<td>4,043,863</td>
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<td>December 2005</td>
<td>45,903</td>
<td>4,052,828</td>
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<td>June 2006</td>
<td>53,894</td>
<td>4,078,163</td>
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<td>December 2006</td>
<td>45,404</td>
<td>4,231,971</td>
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<tr>
<td>June 2007</td>
<td>51,939</td>
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<td>December 2007</td>
<td>57,985</td>
<td>4,525,400</td>
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<td>June 2008</td>
<td>60,166</td>
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<td>December 2008</td>
<td>62,778</td>
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<td>June 2009</td>
<td>64,598</td>
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<td>69,640</td>
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<tr>
<td>June 2010</td>
<td>69,369</td>
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</tr>
<tr>
<td>December 2010</td>
<td>66,577</td>
<td>5,233,054</td>
</tr>
</tbody>
</table>

Source: Statehealthfacts.org

Lessons learned:
One of the major issues facing public health insurance programs is how to reach and enroll more low-income uninsured children. Colorado has seen growth in both Medicaid and SCHIP participation rates but more work remains. Expanding on the CF3 program, The Colorado Partnership for Children’s Oral Health (COPCOH) is a new initiative launched in 2011. The initiative is focused on increasing access to quality dental care for children and pregnant women and increasing awareness of the importance of children seeing a dentist by age 1. A comprehensive data analysis, conducted by the Colorado Health Institute, was used to identify counties/regions to target with this initiative as explained in the attached PowerPoint presentation D.

**Objective 2: By August 2011, conduct Basic Screening Survey of random sample of Early Head Start and Head Start children**

This objective was not met. The Oral Health Unit dedicated considerable time and energy over a period of 18 months completing the Basic Screening Survey of kindergarteners and third-grade students. This effort consumed available resources preventing the completion of the BSS of Early Head Start and Head Start children.

Lessons learned:
The OHU’s attempt to collect BMI data, in addition to oral health data, was met with resistance by certain school districts. This necessitated the expenditure of additional time and effort to provide explanation as to the use of the data and value
provided. Despite these efforts, the Denver Public School (DPS) system refused collection of height and weight on its’ students and denied access to this same information collected by DPS school nurses earlier in the year.

In retrospect, the OHU believes the project could have proceeded more smoothly and quickly if additional measures had taken place before requesting permission from the school districts to conduct the screenings in their schools. Laying the foundation at the start, by identifying and enlisting the assistance of school “health champions” could have led to more acceptance and less resistance to the project.

GOAL 3: INTEGRATE ORAL HEALTH INTO OTHER CHILD HEALTH SYSTEMS, INCLUDING SMART START COLORADO, CSHCN, HEAD START, ECCS, MEDICAL HOME INITIATIVE AND COORDINATED SCHOOL HEALTH.

Objective 1: By August 2011, share success stories with non-dental colleagues in at least two opportunities.

The OHU was afforded two opportunities within the state health department to share accomplishments with non-dental colleagues in FY 2011-2012. The first presentation was delivered by the Interim State Dental Director, Deborah Borek, to the Chronic Disease Branch in 2011. The second was delivered by Dr. Katya Mauritson, State Dental Director, to the Health Equity and Access Branch in February 2012. Copies of the presentations are attached (E).

Lessons learned:

Even in the state health department setting, many health colleagues are unaware of the full meaning of oral health and its importance to general health and well being. Educating co-workers on the consequences of poor oral health and sharing program activities has created integration points and fostered program partnerships within the department as highlighted in the following list of activities and accomplishments.
Additional Program Activities and Accomplishments

- The executive director of the Colorado Department of Public Health and Environment has named oral health as one of the ten “Winnable Battles” for the state. As a result, a Tri-Agency Collaborative has been formed with representation from the Colorado Department of Human Services, Health Care Policy and Finance, and the Colorado Department of Public Health and Environment with additional representation from several Colorado health foundations, all interested in improving the oral health of Coloradans. From the Collaborative, four workgroups have formed, each with a different emphasis or task. The workgroup charged with developing strategies to improve the oral health of school aged children is in the process of conducting key informant interviews and an in-depth literature review to identify best and promising practices. The school workgroup is aligning efforts with Oral Health Colorado (state oral health coalition) on identifying strategies to deliver comprehensive oral health services in the school setting. Under consideration is the standardization of a statewide sealant program branded under the Colorado Department of Public Health and Environment. The state department would coordinate all oral health programs delivering services in a school setting alleviating the confusion and frustration often experienced by school staff when approached by different independent programs wanting to offer oral health services in their school.

- Colorado has had tremendous success in the early childhood state systems work funded through the Maternal Child Health Bureau. The emphasis to integrate health (including oral health) into communities working on the Early Childhood Framework (attached F) has included oral health by way of health integration grants awarded to Early Childhood Councils. One way for councils to address the oral health of their respective community is through promotion of the Cavity Free at Three Model and by working closely with other initiatives such as the Colorado Medical Home, Accountable Care Collaborations and the Colorado Children’s Healthcare Access Program (CCHAP). These linkages have created a great demand for CF3 training. To date, ten councils have identified oral health as a priority and 180 CCHAP pediatric practices have requested the CF3 training.

- Colorado has recently undergone its periodic Maternal and Child Health needs assessment process. Of the nine issues identified as Colorado priorities for the next five years, one emerged that centered on oral health, “Prevent development of dental caries in all children ages birth to 5.” The OHU, with stakeholder input, was given the unique opportunity to develop an action plan to positively impact the oral health of young children. Those efforts led to the creation of a logic model, action plan and A Toolkit for Promoting Maternal and Child Health in Colorado Communities to assist Early Childhood Councils and local health agencies in addressing identified areas for improvement in the oral health status of their community. Copies of these documents are attached (G). The Toolkit can also be found on the Oral Health Colorado website at
The OHU continues to partner with the Lieutenant Governor’s Office, formerly Smart Start, on early childhood systems building activities and has re-enforced its’ involvement with integrated school health, coordinated school health and the medical home initiative by presenting annually at the School-Based Health Center conference and School Nurse State Conference and through monthly participation in Medical Home Initiative meetings.

The Early Childhood Caries Systems Dynamic Modeling project is complete and several simulations have been run. The model was introduced to the larger public health community at the 2011 National Oral Health Conference and to local key stakeholders through several presentations and a webinar. Follow up publications are in progress thanks to collaboration with the Children’s Dental Health Project. Attached is a copy of the final report (H).

In 2010, the OHU contracted with researchers at the University of Colorado Denver, Colorado School of Public Health to estimate cost savings associated with and the cost-effectiveness of dental sealant programs provided in elementary schools for second-grade school children in Colorado. The purpose of the project was to:
1. Describe school dental sealant program utilization and related costs
2. Analyze dental service utilization data for caries in first molars and estimate the costs of treating first molar caries using the data; and
3. Estimate cost savings and the cost effectiveness of Colorado school sealant programs from the societal perspective using the data provided by SEALS and interviews with individual providers.
A Copy of the preliminary report is attached (I). A more comprehensive report is expected in March 2012.

School-based Health Centers (SBHCs) can be instrumental in diminishing the burden of oral disease. The OHU actively participates in the Interagency School Health Team that supports Coordinated School Health programs. This initiative is funded through the Centers for Disease Control and Prevention. Colorado is one of 18 states selected to create a state infrastructure and fund local school districts in the creation of coordinated health and prevention-related programs. The OHU contributed to the creation of a position statement outlining cost effective and evidence-based approaches for integrating preventive oral health services in Colorado SBHCs. (See attached J)

The OHU has partnered with the state WIC program to deliver trainings and education on the use of “A Pediatric Guide to Children’s Oral Health” flip chart. Free copies of the flip chart (in both English and Spanish) will be provided to all WIC educators receiving the training.
The OHU has received funding through the Maternal and Child Health Program to conduct a seminar series to build capacity for program delivery among dental sealant and fluoride varnish providers. The seminar series will assist contractors in becoming successful, independent health care providers, able to bill Medicaid and CHP+ for oral health services delivered in a school setting. This would lead to greater efficiencies and sustainability for the dental sealant and fluoride varnish programs. The seminar series would include topics such as:

1. Business Start-Up: Developing a small business plan, common issues faced by small businesses
2. Counting the Costs: Planning for business income and expenses, cost calculations for population based service delivery/ oral health preventive programs
3. Medicaid and CHP+ Programs: Program structure and funding for dental preventive services, becoming a registered provider, rules, procedures, dental coding and billing, common problems and solutions
4. Community development: working with school systems, Head Start programs, and other community groups to deliver oral health services, community involvement, enhancing program reach & participation
5. Data tracking and monitoring: using data to enhance efficiency

While the target audience would be the dental sealant and fluoride varnish program contractors, plans are underway to expand the audience to include other interested dental professionals (dental hygienists interested in independent practice, newly graduating dentists working with underserved). To address sustainability, a portion of the funds will be used to produce podcasts, webinars, CD-ROMs, resource materials, workbooks and other replicable items.

The Colorado Department of Public Health and Environment’s (CDPHE) Refugee Preventive Health Program of Colorado (RHPC) was established in 1980 to aid refugees and asylees fleeing physical and political persecution in their homeland. Approximately 1,100 refugees arrive each year in Colorado. Serving a widely diverse population, the RHPC provides newly arriving refugees with an initial Public Health screening. In addition, a physical assessment is offered at two locally contracted clinics. These examinations ensure that CDPHE is maintaining the health integrity of the residents of Colorado through referral for treatment of medical and dental conditions. Services are provided to assist refugees in attaining self-sufficiency and contribute to their effective resettlement in Colorado. The OHU has partnered with the RHPC by providing an educational flipchart (attached K) (designed specifically for the RHPC) and toothbrushes for each member of the family. The RHPC collects and provides to the OHU, oral health data (using the BSS) documenting the condition and needs of the population they serve.
The Oral Health Unit completed the first year of the Fluoride Varnish Program in 2010-2011. While the program was successful in delivering fluoride varnish applications and basic screenings in 12 rural schools to 1,908 students in the fall and 1,890 students in the spring, it became clear the Oral Health Unit did not have the resources necessary to maintain or grow the program if required to purchase supplies and reimburse travel costs and dental hygiene salaries. In order to continue providing valuable fluoride varnish applications and basic screenings at no-cost to high risk children, the Oral Health Unit began exploring other options.

In theory, a dental hygienist should be able to operate a school fluoride varnish program and actualize a profit just through Medicaid and CHP+ reimbursement. Hygienists, however, are often reluctant to “take a chance” to see if this profit can be realized in the field. In an effort to determine the sustainability of the program, The Oral Health Unit embarked on a 2-year pilot project where the time and costs associated with planning and implementing a school fluoride varnish program, and compensation received through Medicaid reimbursements, will be recorded and evaluated (with assistance from CDPHE’s Epidemiology Planning and Evaluation Branch). The OHU has contracted with a dental hygienist to track and record cost data in exchange for monetary support.

Additional Program Details:
1. Fluoride varnish applications and screenings will be offered at no-cost to children K-6
2. The program targets children attending schools with at least 50% free and reduced lunch status or in communities without community water fluoridation
3. Schools currently participating in the program are located in rural and frontier counties
4. Hygienists will accept insurance reimbursement as payment for services rendered and absorb the costs for children who are uninsured

Lessons learned so far:
1. The difficulties encountered in submitting claims to CHP+ makes seeking CHP+ reimbursement cost prohibitive. The small return does not cover the investment of time and effort.
Colorado Schools Receiving Sealant Services and Eligible Schools Not Receiving Services 2006-2007

122 Schools Served
382 Schools Eligible
Colorado Schools Receiving Sealant Services and Eligible Schools Not Receiving Services 2006-2007

122 Schools Served
382 Schools Eligible
Advisory Sealant Committee Meeting
Meeting Minutes

Date: January 25, 2012

Present: Deborah Borek, Moderator
Katya Mauritson, Oral Health Unit Manager
Jean McMains, Program Assistant
Karen Cody Carlson, Oral Health Colorado
Genevieve Valdez, Kids In Need of Dentistry
Julie Collett, Kids In Need of Dentistry
Michelle Quigley, Kids In Need of Dentistry
Laurie Ghigleri, School Smiles
Marcy Bonnett, Health Care Policy and Finance
Alan Kislowitz, Health Care Policy and Finance
Deirdre Callanan, Colorado Association of School Based Health Care & Oral Health Colorado

Remote attendance:
Leslie Powers, Delta Dental of Colorado
Carrie Godes, Garfield County Public Health
Kari Plante, San Juan Basin Health Department

I. Barriers to the delivery of dental sealants in a school setting

- Education/literacy
  - No value being placed on oral health
  - Missing the connection to systemic health
  - May need to target oral health messages to dental providers (often concentrate on “appearance” of teeth rather than the health aspect)

- School Programs
  - Superintendent
    - Not on board
    - Restricts time with students
    - Does not place value on importance of oral health
    - Need to educate administration
  - Schools too busy
    - Understaffed (nurses serve multiple schools)
    - Receptionist – too busy
  - May need to go through channels (red tape)
    - Not always able to contact schools directly
  - Lack of communication within school system itself
  - Lack of space
  - No follow up by providers/schools
    - Screening services only
    - Nurses/schools are not following up with results
    - Providers may need to do this themselves
  - Need place to refer/lack of access
    - At some point, parents need to take responsibility
  - Lack of complete restorative services
  - Some providers skim off Medicaid benefits then skip town
Inappropriate services are using up benefits for comprehensive/appropriate services

- Parents have oral health needs as well
  - No place to refer them
  - Not aware of importance of oral health

- Life in general can create obstacles
  - Circumstances
  - 2-3 jobs/lose job
  - Transportation
  - Cultural barrier
  - Language barrier

- Economics
  - Uninsured patients
  - Can’t pay small co-pay

- Insurance
  - Parents may not provide all information
  - Difficulty in contacting them
  - Parents – working
  - Learning curve on how to secure a provider license and how to file claims
  - Last names of Hispanic children – may have two last names – can’t find them in the system

- Permission Forms
  - Too wordy/confusing/reading level too high
  - Need to use a Spanish translation to reflect local dialect

- School Based Health Centers
  - Do not always/often include oral health
  - Most are secondary (MS & HS)
  - FQHC – may not partner with independent providers
    - Competing for Medicaid population

- Lack of State coordination
  - No way to know what everyone else is doing

- SEALS data collection is time consuming
  - Would prefer to capture data electronically

- CHP+
  - Public health agencies can’t bill without a DDS/RDH license number to bill under
    - 1.5 years ago
      - Did not recognize that RDH can deliver services in a school setting

- Contract
  - When claim is denied for frequency, contract obligates provider to balance bill patient
  - Not a good business model, process requires too much time for little reimbursement
  - RDHs reticent to go under contract

- Website
  - Geared for private practices
  - RDH must identify themselves as a DDS

- State ID #
o CHP+ #s must be converted to Delta Dental #s
  • Delta Dental system cannot take alphas
  • Students can have two last names

II. Solutions to enhance delivery of dental sealants in a school setting
  o Good business model
  o Referral system
  o Enhanced communication
  o Parent advocates building relationships with school administration, staff
  o Policy changes for school districts: include oral health screening
  o Permission slips
    o Need a lot of white space
    o Simple wording
    o Spanish translation consistent with local dialect
  o Whistle blowing on providers that don’t comply with policy
  o Multiple search option to look up state ID #s
  o Central repository of programs

III. Wish List
  o Incorporating oral health educational program in the schools
Child Level Data Collection Form
Event Level Data Collection Form

SEALS
What’s the point?

- The purpose of SEALs is to do a cost effectiveness analysis on one group of kids.
- It tries to answer how many cavities have been averted and at what cost.
Child Level Data Collection Form

- Do Not Enter Information If:
  - Child is Absent From Screening
  - No Consent from Parent
Number 99

- Child Level Form Only
- Placeholder
- Use for any unknown value
Child Level Data Collection Form

- **Q #1: Program Name**
  - Example: “Healthy Smiles”

- **Q #2: Event/Site Name**
  - Usually name of School and Year.
  - “Lincoln Elementary 2010-11”

- **Q #3: Patient Name**
  - Will need this information to do retention checks

- **Q #4: ID #:** Up to 15 characters
Q #5: Sex
   - 0=Male,
   - 1=Female

Q #6: Grade in School
   - Second Graders

Q #7: DOB

Q #8: Age

Q #9: Race/Ethnicity
   - Check all that apply
Q #10: Special Needs Status

- Definition from School Nurse
- Chronic or Severe Asthma

“Special needs children require services beyond that required by children generally”
Q#11: Medicaid/SHCIP status:
- 0 = Medicaid
- 1 = SCHIP (CHP+)
- 2 = Neither
- 99 = Unknown
Part I: Screening

- Key: D = Decay, F = Filled, M = Missing, S = Sealant present, PS = Prescribe sealant, RS = Recommend reseal, No mark = no treatment recommended
- Signature and date line
- Comment Section
- Can make this form your own
  - Add baby teeth
  - Change key
Child Level Data Collection Form

All Teeth or Just First Molars?
Q #12: Untreated Cavities

- All Teeth

- BSS Criteria
  - Loss of \( \frac{1}{2} \) mm of tooth structure
  - Brown coloration of the walls

- Be conservative. *When in doubt, consider it sound.*

- Do count
  - Obvious breakdown of enamel surface
  - Retained root

- Do not count
  - Chipped tooth (unless decay present)
  - White Spot Lesions
  - Stained pits and fissures
Child Level Data Collection Form

- Use of Explorer
  - Without Pressure
  - Feel for Cavitation
  - Visual Inspection

- WHO (or PSR) probe
  - .5mm ball on tip
Examples of Untreated Decay
Child Level Data Collection Form

Retained Root
Q #13: Caries Experience

- All teeth
- Treated or untreated decay
- BSS
  - Include: Fillings, Crowns*, Missing Teeth*, and Extractions**
    - * Due to decay, not from trauma or ortho.
    - **Strict BSS criteria tries to make it easier. Limits view of extractions to first permanent molars. Key: Due to Decay?
Q #14: Sealants Present

- BSS Criteria
  - Permanent molar only
  - Partially retained OK
  - *When in doubt, consider it sealed*
Q #15: Treatment Urgency

- All Teeth
- BSS
  - 3 levels based on how soon a child should visit the dentist for a clinical diagnosis and any necessary treatment:
    - No obvious problem – Code 0
    - Early care needed – Code 1
    - Urgent need – Code 2
**Child Level Data Collection Form**

- **Code 0** = No obvious problem
  - Regular check up
  - What about untreated decay on a primary tooth?
**Code 1 = Early Dental Care**

- **Next visit**
  - Several weeks

- **Examples of conditions**
  - Decayed teeth WITHOUT pain, infection or swelling.
  - Spontaneously bleeding gums
  - Suspicious white or red soft tissue areas
  - Broken or missing fillings
  - What about rampant decay?
**Code 2 = Urgent/Emergency**

- Within 24-48 hours
- Signs of:
  - Pain
  - Infection
  - Swelling
  - Soft tissue ulceration of more than 2 week duration
- Most common reason for urgent referral?
**Q #16: Referred for Treatment**

- **All Teeth**
- **Includes**
  - Code 1 or Code 2 on BSS
  - Restorative, extraction, pain or lesion
- **Does not include**
  - Routine care
  - Orthodontics
Q #17: Decayed or Filled Teeth

- a = First molars only
- b = Second molars only
- Any place on the tooth
- Count number of “teeth” not “surfaces”
- BSS criteria
Section II: Preventive Services

- Mark teeth where sealants were placed with an “S”
- Provider Signature and Date
- Comment section
Q #18: Number of Teeth Sealed

- a = first molars
- b = second molars
- c = other

*When in doubt, consider it sound and seal.*
Evidence-based Clinical Recommendations for the use of pit-and-fissure sealants. A report of the American Dental Association Council on Scientific Affairs
Child Level Data Collection Form

Sound Teeth
Child Level Data Collection Form

Sound Teeth
Q #18 (continued)

- Count only sealants placed by your program
- Occlusal surface only
- Do not count = Buccal pit, distal pit, or lingual groove sealants

Theoretically speaking....
Child Level Data Collection Form

Q #19: Fluoride TX
- 0 = none
- 1 = varnish
- 2 = gen/foam/rinse
Section III. Follow-Up

- Mark teeth where sealants were retained with an R
- Provider’s Signature and Date
- Comment Section
Number of Teeth Retaining a Program Sealant

- Information follow the cohort (current 2nd grade class). You will use this form for two years (first at screening and sealant placement and then at retention check).
- First year = 99, placeholder
- At retention check:
  - Edit to reflect actual number of sealants retained by your program. Do not count sealants delivered by a different program.
- Permanent molars only
- Partially retained are OK
- Advantages of performing retention checks
  - Less variation of results when a larger sample is taken
  - Negative results average out
- What if part of occlusal surface is decayed?
Q #21: Subsequent Visit for Restorative TX

- 0 = No  1 = Yes
- First year = 99
- Second year = Yes or No
  - Was tx done?
  - Not just any treatment… look for conditions your program referred for. Good records are key.
- Pairs with question 16
  - Used to calculate % of successful referrals for tx
- What if you did **not** refer but patient comes back with fillings and/or braces?
Event Level Data Collection Forms
SEALS Event Level aids in calculation of societal costs (more than just out-of-pocket expenses) of a single sealant event.

One of the main goals of SEALS software is to establish the cost-effectiveness of the sealant program so that policy makers, funders, etc. have information helpful for making efficient choices regarding use of scarce resources.
Event Level Data Collection Form

- General Statements:
  - Do not use 99
  - All information follows one class
  - Will use this form for two years
Event Level Data Collection Form

- **Q #1**: Program Name
- **Q #2**: Event Name
  - Name of School Or Location
- **Q #3**: School Year
  - 4 digit year that the school year began
Q #4: Site Type

- 0 = School
- 1 = Community site
- 5 = Community Health Center
Q#5: Number of Dental Chairs

- a. Screening _____
- b. Sealant delivery ____
- c. Retention checks____

Use “0” if one phase has not been completed yet or will not be performed.

Do not use 99!
Q# 6: Total Hours Organizing the Event, not Spent at the Site: ____
   - Quarter hour increments using decimals

Q #7: Total Time Spent at Site for:
   - a. screening____
   - b. sealant delivery____
   - c. retention rate checks____
   - d. setup and breakdown/cleanup____
   - Example: 8:00 to 10:00 = 2 hours
Q #8: Number of Child Hours of Oral Health Education Offered

- Can include education directed at the whole school
- Multiply the length of each education session by the number of children in attendance.
  - $\frac{1}{2}$ hour x 60 students plus 1 hour x 20 students = 50 hours.
- Education done at chair side may also be included.
Event Level Data Collection Form

Q #9: Event Dates

- a. Screening: _______
- b. Sealant placement/fluoride delivery: _______
- c. Follow-up (e.g. retention check, follow up on referral): _______

- Enter in 8 digit format including slashes (08/10/2010)
- Enter 12/31/1998 as the date for phases of the program that have not yet or will not occur.
- You will not be able to enter the same date for sealant placement and retention check.
Q #10: Criteria used to Determine Caries Status

- 1 = BSS

- The BSS is the standard method of measure for the state

- Using the BSS criteria for SEALS data collection allows the information collected by SEALS to be utilized by other programs at the state level

- Both were developed by the CDC
Event Level Data Collection Form

**Total Personnel Hours:**
- a. All Dental Personnel
- b. All Other Personnel

- Q #11: Screening
- Q #12: Sealant Delivery
- Q #13: Retention Check
Q #14: Population targeted:
- 3 = \geq 50\% of children in free or reduced lunch program
- 4 = other target

Q #15: Grade Level “Targeted”
- 2^{nd} Grade
- Ok to occasionally see a K or 3^{rd} Grader

Q #16: Permanent Teeth Targeted
- First Molars
Event Level Data Collection Form

- Q #17: Number of Consent Forms Distributed
  - Enter “0” if unknown

- Q #18: Type of Consent
  - 0 = Positive
  - 1 = Passive
Q #19: Type of Sealant Material
- 0 = Light-cured

Q #20: Sealant Placement Procedure:
- 0 = 2-Handed
- 1 = 4-Handed
- 2 = Combination
Q #21 - #26: Value of Total Resources Used:
- Labor
- Equipment
- Instrument
- Administrative
- Cost of consumables
- Other
### SEALS Cost Calculation Workbook

**Purpose:**
- This workbook is designed to walk the SEALS user through the calculation of values for questions #21 - 26 of the SEALS Event-Level Data Collection Form.
- As such, it aids in the calculation of societal costs of a single sealant event.

#### A note on societal costs:
- Societal costs do not necessarily equal out-of-pocket costs. For example, if a parent volunteers to help with your event, the value of his/her labor is a resource used by your event. Even though it cost you nothing directly, this time is a valuable resource that is now not available for other productive activities. Costs are calculated in this way because one of the main goals of the SEALS software is to estimate the cost effectiveness of your sealant program to policy makers, funders, etc. Have information helpful for making efficient choices regarding use of scarce resources. Since sealant programs are usually cost effective relative to most public programs (and, not uncommonly cost saving) this is also useful information for you in justifying your program with hard numbers.

#### A note on the meaning and scope of event:
- In most cases an event corresponds to serving a particular school (although some sealant events may take the form of a sealant day at a dental hygiene school or Boys and Girls Club, etc.) from initial screening through retention checks and follow-ups (where applicable) for a specific cohort of children (for example, children who were in the 2nd and 6th grade in 2010).

Please read the "Workbook Instructions" tab before proceeding to the remaining tabs.
Hourly Rates of Professionals

Event Level Data Collection Form
### Healthcare Practitioner and Technical Occupations

<table>
<thead>
<tr>
<th>Occupation Code</th>
<th>Occupation Title</th>
<th>Employment</th>
<th>Median Hourly</th>
<th>Mean Hourly</th>
<th>Mean Annual</th>
<th>Mean RSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>29-000</td>
<td>Healthcare Practitioner and Technical Occupations</td>
<td>112,440</td>
<td>$29.57</td>
<td>$34.38</td>
<td>$71,520</td>
<td>1.4%</td>
</tr>
<tr>
<td>29-101</td>
<td>Chiropractors</td>
<td>730</td>
<td>$17.59</td>
<td>$22.90</td>
<td>$47,620</td>
<td>8.1%</td>
</tr>
<tr>
<td>29-102</td>
<td>Dentists, General</td>
<td>1,600</td>
<td>$62.18</td>
<td>$71.91</td>
<td>$149,560</td>
<td>10.9%</td>
</tr>
<tr>
<td>29-103</td>
<td>Orthodontists</td>
<td>170</td>
<td>$59.16</td>
<td>$65.88</td>
<td>$129,100</td>
<td>14.8%</td>
</tr>
<tr>
<td>29-1031</td>
<td>Dentists and Periodontists</td>
<td>730</td>
<td>$24.58</td>
<td>$29.04</td>
<td>$49,900</td>
<td>1.8%</td>
</tr>
<tr>
<td>29-1041</td>
<td>Optometrists</td>
<td>740</td>
<td>$34.93</td>
<td>$41.65</td>
<td>$86,640</td>
<td>9.9%</td>
</tr>
<tr>
<td>29-1051</td>
<td>Pharmacists</td>
<td>4,320</td>
<td>$53.09</td>
<td>$61.76</td>
<td>$107,670</td>
<td>13.5%</td>
</tr>
<tr>
<td>29-1061</td>
<td>Anesthesiologists</td>
<td>610</td>
<td>$ ( )</td>
<td>$ ( )</td>
<td>$ ( )</td>
<td>( )</td>
</tr>
<tr>
<td>29-1062</td>
<td>Family and General Practitioners</td>
<td>1,900</td>
<td>$88.40</td>
<td>$104,290</td>
<td>9.4%</td>
<td></td>
</tr>
<tr>
<td>29-1063</td>
<td>Internists, General</td>
<td>200</td>
<td>$73.38</td>
<td>$80.46</td>
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<td>6.2%</td>
</tr>
<tr>
<td>29-1064</td>
<td>Obstetricians and Gynecologists</td>
<td>940</td>
<td>$ ( )</td>
<td>$ ( )</td>
<td>$ ( )</td>
<td>( )</td>
</tr>
<tr>
<td>29-1065</td>
<td>Pediatricians, General</td>
<td>260</td>
<td>$73.36</td>
<td>$76.70</td>
<td>$165,220</td>
<td>8.1%</td>
</tr>
<tr>
<td>29-1066</td>
<td>Psychologists</td>
<td>270</td>
<td>$72.35</td>
<td>$70.71</td>
<td>$147,000</td>
<td>6.9%</td>
</tr>
<tr>
<td>29-1067</td>
<td>Surgeons</td>
<td>950</td>
<td>$ ( )</td>
<td>$ ( )</td>
<td>$ ( )</td>
<td>( )</td>
</tr>
<tr>
<td>29-1069</td>
<td>Physicians and Surgeons, All Other</td>
<td>3,100</td>
<td>$89.74</td>
<td>$106,600</td>
<td>5.3%</td>
<td></td>
</tr>
<tr>
<td>29-1071</td>
<td>Physician Assistants</td>
<td>1,420</td>
<td>$39.56</td>
<td>$46.26</td>
<td>$96,850</td>
<td>3.0%</td>
</tr>
<tr>
<td>29-1081</td>
<td>Pediatricians</td>
<td>1,100</td>
<td>$61.92</td>
<td>$68.04</td>
<td>$141,520</td>
<td>5.3%</td>
</tr>
<tr>
<td>29-1111</td>
<td>Registered Nurses</td>
<td>41,750</td>
<td>$31.74</td>
<td>$32.12</td>
<td>$66,000</td>
<td>0.7%</td>
</tr>
<tr>
<td>29-1121</td>
<td>Audiologists</td>
<td>370</td>
<td>$28.44</td>
<td>$28.21</td>
<td>$58,670</td>
<td>6.1%</td>
</tr>
<tr>
<td>29-1122</td>
<td>Occupational Therapists</td>
<td>1,900</td>
<td>$32.50</td>
<td>$33.30</td>
<td>$69,990</td>
<td>3.6%</td>
</tr>
<tr>
<td>29-1123</td>
<td>Physical Therapists</td>
<td>3,290</td>
<td>$31.62</td>
<td>$33.85</td>
<td>$69,780</td>
<td>2.8%</td>
</tr>
<tr>
<td>29-1124</td>
<td>Radiation Therapists</td>
<td>280</td>
<td>$39.23</td>
<td>$39.55</td>
<td>$82,270</td>
<td>5.1%</td>
</tr>
<tr>
<td>29-1125</td>
<td>Recreational Therapists</td>
<td>170</td>
<td>$19.29</td>
<td>$19.33</td>
<td>$40,210</td>
<td>3.3%</td>
</tr>
<tr>
<td>29-1126</td>
<td>Respiratory Therapists</td>
<td>1,420</td>
<td>$26.19</td>
<td>$29.99</td>
<td>$54,060</td>
<td>0.8%</td>
</tr>
<tr>
<td>29-1127</td>
<td>Speech-Language Pathologists</td>
<td>2,520</td>
<td>$36.83</td>
<td>$37.82</td>
<td>$79,880</td>
<td>2.4%</td>
</tr>
<tr>
<td>29-1129</td>
<td>Therapists, All Other</td>
<td>390</td>
<td>$28.07</td>
<td>$27.93</td>
<td>$58,000</td>
<td>1.7%</td>
</tr>
<tr>
<td>29-1131</td>
<td>Veterinarians</td>
<td>1,500</td>
<td>$35.87</td>
<td>$35.90</td>
<td>$74,670</td>
<td>4.7%</td>
</tr>
<tr>
<td>29-1199</td>
<td>Health Diagnosing and Treating Specialists, All Other</td>
<td>620</td>
<td>$29.15</td>
<td>$37.63</td>
<td>$78,260</td>
<td>15.1%</td>
</tr>
<tr>
<td>29-1201</td>
<td>Medical and Clinical Laboratory Technologists</td>
<td>3,120</td>
<td>$27.27</td>
<td>$28.68</td>
<td>$55,920</td>
<td>1.5%</td>
</tr>
<tr>
<td>29-1202</td>
<td>Medical and Clinical Laboratory Technologists</td>
<td>1,900</td>
<td>$16.50</td>
<td>$17.56</td>
<td>$36,530</td>
<td>1.4%</td>
</tr>
</tbody>
</table>
Event Level Data Collection Form

Minimum Wage
Event Level Data Collection Form

Consumer Price Index
Event Level Data Collection Form
Event Level Data Collection Form

Mileage Reimbursement Rates

Privately Owned Vehicle (POV) Mileage Reimbursement Rates

Current Privately Owned Vehicle Reimbursement Rates

Modes of Transportation | Effective/applicability Date | Rate per mile
--- | --- | ---
Airplane* | January 1, 2010 | $1.29
Automobile | | |
If no Government Owned Automobile available | January 1, 2010 | $0.50
If Government Owned Automobile available | February 4, 2006 | $0.20
If committed to use Government Owned Automobile | February 4, 2006 | $0.125
Motorcycle | January 1, 2010 | $0.47

* Airplane nautical miles (NMls) should be converted into statute miles (SMls) or regular miles when submitting a voucher using the formula 1 NMl equals 1.107784 SMls. You can also use the link to DirectRate.com (a non-government website) to assist you in converting NMls to SMls or SMls to NMls.

The shortcut to this page is www.gsa.gov/mileage.

Last Updated 07/07/2010
Event Level Data Collection Form

- What are you waiting for?
Send three reports to the State
- Child Level Data
- Event Level Data
- Program Report

Program Report
- Medicaid Reimbursement
- State Grant $
Guidelines for Completion Of
Child Level
Data Collection Forms

Updated 8/04/10

General Notes:

1. “99” is used for data that is missing or has not yet been collected. Will generally only be used on question #20 and #21.
2. “99” can only be used on the Child Level Data Collection Form.
3. If a child is absent for the screening, do not enter the child’s information into SEALs.
4. If permission is not given by the parent for the child to be screened, do not enter the child’s information into SEALs even if demographic information is available. We do not have the parents’ permission to use it.

Questions:

1. Program Name:
   a. Name of the sealant program or clinic name
2. Event/Site Name:
   a. Name of the school or location where the event is taking place
   b. Each individual event should be assigned a single unique name
   c. Use school year identifier in event name (2010-2011) in case form is not signed by hygienist
3. Patient Name:
4. ID#:
   a. Enter a unique ID number for each child
   b. May be up to 15 characters in length
5. Child’s Sex:
   a. Entry must be numeric (0 = Male, 1 = Female)
6. Grade in School:
   a. Enter 0 for kindergarten.
   b. Only grades 0 through 12 are accepted.
   c. Only record data for children in second grade
7. DOB: Date of Birth
8. Age:
   a. Only ages between 4 and 18 are accepted
9. Race/Ethnicity:
   a. Check all that apply.
   b. Press the spacebar once to “check” and again to “uncheck” the highlighted category.
   c. If race/ethnicity data is missing on the paper form, check the last box in the software for “Race/ethnicity data missing”.

10. Special Needs Status: (0 = No, 1 = Yes)
    a. This designation should come from the school nurse.
    b. Chronic or severe asthma, one that requires frequent medical care (trips to a doctor or emergency room, school nurse, etc.), falls under the special needs status. Behavioral issues (ex: misbehaving at the time of sealant placement) should not be counted.
    c. Children with special health care needs are defined by the Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau as: “…those who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally.”

11. Medicaid/SCHIP status (0= Medicaid, 1=SCHIP, 2=neither, 99=unknown).
    a. SCHIP is the same as CHP+
    b. A child cannot have Medicaid and SCHIP at the same time.
    c. Try to obtain information to accurately complete this question.

12. Untreated Cavities (0 = No untreated cavities 1= Untreated cavities present)
    a. Includes any cavities in any teeth. Look at all teeth in the mouth.
    b. Use BSS criteria
       1. Permanent or primary teeth with
          a. A loss of at least ½ mm of tooth structure at the enamel surface (cavitation) and
          b. Brown to dark-brown coloration of the walls of the cavity
          c. Be conservative. When in doubt, assume the tooth is sound.
          d. Count obvious breakdown of enamel surface. Only cavitated lesions.
          e. Calibrate using PSR or WHO probe (.5 mm ball on the end).
          f. An explorer may also be used to gently confirm cavitations or breaks in the continuity of the surface; do not use a sharp explorer under force.
          g. Do not count white spot lesions
          h. Do not count stained pits and fissures
          i. Retained root. Assume the tooth was destroyed by caries and code as untreated decay.
          j. Chipped tooth from trauma? Not decay.

13. Caries Experience: (0= No caries experience, 1 = Caries Experience)
    a. Includes treated or untreated decay in any teeth. Look at all teeth in the mouth.
    b. Includes fillings, crowns (placed as a result of decay, not trauma) and missing teeth as a result of decay.
    c. If it can be determined that deciduous teeth were extracted due to decay, count as caries experience.
14. Sealants Present: (0=No Sealants, 1= Sealant Present)
   a. Based on BSS criteria
      i. Any amount of sealant that is detected on a permanent molar only.
      ii. Include partially retained sealants.
      iii. When in doubt, assume it is sealed.

15. Treatment Urgency: (0 = No, 1=Early Dental Care, 2=Urgent Care)
   a. Look at all teeth in the mouth
   b. Use BSS criteria
      i. Code 0 = No obvious problem.
         1. The next dental visit would be the next regular check-up.
         2. Untreated decay on a primary tooth ready to exfoliate is classified as untreated decay with no obvious problem.
      ii. Code 1 = Early dental care is needed. Next dental visit should occur within several weeks or before next regularly scheduled dental appointment.
         1. Examples:
            a. Decayed teeth without pain, infection, swelling
            b. Individuals with spontaneous bleeding gums
            c. Suspicious white or red soft tissue areas
            d. Broken or missing filling
      iii. Code 2 = Urgent/Emergency need for dental care. Next dental visit within 24-48 hours.
         1. Signs or symptoms of:
            a. Pain
            b. Infection
            c. Swelling
            d. Soft tissue ulceration of more than two weeks duration
            e. Most common reason is an abscess

16. Referred for Treatment: (0 = No, 1 = Yes)
   a. Look at all teeth in the mouth
   b. Does not apply to routine dental exams or referral for ortho.
   c. Includes restorative, extraction, pain or lesion.
   d. Based on the treatment urgency in question 15
      i. Did you refer the child for treatment? Refer those situations that fall into Code 1 or Code 2 on BSS.
   e. What counts as a referral?
      i. Parent notification of child’s need
      ii. A list of dental providers may accompany parent notification
   f. Ties into Question 21.

17. (Number of) Decayed or Filled Teeth: (a. 1st permanent molars, b. 2nd permanent molars)
   a. This population (second grade students) will not have 2nd permanent molars so “b” should always be zero.
   b. Only looking at first permanent molars for “a”
      i. Do not count surfaces. Count the number of teeth.
      ii. Answers can only be 0, 1, 2, 3, or 4.
      iii. Use BSS criteria
         1. Buccal pit or lingual groove decay or fillings would apply.
18. Number of Teeth Sealed among: (a. 1st permanent molars b. 2nd permanent molars c. other)
   a. Indicate the number sealants placed on first molars by your program at this event.
   b. If the child has been screened but is absent on the date of sealant placement, enter “zero” for the number of sealants placed.
   c. Focus is on the occlusal surface only
      i. Do not count buccal pit or lingual groove sealants.
   d. Only able to enter the numbers 0, 1, 2, 3 or 4.
   e. This population will not have 2nd molars so “b” should always be zero.
   f. “C” for “other” refers to any other sealant your program placed. Includes primary dentition.
   g. Note: Theoretically, it is possible to have four decayed teeth (buccal pit, distal pit, etc.) and place four sealants. Remember to be conservative when determining decay (per BSS). When in doubt, assume the tooth is sound and seal the tooth.
      1. The WHO (or PSR) probe can be used as a guide. The ball shaped tip is .5mm in diameter.
      2. An explorer may also be used to gently confirm cavitations or breaks in the continuity of the surface; do not use a sharp explorer under force.

19. Fluoride treatment received: (0 = none, 1 = varnish, 2 = gel/foam/rinse)

20. Number of teeth retaining a program sealant:
   a. This information follows the cohort (current 2nd grade class)
   b. The first year, on the date of sealant placement, enter “99”
      i. “99” acts as a place holder
   c. Before conducting follow up retention checks, pull the Child Level Data Forms used the first year. Use these forms to record sealant retention information for this student population. In most cases, these students will now be in the third grade.
   d. After completing the retention checks, record the new information in SEALS by editing “99” to reflect the actual number of sealants (0 – 4) that were placed and retained by your program.
   e. Do not count sealants delivered privately or by another program.
   f. BSS criteria:
      i. Any amount of sealant that is detected on a permanent molar only.
      ii. Include partially retained sealants
   g. Advantages of performing retention checks on all eligible children in the program:
      i. Less variation of results when a larger sample is taken.
      ii. Negative results will average out.

21. Subsequent visit for restorative treatment: (0=No, 1=Yes, 99= Unknown, No follow-up performed by program)
   a. This information follows the cohort (current 2nd grade class)
   b. The first year, on the date of sealant placement, enter “99”
   c. This question pairs with question #16. The questions are collectively used to calculate the percentage of successful referrals for treatment.
   d. If you did NOT refer a child for treatment, but the child received a filling (or other restorative treatment) by the time a retention check was made, you would still enter “0”.
Guidelines for Completion Of

Event Level

Data Collection Form

Update 8/10/10

General Statements:

1. Do not use “99” as a placeholder when completing this form. If you enter “99” for missing data in the event form, all calculations will be performed using 99 as the value.
2. You must enter all the event level data for a given event at once. You will receive an error message if any fields are left blank.
3. All information entered into this form follows one class, one cohort, the current second grade class.
4. The purpose of SEALS is to do a cost effectiveness analysis on one group of kids. It tries to answer how many cavities have been averted (as a result of the program) and at what cost.
5. When generating the program report, Medicaid Reimbursement and State Grant boxes on the front screen must be filled in. To address the issue of delayed reimbursement, Medicaid reimbursement totals can be added at time of retention checks.

Questions:

1. Program Name
2. Event Name
   a. Name of the school or location where the event is taking place
3. School Year
   a. Enter the 4-digit year that the school year began. 04-05 would be entered as 2004.
4. Site type:
   a. 0 = School
   b. 1 = Community site
   c. 5 = Community health center
5. Number of dental chairs used for: (a. screening b. sealant delivery c. retention)
   a. Enter the number of chairs used for each phase of screening, sealant placement and retention checks.
   b. Use “0” if one phase has not been done yet or will not be performed.
   c. Retention checks refer to the current 2nd grade class and will be performed the following year in most cases.
      i. “0” will be entered the first year
ii. The field can be edited to reflect the actual number of chairs used when the retention check is performed at a later date.

6. Total hours organizing event, not spent at site:
   a. Enter times in quarter hour increments using the decimals .25, .5 and .75
   b. Focus on time spent when NOT physically at the site
   c. Qualifying activities: Pre-planning, organizing, data entry, billing, grant and/or report writing, scheduling staff, supply management, etc.

7. Total time spent at site (in hours) for:
   a. Enter times in quarter hour increments using the decimals .25, .5 and .75
   b. Enter 0 for “c. retention checks” if not performed. This information will need to be changed for this cohort (or current second grade class) once retention checks are performed the following year.

8. Number of child hours of oral health education offered:
   a. To calculate the number of child hours of oral health education offered, multiply the length of each educational session by the number of children in attendance.
   b. For example: If a half hour was spent with an assembly of 60 students, and one hour was spent in a classroom of 20 students, the number of child hours of oral health education offered is (.5 x 60) plus (1 x 20), or 50 hours.
   c. Education done at chair side may also be included.

9. Event dates:
   a. Choose a single representative date for each of the following: (a. screening b. sealant delivery c. retention rate checks d. setup and breakdown/cleanup)
   b. Dates should be entered in 8-digit format, including slashes.
      i. For example, January 1, 2000 should be entered 01/01/2000.
   c. Enter 12/31/1998 as the date for phases of the program that have not yet or will not occur.
   d. You will not be able to enter the same date for “b. sealant placement” and “c. retention check”. It is assumed retention checks on this cohort will occur at a later date.

10. Criteria used to determine caries status:
    a. State of Colorado uses the BSS so enter “1”
    b. Both SEALS and the BSS were developed using the same format by the CDC and are made to function together.
    c. The BSS is the standard method of measure for the state. Colorado conducts the BSS statewide every 3-5 years. Using the BSS criteria for SEALS data collection allows the information collected by SEALS to be utilized by other programs at the state level.

11. 12. and 13. Total Personnel Hours for screening, sealant delivery and retention check: (a. All dental personnel hours and b. All other personnel hours)
    a. Enter times in quarter hour increments using the decimals .25, .5 and .75
    b. “Dental” personnel include dentists, hygienist, and dental assistants
c. “Other” personnel include data entry clerks, parent volunteers, or other non-dental personnel.

d. You can enter “0” if there are no hours recorded for one area, but you must enter something in each box.

14. Population targeted:
   a. The CDPHE targets schools with $\geq 50\%$ of children in free or reduced lunch program or “3”
   b. Other programs may use “4” for “other”
      i. Rural programs
      ii. Mobile van

15. Grade level(s) targeted (Check all that apply):
   b. 2nd grade

16. Permanent teeth targeted (Check all that apply):
   a. First molars

17. Number of consent forms distributed:
   a. Enter the number of consent forms sent, or enter “0” if this value is unknown
   b. If you enter “99” for an unknown quantity, it will reflect 99 consent forms distributed.

18. Type of consent: (0 = positive, 1 = passive)
   a. Positive consent requires that a parent or guardian sign and return a consent form before services can be delivered.
   b. Passive consent means that a parent must opt out of the event by signing a form stating that they do not want their child to participate.
   c. Each school district in Colorado can determine how they want this done. Follow school policy.

19. Type of sealant material used:
   a. Evidenced-based research has shown light cured sealant material to be the best option at this time and is recommended by the CDPHE. This must be recorded numerically: 0 = light cured.

20. Sealant placement procedure: (0 = 2-handed, 1 = 4-handed, 2 = Combination)
   a. Combination refers to the fact that both techniques were used in the same day.
   b. Research supports the use of a four-handed technique when resources allow

21-26 Value of total resources used, by category:
   a. Enter the amount in dollars without the dollar sign.
   b. Detailed instructions are included in the SEALS manual in Appendix C.
   c. Another valuable resource is the Cost Calculation Worksheet, an electronic worksheet that will perform the calculations for you.
   d. Total resources should include the cost of retention checks for the cohort. The figures must be updated after retention checks are completed.
Targeting CoPCOH efforts for the benefit of Colorado’s children

February 2, 2012
Introduction

The vision of the Colorado Partnership for Children’s Oral Health (CoPCOH) is to ensure that all Colorado children, regardless of where they live or their insurance status, have access to preventive oral care and a dental home starting at one year of age. As such, CoPCOH retained the Colorado Health Institute to analyze and quantify barriers to preventive dental care at the county level. As the two organizations began to analyze available data, three barriers to care were identified:

1. Enrollment of children in Medicaid who qualify for dental visits
2. Utilization of preventive dental services once enrolled in Medicaid
3. The lack or dentists who a) provide care to Medicaid children and b) are willing to provide care to children and pregnant women.

This report outlines baseline data for three categories of indicators: enrollment of children in Medicaid; Medicaid children’s utilization of oral health services; and the oral health workforce. Based on these data, the report categorizes counties based on high, medium and low need for CoPCOH outreach efforts.

Methodology

DATA SOURCES

To determine which counties/regions to target with this initiative, the Colorado Health Institute (CHI) used the following data sources:

- The Centers for Medicaid and Medicare Services (CMS) Early Periodic Screening, Diagnosis and Treatment (EPSDT) 416 report (referred to as the “CMS 416 report”). Data from the 416 report were calculated on a county basis by the Colorado Department of Health Care Policy and Financing (HCPF) and provided to CHI. The data include HCPF fee-for-service paid claims and clients who have had a fee for service claim. EPSDT clients who belong to HMOs are not counted and services administered to those clients are not included. In addition, there is a possibility that a client may have lived in multiple counties during the time period reported. If this occurred, one service may be counted each time a client is reported to live in a county. For example, if a child received two preventive visits and lived in three different counties during the year, then the number of preventive visits for that client will be six. The data are from federal fiscal year 2009-10, which refers to the year beginning October 1, 2009, and ending September 30, 2010. “Not available” indicates that the data were not provided by HCPF due to small numbers (i.e., cell sizes fewer than 30 individuals).

- CHI analysis of the 2010 American Community Survey (ACS), U.S. Census Bureau.

- The 2011 Peregrine Management Corporation provider database. The database includes any dentist who filed an insurance claim. Due to the difficulty of collecting a comprehensive database of providers, the Peregrine database may slightly underestimate the number of dentists in a community. However, the Peregrine Management Corporation estimates that its database captures approximately 95% of the practicing dentists in Colorado.

• The Colorado Pregnancy Risk Assessment and Monitoring System (PRAMS), Colorado Department of Public Health and Environment (CDPHE). PRAMS is a population-based surveillance system designed to identify and monitor behaviors and experiences of women before, during or after pregnancy. CHI obtained the PRAMS data by querying the Colorado Health Information Dataset (http://www.cdphe.state.co.us/cohid/prams.html). Five years of data (2006-2010) were used. Due to small sample sizes, caution should be used when interpreting estimates.

INDICATOR NOTES, CAVEATS AND LIMITATIONS

The following indicators were analyzed by county:

Table 1. Enrollment
A. Total children ages 0-20. (Data source: Colorado State Demography Office)
B. Total individuals eligible for EPSDT for 90 continuous days. (Data source: CMS 416 report, Row 1B)
C. Number of low-income children (ages 0-18) eligible but not enrolled (EBNE) in Medicaid. (Data source: CHI analysis of the 2010 American Community Survey) This indicator includes the estimated number of children who are uninsured and eligible for Medicaid given their family income, age and documentation or citizenship status. Due to limitations of the American Community Survey, this indicator, unlike the other indicators, is limited to the low-income child category. It does not capture children EBNE in other Medicaid eligibility categories such as those with disabilities or in foster care.

Table 2. Utilization
D. Total individuals eligible for EPSDT for 90 continuous days getting any dental or oral health services by a dentist or registered dental hygienist. (Data source: CMS 416 report, Row 12G) Services provided by independent dental hygienists are included in this calculation.
E. Proportion of individuals eligible for EPSDT for 90 continuous days receiving dental or oral health services by a dentist or registered dental hygienist. (Data source: CMS 416 Report, Row 12G divided by CMS 416 Report, Row 1B)
F. Total individuals eligible for EPSDT for 90 continuous days getting any Medicaid oral health services by a non-dentist provider (Data source: CMS416 report, Row 12F) This includes pediatric and family clinicians.
G. Proportion of individuals eligible for EPSDT for 90 continuous days getting dental or oral health services from a non-dentist provider. (Data source: CMS 416 Report, Row 12F divided by CMS 416 Report, Row 1B)
H. Proportion of women who visited a dentist or dental clinic during or after pregnancy. (Data source: 2006-10 PRAMS)
Table 3. Workforce
I. Number of practicing dentists (Data source: Peregrine Management Corporation) Practicing dentists include dentists listing their specialty as “general practice dentistry” or “pediatric dentistry.”
J. Number of practicing dentists who accept Medicaid patients. (Data source: Peregrine Management Corporation) Any dentist who accepts any Medicaid patient is included in this category; for example, a provider who accepts only one Medicaid patient would be included.
K. Number of practicing dentists who do not accept Medicaid patients. (Data source: Peregrine Management Corporation) (Column I – Column J)

Table 4. Ranking of Medicaid enrollment, utilization and workforce indicators
Note: For all columns in this table, CHI analyzed the data and divided the counties into thirds (i.e., top 33%, middle 33% and bottom 33%). Red indicates the highest need (or opportunity) for CoPCOH outreach efforts. Yellow indicates average need, and green indicates the least amount of need.
L. Total individuals eligible for EPSDT for 90 continuous days per 1,000 child population. (Column B divided by Column A, multiplied by 1,000)
M. Proportion of individuals eligible for EPSDT for 90 continuous days receiving dental or oral health services by a dentist or registered dental hygienist. (Identical to Column E)
N. Number of practicing dentists who accept Medicaid per 1,000 individuals eligible for EPSDT for 90 continuous days. (Column J divided by Column B, multiplied by 1,000)
O. Number of practicing dentists who do not accept Medicaid per 1,000 individuals eligible for EPSDT for 90 continuous days. (Column K divided by Column B, multiplied by 1,000)

Results (see next page)

1 Colorado Department of Public Health and Environment. http://www.cdphe.state.co.us/hs/prams/
<table>
<thead>
<tr>
<th>County</th>
<th>A. Total children ages 0-20</th>
<th>B. Total individuals eligible for EPSDT for 90 continuous days*</th>
<th>C. Number of low-income kids EBNE in Medicaid</th>
<th>D. Total individuals eligible for EPSDT for 90 continuous days receiving any dental or oral health services by a dentist or registered dental hygienist.</th>
<th>E. Proportion of individuals eligible for EPSDT for 90 continuous days receiving dental or oral health services by a dentist or registered dental hygienist. (D / B)</th>
<th>F. Total individuals eligible for EPSDT for 90 continuous days getting any Medicaid oral health services by a non-dentist provider. (F / B)</th>
<th>G. Proportion of individuals eligible for EPSDT for 90 continuous days receiving dental or oral health services by a non-dentist provider. (F / B)</th>
<th>H. Proportion of pregnant women who visited a dentist or dental clinic during or after pregnancy</th>
<th>I. Number of practicing dentists</th>
<th>J. Number practicing Medicaid patients</th>
<th>K. Number practicing who do NOT accept Medicaid patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>2010</td>
<td>FFY 2009-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2012</td>
<td>2012</td>
<td>2012</td>
</tr>
<tr>
<td>Adams</td>
<td>143,813</td>
<td>49,347</td>
<td>5,628</td>
<td>24,882</td>
<td>50%</td>
<td>Not available</td>
<td>Not available</td>
<td>0.3%</td>
<td>33.9%</td>
<td>196</td>
<td>86</td>
</tr>
<tr>
<td>Alamosa</td>
<td>4,888</td>
<td>2,262</td>
<td>118</td>
<td>995</td>
<td>44%</td>
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<td>Not available</td>
<td>32.8%</td>
<td>11</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Arapahoe</td>
<td>167,767</td>
<td>43,158</td>
<td>3,761</td>
<td>20,877</td>
<td>48%</td>
<td>153</td>
<td>0.4%</td>
<td>42.8%</td>
<td>351</td>
<td>87</td>
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<td>Baca</td>
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<td>352</td>
<td>36</td>
<td>99</td>
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<td>Not available</td>
<td>Not available</td>
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<td>3</td>
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<tr>
<td>Bent</td>
<td>1,244</td>
<td>569</td>
<td>77</td>
<td>251</td>
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<td>Not available</td>
<td>Not available</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Boulder</td>
<td>81,568</td>
<td>13,869</td>
<td>2,308</td>
<td>6,608</td>
<td>48%</td>
<td>32</td>
<td>0.2%</td>
<td>54.8%</td>
<td>206</td>
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<td>Broomfield</td>
<td>16,485</td>
<td>1,839</td>
<td>33</td>
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<td>42%</td>
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<td>2</td>
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<td>Chaffee</td>
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<td>33.0%</td>
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<td>Cheyenne</td>
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<td>128</td>
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<tr>
<td>Clear Creek</td>
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<td>383</td>
<td>22</td>
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<td>46%</td>
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<td>Conejos</td>
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<td>1,079</td>
<td>66</td>
<td>535</td>
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<td>Not available</td>
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<tr>
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<td>48%</td>
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<td>Not available</td>
<td>Not available</td>
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<td>0</td>
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<td>Crowley</td>
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<td>466</td>
<td>71</td>
<td>195</td>
<td>42%</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Custer</td>
<td>804</td>
<td>297</td>
<td>39</td>
<td>139</td>
<td>47%</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Delta</td>
<td>7,767</td>
<td>2,577</td>
<td>302</td>
<td>1,119</td>
<td>43%</td>
<td>Not available</td>
<td>Not available</td>
<td>29.6%</td>
<td>10</td>
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<tr>
<td>Denver</td>
<td>152,879</td>
<td>64,709</td>
<td>6,934</td>
<td>35,269</td>
<td>55%</td>
<td>76</td>
<td>0.1%</td>
<td>37.2%</td>
<td>297</td>
<td>70</td>
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</tr>
<tr>
<td>Dolores</td>
<td>501</td>
<td>146</td>
<td>20</td>
<td>62</td>
<td>42%</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Douglas</td>
<td>94,998</td>
<td>5,853</td>
<td>304</td>
<td>2,159</td>
<td>37%</td>
<td>38</td>
<td>0.6%</td>
<td>59.4%</td>
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<td>Eagle</td>
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<td>2,670</td>
<td>139</td>
<td>969</td>
<td>36%</td>
<td>90</td>
<td>3.4%</td>
<td>39.7%</td>
<td>22</td>
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<tr>
<td>El Paso</td>
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<td>45,300</td>
<td>5,246</td>
<td>21,881</td>
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<td>92</td>
<td>0.2%</td>
<td>41.8%</td>
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<tr>
<td>Elbert</td>
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<td>932</td>
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<td>Fremont</td>
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<td>3,561</td>
<td>510</td>
<td>1,894</td>
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<tr>
<td>Garfield</td>
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<td>4,709</td>
<td>522</td>
<td>1,830</td>
<td>39%</td>
<td>45</td>
<td>1.0%</td>
<td>32.3%</td>
<td>29</td>
<td>7</td>
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<tr>
<td>Gilpin</td>
<td>1,068</td>
<td>245</td>
<td>11</td>
<td>83</td>
<td>34%</td>
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<td>Not available</td>
<td>Not available</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Grand</td>
<td>3,411</td>
<td>614</td>
<td>41</td>
<td>178</td>
<td>29%</td>
<td>Not available</td>
<td>Not available</td>
<td>34.7%</td>
<td>3</td>
<td>1</td>
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<tr>
<td>Gunnison</td>
<td>3,862</td>
<td>634</td>
<td>47</td>
<td>236</td>
<td>37%</td>
<td>Not available</td>
<td>Not available</td>
<td>36.3%</td>
<td>6</td>
<td>1</td>
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<tr>
<td>Hinsdale</td>
<td>181</td>
<td>52</td>
<td>3</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Huerfano</td>
<td>1,389</td>
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<td>372</td>
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<td>Not available</td>
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<td>Not available</td>
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<td>1</td>
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<tr>
<td>Jackson</td>
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<td>19</td>
<td>40</td>
<td>43%</td>
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<td>Not available</td>
<td>Not available</td>
<td>0</td>
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<tr>
<td>Jefferson</td>
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<td>25,493</td>
<td>3,686</td>
<td>12,564</td>
<td>49%</td>
<td>139</td>
<td>0.5%</td>
<td>43.0%</td>
<td>307</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Kiowa</td>
<td>354</td>
<td>107</td>
<td>21</td>
<td>42</td>
<td>39%</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Kit Carson</td>
<td>2,108</td>
<td>657</td>
<td>103</td>
<td>218</td>
<td>33%</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>0</td>
<td>0</td>
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<tr>
<td>La Plata</td>
<td>13,165</td>
<td>2,880</td>
<td>477</td>
<td>1,223</td>
<td>42%</td>
<td>Not available</td>
<td>Not available</td>
<td>49.2%</td>
<td>33</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Lake</td>
<td>2,118</td>
<td>805</td>
<td>26</td>
<td>352</td>
<td>44%</td>
<td>Not available</td>
<td>Not available</td>
<td>22.5%</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>County</td>
<td>Year</td>
<td>A. Total children ages 0-20</td>
<td>B. Total individuals eligible for EPSDT for 90 continuous days</td>
<td>C. Number of low-income kids EBNES in Medicaid</td>
<td>D. Total individuals eligible for EPSDT for 90 continuous days getting any dental or oral health services by a dentist or registered dental hygienist.</td>
<td>E. Proportion of individuals eligible for EPSDT for 90 continuous days receiving dental or oral health services by a dentist or registered dental hygienist. (D / B)</td>
<td>F. Total individuals eligible for EPSDT for 90 continuous days getting any Medicaid oral health services by a non-dentist provider.</td>
<td>G. Proportion of individuals eligible for EPSDT for 90 continuous days getting a dental or oral health services by a non-dentist provider. (F / B)</td>
<td>H. Proportion of pregnant women who visited a dentist or dental clinic during or after pregnancy</td>
<td>I. Number of practicing dentists</td>
<td>J. Number practicing who accept Medicaid patients</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
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<td>--------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Larimer</td>
<td>2010</td>
<td>81,933</td>
<td>16,372</td>
<td>901</td>
<td>7,784</td>
<td>48%</td>
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<td>Not available</td>
<td>48.5%</td>
<td>161</td>
<td>32</td>
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<tr>
<td>Las Animas</td>
<td>2010</td>
<td>3,878</td>
<td>1,577</td>
<td>120</td>
<td>716</td>
<td>45%</td>
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* As per HCFA’s definition, the term “eligible” means children who meet the eligibility requirements for Medicaid and are enrolled in the program.
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<th>Area</th>
<th>Total Individuals Eligible for EPSDT for 90 Continuous Days per 1,000 Child Population</th>
<th>Proportion of Individuals Eligible for EPSDT for 90 Continuous Days Receiving Dental or Oral Health Services by a Dentist or Registered Dental Hygienist</th>
<th>Number of Practicing Dentists Who Accept Medicaid per 1,000 Individuals Eligible for EPSDT for 90 Continuous Days</th>
<th>Number of Practicing Dentists Who Do Not Accept Medicaid per 1,000 Individuals Eligible for EPSDT for 90 Continuous Days</th>
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<td>M. Proportion of individuals eligible for EPSDT for 90 continuous days receiving dental or oral health services by a dentist or registered dental hygienist.</td>
<td>N. Number of practicing dentists who accept Medicaid per 1,000 individuals eligible for EPSDT for 90 continuous days</td>
<td>O. Number of practicing dentists who do not accept Medicaid per 1,000 individuals eligible for EPSDT for 90 continuous days</td>
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</tbody>
</table>

**Note:** Per CoPCOH’s request, red indicates the one-third of counties with the highest need for CoPCOH intervention. Yellow indicates the one-third of counties with moderate need for CoPCOH intervention. Green indicates the one-third of counties with the lowest potential need for CoPCOH intervention.
Objectives

- To gain an understanding of:
  - Oral health
  - The importance of oral health
  - The role and responsibilities of the Oral Health Unit
  - The projects currently being undertaken by the OHU
Infectious Disease

- The most common dental diseases are dental caries and periodontal disease.

- Different bacteria are responsible for tooth decay and periodontal (gum) disease
  - DECAY: Streptococcus mutans, gram +
  - PERIO: Gram --, anaerobes, facultative anaerobes

- Transmissible infectious disease that can be passed vertically or horizontally

- Nearly, if not entirely, 100% preventable
Just to be clear...

This is oral health.
This is not.
Surgeon General’s Report

- **2000** Landmark report, “Oral Health in America,” described the poor oral health of our nation as a silent epidemic.

- **Major Findings**
  - Oral health is more than healthy teeth
  - OH is *integral* to the general health and well-being of all Americans
  - Oral diseases and conditions are *associated* with other health problems
  - There are profound and consequential OH *disparities* within the American population
  - There are safe and effective measures to *prevent* the most common dental diseases – dental caries and periodontal diseases.
  - Identified dental caries as “the single *most common* chronic childhood disease.”
Systemic Condition

- Periodontal disease may be associated with:
  - Adverse pregnancy outcomes
  - Respiratory disease
  - Cardiovascular disease
  - Coronary heart disease
  - Stroke
  - Rheumatoid arthritis
  - Diabetes

- Periodontal bacteria has been found in samples removed from:
  - Brain abscesses
  - Pulmonary tissue
  - Cardiovascular tissue
  - Amniotic fluid
Systemic Connection

- Attention to the connection between OH and overall health increased dramatically in 2007 with the death of Deamonte Driver, a 12 year old boy from Maryland who died when bacteria from an untreated tooth infection spread to his brain.
Oral Piercing
The general public lacks knowledge about oral health.

Oral diseases remain prevalent, especially in vulnerable and underserved populations.

Many children and adults lack access to preventive dental care.

Certain populations are at a higher risk for oral diseases.

Early tooth loss by dental decay can result in:
  - Impaired speech development
  - Failure to thrive
  - Inability to concentrate in school; decreased performance
  - Reduced self-esteem; poor social relationships
  - Less success later in life
Oral Health Unit

- Mission: To improve the OH of all Coloradans.

- What is the OHU doing to move the needle?
Oral Health Unit
Org Chart

Director
Deborah Borek (Interim)

Adult & Community OH Program Coordinator
Open

Program Assistant
Jean McMains

Child and School OH Program Coordinator
Deborah Borek

Network of organizations we rely on for success:

Oral Health Coalitions
State & Local Partners
Contractors
State & Federal Agencies
Professional Organizations
<table>
<thead>
<tr>
<th>Program/Project</th>
<th>Status</th>
<th>Key Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Fluoride Mouth Rinse</td>
<td>Red</td>
<td>Transitioning to Fluoride Varnish</td>
</tr>
<tr>
<td>School Fluoride Varnish (W)</td>
<td>Green</td>
<td>Well received</td>
</tr>
<tr>
<td>School Sealant (W)</td>
<td>Yellow</td>
<td>Decreased funding</td>
</tr>
<tr>
<td>MCH Priority (W)</td>
<td>Green</td>
<td>Identified 2 action items. 1. Adoption of State Standards for PG and EC 2. Develop toolkit and modules—Standards for a Healthy Dental Community</td>
</tr>
<tr>
<td>Community Water Fluoridation (W)</td>
<td>Yellow</td>
<td>CDC revised the standard.</td>
</tr>
<tr>
<td>Fluoridation Variable Study</td>
<td>Green</td>
<td>9/12 months to be considered optimally fluoridated.</td>
</tr>
<tr>
<td>Dental Care for the Infirm</td>
<td>Green</td>
<td>Mobile equipment. Dental House Calls. State general funds.</td>
</tr>
<tr>
<td>Old Age Pension Dental Asst.</td>
<td>Red</td>
<td>Same program. State general fund. Not currently funded.</td>
</tr>
<tr>
<td>Dental Loan Repayment (W)</td>
<td>Yellow</td>
<td>Transitioning to PCO. Merged into one application. Falls under Colorado Health Service Corps</td>
</tr>
<tr>
<td>Program/Project</td>
<td>Status</td>
<td>Key Issue</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BSS/BMI – Surveillance (W)</td>
<td>Yellow</td>
<td>May not have a representative sample.</td>
</tr>
<tr>
<td>State OH Plan (W)</td>
<td>Green</td>
<td>Target completion date is December.</td>
</tr>
<tr>
<td>Systems Dynamic Model (W)</td>
<td>Green</td>
<td>Child focused. Start with existing data….what ifs?</td>
</tr>
<tr>
<td>Workforce Modeling (W)</td>
<td>Green</td>
<td>More general. Plug in …increase access.</td>
</tr>
<tr>
<td>Dental Workforce Development (W)</td>
<td>Green</td>
<td>Univ. of Col. School of Dental Medicine. Cross discipline training involving medical and dental students.</td>
</tr>
<tr>
<td>Colorado Smile Makers Mobile Van (W)</td>
<td>Green</td>
<td>Serves low income children in rural Colorado. 4th year dental students participate in public health service learning projects.</td>
</tr>
<tr>
<td>Cost Study Analysis – Sealant (W)</td>
<td>Yellow</td>
<td>Requesting contract extension.</td>
</tr>
</tbody>
</table>
## Oral Health

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Healthy People 2020</th>
<th>Target 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Increase the percent of children ages 1-5 who first went to the dentist by 12 months of age</td>
<td>3.4% (2009)</td>
<td>NA</td>
</tr>
<tr>
<td>2.</td>
<td>Decrease the percent of children ages 1-14 with pain, cavities, broken or missing fillings, teeth pulled because of cavities, or bleeding gums</td>
<td>18.7% (2009)</td>
<td>NA</td>
</tr>
<tr>
<td>3.</td>
<td>Increase the percent of the population served by community water systems who receive optimally fluoridated water</td>
<td>73.6% (2006)</td>
<td>79.6%</td>
</tr>
</tbody>
</table>
Oral Health Unit
Improving the Oral Health of all Coloradans
What is good oral health?

- More than just strong teeth.
- Being free of mouth & facial pain, oral and throat cancer, oral sores, birth defects, gum disease, tooth decay and tooth loss...
- Oral health—the health of your teeth, gums, and mouth—affects your whole body.
- Links to cardiovascular disease, stroke, diabetes, respiratory diseases.
Is your mouth healthy?
Genetic causes?

- Cleft lip and/or palate
- Dentin and/or enamel issues
- Oral pharyngeal cancers
  - Tobacco, alcohol, other carcinogens
- Early/juvenile onset periodontitis
Most oral diseases are almost 100% preventable
Preventable issues

- Oral health of primary care provider
  - Transmission theory: bacteria can be passed on
  - Nutrition: baby-bottle, early childhood caries
  - Habits
Preventable issues

- Daily habits
  - Oral hygiene, fluoridated water, drinks, foods,
- Other diseases can complicate mouth and vice versa: autoimmune, inflammatory
- Medications causing dry mouth

“Side effects include, headache, dry mouth, muscle fatigue and turning into a frog.”
Cavities: the most common chronic disease of childhood
Gum disease

- Daily habits
  - Brushing, flossing
- Vastly underestimated in surveys
- Bad gums = bad overall health
- Perfect storm?
2000 Landmark report, *Oral Health in America*
Poor oral health of our nation = A silent epidemic

**Major Findings**

- OH is integral to the general health
- Oral diseases are associated with other health problems
- There are safe and effective ways to prevent most dental diseases
- Disproportionately affect minorities and the poor
IOM reports

- Improving Access to Oral Health Care for Vulnerable & Underserved Populations:
  - OH integral to overall health; essential part of comprehensive health care
    - OH promotion & disease prevention: essential strategies for better access
- Advancing Oral Health in America
  - Accountability
  - Prevention & promotion
  - Reduce disparities
Worst Outcomes

- 2007: Deamonte Driver
- 2011: Kyle Willis
Problem

- The general public lacks oral health knowledge.
- Oral diseases remain prevalent, especially in vulnerable and underserved populations.
- Many children and adults lack access to preventive dental care.
- Certain populations are at a higher risk for oral diseases.
- Early tooth loss by dental decay can result in:
  - Impaired speech development
  - Failure to thrive
  - Inability to concentrate in school; decreased performance
  - Reduced self-esteem; poor social relationships
  - Less success later in life
Winnable Battle

- $108 Billion in 2010
- Dental insurance?
  - 22% children without
  - 40-50% working age
  - 60% over age 65
- Local ER: $260,000 on dental emergencies
  - $450/visit to treat symptoms, not treat problem
- Over $10 million for OR cases
Oral Health Unit

- Mission: To improve the OH of all Coloradans, especially vulnerable populations

- What is the OHU doing to move the needle?

  3 Core Public Health Functions
  - Assessment
  - Policy Development
  - Assurance
1. Assessment

Monitor Health Status

- Surveys
  - CHS, BRFSS
  - Phone Interview
  - NHANES (exam too)

- Screenings
  - BSS (Basic Screening Survey)
  - Direct Observation
Direct link between student’s health and educational outcomes

BSS is a reliable measure of the OH status of children

Prevalence of decay is measured by assessing

- Caries experience
- Untreated Decay
- Urgent Care
2. **Policy Development**

- **Support policies and plans for individual and community health efforts**
  - Public Health Act: SB 08-194
    - MCH priorities and work plans, toolkit
    - Community water fluoridation toolkit

- **Enforce laws and regulations that protect health and ensure safety**
  - x-ray certification

- **Research solutions to health problems**
  - Medicaid/CHP+ Reimbursement
  - Promote Healthy Environment
    - Policies for better nutrition
    - Vending machines, junk food, sodas, etc.
  - Promote oral health equity
  - Statewide school sealant program
3. Assurance

- Link people to needed services
- Assure competent workforce
- Inform and educate people about health issues
- Mobilize community partnership to identify and solve health problems (OHCO)

Prevention Services:
- Community Water Fluoridation
- School Dental Sealant Program
- School Fluoride Varnish Program

Treatment Services:
- OAP
- KIND
Other projects

- Loan repayment: water fluoridation, oral health champions
- State sealant program branding
- Oral health promotion: messaging summit
- OHCO efforts: DentaQuest grant
Questions?
Children have high quality early learning supports and environments and comprehensive health care.

Families have meaningful community and parenting supports.

Early childhood professionals have the knowledge, skills, and supports to work effectively with and on behalf of families and children.

all children are valued, healthy, and thriving

GOALS

outcomes

ACCESS OUTCOMES

EARLY LEARNING

- Increased availability of formal education and professional development opportunities for early childhood professionals related to early learning standards.
- Increased access to high quality early learning, birth through third grade.
- Increased number of children meeting developmental milestones to promote school readiness.
- Increased number of programs that are accredited and/or quality rated.
- Increased number of schools that have leadership and educational environments that support young children’s success.
- Increased availability of community resources and support networks for early childhood practitioners, professionals, and programs.
- Increased number of children meeting special needs who receive consistent early learning services and supports.
- Decreased gaps in school readiness and academic achievement between populations of children.

FAMILY SUPPORT AND PARENT EDUCATION

- Increased availability and family use of high quality parenting/child development information, services, and supports.
- Increased parent engagement and leadership at program, community, and policy levels.
- Increased number of children who live in safe, stable, and supportive families.
- Improved family and community knowledge and skills to support children’s health and development.
- Increased family ability to identify and select high quality early childhood services and supports.
- Increased availability and use of family literacy services and supports.
- Increased availability of resources and supports, including financial and legal, to promote family self-sufficiency.
- Increased coordination of services and supports for families and children who are at-risk or have special needs.

SOCIAL, EMOTIONAL, AND MENTAL HEALTH

- Increased availability and use of high quality social, emotional, and mental health training and support.
- Increased number of supportive and nurturing environments that promote children’s healthy social and emotional development.
- Increased number of environments, including early learning settings, providing early identification and mental health consultation.
- Improved knowledge and practice of nurturing behaviors among families and early childhood professionals.
- Increased number of mental health services for children with persistent, serious challenging behaviors.
- Decreased number of out-of-home placements of children.

HEALTH

- Increased access to preventive oral and medical health care.
- Increased number of children covered by consistent health insurance.
- Increased number of children who receive a Medical Home approach.
- Increased number of children who are fully immunized.
- Increased knowledge of the importance of health and wellness (including nutrition, physical activity, medical, oral, and mental health).
- Increased percentage of primary care physicians and dentists who accept Medicaid and Child Health Plan Plus.
- Increased percentage of women giving birth with timely, appropriate prenatal care.
- Decreased number of underinsured children.

QUALITY OUTCOMES

EQUITY OUTCOMES

strategies for action

- Develop and support use of early learning standards by families, programs, and professionals.
- Evaluate and progress high quality programs with a comprehensive rating and reimbursement system.
- Develop, promote, and support high quality professional development and formal training for adults who work with young children.
- Monitor children’s learning and development through screening and on-going assessments.
- Improve financial sustainability and governing efficiency of early learning programs and infrastructure.
- Strengthen coordinated efforts of public and private stakeholders to meet the needs of children and families.
- Strengthen and support family leadership through effective training models.
- Provide tools and information to families to strengthen their own engagement and involvement in their children’s lives.
- Provide information to families to facilitate connection to services and supports.
- Promote caregivers’ knowledge of the social, emotional, and mental health of young children.
- Provide early childhood professionals with effective practices that promote children’s social-emotional development and mental health.
- Strengthen and support community based mental health services that identify and serve young children.
- Enroll more children in health insurance programs.
- Promote and support use of standards for a Medical Home approach (including medical, oral, and mental health standards, as well as developmental, vision, and hearing screening and services).
- Strengthen coordinated efforts of public and private stakeholders to support health and wellness.

Build and Support Partnerships
Fund and Invest
Change Policy
Build Public Engagement
Share Accountability
Generate Education and Leadership Opportunities

For more information contact EarlyChildhoodTeam@capital.state.co.us.

EARLY CHILDHOOD COLORADO FRAMEWORK / JULY 2008

EARLY CHILDHOOD COLORADO PROVIDES A FRAMEWORK THAT:

- Recognizes the needs of the whole child and family.
- Communicates the vision for comprehensive early childhood work.
- Focuses on specific measurable outcomes.
- Guides, organizes, and focuses the actions and accountability of public and private stakeholders.

THIS WORK IS GUIDED BY THE FOLLOWING PRINCIPLES:

- Be child-focused and family-centered.
- Recognize and respond to variations in cultures, languages, and abilities.
- Use data to inform decisions.
- Build on strengths of communities and families.
- Focus on children from birth to age 8.
- Promote partnerships.
- Act at state, local, and statewide levels.

For more information contact EarlyChildhoodTeam@capital.state.co.us.
A COLLECTIVE VISION ON BEHALF OF COLORADO’S YOUNG CHILDREN
AND THEIR FAMILIES.

KEY LEADERS FROM THE FOLLOWING EARLY CHILDHOOD GROUPS REVIEWED AND SUPPORT THE EARLY CHILDHOOD COLORADO FRAMEWORK:

Aloha Foundation
American Academy of Pediatrics, Colorado Chapter
Blue Ribbon Policy Council
Chambers Family Fund
Clayton Early Learning
Colorado Association for the Education of Young Children
Colorado Bright Beginnings
Colorado Children’s Campaign
Colorado Department of Education
Colorado Department of Health Care Policy and Financing
Colorado Department of Human Services
Colorado Department of Public Health and Environment
Colorado Foundation for Families and Children
Colorado Head Start Association
Colorado Interagency Coordinating Council
Colorado Medical Home Advisory
Colorado Office of Professional Development
Colorado Parent and Child Foundation
Colorado Parent Teacher Association
Colorado Statewide Parent Coalition
Colorado Trust
Daniels Fund
Donnell-Kay Foundation
Early Childhood Councils Advisory Team
Early Childhood Councils Leadership Alliance
Early Childhood Education Association of Colorado
Early Childhood State Systems Team
Early Childhood Summit
Education Commission of the States
Family leaders
Family Resource Centers
Invest in Kids
JFK Partners, Project BLOOM
Local early childhood councils
Marsico Family Foundation
Menage Foundation
Mile High United Way
Morgridge College of Education, University of Denver
National Conference of State Legislatures
Office of Lt. Governor Barbara O’Brien
P-3 Subcommittee of P-20 Education Coordinating Council
Piton Foundation
Qualistar Early Learning
Rose Community Foundation
State Board of Education
Temple Hoyne Buell Foundation

Early Childhood Colorado Framework

Family leaders
Family Resource Centers
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**MCH Implementation Team Local Level Action Plan**

**Oral Health – Decrease development of caries in children age birth to 5**

3-Year Planning Period: 2012-2015

<table>
<thead>
<tr>
<th>Context MIT + LPHA customizes</th>
</tr>
</thead>
</table>

Oral health and general health are not separate entities. Oral health is a critical component of health and must be included as part of individual and community health programs. While dental health has been improving in the US, children have not benefited at the same rates as adults. The proportion of children between 2 and 5 years old with cavities increased 15 percent during the past decade and poor children continue to suffer the most from dental decay. Influences on the oral health status of children go beyond what occurs inside the mouth. Complex and interactive influences on oral health occur at the child level, family level and community level and involve biological, behavioral, psychological and social protective and risk factors (Owens-Fischer Model).

Dental disease is largely preventable, and is less expensive when prevented than when treated. Prevention strategies are critical to a cost-efficient, effective system of dental care delivery. Targeting children at an early age with education, lifestyle changes and early intervention reduces future demand for dental services and health care system costs.

Several programs are addressing the oral health crisis of Colorado’s vulnerable children. Colorado has recently undergone its periodic Maternal and Child Health needs assessment process. Of the nine issues identified as Colorado priorities for the next five years, one emerged that centered on oral health, “Prevent development of dental caries in all children ages birth to 5.” In addition, oral health was recently named as one of the 10 Winnable Battles for the Colorado Department of Public Health and Environment. Cavity Free at Three (CF3), founded in 2007, is a statewide effort to prevent oral disease in children from infancy to age 3 by educating health professionals about the consequences of early childhood caries and their role in preventing this disease. Since many children will see doctors and nurses earlier and more often than dentists, the CF3 model integrates caries risk assessments, anticipatory guidance, parent counseling and goal setting, establishment of a dental home, and fluoride varnish application into well child care visits. Training sessions lead by dental professionals give medical providers hands on practice with infants and toddlers for oral exams and fluoride varnish applications. COPCOH, The Colorado Partnership for Children’s Oral Health, is a new initiative launched in 2011. The initiative is focused on increasing access to quality dental care for children and pregnant women and increasing awareness of the importance of children seeing a dentist by age 1.

There are already a number of systems serving young children and their families who could become a more integral part of oral health awareness and access. Such organizations include, but are not limited to: Head Start, child care, school nursing, home visitation, and the preventive and primary care services for children provided by Title V (Maternal and Child Health/Children with Special Health Care Needs).

Both prenatal and oral health providers are limited in providing oral health care during pregnancy by their lack of understanding about its impact and safety. Many dentists needlessly withhold or delay treatment of pregnant patients because of fear about injuring either the woman or the fetus or fear of litigation. A set of oral health practice guidelines during pregnancy and early childhood have been developed to assist health care professionals in delivering safe and effective oral health services to pregnant women and their children based on a review of the current science-based literature. Adoption of these Guidelines by the Colorado Dental Association will give Colorado providers an easily accessible and recognized reference to agreed upon treatments protocols for pregnant women and young children.

The issues and problems of Colorado children’s access to oral health care are multifaceted and complex, requiring multiple strategies. Key issues facing our rural and frontier counties include limited access to health care, health professional workforce shortages, health disparities, and health insurance availability. Addressing and solving these issues is critical for rural communities.

A **Toolkit for Promoting Maternal and Child Oral Health in Colorado Communities** was developed by the Colorado Department of Public Health and Environment (CDPHE) to assist Local Health Agencies, Early Childhood Councils, educators, and others working to improve the oral health of young children in Colorado by offering information, resources and tools. The toolkit is designed as a companion document to the **Colorado Healthy Community Standards, Oral Health** that were developed to support maternal and child health efforts of the Colorado Department of Public Health and Environment. The standards are envisioned as aspirational goals for all Colorado communities to achieve. It is expected that if all standards are met then residents of a given community will have good oral health. [http://www.oralhealthcolorado.org/new-toolkit-for-promoting-oral-health-in-colorado-communities](http://www.oralhealthcolorado.org/new-toolkit-for-promoting-oral-health-in-colorado-communities)

The **Colorado Community Water Fluoridation Toolkit** is currently being developed by the Oral Health Unit at the Colorado Department of Public Health and Environment and is set for completion in April 2012. The purpose of the Toolkit is to provide information, guidance and resources to support local efforts in educating the public on the health benefits of community water fluoridation and/or creating policy change favoring fluoridation in their community.
<table>
<thead>
<tr>
<th>Goals</th>
<th>Data Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Decreased development of dental caries among children aged 0-5 years</td>
</tr>
<tr>
<td>G2</td>
<td>Decreased health disparities associated with dental caries among children aged 0-5 years</td>
</tr>
<tr>
<td>G3</td>
<td>Increased percentage of county population receiving fluoridated water from community water systems</td>
</tr>
<tr>
<td>G4</td>
<td>Increased percentage of children Birth to 5 years having a dental home</td>
</tr>
<tr>
<td>G5</td>
<td>Increased percentage of children who see a dentist by age 1</td>
</tr>
<tr>
<td>G6</td>
<td>Increased percentage of pregnant women who see the dentist</td>
</tr>
<tr>
<td>G7</td>
<td>Colorado Oral Health Guidelines for Pregnancy and Early Childhood are adopted and providers consistently use best practices</td>
</tr>
</tbody>
</table>

**State Performance Measure(s)**

Percentage of children who see a dentist by age 1

**National Performance Measure(s)**

NA
Objective A: (Core - Year 1) By September 30, 2015, ___ (insert number) of the 7 Healthy Community Standards for Oral Health have been addressed in ____________ county.

Lead: LPHA

**Target Population:** Community members, Local coalitions, City and County Public Officials, Early Childhood Councils

**Criteria for Success:** MIT + LPHA customizes

- Number of opportunities to improve the oral health of the community based on the *Healthy Community Standards, Oral Health* that have been addressed with special emphasis on the maternal and child population

**As Measured by:** MIT + LPHA customizes

- Comparison of completed *Community Oral Health Checklist*, pre and post

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine the oral health status of the community as identified by the <em>Standards for a Healthy Community, Oral Health</em></td>
<td>Convene a stakeholder group whose purpose is to identify and address opportunities for improvement in the oral health status of the community as identified by the <em>Standards for a Healthy Community, Oral Health</em> with special emphasis on the maternal and child population.</td>
<td>LPHA</td>
<td>LPHA</td>
<td>MIT + LPHA customizes Meeting Minutes Membership roster Schedule of Meetings</td>
</tr>
<tr>
<td></td>
<td>Identify ____ (insert number) of the 7 opportunities for improvement by completing a <em>Community Oral Health Checklist</em> (provided by the Oral Health Unit).</td>
<td></td>
<td></td>
<td>Completed <em>Community Oral Health Checklist</em></td>
</tr>
<tr>
<td></td>
<td>Formulate strategies to address ____ (insert number) of the 7 Standards based on the recommendations and guidelines offered in the <em>Toolkit for Promoting Maternal and Child Oral Health of Colorado Communities</em>.</td>
<td></td>
<td></td>
<td>Documented Improvement Plan for each Standard being addressed</td>
</tr>
</tbody>
</table>
Objective B: (Complementary) By September 30, 2015, communities not currently fluoridating the community water supply will adopt a county or city ordinance in support of community water fluoridation. Lead: LPHA

Target Population: Community members, Local coalitions, City and County Public Officials, Early Childhood Councils

<table>
<thead>
<tr>
<th>Criteria for Success: MIT + LPHA customizes</th>
<th>As Measured by: MIT + LPHA customizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enactment of a city or county ordinance in support of community water fluoridation</td>
<td>• Fluoridation status</td>
</tr>
<tr>
<td></td>
<td>• City or county ordinance in support of community water fluoridation</td>
</tr>
</tbody>
</table>

### Strategy

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase public awareness of importance of fluoridation</td>
<td>Determine current fluoridation status of community</td>
<td>LPHA</td>
<td>LPHA</td>
<td>MIT + LPHA customizes - Printout of local data from CDC website, My Water’s Fluoride <a href="http://apps.nccd.cdc.gov/MWF/Index.asp">http://apps.nccd.cdc.gov/MWF/Index.asp</a></td>
</tr>
<tr>
<td></td>
<td>Participate in state offered fluoridation trainings</td>
<td></td>
<td></td>
<td>Certificate of Completion</td>
</tr>
<tr>
<td></td>
<td>Develop community based efforts in partnership with the Oral Health Unit at the Colorado Department of Public Health and Environment to promote public awareness on the health benefits of water fluoridation using the recommendations found in the <em>Colorado Community Water Fluoridation Toolkit</em>.</td>
<td></td>
<td></td>
<td>Documented plan to increase public awareness</td>
</tr>
</tbody>
</table>

### Strategy

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Advocate for policy change that supports community water fluoridation</td>
<td>Determine existence of city/county ordinance</td>
<td>City or county records</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify local champion(s)</td>
<td>Name and biography of local champion(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Form stakeholder group</td>
<td>Meeting minutes</td>
<td>Membership Roster</td>
<td>Schedule of Monthly Meetings</td>
</tr>
<tr>
<td>Action Plan Development</td>
<td>Documented Action Plan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop local action plan in partnership with the Oral Health Unit at the Colorado Department of Public Health and Environment to advocate for policy change using the recommendations found in the <em>Colorado Community Water Fluoridation Toolkit</em>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Objective C: (Core – Year 1, 2 or 3)** By September 30, 2015, increase the number of active and engaged cross-system partnerships that include oral health in a medical home approach will increase from ___ to ___ (insert numbers).

**Lead:** LPHA

**Target Population:** Medical providers, dental providers, Early Childhood Councils

**Criteria for Success:** MIT + LPHA customizes

- Key stakeholders demonstrate an understanding of each other’s role and the role of oral health in coordinating efforts to reduce barriers to a medical home approach.

**As Measured by:** MIT + LPHA customizes

- Locally developed measures to document the effectiveness and sustainability of cross-system partnerships.

<table>
<thead>
<tr>
<th>Strategy</th>
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<th>Target Completion Date</th>
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<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilize partnerships to support the inclusion of oral health in local medical home projects and initiatives</td>
<td>Identify local oral health champion(s)</td>
<td>LPHA</td>
<td>LPHA</td>
<td>Documentation of recruitment of key oral health champions</td>
</tr>
<tr>
<td></td>
<td>In communities that do not have an active medical home initiative, oral health champion(s) facilitate(s) monthly stakeholder meetings to determine the role of oral health in a medical home approach</td>
<td></td>
<td></td>
<td>Meeting Minutes</td>
</tr>
<tr>
<td></td>
<td>The role of oral health in a medical home approach at the local community level is described in a white paper and informs partnership mobilization efforts.</td>
<td></td>
<td></td>
<td>White Paper</td>
</tr>
<tr>
<td></td>
<td>In communities with an existing medical home initiative, opportunities to include oral health in local medical home efforts are prioritized and implemented.</td>
<td></td>
<td></td>
<td>Participation in the medical home initiative and identified opportunities to incorporate oral health into medical home efforts are documented</td>
</tr>
</tbody>
</table>
**Objective D: (Complementary) By September 30, 2015, state developed oral health messages will be integrated into _____ (insert number) community programs and services.**

**Lead: LPHA**

**Target Population:** Community programs and services, Early Childhood Councils, local coalitions, oral health advocates

**Criteria for Success: MIT + LPHA customizes**
- Number of community programs and services participating in oral health education efforts

**As Measured by:** MIT + LPHA customizes
- Integration of oral health messaging into ____ community programs and services
- Number of oral health educational trainings held

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
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<th>Monitoring Plan</th>
</tr>
</thead>
</table>
| Integrate state developed oral health messaging into existing community programs and services | Identify a minimum of three integration points with existing community programs/services that routinely touch the general public and/or serve pregnant women and young children (WIC, child care, school health, etc). | LPHA                  | LPHA                      | MIT + LPHA customizes
List of identified programs                                                          |
|         | Facilitate _____ (insert number) oral health educational opportunities/trainings in partnership with the Colorado Partnership for Children’s Oral Health (COPCOH) statewide initiative for staff at each community program/service. |                        |                           | List of trainings held                                                         |
|         | In partnership with the community program or service, define the best method of incorporating oral health messaging into the routine operations of the program (screenings, curriculum, etc.). |                        |                           | Written description of plan for incorporating oral health messaging into program operations |
|         | Follow-up with programs in three months to offer technical assistance as required.                                                                                                                                             |                        |                           | Record of follow-up and TA delivered                                           |
**Objective E: (Core – Year 1, 2 or 3)** By September 30, 2015, the number of local dental providers providing services to Medicaid and CHP+ recipients will increase from ____ to ____ (insert numbers).

**Lead: LPHA**

**Target Population: Local dental providers**

**Criteria for Success: MIT + LPHA customizes**
- Number of dental providers accepting Medicaid and CHP+ insurance plans

**As Measured by: MIT + LPHA customizes**
- Pre and post list of Medicaid and CHP+ local dental providers

<table>
<thead>
<tr>
<th>Strategy</th>
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<th>Target Completion Date</th>
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<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify and address barriers to Medicaid and CHP+ participation for dental care providers</td>
<td>Identify local dentists not currently participating in Medicaid and CHP+ insurance plans.</td>
<td>LPHA</td>
<td>LPHA</td>
<td>MIT + LPHA customizes List of non-participating dental providers</td>
</tr>
<tr>
<td></td>
<td>Convene workgroup of key stakeholders to identify barriers to participation in Medicaid and CHP+ insurance plans.</td>
<td></td>
<td></td>
<td>Meeting Minutes</td>
</tr>
<tr>
<td></td>
<td>Design strategies to address identified barriers utilizing the <em>Toolkit for Promoting Maternal and Child Health in Colorado Communities.</em></td>
<td></td>
<td></td>
<td>Documented Strategic Plan</td>
</tr>
<tr>
<td></td>
<td>Coordinate educational opportunities, in partnership with the Oral Health Unit, Colorado Department of Public Health and Environment (CDPHE), informing local dental providers on how to become a licensed Medicaid and CHP+ provider.</td>
<td></td>
<td></td>
<td>Record of technical assistance and trainings provided to dental professionals</td>
</tr>
<tr>
<td></td>
<td>Coordinate educational opportunities, in partnership with the Oral Health Unit, CDPHE, informing local dental professionals on the insurance claim process for Medicaid and CHP+.</td>
<td></td>
<td></td>
<td>Record of technical assistance and trainings provided to dental professionals</td>
</tr>
<tr>
<td></td>
<td>Align with statewide efforts by partnering with Colorado Partnership for Children’s Oral Health (COPCOH) to encourage participation in Medicaid and CHP+ insurance plans.</td>
<td></td>
<td></td>
<td>Record of activities and participation</td>
</tr>
</tbody>
</table>
Objective F: *(Complementary)* By September 30, 2015, the number of medical and dental practices receiving customized introductory presentations to the Colorado Oral Health Guidelines for Pregnancy and Early Childhood will have increased from zero to ____ (insert number).

<table>
<thead>
<tr>
<th>Target Population: Medical and Dental Providers</th>
</tr>
</thead>
</table>

**Criteria for Success: MIT + LPHA customizes**
- Number of local medical and dental practices introduced to the Guidelines

**As Measured by: MIT + LPHA customizes**
- List of medical and dental practices contacted and receiving copies of the Guidelines

<table>
<thead>
<tr>
<th>Strategy</th>
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<th>Target Completion Date</th>
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<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote the Colorado Oral Health Guidelines for Pregnancy and Early Childhood</td>
<td>Identify all medical and dental practices and professional associations in the community.</td>
<td>LPHA</td>
<td>LPHA</td>
<td>MIT + LPHA customizes Complete list of local medical and dental providers and professional associations</td>
</tr>
<tr>
<td></td>
<td>Send out a state developed introductory letter to all local medical and dental practices and local professional associations introducing the <em>Colorado Oral Health Guidelines for Pregnancy and Early Childhood</em>.</td>
<td></td>
<td></td>
<td>Record of communications sent</td>
</tr>
<tr>
<td></td>
<td>Arrange to be on the agenda of ____ (insert number) local component meetings of professional associations (medical and dental) to promote the Guidelines. Present attendees with printed copies of the Guidelines.</td>
<td></td>
<td></td>
<td>Agenda of meetings and list of participants</td>
</tr>
<tr>
<td></td>
<td>Schedule follow-up one-on-one meetings with ____ (insert number) individual medical and dental practices to promote the Guidelines. Present each practice with printed copies of the Guidelines. Practices providing services to the underserved maternal and child population to be prioritized (e.g., women’s clinics, community dental clinics, pediatricians, pediatric dentists, Medicaid providers).</td>
<td></td>
<td></td>
<td>Record of meetings and list of participants</td>
</tr>
<tr>
<td></td>
<td>Follow up with providers in three to six months for questions, clarifications, etc.</td>
<td></td>
<td></td>
<td>Call record</td>
</tr>
</tbody>
</table>
Objective G: *(Complementary)* By September 30, 2015, increase the number of Primary Care Practices and/or public health partners implementing the Cavity Free at Three (CF3) program from ______ to _______ (insert numbers).

| Target Population: Local medical and dental providers, public health partners (WIC, Head Start, etc.) |

Criteria for Success: MIT + LPHA customizes
- Number primary care practices and/or public health programs implementing the Cavity Free at Three program

As Measured by: MIT + LPHA customizes
- Number of programs/practices implementing CF3 after receiving training

<table>
<thead>
<tr>
<th>Strategy</th>
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<th>Target Completion Date</th>
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<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement or Enhance Cavity Free at Three</td>
<td>Work with Cavity Free at Three (CF3) program to determine current level of adoption of the program in the community.</td>
<td>LPHA</td>
<td>LPHA</td>
<td>MIT + LPHA customizes List of community programs/practices trained in CF3</td>
</tr>
<tr>
<td></td>
<td>Develop strategies with CF3 state staff to increase local participation.</td>
<td></td>
<td></td>
<td>Documented Strategic Plan</td>
</tr>
<tr>
<td></td>
<td>Organize ___ (insert number) CF3 trainings.</td>
<td></td>
<td></td>
<td>Record of completed trainings and list of participants</td>
</tr>
<tr>
<td></td>
<td>Follow up with providers/programs in three months and deliver technical assistance as needed.</td>
<td></td>
<td></td>
<td>Record of follow-up activities and TA delivered</td>
</tr>
</tbody>
</table>

Key
LPHA – Local public health agency completes section
MIT – MCH Implementation Team completes section
MIT + LPHA customizes – MIT provides the foundation and essential components. The LPHA fills in the details specific to the agency, i.e. dates, data, individuals, etc.
Overarching Goal: Optimal health and well-being for the Maternal & Child Health population in Colorado

INPUTS
- Funding
  - MCH Block Grant
  - Health Integration Grant
- CDPHE
  - Oral Health Unit
  - Early Childhood Specialist
  - Maternal and Child Health Program
- Partners
  - Dental & Medical Professional Associations
  - Primary Care Providers
  - Dental Providers
  - Early Childhood Councils
  - Community Organizations
  - Faith Based Organizations
  - Local Coalitions
  - Local Health Advocates
  - Foundations
  - CF3
  - COPCOH
- State OH Initiatives
  - Cavity Free at Three
  - Colorado Partnership for Children’s Oral Health
  - State Oral Health Coalition
- Resources
  - State Oral Health Plan
  - Oral Health Burden Report
  - Basic Screening Surveys
  - State Fluoridation Plan
  - Community Water Fluoridation Toolkit
  - Toolkit for Promoting Maternal and Child Oral Health in Colorado Communities
  - My Water’s Fluoride Website
  - Colorado Oral Health Surveillance System Plan
  - Oral Health Colorado’s Policy Toolkit for Locals
  - Community Standards for Oral Health
  - Community Health Checklist

OUTPUTS

Strategies
- Determine the oral health status of the community as identified by the Standards for a Healthy Community; Oral Health
- Increase public awareness of the importance of fluoride
- Advocate for policy change that support community water fluoridation
- Mobilize partnerships to support the inclusion of oral health in local medical home projects and initiatives
- Integrate state developed oral health messaging into existing community programs and services
- Identify and address barriers to Medicaid and CHP+ participation for dental care providers
- Implement Cavity Free at Three
- Promote the Oral Health Guidelines for Pregnancy and Early Childhood

Participation
- Community Members, Local Coalitions, City and County Public Officials, ECCs
- Community Members, Local Coalitions, City and County Public Officials, ECCs
- Medical providers, dental providers, Early Childhood Councils
- ECCs, Local Coalitions, Oral Health Advocates, Community Organizations
- Local Dental Providers
- Local Medical and Dental Providers, Public Health Partners (WIC, Head Start, etc.)
- Local Medical and Dental Providers, Local Professional Organizations

OUTCOMES

Short Term
- Local ordinance (city or county) that supports community water fluoridation
- Increased percentage of children Birth to 5 years having a dental home
- Increased public awareness on the importance of early oral health care
- Increased number of dental providers willing to accept Medicaid and CHP+ insurance plans
- Parents are educated on the importance of dental exam before age 1 in primary care and other community settings
- Primary care providers and public health partners conduct oral health screening
- Increased awareness of Colorado Oral Health Guidelines for Pregnancy and Early Childhood

Medium Term
- Increased number of local medical and dental providers participating in the medical home approach
- Increased percentage of children who see the dentist by age 1
- Increased percentage of pregnant women who see the dentist
- Colorado Oral Health Guidelines for Pregnancy and Early Childhood are adopted and providers consistently use best practices

Long Term
- Decreased development of dental caries among children ages 0-5 years
- Decreased health disparities associated with dental caries among children ages 0-5 years
<table>
<thead>
<tr>
<th>LOGIC ASSUMPTIONS</th>
<th>EXTERNAL FOCUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Education on oral health care for children must start early – as early as during pregnancy. Pregnant women who</td>
<td>• Oral health has been named as one of the ten CDPHE Winnable Battles and is being addressed by</td>
</tr>
<tr>
<td>receive optimal dental care are more likely to understand the importance of early oral health care for their child.</td>
<td>a newly formed task group, Tri-Agency Oral Health Collaborative, consisting of three state agencies</td>
</tr>
<tr>
<td>• In addition to dental providers, strategies target medical professionals and public health professionals. They have</td>
<td>(CDHS, CHPF and CDPHE) and state partners.</td>
</tr>
<tr>
<td>more frequent contact with pregnant women and young children &lt; 1 year of age, and thus have opportunities to educate</td>
<td>• A national advertising campaign from The Ad Council to improve children’s oral health is set to</td>
</tr>
<tr>
<td>and refer on oral health needs.</td>
<td>launch in 2012.</td>
</tr>
<tr>
<td>• Optimally fluoridating water for oral health is the single most cost-effective strategy a community can take to</td>
<td>• COPCOH, The Colorado Partnership for Children’s Oral Health, is a new initiative launched in</td>
</tr>
<tr>
<td>improve the oral health of its residents, young and old. Studies consistently show that water fluoridation reduces</td>
<td>2011. The initiative is focused on increasing access to quality dental care for children and pregnant</td>
</tr>
<tr>
<td>tooth decay by 20 to 40 percent.</td>
<td>women and increasing awareness of the importance of children seeing a dentist by age 1.</td>
</tr>
<tr>
<td>• This logic model is based off of the Seven Healthy Community Standards for Oral Health that were developed with</td>
<td>• Cavity Free at Three (CF3), founded in 2007, is a statewide effort to prevent oral disease in children</td>
</tr>
<tr>
<td>stakeholder input to support maternal and child health efforts of the Colorado Department of Public Health and</td>
<td>from infancy to age 3 by educating health professionals about the consequences of early</td>
</tr>
<tr>
<td>Environment. A Toolkit for Promoting Maternal and Child Health in Colorado Communities was subsequently released</td>
<td>childhood caries and their role in preventing this disease. Since many children will see doctors and</td>
</tr>
<tr>
<td>to assist locals in addressing identified areas for improvement in the oral health status of their community.</td>
<td>nurses earlier and more often than dentists, the CF3 model integrates caries risk assessments,</td>
</tr>
<tr>
<td><a href="http://www.oralhealthcolorado.org/new-toolkit-for-promoting-oral-health-in-colorado-communities">http://www.oralhealthcolorado.org/new-toolkit-for-promoting-oral-health-in-colorado-communities</a></td>
<td>anticipatory guidance, parent counseling and goal setting, establishment of a dental home, and</td>
</tr>
<tr>
<td>• A Toolkit to Promote Community Water Fluoridation in Colorado Communities is currently being developed by the Oral</td>
<td>fluoride varnish application into well child care visits. Training sessions lead by dental</td>
</tr>
<tr>
<td>Health Unit at the Colorado Department of Public Health and Environment and is set for completion in April 2012.</td>
<td>professionals give medical providers hands on practice with infants and toddlers for oral exams and</td>
</tr>
<tr>
<td>• The Oral Health Unit will work with all Local Health Agencies who select Dental Caries as a local priority.</td>
<td>fluoride varnish applications.</td>
</tr>
</tbody>
</table>
# MCH Implementation Team Action Plan

**Oral Health-Decrease development of caries in children age birth to 5**

3-Year Planning Period: 2010-2015

## Context

Oral health and general health are not separate entities. Oral health is a critical component of health and must be included as part of individual and community health programs. While dental health has been improving in the US, children have not benefited at the same rates as adults. The proportion of children between 2 and 5 years old with cavities increased 15 percent during the past decade and poor children continue to suffer the most from dental decay. Influences on the oral health status of children go beyond what occurs inside the mouth. Complex and interactive influences on oral health occur at the child level, family level and community level and involve biological, behavioral, psychological and social protective and risk factors (Owens-Fischer Model).

Several programs are addressing the oral health crisis of Colorado’s vulnerable children. Colorado has recently undergone its periodic Maternal and Child Health needs assessment process. Of the nine issues identified as Colorado priorities for the next five years, one emerged that centered on oral health, “Prevent development of dental caries in all children ages birth to 5.” An implementation team has formed and been given the unique opportunity to develop an action plan to positively impact the oral health of this segment of the population. In addition, oral health was recently named as one of the 10 Winnable Battles for the Colorado Department of Public Health and Environment.

Cavity Free at Three (CF3), founded in 2007, is a statewide effort to prevent oral disease in children from infancy to age 3 by educating health professionals about the consequences of early childhood caries and their role in preventing this disease. Since many children will see doctors and nurses earlier and more often than dentists, the CF3 model integrates caries risk assessments, anticipatory guidance, parent counseling and goal setting, establishment of a dental home, and fluoride varnish application into well child care visits. Training sessions lead by dental professionals give medical providers hands on practice with infants and toddlers for oral exams and fluoride varnish applications.

Both prenatal and oral health providers are limited in providing oral health care during pregnancy by their lack of understanding about its impact and safety. Many dentists needlessly withhold or delay treatment of pregnant patients because of fear about injuring either the woman or the fetus or fear of litigation. A set of Perinatal Oral Health Guidelines have been developed to assist health care professional in delivering safe and effective oral health services to pregnant women and their children based on a review of the current science-based literature. Adoption of these Guidelines by the Colorado Dental Association will give Colorado providers an easily accessible and recognized reference to agreed upon treatments protocols for pregnant women and young children.

Currently, Colorado Medicaid does not cover dental services for adults except in cases of emergency or when a condition of the oral cavity is making a concurrent medical condition worse, and even in these situations the services are very limited. Even though pregnancy is considered a concurrent medical condition, only a limit set of services are available and generally must be prior authorized. Medicaid clients age 20 and under have access to comprehensive dental services. Consequently, only pregnant women who are age 20 or younger would have access to Medicaid covered preventive dental services. Pregnant women on CHP+ have access to limited dental services in emergency situations only.
<table>
<thead>
<tr>
<th>Goal(s)</th>
<th>Data Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1 Increased percentage of pregnant women who see a dentist</td>
<td>Medicaid data</td>
</tr>
<tr>
<td>G2 Increased percentage of children birth to five having a dental home</td>
<td>Medicaid data</td>
</tr>
<tr>
<td>G3 By September 30, 2015, increase the proportion of children receiving their first dental visit by age one from 3.4% to 4.4%. (Winnable Metric)</td>
<td>Child Health Survey</td>
</tr>
<tr>
<td>G4 Increased percentage of children birth to five having a dental home</td>
<td>Medicaid data</td>
</tr>
<tr>
<td>G5 Increased number of dental providers who see pregnant women and/or children age birth to five</td>
<td>Medicaid data</td>
</tr>
<tr>
<td>G6 Increased percentage of the population receiving fluoridated water from community water systems from 70.6% to 79.6 % by September 30, 2015 (HP 2020 Goal)</td>
<td>Water Fluoridation Reporting System (WFRS)</td>
</tr>
<tr>
<td>G7 Decreased development of dental caries in all children age birth to five</td>
<td>Basic Screening Survey</td>
</tr>
<tr>
<td>G8 Decreased health disparities associated with dental caries among children age birth to five</td>
<td>Basic Screening Survey</td>
</tr>
</tbody>
</table>

**Objective A:** By September 30, 2015, oral health partners will reach agreement on consistent oral health messaging for early childhood. 

**Target Population:** CDPHE Birth to 8 (B-8) Collaborative, Tri-Agency Collaborative (addressing the Winnable Battle on oral health) consisting of Colorado Department of Public Health and Environment, Health Care Policy and Financing, Colorado Department of Human Services

**Criteria for Success:**
- A list of key messages have been created and adopted by the B-8 Collaborative and the Tri-Agency Collaborative

**As Measured by:**
- A list of key messages to be used in all oral health messaging from state agencies

<table>
<thead>
<tr>
<th>Strategy</th>
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</tr>
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<tbody>
<tr>
<td>Develop and promote complimentary components to reinforce existing</td>
<td>Participate in monthly B-8 Collaborative meetings and integrate the importance of oral health in early childhood into the groups’ larger messaging and marketing efforts</td>
<td>September 30, 2015</td>
<td>Child &amp; School OH Coordinator (Deborah Borek)</td>
<td>Marketing materials incorporating the importance of oral health in early childhood development</td>
</tr>
</tbody>
</table>
Cavity Free at Three efforts

Convene and coordinate a Tri-Agency workgroup to address the CDPHE Winnable battle on oral health

<table>
<thead>
<tr>
<th>Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 30, 2015</td>
<td>Dental Director (Katya Mauritson)</td>
<td>Workgroup activities and accomplishments are posted on CoPrevent website</td>
</tr>
</tbody>
</table>

Participate in monthly Tri-Agency Workgroup meetings and integrate the early childhood perspective into the activities of the subcommittee working on public service announcements

<table>
<thead>
<tr>
<th>Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 30, 2015</td>
<td>Dental Director, Child &amp; School OH Coordinator</td>
<td>PSA announcements are developed highlighting the importance of oral health in early childhood development</td>
</tr>
</tbody>
</table>

Objective B: By September 30, 2015, the number of primary care providers, local health agencies and dental professionals completing Cavity Free at Three training provided by the Oral Health Unit staff will increase from zero to 120 (40 per year).

| Lead: | Deborah Borek |

Target Population: Primary care providers, public health practitioners, dental providers

Criteria for Success:

- Number of participants who complete CF3 trainings delivered by or required by CDPHE

As Measured by:

- Lists of attendees
- Contractor performance evaluations

<table>
<thead>
<tr>
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<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop and promote complimentary components to reinforce existing Cavity Free at Three efforts</td>
<td>Three members of the OHU staff will complete CF3 Train the Trainer course.</td>
<td>April 30, 2012</td>
<td>Oral Health Unit</td>
<td>Train the Trainer certification</td>
</tr>
<tr>
<td></td>
<td>OHU staff will deliver two CF3 trainings a year, one to a local health agency and one to primary care providers serving a high percentage of Medicaid recipients</td>
<td>September 30, 2015</td>
<td>Oral Health Unit</td>
<td>Record of completed trainings; list of attendees</td>
</tr>
</tbody>
</table>

Explore and advocate for policy changes that support oral health

<table>
<thead>
<tr>
<th>Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 30, 2012</td>
<td>Dental Director (Katya Mauritson)</td>
<td>CF3 requirement is included in contracts</td>
</tr>
</tbody>
</table>
Collaborate with the Primary Care Office to ensure loan reimbursement recipients have completed the CF3 training.

<table>
<thead>
<tr>
<th><strong>Objective C:</strong> By July 30, 2012, the Colorado Oral Health Guidelines for Pregnancy and Early Childhood will be formally adopted by the Colorado Dental Association.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lead:</strong> Deborah Borek</td>
</tr>
</tbody>
</table>

**Target Population:** Colorado Dental Association

**Criteria for Success:**
- Formal adoption of the Guidelines by the Colorado Dental Association

<table>
<thead>
<tr>
<th><strong>Strategy</strong></th>
<th><strong>Milestones / Key Activities</strong></th>
<th><strong>Target Completion Date</strong></th>
<th><strong>Responsible Persons/Group</strong></th>
<th><strong>Monitoring Plan</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore and advocate for policy changes that support oral health providers in caring for young children and pregnant women</td>
<td>Receive permission to brand California guidelines as our own</td>
<td>December 31, 2011</td>
<td>Dr. Jeff Kahl, (Implementation Team)</td>
<td>Written approval received</td>
</tr>
<tr>
<td></td>
<td>Re-brand the Guidelines using the Colorado Dental Association information and logo</td>
<td>April 30, 2012</td>
<td>Dr. Jeff Kahl (Implementation Team)</td>
<td>Finished document posted to the following websites: Colorado Dept of Public Health, Colorado Dental Association, Colorado Dental Hygiene Association and Oral Health Colorado</td>
</tr>
<tr>
<td></td>
<td>Present the Colorado Guidelines to the Colorado Dental Association for adoption</td>
<td>July 30, 2012</td>
<td>Dr. Jeff Kahl (Implementation Team)</td>
<td>Adoption of Guidelines by CDA</td>
</tr>
</tbody>
</table>

**Objective D:** By March 31, 2013, the number of Colorado medical associations who have endorsed the Colorado Oral Health Guidelines for Pregnancy and Early Childhood will have increased from zero to three.

**Lead:** Deborah Borek

**Target Population:** Colorado medical Associations (e.g. OB-GYNs, Nurse Practitioners, Physician Assistants, etc.)
Criteria for Success:

- Endorsement of the Guidelines by three Colorado medical associations

As Measured by:

- A written article describing and endorsing the Guidelines is posted on three medical association websites or included in association newsletters

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore and advocate for policy changes that support oral health providers in caring for young children and pregnant women</td>
<td>Identify three Colorado medical associations with a focus on primary care, pediatrics, and/or pregnancy to endorse the Guidelines</td>
<td>September 30, 2012</td>
<td>Implementation Team</td>
<td>List of three medical professional associations to reach out to with education on the Guidelines</td>
</tr>
<tr>
<td></td>
<td>Develop a Power Point presentation highlighting the importance of oral care for pregnant women and their children and information on the Cavity Free at Three model to be used in meetings with representatives from selected medical associations</td>
<td>October 31, 2012</td>
<td>Child &amp; School OH Coordinator (Deborah Borek)</td>
<td>Power Point Presentation</td>
</tr>
<tr>
<td></td>
<td>Deliver presentation to representatives from medical professional associations</td>
<td>December 31, 2012</td>
<td>Implementation Team</td>
<td>Follow-up thank you letters to representatives of medical professional associations</td>
</tr>
<tr>
<td></td>
<td>Create a draft write up or press release describing and endorsing the Guidelines to be used by the representatives for posting to websites and/or inclusion into newsletters</td>
<td>January 31, 2013</td>
<td>Child and School OH Coordinator (Deborah Borek)</td>
<td>Write/up or press release is approved by CDPHE and shared with professional associations for their use</td>
</tr>
</tbody>
</table>

Objective E: By September 20, 2015, the number of dental loan repayment program providers working in underserved areas will have increased from 52 to 60.

Target Population: Dental Providers participating in the dental loan repayment program

Lead: Katya Mauritson
### Criteria for Success:
- Number of dental loan recipients working in underserved areas

### As Measured by:
- Number of active dental loan contracts

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore and advocate for policy changes that support oral health providers in caring for young children and pregnant women</td>
<td>Meet with the Primary Care Office staff to create a Resource Development Plan outlining the current status of the program, political climate, funding and grant opportunities, etc.</td>
<td>December 31, 2012</td>
<td>Dental Director (Katya Mauritson)</td>
<td>Resource Development Plan is complete</td>
</tr>
<tr>
<td></td>
<td>Conduct literature review on best and/or promising practices to increase the reach of dental loan repayment programs</td>
<td>March 31, 2013</td>
<td>Adult &amp; Community OH Coordinator (Corinne Allen-Ziser)</td>
<td>Written synthesis of literature reviews complete</td>
</tr>
<tr>
<td></td>
<td>Convene internal workgroup (Primary Care Office, Oral Health Unit) to review Resource Development Plan and identified best and promising practices and develop an action plan for increasing the number of dental loan repayment recipients</td>
<td>May 31, 2013</td>
<td>Dental Director (Katya Mauritson)</td>
<td>Action Plan is complete</td>
</tr>
<tr>
<td></td>
<td>Implement action plan</td>
<td>September 30, 2015</td>
<td>Dental Director (Katya Mauritson)</td>
<td></td>
</tr>
</tbody>
</table>

**Objective F:** By September 30, 2015, Colorado Medicaid and CHP+, currently reimbursing for emergency only services for pregnant women, will expand coverage to include preventive and restorative services thereby offering “comprehensive care” to pregnant women.  

**Lead:** Deborah Borek

**Target Population:** Health Care Policy and Financing
**Criteria for Success:**
- Medicaid and CHP+ coverage for comprehensive dental care for pregnant women

**As Measured by:**
- Medicaid and CHP+ benefit for pregnant women

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore and advocate for policy changes that support oral health providers in caring for young children and pregnant women</td>
<td>Meet with internal partners, Zula Solomon, Health Systems Unit Director, and Mandy Bakulski, Maternal Wellness Director, to discuss opportunities to coordinate/integrate insurance benefits for pregnant women that include comprehensive dental benefits</td>
<td>December 31, 2012</td>
<td>Child and School OH Coordinator (Deborah Borek), Dental Director (Katya Mauritson)</td>
<td>Create a written report to share with members of the Oral Health Unit and the Tri-Agency work group describing opportunities to integrate oral health into insurance benefit packages for pregnant women</td>
</tr>
<tr>
<td></td>
<td>Share the report generated from the meeting with internal partners describing opportunities to integrate oral health into insurance benefit packages for pregnant women with both the Oral Health Unit and the Tri-Agency workgroup (Winnables) tasked with establishing a comprehensive dental benefit for pregnant women</td>
<td>January 31, 2013</td>
<td>Dental Director (Katya Mauritson)</td>
<td>Shared report</td>
</tr>
<tr>
<td></td>
<td>Support the Tri-Agency workgroup (Winnables) tasked with establishing a comprehensive dental benefit for pregnant women by delivering expert opinion (on an ongoing basis and as requested) regarding evidence based treatment protocols for pregnant women</td>
<td>September 30, 2015</td>
<td>Dental Director (Katya Mauritson)</td>
<td>Delivery of technical assistance (as requested) is documented</td>
</tr>
</tbody>
</table>

**Objective G:** By September 30, 2015, the number of local health agencies, councils, coalitions or community advocates referencing the Healthy Community Standards for Oral Health to identify local oral health needs and improve the oral health status of their community will have increased from zero to 15.

**Lead:** Deborah Borek

**Target Population:** Local health agencies, Early Childhood Councils, local oral health coalitions, community advocates
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop and promote the Healthy Community Standards for Oral Health</td>
<td>Create a Toolkit to assist Early Childhood Councils, educators, and others working to improve the oral health of young children in Colorado by offering information, resources and tools to support the Community Standards for Oral Health</td>
<td>December 31, 2011</td>
<td>Helene Kent, Consultant</td>
<td>Final Toolkit is completed and approved by the Implementation Team</td>
</tr>
<tr>
<td></td>
<td>Post Toolkit to Oral Health Colorado website</td>
<td>January 31, 2012</td>
<td>Child &amp; School OH Coordinator (Deborah Borek)</td>
<td>Toolkit posted to OHCO website</td>
</tr>
<tr>
<td></td>
<td>Host introductory webinar to introduce Toolkit to Early Childhood Councils, local oral health coalitions and community advocates</td>
<td>February 29, 2012</td>
<td>Helene Kent, Consultant</td>
<td>Delivery of Webinar</td>
</tr>
<tr>
<td></td>
<td>Present the Toolkit to local health agencies at Maternal Child Health annual session</td>
<td>March 09, 2012</td>
<td>Child &amp; School OH Coordinator (Deborah Borek)</td>
<td>2012 MCH Annual Session agenda</td>
</tr>
<tr>
<td></td>
<td>Survey local health agencies, coalitions, Early Childhood Councils and community advocates to assess usage and perceived “value” of the Standards</td>
<td>December 31, 2012</td>
<td>Child &amp; School OH Coordinator (Deborah Borek)</td>
<td>Survey results</td>
</tr>
<tr>
<td></td>
<td>Deliver ongoing technical assistance to local agencies and advocates on how to use the Standards and Toolkit to improve the oral health of children in their community</td>
<td>September 30, 2015</td>
<td>Child &amp; School OH Coordinator (Deborah Borek)</td>
<td>List of agencies and/or advocates requesting assistance</td>
</tr>
</tbody>
</table>

**Objective H:** By September 30, 2015, the Oral Health Unit will have provided stakeholders with accurate and timely oral health data to inform program development and decision making.

**Lead:** Katya Mauritson

**Target Population:** Federal, state and local stakeholders
Criteria for Success:
• Accurate data is disseminated to the appropriate stakeholders in a timely fashion

As Measured by:
• Execution of data dissemination plan

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Milestones / Key Activities</th>
<th>Target Completion Date</th>
<th>Responsible Persons/Group</th>
<th>Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect, analyze, monitor and disseminate Colorado oral health data</td>
<td>Complete Basic Screening Survey (BSS) of Kindergarten and 3rd grade students</td>
<td>January 31, 2012</td>
<td>Adult and Community OH Coordinator (Corinne Allen-Ziser)</td>
<td>Data sent to Epidemiology, Planning and Evaluation Branch</td>
</tr>
<tr>
<td></td>
<td>Analyze primary BSS data</td>
<td>February 29, 2012</td>
<td>Epidemiology, Planning and Evaluation Branch, Oral Health Unit</td>
<td>Complete data set</td>
</tr>
<tr>
<td></td>
<td>Work with EPE to interpret BSS data and highlight key findings for final report</td>
<td></td>
<td>Epidemiology, Planning and Evaluation Branch, Oral Health Unit</td>
<td>2011 Basic Screening Survey Report</td>
</tr>
<tr>
<td></td>
<td>Post Burden Document to CDC grant website (MOLAR)</td>
<td>March 31, 2012</td>
<td>Dental Director (Katya Mauritson)</td>
<td>Burden Document uploaded to MOLAR</td>
</tr>
<tr>
<td></td>
<td>Create statewide dissemination plan for BSS data, Burden Document, Surveillance system Plan, Workforce Modeling report, and Child Health Survey results.</td>
<td>March 31, 2012</td>
<td>Dental Director (Katya Mauritson)</td>
<td>Written dissemination plan</td>
</tr>
<tr>
<td></td>
<td>Execute statewide data dissemination plan</td>
<td>August 31, 2012</td>
<td>Dental Director (Katya Mauritson)</td>
<td>All data disseminated per plan</td>
</tr>
<tr>
<td></td>
<td>Supply data to local, state and federal stakeholders as requested</td>
<td>September 30, 2015</td>
<td>Epidemiology, Planning and Evaluation Branch, Oral Health Unit</td>
<td>Data requests are completed and documented</td>
</tr>
</tbody>
</table>
Budget Information

The Oral Health Unit currently has 1.55 FTE dedicated to this MCH priority for the current fiscal year, pending approval. $8000 from the Colorado Trust Grant is being used to fund the development of a Toolkit (companion document to the Healthy Community Standards for Oral Health) offering information, tools and resources to assist local agencies and advocates improve the oral health of pregnant women and children in their community.

General Information

**Primary Contact:** Deborah Borek, Child and School Oral Health Coordinator  
**Phone Number:** 303-692-2529

**Integration Points:** Primary Care Office, Maternal Wellness Unit, Health Integration Initiative, State Oral Health Plan, Winnable Battles, B-8 Collaborative, Health Systems Unit

**Link with Health Equity:** The burden of oral disease is disproportionately borne by individuals with low socioeconomic status. Poor children suffer twice as much dental caries as their more affluent peers, and their disease is more likely to be untreated. One out of four children in America is born into poverty and children living below the poverty line have more severe and untreated decay.

**Strategic Partners:** Cavity Free at Three, Oral Health Colorado, Health Care Policy and Financing, Professional Associations, Caring for Colorado, Delta Dental Foundation, Colorado Department of Health and Human Services

**Stakeholders:** Local Public Health Agencies, Early Childhood Councils, Local Coalitions
**Colorado Maternal & Child Health Priority on Dental Caries in Children Birth - 5 years**

**State Logic Model**

December 30, 2011

(See page 2 for Logic Assumptions & External Factors)

**Overarching Goal:** Optimal health and well-being for the Maternal & Child Health (MCH) population in Colorado

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>OUTPUTS</th>
<th>OUTCOMES</th>
<th>IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies</td>
<td>Participation</td>
<td>Short Term Accomplished in 1-3 years</td>
<td>Medium Term Accomplished in 4-6 years</td>
</tr>
</tbody>
</table>

**Funding**
- CDC Cooperative Agreement
- MCH Block Grant
- Preventive Health & Human Services Grant
- Private Foundation Funding

**CDHE**
- Oral Health Unit
- Epidemiology, Planning & Evaluation Branch
- Primary Care Office
- Birth & Collaborative
- Early Childhood Specialist
- Oral Health / MCH Implementation Team
- Tri-Agency Collaboration for Oral Health

**Partners**
- Dental & Medical Professional Associations
- State & Local Coalitions
- Local Health Agencies (LHA)
- Early Childhood Councils (ECC)

**State Oral Health Initiatives**
- Cavity Free at Three
- Health Integration, Colorado Partnership for Children’s Oral Health

**Resources**
- State Oral Health Plan
- Oral Health Burden Report
- Basic Screening Survey
- Results Colorado Oral Health Surveillance System
- State Fluoridation Plan

**INPUTS**

**Outcomes**

**Impact**

**Strategies**

- Explore and advocate for policy changes that support oral health providers in caring for young children and pregnant women.
- CDPHE Primary Care Office, Medicaid / CHP+ Medical and Dental Professional Organizations
- Develop and promote Health Community Standards for Oral Health
- Collect, analyze, monitor, and disseminate Colorado oral health data

**Outputs**

- Cavity Free at Three Program Partners, Community Organizations, Primary Care Providers, Dental Providers
- Colorado Oral Health Guidelines for Pregnancy and Early Childhood are adopted and providers consistently use best practices
- LHAS, ECCs, Local coalitions, Oral Health Advocates
- Federal, State, and Local Stakeholders

**Increased public awareness on the importance of early oral health care**

- PCPs conduct oral health screening during well child visit and educate parents on importance of dental exam before age 1
- Increased % of pregnant women who see the dentist

- Increased % of children who see the dentist by age 1
- Increased % of children Birth to 5 years having a dental home

- Increased number of dental providers who accept Medicaid and CHP+ and see pregnant women and/or children B-5 years
- Decreased development of dental carries among children aged 0-5 years
- Decreased health disparities associated with dental carries among children aged 0-5 years

- Increased % of Colorado population with optimally fluoridated water

(See page 2 for Logic Assumptions & External Factors)
### Logic Assumptions

The CDPHE program builds on initiatives for screening and referral that already exist, such as Cavity Free at Three. Education on oral health care for children must start early – as early as during pregnancy. Pregnant women who receive optimal dental care are more likely to understand the importance of early oral health care for their child. In addition to dental providers, strategies target medical professionals and public health professionals. They have more frequent contact with pregnant women and young children < 1 year of age, and thus have opportunities to educate and refer on oral health needs. Additionally, strategies target medical and dental professional organizations. Their support and endorsement adds credibility to one common set of Colorado Oral Health Guidelines for Pregnancy and Early Childhood and creates a new “standard of practice” in both the dental and primary care settings. Medicaid and CHP+ coverage will facilitate an increase in the number of dental providers who are willing to see pregnant women and young children. Optimally fluoridating water for oral health is the single most cost-effective strategy a community can take to improve the oral health of its residents, young and old. Studies consistently show that water fluoridation reduces tooth decay by 20 to 40 percent.

The OHU will work with all LHA who selected Dental Caries as a local priority.

### External Factors

Oral health has been named as one of the ten CDPHE Winnable Battles and is being addressed by a newly formed task group, Tri-Agency Oral Health Collaborative, consisting of three state agencies (Colorado Department of Human Services, Health Care Policy and Financing and Colorado Department of Public Health and Environment) and state partners.

A national advertising campaign from The Ad Council to improve children’s oral health is set to launch in 2012.

The Colorado Partnership for Children’s Oral Health (COPCOH) is a new initiative launched in 2011. The initiative is focused on increasing access to quality dental care for children and pregnant women and increasing awareness of the importance of children seeing a dentist by age 1.

Cavity Free at Three (CF3), founded in 2007, is a statewide effort to prevent oral disease in children from infancy to age 3 by educating health professionals about the consequences of early childhood caries and their role in preventing this disease. Since many children will see health care professionals earlier and more often than dentists, the CF3 model integrates caries risk assessments, anticipatory guidance, parent counseling and goal setting, establishment of a dental home, and fluoride varnish application into well child care visits. Training sessions with medical providers hands give hands-on practice with infants and toddlers for oral exams and fluoride varnish applications.
Toolkit for Promoting Maternal and Child Oral Health in Colorado Communities

Oral Health Unit,
Colorado Department of Public Health and Environment
INTRODUCTION

Background
You cannot be healthy without oral health. Oral health and general health are not separate entities. The mouth is part of the body the same as the heart or the kidneys in that you cannot experience systemic, or overall, health without good oral health. Oral health is a critical component of health and must be included as part of individual and community health programs.¹

The landmark Oral Health in America: A Report of the Surgeon General emphasized that oral health means much more than healthy teeth. It also means being free of chronic pain, cancers lesions, birth defects and other diseases and condition affecting the oral area. It is the part of the body that encompasses the mouth “allows us to speak and smile; sigh and kiss; smell, taste, touch, chew and swallow; cry out in pain; and convey a world of feelings and emotions through facial expressions.” It also provides protection against infections and environmental insults. Oral examination can detect signs of nutritional deficiencies as well as a number of diseases, including microbial infections, immune disorders, injuries and some cancers. Research shows associations between oral infections and heart and lung diseases, stroke, and low-birth-weight, premature births.²

Purpose
This toolkit was developed by the Colorado Department of Public Health and Environment (CDPHE) to assist Early Childhood Councils, educators, and others working to improve the oral health of young children in Colorado by offering information, resources and tools. The toolkit is designed as a companion document to the Colorado Healthy Community Standards, Oral Health that were developed to support maternal and child health efforts of the Colorado Department of Public Health and Environment. For more information go to http://www.cdphe.state.co.us/ps/mch/index.html. The standards are envisioned as aspirational goals for all Colorado communities to achieve. It is expected that if all standards are met then residents will have good oral health.

Community Standards, Oral Health

1. Every person has a dental home that interacts with a health home to promote overall wellbeing and address physical, behavioral and oral health needs.

2. Community water is fluoridated at optimal levels to prevent tooth decay.

3. Oral health education is provided in health care, child care, school, workplace and other settings

4. There are sufficient dental professionals to meet oral preventive care and treatment needs and sufficient dental and other trained professionals to address oral health promotion needs.

5. Every person receives evidenced-based interventions to promote oral health.

6. The oral health needs of the community are identified and advocates work to meet these needs.
7. Disparities in access to care are actively monitored and the community is engaged in promoting health equity.

How to Use This Toolkit
Each chapter contains background information, suggestions for action and resources. Chapters concisely summarize key concepts helpful to understanding each standard. Each chapter offers suggestions for what activities individuals, child care centers, and Early Child Care Councils can take to make a difference in their communities. Finally, resources are listed that will provide more detailed information, if desired.

Two other resources are provided in this section.

**Oral Health Statistics** - offers a snapshot of national and Colorado specific statistics about children's oral health illustrating the need to address this important area.

**Factors to Promote Good Oral Health and Prevent Cavities in Children** - summarizes key factors that need to be available to help ensure all Colorado children have healthy teeth. Understanding these factors and how they are interrelated will illustrate why the different community standards are important.

Resources
The **National Maternal and Child Oral Health Resource Center's** purpose is to respond to the needs of states and communities in addressing current and emerging public oral health issues. The resource center collaborates with federal, state, and local agencies, national and state organizations, associations and foundations to gather, develop and share quality information and materials.

**Bright Futures** is a national disease prevention and health promotion initiative funded by the Maternal and Child Health Bureau. This toolbox highlights materials that advance the Bright Futures philosophy of promoting and improving the oral health of infants, children, and adolescents. [http://www.mchoralhealth.org/Toolbox/index.html](http://www.mchoralhealth.org/Toolbox/index.html)

ORAL HEALTH STATISTICS

The following information provides a national and Colorado-based snapshot of the oral health of children.

National Data

- **Oral Health in America: A Report of the Surgeon General** identified dental as the most common unmet health need among children in the United States.
- Almost three times as many children lack dental insurance as lack medical insurance.
- Dental caries impact four of 10 children aged 2 to 11 years, particularly those who are from poor families and racial/ethnic minorities.
- On average, 28 percent of children aged 2-5 years have caries.
- According to the U.S. Government Accountability Office, of children enrolled in Medicaid:
  - One in three has untreated tooth decay and one in nine has untreated decay in three or more teeth.
  - One in three children aged 2 to 8 years have received dental care in the previous year and one in eight children have never seen a dentist, compared to half of children with private health insurance.
  - Only 37 percent of children enrolled in Medicaid received a preventive dental service, far below the Healthy People 2010 target of 66 percent.
- Findings from the National Health and Nutrition Examination Survey show that 80 percent of dental caries is found among 25 percent of children.
- Non-white children had greater unmet dental needs than white children, with Hispanic and Native American children at particularly high risk. Native American and Latino children were least likely to have dental insurance, with approximately two thirds of each group having dental coverage, compared with as high as 85 percent coverage rates in other racial/ethnic groups.
- Families of children with special needs identify dental care as the most prevalent unmet health care need, surpassing mental health, home health, hearing aids and all other services.
- There are inadequate numbers of dentists in many rural/frontier areas and in disadvantaged urban settings. It is estimated that it will take over 9,000 professionals to meet the dental needs in these communities.

Colorado Data

- In Colorado, dental decay is a serious problem for children and is a disease of poverty. Third grade children from low income families have nearly double the rate of tooth decay compared to children from higher income families, and their decay is more likely to go untreated.
- Forty-five percent of kindergarten and 57 percent of third-grade children have tooth decay, higher than the Healthy People 2010 goal of 42 percent. Furthermore, 23 percent of children in kindergarten and nearly 25 percent of children in third grade have untreated tooth decay. Among the poorest children, 35 percent have untreated dental caries.
- More than one in four Hispanic children have no regular source of dental care and are three times more likely to have unmet dental needs than White, non-Hispanic children.
- More than 20 percent of low-income children have teeth in fair or poor condition compared to less than 4 percent of higher-income children.
- Only one in three children in low and middle income families have sealants compared to nearly one of two children from higher income families. Furthermore, the children from lower income families are three times more likely to need urgent dental care.
Factors to Promote Good Oral Health and Prevent Cavities in Children

This section summarizes key factors that need to be in place so that all Colorado children have healthy teeth. Understanding these factors and how they are interrelated illustrates why the different community standards are important.

Tooth decay is almost completely preventable. The Association of State and Territorial Dental Directors’ resource Best Practice Approach: Prevention and Control of Early Childhood Tooth Decay have identified key practices to preventing tooth decay. Some of ASTDD suggestions about how families and caregivers can prevent cavities in children are summarized below.

1. **Fluoride** - Fluoride prevents and slows the progression of tooth decay and can even reverse very early tooth decay. Sources include drinking water with optimal levels of fluoride and use of products such as fluoride varnishes, gels, toothpastes, mouth rinses and supplements (See the fluoride chapter for more information.).

2. **Reduction of Bacteria that Cause Tooth Decay** - Children are not born with the bacterium that causes dental decay. It is transmitted from the mother or primary caregiver to the child. The risk of tooth decay can be lowered by reducing the transmission of this bacteria from caregiver to child by:

   **Reducing the bacteria in the mouth of the mother or primary caregiver** - Evidence suggests that most young children acquire bacteria that cause tooth decay primarily from their mothers. Efforts to reduce the transmission of bacteria from mothers to children improve the likelihood of better oral health for the child. This requires oral health education/counseling, preventive treatment, and home care for the parents and primary caregivers. While helping reduce the chance of cavities for the infant, it also improves the well-being of the caregivers.

   **Minimizing the transmission of bacteria that cause tooth decay** - Minimizing saliva-sharing activities between children and parents/caregivers limits bacterial transmission. Examples include avoiding the sharing of utensils, food and drinks; discouraging a child from putting his/her hand in the caregiver’s mouth; not licking a pacifier before giving it to the child; and not sharing toothbrushes. The goal is to help children prevent or delay acquiring the bacteria that cause tooth decay.

3. **Education and Anticipatory Guidance for Parents and Caregivers** - Parents and caregivers benefit from knowing how to promote good oral health. This includes sharing information about good home care practices and prevention strategies and finding dental homes for children. Guidance is needed in the following areas:

   - The causes and prevention of tooth decay
   - Avoidance of saliva-sharing behaviors
   - Appropriate fluoride intake for the child
   - Recognizing early signs of tooth decay
   - Bottle feeding
   - Promoting good oral hygiene and nutrition habits
   - Speech/language development
   - The first dental visit
   - Injury prevention
In addition to taking action to prevent tooth decay, the Association of State and Territorial Dental Directors also recommends all children have an age 1 year dental visit and a dental home.

4. **Age 1 Year Dental Visit** - The American Association of Public Health Dentistry (AAPHD), American Academy of Pediatric Dentistry (AAPD), American Dental Association (ADA), American Academy of Pediatrics (AAP) and American Public Health Association (APHA) recommend that infants receive an oral evaluation within six months of the eruption of the first primary tooth, but by no later than 1 year old. This evaluation is intended to assess and check for dental problems and educate parents/caregivers.

5. **Dental Home** - To achieve optimal oral health, children need professional dental care, which should start in infancy and continue over a lifetime. National organizations such as AAPD, AAP and Children’s Dental Health Project (CDHP) support the concept of a dental home, which brings together the interaction of the child, parents, non-dental professionals, and dental professionals to deliver oral health care in a comprehensive, continuously accessible, coordinated, and family-centered way. A dental home should emphasize prevention and disease management, as well as care tailored to meet individual needs for better health outcomes at lower costs. A dental home should also provide parental education and counseling including anticipatory guidance, and make necessary referrals to dental specialists. The age one visit can be the first step to establishing a dental home.

In summary, if all children and their families develop good oral health habits, participate in an Age 1-year dental visit and have a dental home, many more Colorado children would enjoy good oral health.
Standard 1 - Every person has a dental home that interacts with a health home to promote overall wellbeing and address physical, behavioral and oral health needs.

Background
There are a number of related concepts that address the need to provide care in a more integrated manner. Although navigating the concepts can be confusing, the main idea is that every child has a place where their medical, oral and behavioral health is addressed. The health home concept is recent and becoming more common. The medical home is an idea that has been developing over a number of years. In Colorado, the medical home concept has developed with the inclusion of oral health. Dental home builds from the concept of medical home and applies key concepts to the provision of dental care.

Since oral health is part of overall health, oral health awareness and linkages to a dental home are integral to the medical home concept in Colorado. To provide comprehensive care to patients, a health care provider must assure that oral health needs are being addressed by a trained dental professional. Concurrently, the dental home practitioner must ensure that medical needs are addressed and help to assure that the patient has access to a medical home. Because of the linkage between oral and overall health, it is important that the health care and dental care providers interact when necessary and share relevant information. This requires developing linkages, referral systems and the ability to share health information between offices.

Definitions
Health Home: Health home\(^9\) refers to an approach to providing primary care in which children receive integrated, comprehensive medical, dental and mental health care that is focused on prevention and early intervention, with reliance on specialists to help with disease management and provide intensive care (e.g., treatment procedures and therapies).

Medical Home: The American Academy of Pediatrics defines the medical home\(^10\) as an approach to providing comprehensive primary care, not a building, house, hospital, or home health care service. This approach is characterized as family-centered. A pediatric care team works in partnership with a child and a child's family to assure that all of the medical and non-medical needs of the patient are met. Through this partnership, the pediatric care team helps the family access, coordinate and understand specialty care, educational services, out-of-home care, family support, and other public and private community services important for the overall health of the child and family.

Dental Home: According to the American Academy of Pediatric Dentists, a dental home refers to the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated and family-centered way. Establishment of a dental home begins when a child reaches 12 months of age and includes referral to dental specialists when appropriate.
Colorado Medical Home Initiative
Since 2001, the Colorado Medical Home Initiative\textsuperscript{11} has worked to build a sustainable system that delivers quality health care for all children. Lead agencies include the Colorado Department of Health Care Policy and Financing and the Colorado Department of Public Health and Environment. Numerous government, nonprofit, family and professional organizations support this effort. According to the Colorado Medical Home Initiative in this state, a medical home is not a place, but it:

- Is a concept of quality health care.
- Is a team approach to coordinating health care services
- Promotes a partnership between families and providers.
- Encompasses medical, mental and oral health care.
- Is accomplished when families feel included and valued, and when care and treatment options are mutually discussed and collaboratively decided.

Components of the Colorado Medical Home:

- Accessible - Families know whom to call, insurance plans accepted, community based, and there is physical accessibility to needed services
- Family-Centered - The family is recognized as the principal caregiver and center of strength, knowledge and support for the child. The family voice is valued.
- Continuous - The same health care professionals are available from infancy through adolescence, and transition to the adult health care system is successful.
- Comprehensive - The child's and family's medical, educational, developmental, psychological and other service needs are identified and addressed.
- Coordinated - A plan of care is developed by the health care provider, child and family and is shared with other involved providers, agencies and organizations.
- Compassionate - Efforts are made to understand and empathize with the feelings and perspectives of both the child and family. Families are comfortable, satisfied participants.
- Culturally Responsive - The child's and family's cultural background (including beliefs, rituals and customs) are recognized, respected and incorporated into care planning.

Dental Home Component
According to the American Academy of Pediatric Dentists, the dental home describes the ongoing relationship between the dentist and patient. The dental home includes all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated and family-centered way. Dental home should start no later than when a child reaches 12 months of age. Comprehensive care that includes risk assessment, preventive and restorative care, preventive oral health care, anticipatory guidance and referral to other oral health care professionals is provided through this arrangement. A dental home is a place where the following are available\textsuperscript{12}: 

An accurate risk assessment for oral diseases and conditions
An individualized preventive oral health program based on risk assessment
Anticipatory guidance about growth and development issues (for example, teething; thumb, finger, or pacifier habits; and feeding practices)
A plan for emergency oral trauma treatment
Information about proper care of the infant's or child's teeth and soft oral tissues
Information about proper nutrition and dietary practices
Comprehensive oral health care in accordance with the child's needs and accepted guidelines and periodicity schedules for pediatric oral health
Referrals to other oral health specialists (such as endodontists, oral surgeons, orthodontists and periodontists) when care cannot be provided directly within the dental home.

Action

- Reinforce the relevance of good oral health to good overall health for children and their families.
- Educate families about the value of health, medical and dental home concepts.
- Be aware and participate in efforts in your community to develop health, medical and dental homes and ensure the two concepts are linked.
- Support the integration of oral health information within electronic health records and ensure that dental providers are included in health information exchanges.
- Support training efforts that enhance medical professionals’ ability to provide preventive care and dental professionals’ ability to work with children in an interdisciplinary approach.
- Support public and private financing that supports medical and dental providers’ abilities to work within comprehensive and collaborative health homes.

Resources

The Colorado Medical Home Initiative is a systems-building effort to promote quality health care for all children in Colorado. Bringing together many organizations, the Colorado Medical Home Initiative is dedicated to building a sustainable system that delivers quality health care for all children. http://www.coloradomedicalhome.com/cmhi.html

The National Center for Medical Home Implementation works in cooperation with federal agencies, particularly the MCHB, and other partners and stakeholders to ensure that all children and youth, including children with special needs, have access to a medical home. http://www.medicalhomeinfo.org. Colorado specific information can be found at http://www.medicalhomeinfo.org/state_pages/colorado.aspx.

Standard 2 - Community water is fluoridated at optimal levels to prevent tooth decay.

Background

Water and Fluoride

The use of fluoride is an effective, safe, and low-cost way to prevent tooth decay. The Centers for Disease Control and Prevention (CDC) recognize water fluoridation as one of the great public health achievements of the 20th century. Decades of research document that water fluoridation is an effective, safe, and low-cost way to prevent tooth decay. Fluoride prevents and can even reverse tooth decay by strengthening and rebuilding the hard white surface of teeth known as enamel.

Political opposition is one of the few barriers to fluoridating water supplies as are technical difficulties in fluoridating certain water systems. Numerous studies demonstrate the safety of fluoride and verify its role in reducing tooth decay for people of all ages, cultures and income levels. Over 62 years of scientific research shows no association between fluoridated water and risk for cancers, impaired bone health, or any other adverse health effects.

Fluoride is the name given to a group of naturally occurring compounds present in varying amounts in almost all soil, water supplies, plants, and animals. Nearly all water sources contain some level of fluoride. Water fluoridation is the adjustment of the natural levels of fluoride in drinking water to achieve a level which is optimal for the prevention of tooth decay. These levels are recommended by the Environmental Protection Agency and are routinely re-evaluated through scientific research to reaffirm the safety and effectiveness of the current recommended levels.

In Colorado, community water fluoridation is voluntary, a decision made by local authorities or by public vote. The public can contact the Colorado Department of Public Health and Environment at http://www.cdphe.state.co.us/pp/oralhealth/fluoridation/index.html to learn about community water systems.

Since sources of fluoride are now more readily available (such as in toothpaste), the U.S. Department of Health and Human Services (HHS) and the Environmental Protection Agency have proposed changes in the optimal level for community water fluoridation. To learn more about this proposed change, please visit http://www.cdc.gov/fluoridation/fact_sheets/cwf_qa.htm.

Fluoride varnish is a common method of providing topical fluoride to the primary teeth and is effective in preventing cavities. Varnish is a thick, resinous lacquer that is painted onto the tooth surface and quickly sets. It remains on the tooth surface until removed by repeated tooth brushing. Many dentists, physicians and programs, such as Cavity Free at Three, apply fluoride varnish.

Toothpaste is a good source of topical fluoride. Ask the child’s dentist or health care provider for advice. Caution is needed when providing toothpaste with fluoride to children younger than 24 months as they tend to swallow it. Children usually do not have the skill to brush their teeth well until around age 4 or 5. Parents should brush their young child’s teeth thoroughly twice a day until the child can handle the toothbrush alone. After that continue to monitor that proper brushing techniques are used.
Action

- Find out if your community's water is fluoridated. See resources listed below.
- Educate families about the importance of fluoride to health.
- Encourage children and families to drink water that is fluoridated.
- If parents currently choose to buy bottled water, remind them that tap water is safe, and contains beneficial levels of fluoride. If they choose to buy water ensure that it has adequate fluoride.
- Remind families that when teeth appear, they should be brushed at least twice a day with an aged-appropriate toothbrush with soft bristles. Seek advice from the child’s dentist and pediatrician about when to begin brushing teeth with toothpaste with fluoride. Typically for children younger than five, a "rice-size" amount of fluoridated toothpaste is recommended. Young children will want to swallow toothpaste, and with supervision will learn over time not to do so.
- Children usually do not have the skill to brush their teeth well until around age 4 or 5 or older. Parents should brush their young child’s teeth thoroughly twice a day until the child can handle the toothbrush alone. After that continue to monitor that proper brushing techniques are used.
- If prescribed by a dentist or physician, use prescription fluoride supplements and high concentration fluoride products.
- Encourage regular dental visits
- Educate parents about the value of fluoride varnish for primary teeth and sealants for permanent teeth.

Fluoride Level
To determine if your water has optimal levels of fluoride for the prevention of dental decay, go to My Water's Fluoride, Centers for Disease Control and Prevention. Information is given first by county and then by the name of the water system serving your area.
http://apps.nccd.cdc.gov/MWF/CountydataV.asp?State=CO

Private wells are not subject to safe water drinking standards or testing. It is the private owner’s responsibility to ensure the safety of their drinking water.

For general well water information, Centers for Disease Control and Prevention (CDC):
http://www.cdc.gov/healthywater/drinking/private/wells/testing.html
Well Water and fluoride, CDC:
http://www.cdc.gov/fluoridation/fact_sheets/wellwater.htm
Checklist of questions about well water testing, Colorado Department of Public Health and Environment (CDPHE):
Well water testing, including fluoride, CDPHE:
http://www.cdphe.state.co.us/lr/pages/water/WhenTest4Page.pdf
Labs certified to test private samples, CDPHE:
http://www.cdphe.state.co.us/lr/pages/cert/SDWList.pdf
Various testing packages available through the State Laboratory, CDPHE:
http://www.cdphe.state.co.us/lr/pages/water/WaterPackagesText.pdf
Pricing for various tests through the Colorado State Laboratory, CDPHE:
http://www.cdphe.state.co.us/lr/pages/water/PrivateCustomerWaterTestingPriceList.pdf
Resources
http://www.cdc.gov/fluoridation/benefits/background.htm

http://www.cdc.gov/fluoridation/fact_sheets/fl_caries.htm

Colorado Department of Public Health and Environment, Oral Health Unit
http://www.cdphe.state.co.us/pp/oralhealth/OralHealth.html
Standard 3 - Oral health education is provided in health care, child care, school, workplace and other settings

Background
There are a set of materials provided in this section for use in developing education materials and interventions. The resources listed describe some of the curriculum available to use with young children, child care staff and families. It is hoped that this information will assist the reader in developing the types of materials needed within her or his work environment.

- **Dental Caries Primer** – summarizes the process that leads to cavities and highlights why fluoride, teeth brushing, and good nutrition are important to oral health.
- **Key Education Messages to Promote Oral Health in Children** - lists important messages about children’s oral health. Counseling and education activities can be developed around this information to teach parents and children about good oral health.
- **Health Literacy Primer** – offers background about how to communicate taking health literacy into account.

Action

- Review each section and use within your classroom or other setting.
- Use information to work with parents and to address questions from the community.

Resources

**Cavity Free Kids: Oral Health Education for Preschool Children and Families**, Washington Dental Service Foundation. This is a comprehensive preventive oral health curriculum for preschool children in Head Start and other childcare programs. It is targeted at children, parents and teachers. [http://www.cavityfreekids.org/program/default.php](http://www.cavityfreekids.org/program/default.php)


**Promoting Children's Oral Health. A Curriculum for Health Professionals and Child Care Providers**, California Childcare Health Program. This curriculum is written for early child care educators with an interest in promoting oral health, such as early child care and education professionals, child care health consultants, school nurses and child care health advocates. [http://www.ucschildcarehealth.org/pdfs/Curricula/oral%20health_11_v7.pdf](http://www.ucschildcarehealth.org/pdfs/Curricula/oral%20health_11_v7.pdf)
Open Wide: Oral Health Training for Health Professionals, National Maternal and Child Oral Health Resource Center. This resource is a series of four modules designed to help health and early childhood professionals working in community settings (for example, Head Start and WIC staff) promote oral health in the course of promoting general health for infants, children and their families. [http://www.mchoralhealth.org/OpenWide/index.htm](http://www.mchoralhealth.org/OpenWide/index.htm)

Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs, 3rd Edition, National Resource Center for Health and Safety in Child Care and Early Education. These national standards represent the best evidence, expertise and experience in the country on quality health and safety practices and policies that should be followed in today’s early child care and education settings.

Nothing But the Tooth, National Maternal and Child Oral Health Resource Center. Available in English and Spanish, this video provides information on oral health and oral hygiene for pregnant and parenting women and their infants. The content focuses on the importance of visiting the dentist early in pregnancy, maintaining oral hygiene practices throughout pregnancy, and potential concerns about oral disease during pregnancy. [http://www.youtube.com/watch?v=4m41tR3s9sE&feature=channel_video_title](http://www.youtube.com/watch?v=4m41tR3s9sE&feature=channel_video_title)

Bright Futures, American Academy of Pediatrics. Bright Futures is a national health promotion and disease prevention initiative that addresses children's health needs in the context of family and community. [http://brightfutures.aap.org](http://brightfutures.aap.org)
Dental Caries Primer

Background
Tooth decay affects children in the United States more than any other chronic infectious disease. Young children are more likely than others to experience tooth decay. If left untreated tooth decay causes pain and infections that may lead to problems that affect eating, speaking and learning.

The good news is that tooth decay is preventable! It is now possible to nearly eliminate tooth decay in young children, using a combination of good oral hygiene, dental sealants and fluoride. By understanding the factors that influence tooth decay and cavities, we have a better sense of how to promote healthy teeth for every child in the community.

Definitions
Dental caries is a transmittable and contagious bacterial infection caused primarily by two bacteria: Streptococcus mutans and Lactobacillus. It involves demineralization and remineralization of tooth structure that can lead to tooth decay. In the earliest stages, caries is a preventable and reversible process.

A cavity is the end product of the caries process. A cavity is structural damage or, more simply, a hole in the tooth.

Early childhood caries is the presence of one or more decayed, missing (owing to caries), or filled tooth surfaces in any primary tooth in a child age 6 years or younger.

How Cavities are Formed
Bacteria are normally present in the mouth and convert all foods, especially sugar and starch, into acids. Bacteria, acid, food debris and saliva combine in the mouth to form a sticky substance called plaque that sticks to the teeth. Plaque is most likely found on the back molars, just above the gum line on all teeth, and at the edges of fillings. Plaque that is not removed from the teeth mineralizes into tartar. Plaque and tartar irritate the gums, resulting in gum inflammation and gum disease.

Plaque begins to build up on teeth within 20 minutes after eating (the time when most bacterial activity occurs). If this plaque is not removed thoroughly and routinely, tooth decay will not only begin, but flourish.

The acids in plaque dissolve the enamel surface of the tooth and create cavities. Cavities are usually painless until they grow very large and affect nerves or cause a tooth fracture. If left untreated, an infection can develop and the tooth can be damaged and ultimately lost. Sugars and starches increase the risk of tooth decay. Sticky foods are more harmful than non-sticky foods because they remain on the surface of the teeth. Frequent snacking increases the time that acids...
are in contact with the surface of the tooth. Whether a cavity develops is dependent on a number of factors, including the availability near the decay of fluoride or other minerals needed for healthy teeth.

Resources

**OPEN WIDE Oral Health Training for Health Professionals**

**Tooth Decay from Open Wide: Oral Health Training for Health Professionals**, National Maternal and Child Oral Health Resource Center. This resource is a series of four modules designed to help health and early childhood professionals working in community settings (for example, Head Start and WIC staff) promote oral health in the course of promoting general health for infants, children and their families.  
[http://www.mchoralhealth.org/OpenWide/index.htm](http://www.mchoralhealth.org/OpenWide/index.htm)
Key Education Messages to Promote Oral Health in Children

The following are important messages about children’s oral health. Education and activities can be developed around this information to help ensure good oral health.

**Baby Teeth Matter**
- Baby teeth are important.
- Tooth decay can develop as soon as the first tooth appears.
- Tooth decay in baby teeth can lead to infections --- it hurts.
- If baby teeth are lost too early, the teeth that remain may move and not leave any room for the adult teeth to emerge.
- Teeth are essential to good nutrition.
- Baby teeth are important for speech development.

**Clean and Brush Teeth**
- Even before their teeth emerge, infants need proper oral care to develop strong teeth and avoid cavities. Clean an infant’s gums with a soft damp cloth after feedings to prevent the buildup of bacteria.
- When teeth appear, they should be brushed at least twice a day with an aged-appropriate toothbrush with soft bristles. Seek advice from the child’s dentist and pediatrician about when to begin brushing with toothpaste with fluoride. Typically for children younger than five, a “rice-size” amount of fluoridated toothpaste is recommended. Young children will want to swallow toothpaste and with supervision will learn over time not to do so.
- Children usually do not have the skill to brush their teeth well until around age 4 or 5 or older. Parents should brush their young child’s teeth thoroughly twice a day until the child can handle the toothbrush alone. After that continue to monitor that proper brushing techniques are used.
- Every person has a dental home that collaborates with a health home to promote overall wellbeing and address physical, behavioral and oral health needs.
- They will need ongoing adults help and supervision to do a good job of cleaning their teeth.

**Fluoride Matters**
- Whenever possible drink water with optimal levels of fluoride.
- In communities with inadequate water fluoridation, a child’s doctor or dentist may prescribe daily fluoride supplements beginning at about six months old.
- If using bottled water, chose brands that contain fluoride.

**Good Nutrition and Eating Habits Matter**
- Children should eat well and enjoy age appropriate fruits and vegetables, whole grain foods, calcium-rich low-fat milk, cheese, lean protein and other healthy foods.
- Offer regular meals and snacks. Avoid ongoing and excessive snacking. A typical pattern for children is three meals a day and two or three snacks.
- Limit food and drinks high in sugar.
• The frequency of eating and drinking matters. Avoid frequent eating and drinking as this can promote dental decay. When children sip on beverages (even fruit juice or milk) or eat continuously there is significantly more exposure to bacteria, and they are more likely to develop tooth decay.

• Young children should not be put to bed with a bottle or sippy cup. If this does happen, the only liquid offered should be water, as the sugars in the milk, juice and other liquids come in contact with teeth and can lead to tooth decay.

• Children are encouraged to begin drinking from a cup as they approach their first birthday and to be weaned from the bottle by 12-14 months of age.

**See your Dental and Medical Professional Regularly**

• Children should have their first dental visit no later than their first birthday

• When a child’s permanent teeth emerge, discuss the use of dental sealants with his or her dentist.

• Well child visits are an important time to learn more about healthy eating and developing good oral health.

**Healthy Family Members and Caregivers Help Prevent Cavities**

• All family members and caretakers should take good care of their teeth for their own wellbeing and to avoid passing cavity-causing bacteria to children. This is especially important for pregnant women.

• Germs that cause cavities can be spread from utensils, cups, shared food and other objects, so avoid sharing these objects.

**Resources**


• American Academy of Pediatrics. **First Steps to a Healthy Smile.**

Health Literacy Primer

Background
According to the Centers for Disease Control and Prevention (CDC), health literacy is the degree to which an individual has the capacity to obtain, communicate, process and understand basic health information and services to make appropriate health decisions.

According to the National Assessment of Adult Literacy, about 30 million adults struggle with basic reading tasks. Nearly 40 million adults in the United States are thought to have below-average literacy skills, defined as less than a 5th grade reading level. These individuals may be unable to read or understand basic written information. Furthermore, it is estimated that only 12 percent of consumers have proficient health literacy skills. It is possible that nearly nine of ten adults may lack many of the skills needed to take care of their health. Older people, non-whites, immigrants and those with low incomes are disproportionally more likely to have trouble reading and understanding health information. However, the report cautions it is not easy to know who this issue affects.

Studies indicate that low health literacy is associated with poor health status, higher use of expensive care and emergency services, and increased rates of hospitalizations. Low health literacy can affect a person’s ability to locate health care providers and services, fill out health forms, share personal health information with providers, manage chronic diseases and engage in self-care. People are more likely to ignore or misunderstand educational efforts without clear information and an understanding of the information's importance.

Action

- Provide information in an easy to understand manner.
- Recognize how difficult it is for many adults to understand health related concepts and provide information accordingly.
- Consider the needs of individuals with low literacy when preparing written materials. Make all education and other materials easy to understand and relevant.
- As educators, assist health and dental professionals in your community in preparing health education materials.

Resources


The Centers for Disease Control and Prevention, Health Literacy website provides information and tools to improve health literacy and public health. These resources are for all organizations that interact and communicate with people about health. http://www.cdc.gov/HealthLiteracy/introduction.html
Center for Health Care Strategies A non-profit health policy resource center dedicated to improving health care quality for low-income Americans. 
http://www.chcs.org/usr_doc/Health_Literacy_Fact_Sheets.pdf

Literacy Communication and Information System is a national dissemination and professional development system, providing information on literacy research, practice, and resources http://www.nifl.gov
Standard 4 - There are sufficient dental professionals to meet oral preventive care and treatment needs and sufficient dental and other trained professionals to address oral health promotion needs.

Background²²,²³
Many people in Colorado face economic and geographic barriers to oral health care services. Low-income families, ethnic and racial minorities, immigrants, people with special health care needs and those living in rural areas are more likely to lack access to basic oral health care.

Nationally, compared to the overall population, the number of available dentists has decreased over time due to the decline in the number of practicing professionals and a reduction in dental school graduates. Even where the numbers of dentists are adequate, the distribution of practitioners to serve at-risk and vulnerable populations remains a concern. Of the nation’s dentists, approximately 90 percent provide services in the private sector with more than nine of ten dentists working in solo or two-person practices. Overall, there are few dentists practicing in public and nonprofit oral health clinics.

In 2009, the federal government estimated that to meet the current demand for dental care, an additional 9,432 dentists would be needed. In Colorado that year, there were 18 counties and two parts of counties designated as geographic Dental Health Professional Shortage Areas (HPSA), with another 18 designated as low-income dental HPSAs. Nine counties did not have an active licensed dentist and 13 lacked a dental hygienist; 10 more had only one licensed dentist and three had only a single dental hygienist.
Increasing Access to Oral Health

The Surgeon General’s Report on Oral Health indicated a need for dental, medical and public health providers to work together to promote oral health through campaigns, programs and services that emphasize disease prevention and health promotion. The report called for an interdisciplinary approach and emphasizes expanding workforce capacity and productivity by integrating oral health with general health services and programs.

According to the State and Territorial Dental Directors, the issues and possible solutions impacting oral health and oral health care access are multifaceted. State and local infrastructure and capacity to provide oral health care for underserved populations needs to be enhanced.

- ASTDD recommends these approaches to increasing access to dental care:
  - Expanding the traditional delivery system;
  - Developing community-based integrated delivery systems that are collaborative and innovative;
  - Increasing the health care workforce; and
  - Assuring sustainability through adequate and long-term funding.

- ASTDD strategies to address access to dental care issues include:
  - Dental public health approaches aimed at addressing access to care issues should incorporate strategies that increase the number, distribution and availability of dentists for all populations.
  - Dental public health approaches aimed at addressing access to care issues should incorporate strategies to increase the availability of and expand the scope of practice of dental auxiliary personnel.
  - Dental public health approaches aimed at addressing access to care issues should incorporate strategies to integrate education and prevention with services provided by non-dental providers.
  - Development and promotion of the mid-level oral health providers would require appropriate infrastructure for training, practice-related policy changes and modifications to the current health care system.

In Colorado, efforts are underway to address access and workforce issues. Cavity Free at Three educates health care providers in the early detection and prevention of oral disease in young children. It also assists general dentists on how to provide oral health care for children 0-3 year old and anticipatory guidance for their parents. Dental hygienists are increasingly being called upon to provide more preventive services and care to children. A new effort, Colorado Partnership to Improve Children’s Oral Health, is encouraging more dentists to care for children enrolled in Medicaid. The University of Colorado at Denver Health Sciences Center School of Dental Medicine is training dental and health care professionals in techniques to prevent dental decay in children through the Frontier Center. Oral Health Colorado is working on developing sustainable models of school-based oral health care.

Action

- Become knowledgeable about the issues related to provider access in your community.
Encourage health and dental providers to become involved in efforts like Cavity Free at Three.
Participate in efforts to address provider shortages within your community.

Resources
Cavity Free at Three is a nonprofit Colorado-based program aimed at preventing oral disease in young children and pregnant women using dental and health providers to offer education, screening, fluoride varnish and dental care referrals. Educational resources are available through the website: http://www.ucdenver.edu/life/services/AHEC/ProgramAreas/Pages/CavityFreeatThree.aspx

Oral Health Colorado (OHCO) is the state-wide oral health coalition. OHCO works with community oral health coalitions throughout Colorado, and will develop sustainable models of school-based oral health care that can be replicated throughout the state. www.OralHealthColorado.org

Association of State and Territorial Dental Directors, Best Practice Approach Access to Oral Health Care Services: Workforce Development
http://www.astdd.org/docs/BPAAccessWorkforce.pdf

Assistance in Finding a Dentist
The Colorado Dental Association (CDA) has a tool to assist the user in finding a dentist anywhere in Colorado as well as information on low cost dental resources. http://cdaonline.org/index.php?option=com_content&view=article&id=88&Itemid=56.

In the Denver area, the Metropolitan Denver Dental Society has a referral website for low cost dental resources including information for families with Medicaid. http://www.mddsdentist.com/resources/lowincome.asp. For other communities, contact the local dental association chapter.

The Healthy Teeth Happy Babies Campaign from the Delta Dental of Colorado Foundation has a dental referral webpage. http://www.healthyteethhappybabies.com/index.php/parents/access-to-care
Standard 5 – Every person receives evidenced-based interventions to promote oral health.

Background
According to the University of Massachusetts Medical Library, evidence-based public health practice is “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of communities and populations in the domain of health protection, disease prevention, health maintenance and improvement.”

Evidence-based practice combines a practitioner’s expertise with the best evidence derived from a systematic review of relevant research. It involves finding and selecting resources that are credible, relevant and applicable to the area of practice.

The use of evidenced-based practice is based on the need to make informed decisions using science, rather than intuition, opinion or anecdotal information. The expected outcome of this approach is the higher likelihood that programs, policies and interventions will be effective and that limited resources will be used more efficiently.

The Association of State and Territorial Dental Directors (ASTDD) supports an evidenced-based practice approach and has developed a Best Practices Project. ASTDD defines a best practice as a public health strategy that is supported by evidence for impact and effectiveness. Its website offers evidence based upon research, expert opinion, field lessons and theoretical rationale. The project provides best practice information for state and community oral health programs. The following are some of the best practice approach reports available on the website:

ASTDD Best Practice Approach Reports
- State-based Oral Health Surveillance System
- State Oral Health Coalitions and Collaborative Partnerships
- State Oral Health Plans and Collaborative Planning
- Statutory Mandate for a State Oral Health Program
- Use of Fluoride: Community Water Fluoridation
- Use of Fluoride: School-based Fluoride Mouthrinse and Supplement Programs
- School-based Dental Sealant Programs
- Access to Oral Health Care Services: Workforce Development
- Oral Health of Children, Adolescents and Adults with Special Health Care Needs
- Improving Children's Oral Health through Coordinated School Health Programs
- Prevention and Control of Early Childhood Tooth Decay

Action
- Explore the evidence base when considering strategies to use to improve oral health in a classroom, coalition or community.
- Use tools referenced on this page to learn more about key oral health practices.
Resources
The Institute for Oral Health offers data, insights, and potential solutions for improving the efficiency and effectiveness of dental care treatment, delivery, and policies. http://www.iohwa.org/institute-for-oral-health-about.htm

Evidenced-Based Practice for Public Health, University of Massachusetts Medical Library This informative website provides online access to evidence-based public health resources, knowledge domains of public health, and public health journals and databases. http://library.umassmed.edu/ebpph/index.cfm

Guide to Community Preventive Services, Task Force on Community Preventive Services. This site offers a collection of summaries and recommendations detailing the effectiveness, economic efficiency, and feasibility of interventions for a number of health topics. http://www.thecommunityguide.org/index.html

Model Practice Database, National Association of County and City Health Officials. This is a collection of projects from around the United States highlighting successful public health projects. http://naccho.org/topics/modelpractices/database

Promising Practices Network, RAND Corporation. This tool offers a collection of summaries of successful projects, programs and practices addressing the needs of children and youth. http://www.promisingpractices.net/default.asp
Standard 6 - The oral health needs of the community are identified and advocates work to meet these needs.

Background
Engaging in ongoing assessment of the needs of a community allows concerned residents to identify and resolve problems. Local health departments and early childhood councils are particularly likely to look at the needs of children in their area and seek solutions to address identified needs.

Working with like minded people and organizations has always been an effective way to mobilize action leading to needed changes. The Association of State and Territorial Dental Directors discusses the use of oral health coalitions as a best practice approach in communities. The following section has been excerpted from that document.

“Oral health problems usually involve significant social and cultural factors and require many resources and partners to implement prevention and treatment services. Building linkages with partners can provide more public recognition and visibility, leverage resources to expand the scope and range of services, provide a more comprehensive approach to programming, enhance clout in advocacy and resource development, enhance competence, avoid duplication of services and fill gaps in service delivery, and accomplish what single members cannot.”

Definitions
A coalition is an organization of individuals representing diverse organizations, factions or constituencies who agree to work together to achieve a common goal.

A collaboration is a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals. The relationship includes a commitment to a definition of mutual relationships and goals, a jointly developed structure and shared responsibility, mutual authority and accountability for success, and sharing of resources and rewards.

According to ASTDD, coalitions are important for a number of reasons. Coalitions can:

1. Enable organizations to become involved in new and broader issues without having the sole responsibility for managing or developing those issues.
2. Demonstrate and develop widespread public support for issues, actions or unmet needs.
3. Maximize the power of individuals and groups through joint action (increase the “critical mass” behind a community effort by helping individuals achieve objectives beyond the scope of any one individual or organization.
4. Minimize duplication of effort and services (which can also improve trust and communication among groups that would normally compete with one another).
5. Help mobilize more talents, resources and approaches to influence an issue than any single organization could achieve alone.

6. Provide an avenue for recruiting participants from diverse constituencies, such as political, business, human service, social and religious groups, grassroots groups and individuals.

7. By their flexible nature can allow them to exploit new resources in changing situations.

**Colorado Coalitions**

Each community is likely to have a variety of resources including health departments, schools, nonprofit and private groups interested in improving the health and well-being of children. Many communities already have existing coalitions dedicated to the areas of early childhood education and oral health. Two coalitions that have worked to create this tool kit are listed below.

**Oral Health Colorado**

Since 2003, there has been a statewide oral health coalition in Colorado. In 2010, Oral Health Awareness Colorado! was renamed Oral Health Colorado (OCHO). OHCO is committed to building a strong statewide advocacy network; developing and supporting community oral health coalitions throughout the state; and collaborating with partners to assure that best practices are developed and shared. http://www.oralhealthcolorado.org

**Early Childhood Councils**

The Early Childhood Councils were created by state legislation (HB06-1062). The intent of the councils is to change the way early childhood stakeholders do business through collaborative planning, networking, funding, coordination and implementation. Each county is led locally by a council that is a community-based collaborative working to build a comprehensive early childhood system that connects children, families, and resources to quality services in early care and education, health, mental health and family support.

In Colorado, early childhood services are defined by legislation to encompass: early care and education; family support; mental health; and health (including oral health). An Early Childhood Colorado Framework is available to illustrate how the four service areas can work together to best serve Colorado children and families. The framework is found at http://earlychildhoodcolorado.org/inc/uploads/CO_EC_Framework.pdf.

An Early Childhood Council works to create internal capacity by bringing together local partners from each of the four service areas to make decisions about how to improve the availability, accessibility, capacity and quality of services locally. Community partners then build the local foundations for collaboratively improving services for children and families. Finally, the Early Childhood Councils impact services. The collaborative efforts of local partners participating in the Early Childhood Councils mean that all stakeholders in the community are working together to improve the availability, accessibility, capacity and quality of services. http://www.cde.state.co.us/early/ECC.htm.

**Action**

- Learn about and participate in local community coalition dedicated to improving the health and oral health of children in your area.

**Resources**

*Smart Mouths, Healthy Bodies: An Action Plan to Improve the Oral Health of Coloradans* is the state oral health plan. The plan is being updated and will be complete in early 2012. The plan focuses on six major topic areas. These topic areas, and the related outcomes and strategies, will
help guide and direct a strong, unified statewide movement in support of achieving oral health for all residents. http://www.oralhealthcolorado.org

The **Children's Dental Health Project** is a national non-profit organization with the vision of achieving equity in children's oral health. The project works to eliminate barriers to preventing tooth decay to ensure that all children reach their full potential. http://www.cdhp.org/about_cdhp/about_childrens_dental_health_project
Standard 7 - Disparities in access to care are actively monitored and the community is engaged in promoting health equity.

Background
Health equity exists when all individuals and populations have equal opportunities for good health. Health disparities exist in populations because of differences in the presence of disease, health outcomes, or access to health care across racial, ethnic, socioeconomic and other lines. These disparities are often the outcomes of health inequities associated with uneven exposure to the factors that promote or diminish health. These factors are related to the health care system, the environment and personal behavior. The manner in which care is delivered also plays an important role in health equity. Income inequalities remain an ongoing concern when addressing children's oral health. Children living in poverty suffer twice the tooth decay as their more affluent peers, and their decay is more likely to go untreated. The children who suffer the most dental disease have the least access to oral health care services. Dental care is the most commonly reported unmet health care need in the U.S., two times more common as unmet medical care.

Approximately, 80 percent of tooth decay is found in 25 percent of children. Children from racial/ethnic minority groups experience multiple disparities in medical and oral health, access to care, and use of services. Low-income and minority children including those with special health care needs are at greatest risk of inadequate access and poor oral health. Disparities in access to dental care are associated with family income, race/ethnicity, caregiver education and special health care needs.

Influencing health disparities is complex and multi-dimensional. Reducing disparities requires wide-ranging approaches that target populations at highest risk and use evidenced-based solutions. A starting point is understanding what is leading to the disparities and to seek solutions that make a difference. Increasing access to the factors that support oral health and a reduction of those that cause harm is a good place to begin. In the context of oral health, this includes brushing teeth with fluoridated toothpaste; positive eating habits; drinking fluoridated water; having a dental home; and payment resources.

Determinants of Health
A public health approach to achieving health equity uses a focus on primary prevention of the root causes of illness and poor health. In general, population groups that suffer the worst health status are also those that have the highest poverty rates and the least education. Healthy People 2020 describes how individual and community health are intrinsically linked. A person's health is profoundly affected by the health of the community and the environment in which she lives, works, and plays. At the same time, the collective behaviors, attitudes, and beliefs of everyone who lives in the area also affect the health of the community. Individuals require knowledge, motivation and opportunities to make informed
decisions about their health.

A number of factors interact to determine if a person is healthy or not. These determinants of health: individual biology and behavior; the physical and social environment; societal policies and interventions; and access to quality health care have a profound effect on the health of individuals and communities. It is estimated that individual behaviors and environmental factors have the most impact on health and wellbeing.

An individual’s health is influenced by biology, which includes genetic makeup, family history, and the physical and mental health problems acquired during life. A person engages in specific behaviors such as tooth brushing and this interacts with the biological factors to influence oral health. Additionally, the social and physical environments influence wellbeing by interaction with individual biology and behavior thus influencing influence health. The social environment includes interpersonal interactions, social institutions, the workplace, housing, and many other factors. Examples of the social environment in oral health are factors that support positive oral health, such as access to a year one dental visit. Health is also influenced by the physical environment such as water and air. For oral health, access to fluoridated water is an example of an environmental factor. Access to quality oral health care is another important factor influences health and is a vital component in ensuring that individuals and communities are healthy.

**Action**

- Be aware of the significance of health disparities, their impact and how to improve health outcomes of underserved populations.
- Participate in community efforts to eliminate disparities.
- Participate in efforts that ensure access to quality health and dental care for all children and assist families in getting the dental services they need.
- Support efforts to address the root causes of health disparities such as poverty, lack of education and other determinants of health.
- Develop cultural and linguistic competency within your workplace and council.
- Develop and participate in culturally appropriate health promotion and disease prevention initiatives to reduce health disparities.

**Resources**

*The Connection between Health Disparities and the Social Determinants of Health in Early Childhood* is a Health Watch prepared by the Colorado Department of Public Health and Environment. The report describes the impact of health disparities during the important period of childhood. Colorado Specific information is provided including information on oral health. [http://www.chd.dphe.state.co.us/Resources/pubs/ECHealthDisparities2.pdf](http://www.chd.dphe.state.co.us/Resources/pubs/ECHealthDisparities2.pdf)

*The National Center for Cultural Competency* mission is to increase the capacity of health care and mental health care programs to design, implement, and evaluate culturally and linguistically competent service delivery systems to address growing diversity, persistent disparities, and to promote health and mental health equity. [http://nccc.georgetown.edu/index.html](http://nccc.georgetown.edu/index.html)
The US Department of Health and Human Services, Office of Minority Health’s, National Partnership for Action mission is to increase the effectiveness of programs that target the elimination of health disparities through the coordination of partners, leaders, and stakeholders. The result is the National Stakeholder Strategy for Achieving Health Equity a roadmap for eliminating health. [http://minorityhealth.hhs.gov/npa/templates/browse.aspx?lvl=1&lvlid=11](http://minorityhealth.hhs.gov/npa/templates/browse.aspx?lvl=1&lvlid=11)

Think Cultural Health’s goal is to advance health equity at every point of contact through the development and promotion of culturally and linguistically appropriate services. Think Cultural Health is the flagship initiative of the Office of Minority Health, Center for Linguistic and Cultural Competence in Health Care. It offers the latest resources and tools to promote cultural and linguistic competency in health care. [https://www.thinkculturalhealth.hhs.gov/Content/about_tch.asp](https://www.thinkculturalhealth.hhs.gov/Content/about_tch.asp)

Advancing Health Equity provides information, resources and tools to help organizations provide equitable health care to all. It is a project of the University of California, San Francisco, Center for the Health Professions. [http://www.advancinghealthequity.org](http://www.advancinghealthequity.org)

The Children's Dental Health Project is a national non-profit organization with the vision of achieving equity in children's oral health. The project works to eliminate barriers to preventing tooth decay to ensure that all children reach their full potential. [http://www.cdhp.org/about_cdhp/about_childrens_dental_health_project](http://www.cdhp.org/about_cdhp/about_childrens_dental_health_project)
Resources

The National Maternal and Child Oral Health Resource Center’s purpose is to respond to the needs of states and communities in addressing current and emerging public oral health issues. The resource center collaborates with federal, state, and local agencies; national and state organizations and associations; and foundations to gather, develop and share quality information and materials. [http://www.mchoralhealth.org/about/index.html](http://www.mchoralhealth.org/about/index.html)

Bright Futures is a national disease prevention and health promotion initiative funded by the Maternal and Child Health Bureau. This toolbox highlights materials that advance the Bright Futures philosophy of promoting and improving the oral health of infants, children, and adolescents. [http://www.mchoralhealth.org/Toolbox/index.html](http://www.mchoralhealth.org/Toolbox/index.html)


**Standard 1** - Every person has a health home that promotes overall wellbeing and addresses physical, behavioral and oral health needs.


The Colorado Medical Home Initiative is a systems-building effort to promote quality health care for all children in Colorado. Bringing together many organizations, the Colorado Medical Home Initiative is dedicated to building a sustainable system that delivers quality health care for all children. [http://www.coloradomedicalhome.com/cmhi.html](http://www.coloradomedicalhome.com/cmhi.html)

The National Center for Medical Home Implementation works in cooperation with federal agencies, particularly the MCHB, and other partners and stakeholders to ensure that all children and youth, including children with special needs, have access to a medical home. [http://www.medicalhomeinfo.org](http://www.medicalhomeinfo.org). Colorado specific information can be found at [http://www.medicalhomeinfo.org/state_pages/colorado.aspx](http://www.medicalhomeinfo.org/state_pages/colorado.aspx).

The National Maternal and Child Health Oral Health Resource Center provides a collection of selected resources about oral health, including the dental home. [http://www.mchoralhealth.org](http://www.mchoralhealth.org)

**Standard 2** - Community water is fluoridated at optimal levels or alternative sources of fluoride are promoted and provided.


Colorado Department of Public Health and Environment, Oral Health Unit [Link]

My Water’s Fluoride, Centers for disease Control and Prevention. [Link]

Oral Health Maps, under “Water Fluoridation” tab, Centers for Disease Control and Prevention. [Link]

Standard 3 - Oral health education is provided in health care, child care, school, workplace and other settings

Cavity Free Kids: Oral Health Education for Preschool Children and Families, Washington Dental Service Foundation. This is a comprehensive preventive oral health curriculum for preschool children in Head Start and other childcare programs. It is targeted at children, parents and teachers. [Link]

Partners in Prevention: Getting a Head Start on Oral Health—An Infant/Toddler Oral Health Continuing Education Course, New York University, College of Dentistry, Department of Pediatric Dentistry, New York Head Start Association. This continuing education course is designed for Head Start staff. [Link]

Promoting Children’s Oral Health. A Curriculum for Health Professionals and Child Care Providers, California Childcare Health Program. This curriculum is written for early child care educators with an interest in promoting oral health, such as early child care and education professionals, child care health consultants, school nurses and child care health advocates. [Link]

Open Wide: Oral Health Training for Health Professionals, National Maternal and Child Oral Health Resource Center. This resource is a series of four modules designed to help health and early childhood professionals working in community settings (for example, Head Start and WIC staff) promote oral health in the course of promoting general health for infants, children and their families. [Link]

Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs, 3rd Edition, National Resource Center for Health and Safety in Child Care and Early Education. These national standards represent the best evidence, expertise and experience in the country on quality health and safety practices and policies that should be followed in today’s early child care and education settings. [Link]

Nothing but the Tooth, National Maternal and Child Oral Health Resource Center. Available in English and Spanish, this video provides information on oral health and oral hygiene for pregnant and parenting women and their infants. The content focuses on the importance of visiting the
dentist early in pregnancy, maintaining oral hygiene practices throughout pregnancy, and potential concerns about oral disease during pregnancy.

Bright Futures, American Academy of Pediatrics. Bright Futures is a national health promotion and disease prevention initiative that addresses children’s health needs in the context of family and community. [http://brightfutures.aap.org](http://brightfutures.aap.org).

Primer

Tooth Decay from Open Wide: Oral Health Training for Health Professionals, National Maternal and Child Oral Health Resource Center. This resource is a series of four modules designed to help health and early childhood professionals working in community settings (for example, Head Start and WIC staff) promote oral health in the course of promoting general health for infants, children and their families. [http://www.mchoralhealth.org/OpenWide/index.htm](http://www.mchoralhealth.org/OpenWide/index.htm)

Education Messages


Health Literacy


The Centers for Disease Control and Prevention, Health Literacy website provides information and tools to improve health literacy and public health. These resources are for all organizations that interact and communicate with people about health. [http://www.cdc.gov/HealthLiteracy/introduction.html](http://www.cdc.gov/HealthLiteracy/introduction.html)


Literacy Communication and Information System is a national dissemination and professional development system, providing information on literacy research, practice, and resources [http://lincs.ed.gov/](http://lincs.ed.gov/)
Standard 4 - There are sufficient dental professionals to meet oral preventive care and treatment needs and sufficient dental and other trained professionals to address oral health promotion needs.

Association of State and Territorial Dental Directors, Best Practice Approach Access to Oral Health Care Services: Workforce Development
http://www.astdd.org/docs/BPAAccessWorkforce.pdf

Cavity Free at Three is a nonprofit Colorado-based program aimed at preventing oral disease in children up to age three and pregnant women using dental and health providers to offer education, screening, fluoride varnish and dental care referrals. www.cavityfreeatthree.org

Oral Health Colorado (OHCO) is the state-wide oral health coalition. OHCO works with community oral health coalitions throughout Colorado, and will develop sustainable models of school-based oral health care that can be replicated throughout the state. www.OralHealthColorado.org

Assistance in Finding a Dentist
The Colorado Dental Association (CDA) has a tool to assist the user in finding a dentist anywhere in Colorado as well as information on low cost dental resources. http://cdaonline.org/index.php?option=com_content&view=article&id=88&Itemid=56.

In the Denver area, the Metropolitan Denver Dental Society has a referral website for low cost dental resources including information for families with Medicaid. http://www.mddsdentist.com/web/public For other communities, contact the local dental association chapter.

The Healthy Teeth Happy Babies Campaign from the Delta Dental of Colorado Foundation has a dental referral webpage. http://www.healthyteethhappybabies.com/index.php/parents/access-to-care

Standard 5 - Every person receives evidenced-based interventions such as sealants or fluoride to promote oral health.

The Institute for Oral Health offers data, insights, and potential solutions for improving the efficiency and effectiveness of dental care treatment, delivery, and policies. http://www.iohwa.org/institute-for-oral-health-about.htm

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**Standard 6 - The oral health needs of the community are identified and advocates work to meet these needs.**

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The Children’s Dental Health Project is a national non-profit organization with the vision of achieving equity in children’s oral health. The project works to eliminate barriers to preventing tooth decay to ensure that all children reach their full potential. [http://www.cdhp.org/about_cdhp/about_childrens_dental_health_project](http://www.cdhp.org/about_cdhp/about_childrens_dental_health_project)

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2 IBID
3 IBID
10 National Center for Medical Home Implementation Overview. http://www.medicalhomeinfo.org/ AAPdoctors
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A Simulation Model for Designing Effective Interventions in Early Childhood Caries

Introduction

Dental caries in primary teeth of children 5 years of age or younger is still one of the major health problems in the United States, especially for low-income children. This largely preventable disease continues to affect many children in lower socioeconomic strata and many ethnic minorities. Poor oral health leads to chronic pain that affects a child's ability to chew food, thrive, and speak, as well as their psychological well being. One of the measurable impacts of severe dental disease in young children is the general medical condition referred to as "failure to thrive." Reports of children with severe dental caries and inappropriately low body weight have been reversed after completing dental care. (taken from C M Jones, et al, 2000—could substitute or add material introducing scope of the problem)

This paper presents a framework for assessing the impact of various programs designed to reduce the prevalence and consequences of Early Childhood Caries. The paper describes a System Dynamics simulation model of the population of children 0-5 years old in Colorado. The development and initial implementation of the model was a joint effort of the Children’s Dental Health Project (CDHP) and the Oral Health Unit of the Colorado Department of Public Health and Environment (CDPHE). The model is designed to be generic and, with the appropriate data inserted, could represent any state or large city, county, or Metropolitan area.

A model such as this one is needed to provide a better idea of the long-term and cumulative effects of different programs on a population of children. Interventions implemented at the same point in time can have very different effects over time depending on the age and income groups they are targeted at, their efficacy in reducing prevalence, and inherent time delays before their impact is realized. Combinations of interventions have even more complex effects that cannot be readily anticipated, but often represent the most effective strategies.

This paper will present the model, describe the various data sources used in its quantification, and present the results of simulations with a number of different interventions and combinations of those interventions. The value of these simulation results is not to provide forecasts, but to help compare interventions for their relative impacts. In addition to calculating reductions in prevalence, dmf scores, and fraction of children with untreated decay, the model also estimates reductions in restorative care costs that may be possible with the application of preventive interventions.

System Dynamics (SD) has a long history of applications to health care delivery and population health. (Homer and Hirsch, 2006) A comprehensive model of dental care and oral health was developed in 1975 for the Division of Dentistry in the Bureau of Health Manpower, USDHEW that projected dental manpower requirements and showed how slightly higher levels of supply could encourage shifts in care-seeking behavior and
improve oral health. (Hirsch and Killingsworth, 1975; Pugh-Roberts Associates, 1975; Levin et al, 1976) Later work applied the methodology to heart disease. (Luginbuhl et al, 1981) More recent work has applied System Dynamics to developing strategies for dealing with chronic illnesses such as diabetes (Homer et al, 2004; A P Jones et al, 2006) and cardiovascular disease (Hirsch et al, 2010; Homer et al, 2010). The CDC has also supported the development of a policy game called HealthBound that is based in an SD model and helps people understand the importance of prevention and primary care capacity in the context of health reform. (Milstein et al, 2010).

Structure of the Early Childhood Caries (ECC) Model

The basic structure of the ECC model emerged from a meeting of experts in various aspects of children’s oral health in April, 2009 at Columbia University. (list attendees?) The overall structure of the model, shown in Figure 1, separates children by age and risk of developing ECC. It was felt that separation by risk is important to characterize differences in ECC prevalence in the population and also to provide options in the model for allocating public health and dental resources to children at greatest risk. Furthermore, socioeconomic status as measured by household income was decided to be the best surrogate for risk, given the significant differences in ECC prevalence among children at different income levels. (Edelstein) The model distributes Colorado’s population of children ages 0 to 5 among these groups.

In simulations with this model, children naturally age over time with births introducing new children and others aging out as they reach their sixth birthday. There is also the
possibility of moving between risk categories if, for example, preventive programs result in a different set of circumstances for some children in lower income (higher risk) groups that are less conducive to ECC development and help to promote better oral health.

There are also important things going on within each of the boxes in Figure 1: the progression of ECC. The stages of the disease process, as represented in the model, are shown in Figure 2. Over the course of a simulation, children move from left to right as they develop ECC. Children start initially with No Caries Activity (NCA) and many remain in this category throughout their early childhood. However, some develop caries at rates tied to their age and risk groups and to various other factors that may be affected by preventive interventions. The experts at the April, 2009 meeting urged that the model make an important distinction between caries, that is any presence of the disease, and cavities where the disease creates measurable depressions in teeth. Children who move from the No Caries Activity (NCA) box to the one second from the left labeled Caries are ones who have developed pre-cavity lesions (e.g., white spots), but do not yet have measurable cavities. The purpose of adding this stage to the model is to provide an additional (critical) point at which to test interventions in the ECC process.

Without treatment or preventive activities, children with Caries develop Cavities that are initially Untreated. Some fraction of these are discovered and Treated during the course of regular dental visits. Others become Symptomatic and require Treatment on a more urgent basis. Some fraction of those children who have had Cavities Treated develop recurrent cavities that are initially Untreated. At each point in a simulation, children are moving in at least two directions as they age and also move through the sequence of stages in ECC and potentially in a third direction if preventive interventions also enable them to move among risk groups.

The model is initially set up in equilibrium and will continue to reflect the initial distribution of children among age and risk groups and distribution among these groups by disease stage in the absence of any new programs. Interventions change rates of flow from one box to another and, over time during a simulation, yield very different patterns of ECC prevalence. The model calculates a number of summary variables (e.g., overall fraction of children with cavities, cumulative cost of restorative care) that enable users to
evaluate the potential impacts of different interventions and combinations of programs. The next section describes how the computer model was quantified.

Quantifying the Early Childhood Caries (ECC) Model

Quantifying the ECC model for Colorado required data on prevalence of ECC relative to different demographic and behavioral characteristics such as household income. These data can be obtained for the entire US through the National Health and Nutrition Examination Survey (NHANES), but are not typically available at the state level. Fortunately, it was possible to access data from the Colorado “callback” survey for children of the Behavioral Risk Factor Surveillance System (BRFSS) that has several oral health questions as well as other relevant ones about access to medical care and insurance and behaviors such as consumption of sugary drinks.¹ (See http://www.cdphe.state.co.us/hs/yrbs/child_health_questionnaire_2004_1.pdf for a complete questionnaire for this survey.) The BRFSS data confirmed the relationship that might be expected between household income and frequency of problems related to cavities. Analysis of cross-tabulations with the data also yielded insights about the relationships between higher prevalence of these problems and other variables that are somewhat related to income

• highest levels of education achieved by adults in the household (HS or less)
• health insurance status (uninsured vs. insured), type of insurance (Medicaid vs. private), and source of regular medical care (clinic vs. doctor’s office)
• later age at first dental visit
• more frequent consumption of sugary drinks and frequency of food insecurity
• Hispanic vs. non-Hispanic ethnic background
• whether dental care had to be delayed for any reason

Whether a family had a regular source of dental care or regular medical doctor appeared to matter less.

The first step in quantifying the ECC model was to choose the income ranges for the High, Moderate, and Low Risk groups. A range typically used in the literature is 0-100, 100-200, and 200+% of Federal Poverty Level (FPL) respectively for High, Moderate, and Low Risk (Beltran-Aguilar). However, it was not clear that these ranges were the best fit for the Colorado population. Because there were no data on the fractions of children with cavities in Colorado to explore this question, fractions from the BRFSS callback survey with a positive answer to the question: Pain\ CAVITIES\ Broken or Missing Fillings\ Teeth Pulled Because of Cavities? were used as a surrogate. These data revealed a pattern, shown in Figure 3, with a consistently high prevalence of these decay-related problems in income levels going up to 200% of FPL with some decline from 200% to 300%, and a much lower level for income levels greater than 300% of FPL. This pattern may reflect a higher income distribution relative to the FPL for Colorado vs. the US.
Ranges of 0-200, 200-300, and 300+% were therefore selected for the High, Moderate, and Low Risk groups. Children for whom there was no response (NR) for income in the BRFSS callback survey (about 6%) were included in the highest risk/lowest income group since their prevalence of these problems was similar to children whose families’ income was 0-100% of FPL. Table 1 shows the distribution of children ages 0-5 in Colorado by age and risk group. Table 2 shows the fractions of children with ECC related problems in each risk group.

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Income Level (% of FPL)</th>
<th>Percent with ECC Related Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>0-200%+NR*</td>
<td>18.6</td>
</tr>
<tr>
<td>Moderate</td>
<td>200-300%</td>
<td>15.0</td>
</tr>
<tr>
<td>Low</td>
<td>&gt;300%</td>
<td>8.4</td>
</tr>
</tbody>
</table>

*NR=Non Response on Income, similar prevalence to 0-100% of FPL

Table 1: Distribution of Colorado’s Young Children by Age and Risk Group

<table>
<thead>
<tr>
<th>Risk Group</th>
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<th>Percent with ECC Related Problems</th>
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<tr>
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<td>&gt;300%</td>
<td>8.4</td>
</tr>
</tbody>
</table>

*NR=Non Response on Income, similar prevalence to 0-100% of FPL

Table 2: Fractions of Children with ECC Related Problems by Risk Group
The next step was to distribute the population of children in each age and risk group into the stages in the ECC disease process shown in Figure 2, beginning with the fractions of children in each group with cavities. As indicated above, the percentages of children with a positive answer to the question Pain\ Cavitied\ Teeth\ Pulled\ Because\ of\ Cavities? in the BRFSS callback survey to establish the pattern of relative prevalence of cavities among the age and risk groups. However, these patterns reflected self-report by parents rather than the more rigorous identification of cavities by examination that is done as part of the NHANES survey. The fractions in the BRFSS data do not, for example, include children whose cavities are asymptomatic and have not come to the attention of parents. Therefore, to get comparable fractions of children with cavities, the fractions with positive answers to this question in the BRFSS survey (about 12.75% overall) were inflated to reflect cavity prevalence of 23% reported for 1999-2002 in the NHANES survey for 2-5 year olds, when adjusted for Colorado’s income distribution. (See Beltran-Aguilar et al, Surveillance for Dental Caries, Dental Sealants, Tooth Retention, Edentulism, and Enamel Fluorosis --- United States, 1988--1994 and 1999--2002, MMWR, August 26, 2005, Table 2).

Fractions with cavities by income reported in that publication were actually aggregated for all children 2-11. A personal communication from Dr. Eugenio Beltran provided the disaggregated fractions for children 2-5. Ratios from a publication based on earlier NHANES data (Vargas et al) were used to further disaggregate the data for the 200-300 and >300% of FPL income groups because the more recent data’s highest income group was >200%. The ratio of fractions with cavities for children aged 6 months to 24 months compared to those ages 2-5 (0.486) came from ratio of ECC related problems for the two age groups from the BRFSS callback survey data. The overall fraction of children aged 0-5 with cavities calculated by the model is 18%, reflecting the lower percentages for children under age 2.

The NHANES data in the personal communication from Dr. Beltran also provided fractions of children 2-5 with untreated cavities, by income level. The fraction of children with symptomatic cavities came from data on 2-5 year olds in “urgent need of treatment” in a GAO report derived from NHANES. (See MEDICAID: Extent of Dental Disease in Children Has Not Decreased, and Millions Are Estimated to Have Untreated Tooth Decay, Government Accountability Office, 2008, Table 5).

There are no readily available data on the prevalence of what we are calling Caries in our model, pre-cavity conditions such as white spots. Fractions with caries (but not cavities) therefore had to be derived using percentage changes in cavity prevalence between the age groups (6-24 months→2-5 years from the BRFSS callback survey; 2-5 years→6-11 years from the NHANES data), assuming that children developing cavities in a particular age group who didn’t have them before would be likely to have a “pre-cavity” condition. While this is an estimate synthesized from the data, one point of comparison is a study of prevalence of both cavitated and non-cavitated lesions in primary teeth of 698 children (Warren et al). That study found a ratio of children with non-cavitated lesions (d₁) to
those with both cavitated and non-cavitated ($d_1d_{2,3}$) lesions very similar to the ratio calculated in the model.

Table 3 shows the fractions of children in the different age/risk groups at different stages in the disease process. Transition rates (flows between the boxes in Figure 2 expressed in terms of children per month) were estimated initially based on increases in prevalence in the various ECC stages between one age group and the next (6-24 months → 2-5 years and 2-5 years → 6-11 years). The model was then used to more finely calibrate these rates (children per month moving from one stage to the next). As indicated earlier, the purpose of this calibration was to create a model in equilibrium that would make it possible to see the incremental effect of any interventions.

One check on the calibration resulted in an additional adjustment. Treatment rates for cavities generated by the model (numbers of children moving from the Untreated Cavities to Treated Cavities boxes) were compared to numbers of children who could be expected to have a restorative procedure during a year based on data from the Medical Expenditure Panel Survey (MEPS) (Manski and Brown). The data in the MEPS Chartbook on restorative procedures were presented for all children and a personal communication from Dr. Rich Manski was required to get the appropriate fractions for children ages 0-5. This comparison revealed that the numbers being generated by the model were too low and they were increased accordingly. Recurrence rates (children with Treated Cavities developing new Untreated Cavities) were revised upwards as well to maintain the model’s equilibrium state and, presumably, to reflect more accurate rates of recurrence. Unfortunately, children who develop cavities tend to be at greatest risk for developing additional cavities. (Edelstein)

<table>
<thead>
<tr>
<th>Age 6-24 Months</th>
<th>No Caries Activity</th>
<th>Untreated Caries</th>
<th>Untreated Cavities</th>
<th>Treated Cavities</th>
<th>Symptomatic Cavities</th>
<th>Fraction with Cavities</th>
<th>Fraction with Untreated Cavities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk</td>
<td>0.85</td>
<td>0.08</td>
<td>0.03</td>
<td>0.03</td>
<td>0.01</td>
<td>0.07</td>
<td>0.63</td>
</tr>
<tr>
<td>Moderate Risk</td>
<td>0.73</td>
<td>0.14</td>
<td>0.08</td>
<td>0.03</td>
<td>0.02</td>
<td>0.13</td>
<td>0.74</td>
</tr>
<tr>
<td>High Risk</td>
<td>0.67</td>
<td>0.17</td>
<td>0.10</td>
<td>0.04</td>
<td>0.03</td>
<td>0.16</td>
<td>0.76</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age 2-5 Years</th>
<th>No Caries Activity</th>
<th>Untreated Caries</th>
<th>Untreated Cavities</th>
<th>Treated Cavities</th>
<th>Symptomatic Cavities</th>
<th>Fraction with Cavities</th>
<th>Fraction with Untreated Cavities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk</td>
<td>0.76</td>
<td>0.09</td>
<td>0.07</td>
<td>0.06</td>
<td>0.03</td>
<td>0.15</td>
<td>0.64</td>
</tr>
<tr>
<td>Moderate Risk</td>
<td>0.57</td>
<td>0.16</td>
<td>0.16</td>
<td>0.07</td>
<td>0.04</td>
<td>0.27</td>
<td>0.74</td>
</tr>
<tr>
<td>High Risk</td>
<td>0.46</td>
<td>0.20</td>
<td>0.20</td>
<td>0.08</td>
<td>0.06</td>
<td>0.34</td>
<td>0.76</td>
</tr>
</tbody>
</table>

Table 3: Fractions of Children at Various Stages of ECC Development by Age and Risk
It is also useful to have a dft index to compare simulations with different interventions. Data for average dft (for children 2-5 years with at least one decayed or filled tooth) came from NHANES data as well. (Beltran-Aguilar) Published data aggregated dft rates for all children 2-11, but again the personal communication from Dr. Beltran provided separate data for children aged 2-5. The NHANES data were adjusted for differences between Colorado’s income distribution and that for the entire US and dft rates for 6-24 month olds were scaled down from the 2-5 year old rates. Table 4 shows the dft rates used in the model.

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>6-24 months</th>
<th>2-5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk</td>
<td>0.16</td>
<td>0.34</td>
</tr>
<tr>
<td>Moderate Risk</td>
<td>0.3</td>
<td>0.63</td>
</tr>
<tr>
<td>High Risk</td>
<td>0.76</td>
<td>1.57</td>
</tr>
</tbody>
</table>

Table 4: dft Rates

The model also includes fractions of children in the different age/risk groups with detectable levels of s. mutans bacteria, a prime causal agent in the ECC disease process. These were derived from two studies, one by Edelstein and Tinanoff of patients in a private office that had a rate of s. mutans colonization equal to 58% of the patients and another by Litt, Reisine, and Tinanoff done on a low income population that had a rate of 79%. An article by Caulfield et al, (Initial Acquisition of Mutans Streptococci by Infants: Evidence for a Discrete Window of Infectivity, J Dent Res, 1993), suggests that there is a window between 19 and 31 months, centered on 26 months which straddles the dividing point between our 6-24 month and 2-5 year age groups. As a result, the acquisition of s. mutans was spread between the two age groups.

The presence of s. mutans colonization as a discrete element in the model will enable us to test the effects of various interventions such as reducing the transmission of s. mutans from caregiver to child and education to reduce the consumption of sugary drinks and use of baby bottles to put children to sleep. In the BRFSS data, 68% of the kids who consumed any amount of sugary drinks appeared to suffer somewhat elevated levels of caries-related problems compared to those who never had those drinks.

The impact of treatments to reduce transmission of s. mutans reflected in the model comes from a set of studies done in Finland that followed a group of mothers and children over a six-year period. (Isokangas et al, Soderling et al). The mothers had been treated with xylitol gum to reduce their s. mutans levels. That work demonstrated an 88% reduction in colonization for two-year-olds whose mothers had been treated and a 64% reduction on average for 3-5 year-olds. There was a 73% reduction in children who had any caries experience in those who were not colonized by age 2 compared to those who were.
Data on costs of restorative care came from the MEPS Chartbook (Manski and Brown, Medical Expenditure Panel Survey, AHRQ) which indicated that the average restorative visit cost $216 in 2004. This translates into $276 in 2009 after inflating the 2004 cost by about 5% per year. Visits for symptomatic problems are assumed to cost 50% more. The model produces restorative visit rates that fall within the range suggested by the MEPS data. Cumulative costs for restorative care are a useful metric for comparing simulations and estimating potential savings on restorative care that might offset programmatic costs for implementing various interventions. Costs of restorative care and potential savings projected by the model are probably still an underestimate because they represent average costs for all children (disaggregated data for ages 2-5 was not available) and do not adequately reflect expensive visits for very young children that may require anesthesia and more intensive work. A future task will be to improve the cost estimates for restorative care used in the model.

Simulations with Different Interventions

The model supports a number of possible interventions. Simulations with the model over a ten year period can project fractions of children ages 0-6 with cavities and with untreated cavities and symptomatic cavities, dft scores, and costs of restorative care. These results can be weighed against estimated program costs to get a rough idea of cost-benefit ratios for different interventions. Interventions can be applied to the entire populations or to particular age and/or risk groups. Possible interventions include:

- Educational programs that reduce the consumption of sugary drinks, use of baby bottles at night, and other harmful practices that contribute to the growth of s. mutans and the ECC disease process.

- Programs aimed at reducing the transmission of s. mutans from parents and other caregivers to children using xylitol gum, chlorhexidine, or other substances.

- Use of xylitol products directly with older children.

- Aggressive screening for and treatment of caries (pre-cavities) to reduce progression to cavities.

- Expanded use of fluoride varnish.

- Focused preventive care and education for children who already have cavities to reduce recurrence rates.

- Rigorous tooth brushing programs with fluoride toothpaste.

- Expansion of Community Water Fluoridation (CWF) to the entire population.

- Motivational interviewing with a strong educational component.
The following section describes a number of simulations done with the model and presents their results.

**Community Water Fluoridation and Application of Topical Fluorides**

Assumptions:

- In the first simulation (only), Community Water Fluoridation (CWF) is extended to the 24.6% of the population in Colorado not currently covered.

- Initiation of CWF in a population reduces measured caries by 50.7% based on post exposure measurements of concurrent comparison groups (range: 22.3% to 68.8%) (CDC Task Force on Community Preventive Services, 2002)

- In the second simulation, fluoride varnish is applied to all children in age groups 2 and 3 and, in the third simulation, only to children in the high risk groups

- Application of fluoride varnish reduces dmfs in deciduous dentition by 33% (pooled estimate from Cochrane database review reported in Marinho et al) (range of 27% to 44% reported in Kanellis)

- A very modest cost of $10 per child is assumed for fluoride varnish application

<table>
<thead>
<tr>
<th></th>
<th>Overall Fraction with Cavities</th>
<th>Overall Fraction with Untreated Cavities</th>
<th>Overall_dft</th>
<th>Average_dft</th>
<th>Average_dft for Those with Cavities</th>
<th>Cumulative Cost of Restorative Care ($ Mil)</th>
<th>Cumulative Program Cost ($ Mil)</th>
<th>Difference in Cumulative Cost of Restorative Care Relative to Base ($ Mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>0.181</td>
<td>0.71</td>
<td>264,214</td>
<td>0.67</td>
<td>3.68</td>
<td>51.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Extending CWF to Everyone</td>
<td>0.159</td>
<td>0.70</td>
<td>232,381</td>
<td>0.59</td>
<td>3.70</td>
<td>44.9</td>
<td>-6.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Fluoride Varnish, All, Ages 2 and 3</td>
<td>0.124</td>
<td>0.67</td>
<td>182,196</td>
<td>0.46</td>
<td>3.71</td>
<td>35.7</td>
<td>-15.8</td>
<td>10.7</td>
</tr>
<tr>
<td>Fluoride Varnish, Risk 3 Only, Ages 2 and 3</td>
<td>0.157</td>
<td>0.69</td>
<td>214,281</td>
<td>0.54</td>
<td>3.46</td>
<td>43.5</td>
<td>-8.0</td>
<td>3.4</td>
</tr>
</tbody>
</table>

**Table 5: Results of Simulations Extending CWF and Applying Fluoride Varnish**

Extending CWF to all children has only a limited impact because such a large fraction of the population is already covered by community-level fluoridation. Providing topical fluoride varnish for all children in age groups 2 and 3 yields a more significant impact, especially because it reaches children early before cavities develop. Providing this intervention for the highest risk (lowest income group) only has a smaller overall impact, as might be expected, but a higher ratio of benefit (in terms of reduced restorative care cost) to program cost. This suggests that, with limited funding, priority be given to children at highest risk.
Treatment of Mothers with Xylitol to Prevent Transmission of S. Mutans

Assumptions

- 88% reduction in age group 2 and 64% reduction in age group 3 in S. Mutans colonization for children whose mothers were treated with Xylitol (based on .2 RR at age 2 and .42 RR at age 3 in Soderling et al, increased slightly to produce better match with Soderling colonization prevalence data in older age group)

- 73% reduction in development of caries in children without S. Mutans colonization (based on .27 RR in 3-5 year olds who did not have S. Mutans colonization as two-year olds in Isokangas et al)

- Applied to mothers of children in age groups 1 and 2 only; delayed effect on children in age group 3 as children who did not benefit from treatment age out and those whose mothers were treated age into that group; 12 month delay assumed between time mother’s S. Mutans level is lowered and time transmission would have occurred

- $100 average cost per mother (better data may be forthcoming from Dental Aid of Colorado)

<table>
<thead>
<tr>
<th></th>
<th>Overall Fraction with Cavities</th>
<th>Overall Fraction with Untreated Cavities</th>
<th>Overall $dft$</th>
<th>Average $dft$</th>
<th>Average $dft$ for Those with Cavities</th>
<th>Cumulative Cost of Restorative Care ($ Mil)</th>
<th>Difference in Cumulative Cost of Restorative Care Relative to Base ($ Mil)</th>
<th>Cumulative Program Cost ($ Mil)</th>
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<td>0.67</td>
<td>3.68</td>
<td>51.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Xylitol Moms, All Kids</td>
<td>0.108</td>
<td>0.68</td>
<td>160,609</td>
<td>0.41</td>
<td>3.74</td>
<td>37.8</td>
<td>-13.7</td>
<td>79.3</td>
</tr>
<tr>
<td>Xylitol Moms, Risk 3 Only</td>
<td>0.150</td>
<td>0.69</td>
<td>201,765</td>
<td>0.51</td>
<td>3.39</td>
<td>44.8</td>
<td>-6.8</td>
<td>24.9</td>
</tr>
</tbody>
</table>

Table 6: Results of Treating Mothers with Xylitol to Reduce Transmission of S. Mutans

A significant (40%) reduction in fraction of children with cavities is projected to occur when mothers are treated with Xylitol gum to reduce transmission of S. Mutans bacteria. Again, concentrating on the highest risk children will yield a smaller overall effect, but larger reduction in restorative care cost per program dollar spent. (Reduction in restorative care cost underestimates the benefit from this and other interventions since it doesn’t include many other benefits of improved oral health.) Treating mothers with Xylitol has its most direct effects on the youngest children and more delayed effects on those in the oldest age group. Figure 5 contrasts the benefit over time from this intervention with the one in the previous set using fluoride varnish with all children in age groups 2 and 3. The graph shows the effect on the number of children in age group 3 with cavities and how treating mothers with Xylitol is slower to have an impact, but eventually can have a greater effect than the fluoride varnish.
Figure 4: Results Over Time Comparing Fluoride Varnish with Xylitol Treatment of Mothers

Treatment of Children Directly with Xylitol Products

Assumptions

- Treatment of children directly is limited to children in age group 3 since there are currently no products available in the US suitable for very young (Ly et al)

- Effects of use of Xylitol products range from a 44% reduction to a 73% reduction (.56 and .27 RR’s from Hayes cited in Lynch and Milgrom). In the results on the next page, the smaller reduction is referred to as Lower Impact and the larger as Higher Impact. Results are shown for simulations with High and Low impact for all children and only for those in the highest risk group. Results of an additional simulation are shown to indicate how much greater an effect this intervention could have had if it could also be applied to younger children in age group 2.

- A cost of $100 per child is assumed in the absence of better data.

The effects of using Xylitol directly with kids are somewhat more limited because it cannot be used with the youngest children. Some develop caries and cavities before the Xylitol can have its preventive effect in reducing bacterial loads. Even assuming the highest impact and applying the intervention to all children, there is only a 27% reduction in the fraction with cavities compared to an (eventual) 40% reduction when mothers are
treated to reduce transmission that, of course, affects the youngest children. The final simulation shown suggests what could happen if Xylitol products became available in forms that could be used with younger children. These results suggest a combined strategy of using Xylitol with both mothers and children that can be explored in future simulations.

<table>
<thead>
<tr>
<th></th>
<th>Overall Fraction with Cavities</th>
<th>Overall Fraction with Untreated Cavities</th>
<th>Overall dft</th>
<th>Average dft for Those with Cavities</th>
<th>Cumulative Cost of Restorative Care ($ Mil)</th>
<th>Difference in Cumulative Cost of Restorative Care Relative to Base ($ Mil)</th>
<th>Cumulative Program Cost ($ Mil)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.181</td>
<td>0.71</td>
<td>264,214</td>
<td>0.67</td>
<td>3.68</td>
<td>51.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Xylitol Direct, On All Kids Age 3, Lower Impact</td>
<td>0.152</td>
<td>0.66</td>
<td>222,741</td>
<td>0.56</td>
<td>3.69</td>
<td>42.8</td>
<td>-8.7</td>
</tr>
<tr>
<td>Xylitol Direct, On All Kids Age 3, Higher Impact</td>
<td>0.133</td>
<td>0.60</td>
<td>193,797</td>
<td>0.49</td>
<td>3.69</td>
<td>37.0</td>
<td>-14.6</td>
</tr>
<tr>
<td>Xylitol Direct, On Risk 3 Only Age 3, Lower Impact</td>
<td>0.169</td>
<td>0.68</td>
<td>238,711</td>
<td>0.60</td>
<td>3.58</td>
<td>47.0</td>
<td>-4.5</td>
</tr>
<tr>
<td>Xylitol Direct, On Risk 3 Only Age 3, Higher Impact</td>
<td>0.160</td>
<td>0.66</td>
<td>220,179</td>
<td>0.56</td>
<td>3.49</td>
<td>43.8</td>
<td>-7.7</td>
</tr>
<tr>
<td>Xylitol direct, All Kids Ages 2 and 3, Higher Impact</td>
<td>0.056</td>
<td>0.55</td>
<td>82,187</td>
<td>0.21</td>
<td>3.73</td>
<td>19.1</td>
<td>-32.4</td>
</tr>
</tbody>
</table>

Table 7: Results of Treating Children Directly with Xylitol Products

**Secondary Prevention: Screening for and Treatment of Children Who Already Have ECC**

Assumptions

- Children who already have caries or cavities are at high risk of developing additional disease. (Edelstein)

- The first two simulations below assume that caries (pre-cavity lesions) are screened for and treated before they become cavities. The first one assumes treatment rates (fraction of untreated who are treated per month) equal to the model’s rates for cavities. The second (higher impact) assumes a more aggressive program of screening and treatment. This intervention is applied to all children in age groups 2 and 3, regardless of risk group.

- The cost per child for caries screening and treatment is $40.

- In the third and fourth simulations, there is more aggressive follow-up of children who have had restorative care for cavities. In the first of these, recurrence rates (fractions per month of those who were treated that develop new untreated cavities) are reduced by 50%. In the second, recurrence rates are reduced by 75%. There is no additional programmatic cost assumed, although such a cost might be estimated.
The results shown in the table suggest that screening and treatment for caries can be productive in terms of reducing the fractions of children with cavities and resulting costs for restorative care. Children with treated caries are much less likely to move on to having cavities and there are more that remain at that stage: 76, 142 in the higher impact simulation and 70,088 in the lower impact one vs. 52,529 in the baseline. The graphs on the next page show the extent of shifts between untreated and treated caries in the two simulations.

Preventive care aimed at reducing recurrence does not, by definition, affect the fraction with cavities, but does, as shown in the table, reduce the fraction of children with cavities that are untreated. The effect of this type of secondary prevention is also evident in the reduced cost for restorative care that would otherwise be required for children with recurrent cavities.

### Table 8: Results of Strategies Aimed at Secondary Prevention

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Overall Fraction with Cavities</th>
<th>Overall Fraction with Untreated Cavities</th>
<th>Overall_dft</th>
<th>Average dft</th>
<th>Average dft for Those with Cavities</th>
<th>Cumulative Cost of Restorative Care ($ Mil)</th>
<th>Difference in Cumulative Cost of Restorative Care Relative to Base ($ Mil)</th>
<th>Cumulative Program Cost ($ Mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>0.181</td>
<td>0.71</td>
<td>264,214</td>
<td>0.67</td>
<td>3.68</td>
<td>51.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Caries Treatment, Ages 2 and 3, Lower Impact</td>
<td>0.142</td>
<td>0.71</td>
<td>209,833</td>
<td>0.53</td>
<td>3.75</td>
<td>44.0</td>
<td>-7.5</td>
<td>5.4</td>
</tr>
<tr>
<td>Caries Treatment, Ages 2 and 3, Higher Impact</td>
<td>0.128</td>
<td>0.70</td>
<td>189,550</td>
<td>0.48</td>
<td>3.76</td>
<td>41.9</td>
<td>-9.6</td>
<td>8.1</td>
</tr>
<tr>
<td>Prevention Aimed at Recurrence, 50% Reduction</td>
<td>0.182</td>
<td>0.63</td>
<td>265,923</td>
<td>0.67</td>
<td>3.69</td>
<td>46.4</td>
<td>-5.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Prevention Aimed at Recurrence, 75% Reduction</td>
<td>0.182</td>
<td>0.55</td>
<td>265,923</td>
<td>0.67</td>
<td>3.69</td>
<td>42.1</td>
<td>-9.4</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Figure 5: Treated and Untreated Caries with High and Low Impact Assumptions
Motivational Interviewing

Assumptions

- Motivational interviewing, with appropriate follow-up, can reduce cavity prevalence by 63% (Weinstein). Simulations were done applying this intervention for all children and for those in the highest risk group only.

- The cost is $100 per child.

Table 9: Results with Motivational Interviewing

Motivational interviewing can have a significant impact on reducing the fraction of children with cavities and the costs of restorative care. As indicated earlier, these cost savings are only a fraction of the benefit that would be derived from such a large reduction in cavities. Using this technique with only the high-risk group will, as with the other interventions, produce a smaller overall impact, but a larger benefit per dollar spent on the program. Concentrating on the highest risk group also helps to improve equity among the different risk groups. The following table shows the fraction of children with cavities for the different risk groups and the ratio of those fractions for the highest risk group (Group 3) to that for the lowest (Group 1).

In these simulations, motivational interviewing was represented as having a direct effect on rates at which children develop caries and cavities. An alternative to be tried in additional simulations might be to model the impact as one of causing a shift among risk groups rather than having a direct effect on cavities. This would be the equivalent of children benefiting from the environment of a lower risk group even though they remain in a lower income household. The effect would still be to reduce the population’s overall fraction with cavities, dft, and restorative care costs, but this would happen by a different mechanism.
**Combined Interventions**

The following interventions were combined in each of the simulations whose results are shown in the table below:

1. Fluoride varnish for all children in age groups 2 and 3 together with screening and treatment for caries (pre-cavity lesions) using lower impact assumption.

2. Interventions in #1 together with secondary prevention aimed at children who have had restorative care for cavities with the assumption that recurrence rates are cut by 50%.

3. Interventions in #2 together with motivational interviewing benefiting all children. The overall effect of this combination is to reduce cavities by 75% as a result of the fluoride varnish (33%) and the motivational interviewing (an additional 63%) and a further amount due to the effect of screening and treating for caries. Program costs are $10 per child for the fluoride varnish, $100 for the motivational interviewing, and $40 for the caries screening and treatment.

<table>
<thead>
<tr>
<th></th>
<th>Overall Fraction with Cavities</th>
<th>Overall Fraction with Untreated Cavities</th>
<th>Overall dft</th>
<th>Average dft for Those with Cavities</th>
<th>Cumulative Cost of Restorative Care ($ Mil)</th>
<th>Difference in Cumulative Cost of Restorative Care Relative to Base ($ Mil)</th>
<th>Cumulative Program Cost ($ Mil)</th>
</tr>
</thead>
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<td>Base</td>
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<td>0.71</td>
<td>264,214</td>
<td>0.67</td>
<td>3.68</td>
<td>51.5</td>
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<tr>
<td>Combined 1</td>
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<td>0.34</td>
<td>3.76</td>
<td>32.1</td>
<td>-19.5</td>
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<tr>
<td>Combined 2</td>
<td>0.091</td>
<td>0.62</td>
<td>136,005</td>
<td>0.34</td>
<td>3.76</td>
<td>28.5</td>
<td>-23.0</td>
</tr>
<tr>
<td>Combined 3</td>
<td>0.038</td>
<td>0.60</td>
<td>56,158</td>
<td>0.14</td>
<td>3.75</td>
<td>17.7</td>
<td>-33.9</td>
</tr>
</tbody>
</table>

**Table 10: Results with Combined Interventions**

The results in this table show that combining the various interventions can have cumulative and complementary effects. Combining several interventions can produce a smaller fraction of children with cavities than any of the interventions can individually. Adding secondary prevention for children who already have cavities can reduce the fraction with untreated cavities and the cost of restorative care.

**Conclusions**

This paper has described a model of Early Childhood Caries in a population of children aged 0-5 and presented results of simulations with a variety of interventions designed to reduce the prevalence and consequences of ECC. The following general conclusions can be drawn from the simulation results presented in Tables 5-10:
• Interventions aimed at the youngest children will take longer to affect the entire population, but will ultimately have a more profound effect in reducing prevalence as the impact percolates into the older groups as children age.

• Interventions limited to the highest risk (lowest income) groups of children will have the greatest impact per dollar spent because of the greater relative risk of ECC in that population. Limited budgets are best spent on these groups.

• Combined interventions that target ECC at several stages of development in the disease process are likely to have the greatest impact. Primary prevention provides the greatest leverage, but it is also productive to limit disease progression by, for example, screening for and treating caries before cavities form.

These conclusions are likely to hold for any population of children, but the impacts of particular interventions will differ somewhat depending on the composition of the population and prevalence of ECC. With data similar to that used to quantify the model for Colorado’s children, the model can represent any other state, large city or county, or Metropolitan area population and provide simulation results more closely tailored to that area’s population of young children and their oral health needs.
School Dental Sealant Programs in Colorado:
An Overview of Program Utilization, Service Delivery, and Costs
during the 2009-2010 Academic Year
for the
Colorado Department of Public Health and the Environment

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Swathy Sundaram, PhD

Colorado School of Public Health
University of Colorado Denver
November 11, 2011

This project was funded by the Colorado Department of Public Health and the Environment
Executive Summary

During 2010, the Colorado Department of Public Health and the Environment (CDPHE) contracted with researchers at the University of Colorado Denver, Colorado School of Public Health (CSPH) to estimate cost savings associated with and the cost-effectiveness (CE) of dental sealant programs provided in elementary schools for second-grade school children in Colorado. The specific aims of the project were to:

1) Describe school dental sealant program (SDSP) utilization and related costs for programs offered to second grade children in Colorado;

2) Analyze dental service utilization data for caries in first molars by persons in Colorado and estimate the costs of treating first molar caries using the data; and

3) Estimate cost savings and the CE of Colorado SDSP for second grade children, from the societal perspective.

For Specific Aim 1, we analyzed data for the 2009-2010 academic year submitted by 10 Colorado SDSP providers, using the Sealant Efficiency Assessment for Locals and States (SEALS) software, to CDPHE. Aim 1 findings are provided in this report. Specific Aim 2 and 3 findings are provided in the report titled Cost Savings Associated with School Dental Sealant Programs in Colorado.

Key Findings

- The 10 Colorado SDSP conducted oral health screenings for nearly 5,000 and provided dental sealant services for nearly 70% (n=3,389) of the children screened. The average number of teeth sealed per child who had sealants placed was 3.1.
- The average SDSP participation rate was 50% (i.e., number of children screened divided by the number of program consent forms distributed in the second grade classes).
- Twenty-five percent of children screened had existing decay. On average, they had 2.0 first molars with existing decay. Approximately two-thirds of these children had sealants placed; the average number of teeth sealed among these children was 2.3.
- The SDSP average cost per child provided dental sealants was $113. The average cost per sealant placed was $37.

This is the first detailed analysis of SEALS data for 10 Colorado SDSP. Findings concerning program participation, delivery of services, and costs may be used to identify strategies to enhance service delivery, promote financial sustainability and the expansion of services, and inform state and local policymakers about the programs. In addition, information in this report may be used to assist SDSP in developing methods to improve the accuracy of reported data.
School dental sealant programs increase access to dental sealant services for children who may not otherwise have sealants applied to their permanent molars. Even though dental sealants are clinically effective at preventing caries, access to SDSP by at-risk children in Colorado is limited. Increased access and participation in SDSP will improve the oral health of children in Colorado, and may ultimately contribute to reductions in income-related oral health disparities.
I. Introduction

The American Dental Association Council on Scientific Affairs recommends sealants be placed on pits and fissures of children’s and adolescents’ permanent teeth when it is determined that the tooth, or the patient, is at risk of developing caries as about 90% of carious lesions occur in pits and fissures of permanent posterior teeth.(1) Due to the effectiveness of dental sealants in preventing tooth decay, one of the Healthy People 2020 oral health objectives is to increase the proportion of children who have received dental sealants on their molar teeth.(2) Three age-specific targets were established to assess progress in meeting this objective (i.e., targets for children aged three to five years, six to nine years, and 13 to 15 years). The Healthy People 2020 target for children aged six to nine years is 28.1% have received dental sealants on one or more of their permanent first molar teeth. Similar to findings for the U.S. population, sealant rates in Colorado are lowest among economically disadvantaged youth, who have the highest rates of untreated decay.(3) Given the long-term consequences of tooth decay over the course of a lifetime, a number of initiatives have been implemented in Colorado to increase access to dental sealant services in clinics and school programs.

During 2010, the Colorado Department of Public Health and the Environment (CDPHE) contracted with researchers at the University of Colorado Denver, Colorado School of Public Health (CSPH) to estimate cost savings associated with and the cost-effectiveness (CE) of dental sealant programs provided in elementary schools for second-grade school children in Colorado. The schools include a large percentage of children enrolled in the free and reduced school lunch program who may be at high risk for caries. The specific aims of the project were to:

1) Describe school dental sealant program (SDSP) utilization and related costs for programs offered to second grade children in Colorado;
2) Analyze dental service utilization data for caries in first molars by persons in Colorado and estimate the costs of treating first molar caries using the data; and
3) Estimate cost savings and the CE of Colorado SDSP for second grade children, from the societal perspective.

For Specific Aim 1, we analyzed SDSP data submitted by Colorado SDSP providers, using the Sealant Efficiency Assessment for Locals and States (SEALS) software, to CDPHE. Aim 1 findings are provided in this report. Specific Aim 2 and 3 findings are provided in the report titled Cost Savings Associated with School Dental Sealant Programs in Colorado.
II. Data and Analysis

A. Data

The primary data source was 2009-2010 CDPHE SEALS data, submitted to CDPHE by the SDSP providers using SEALS software. The data included information on program utilization (e.g., enrollment, number of services by type), delivery (e.g., personnel, sealant delivery method), and costs.

During the 2009-2010 academic year, a number of organizations provided dental sealant services in elementary schools in Colorado. This report includes data for 10 providers that submitted SEALS data to CDPHE for services provided during the 2009-2010 academic year. CDPHE provided CSPH SEALS data extracts. Program utilization data was available for all 10 providers and program delivery data was available for nine. We excluded program delivery data for one provider due to concerns related to data quality and the provider’s unique delivery model. Program cost data were available for seven of the 10 providers.

B. Assessment of Program Cost Data

While the program utilization data was considered to be of high quality, the program delivery and cost data had not been previously analyzed in such detail. For this reason, we decided to obtain additional information on program delivery and costs from the providers by means of face-to-face meetings, telephone calls, and email. To facilitate our work, we presented information about the project to providers at a Colorado SDSP quarterly meeting. We attempted with contact each SDSP to review the reported delivery and cost data, discussed the delivery model, and if deemed appropriate, worked with the provider to refine the data. These interactions focused primarily on program cost data, due to project timeline, and the need to reduce the reporting burden on SDSP providers.

At the same time we were contacting the providers, the Centers for Disease Control and Prevention (CDC) released a beta version of an excel cost report file that SDSP providers could use to report program costs for the 2010-2011 academic year (i.e., 2011 Sealant Program Cost Beta Excel File). In our discussions with SDSP providers, we referenced both the SEALS directions for reporting costs and those in the 2011 Sealant Program Cost Beta Excel File.

1 The RE-1 Valley School District used a van to transport school children to a dental clinic rather than providing services at the school.
SDSP varied by the number of events, organizational structure, and location. The 10 SDSP were classified into the following categories:

(1) Denver providers,
(2) Area Health Education Center providers,
(3) Other type of organizational providers,
(4) Independent hygienist providers, and
(5) Unique program delivery models.

We discussed SDSP delivery and costs with six of the nine providers we contacted. One provider’s CDPHE contract ended during 2011 and we did not attempt to contact this provider. We met in-person with the two Denver providers, Denver Health and Kids in Need of Dentistry (KIND). KIND submitted revised data and that data is included in this report. We discussed potential cost data revisions with Denver Health. In May 2011, Denver Health provided revised program cost data for the 2010-2011 academic year, using the 2011 Sealant Program Cost Beta Excel File. Initially, we thought we could use these data to estimate Denver Health’s 2009-2010 program costs. However, we identified concerns with the data that could not be resolved over the course of the summer. Therefore, the Denver Health data included in this report is the originally submitted cost data.

CSPH met in-person a Western Colorado Area Health Education Center (AHEC) program representative to discuss the submitted program cost data. While no revisions were made to the 2009-2010 data, the Western Colorado AHEC representative discussed modifying the approach used to estimate program costs for the 2010-2011 academic year. Although we attempted to contact the Centennial AHEC SDSP representative, we were not able to schedule a call. This SDSP did not submit SEALS program cost data.

We were able to contact only one of the two SDSP categorized as an other type of organizational provider. Although we discussed program delivery with the San Juan Basin Health Department, this SDSP did not submit SEALS program cost data.

Similarly, CSPH was able to contact only one of the two independent hygienists who offered SDSP services. We reviewed the submitted cost data with Laurie Ghigler and concluded the data did not require any modifications since she had already revised the 2009-2010 program cost data, using the 2011 Sealant Program Cost Beta Excel File. She developed and uses excel files to track sealant activities and program costs throughout the academic year. Ms. Ghigler offered to provide her excel files to other independent providers and those who work through AHECs. The other independent hygienist did not submit SEALS program cost data.
We attempted to reach only one of the two providers that used a unique program delivery model to provide dental sealants for schoolchildren in second grade. We met in-person with representatives from the Rocky Mountain Youth Clinics. This SDSP provides prevention and treatment services using a mobile dental van. Rocky Mountain Youth Clinics estimated the dental application costs from general operating cost data; no revisions were made to those data. As noted above the CDPHE contract with the other provider ended in 2011. Due to their unique program model (i.e., busing children to a providers office) and contract status, we did not contact this provider.

CDPHE asked us to participate in a Centers for Disease Control and Prevention conference call to discuss potential revisions to SEALS forms used to report data due to our work conducting analyses of SEALS utilization, program delivery, and cost data. We provided suggestions verbally and in writing. The suggestions are summarized in Appendix A.

C. Analysis of Program Utilization, Delivery, and Cost Data

The SEALS data extracts were analyzed using SAS, version 9.2, statistical software. The first type of extract, known as the child-level data, included utilization data for children who participated in the program. The extracts for all SDSP providers were combined into one data set that included one record per child (n=4,922). The data contained a random number assigned to each child’s record; it was used as a child identification number in our analysis. This number was not the child identification number used by the SDSP providers to track child utilization. The second type of extract, known as the event-level data, included information on SDSP delivery methods and costs. Similar to the child-level data, we combined the event-level data for all SDSP into one data set that included one record per dental sealant program event. An event includes one or more days at an elementary school for the provision of sealant services.  

III. Results

Tables 1-4 provide information on 10 Colorado SDSP for the 2009-2010 academic year. In this section of the report, we highlight a number of key data findings. We provide additional information on the SDSP providers in Section IV. Overview of School Dental Sealant Providers by Provider Type.

A. Overview of Program Utilization and Costs

Summary findings concerning program utilization and costs are provided in Table 1. The 10 Colorado SDSP providers screened a total of 4,922 children at 220 school sealant events. The

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2 If a SDSP provider is at a school for more than one day, all days at the school are considered one event.
number of events conducted by each SDSP varied among providers. Six providers conducted ten or fewer events. KIND and Denver Health conducted 62 and 48 events, respectively.

The average SDSP participation rate, or the number of children screened divided by the number of program consent forms distributed in the second grade classes, was 50%. Participation at schools served by the two large Denver providers was close to the average. Participation rates for two of the 10 providers were lower than 40%.

Approximately 70% of children screened were provided sealants. Reasons for children not having sealants placed include having sealants already placed on their first molars, having existing decay, and not having erupted first molars. Among the children who had sealants placed, the average number of teeth sealed was 3.1.

Programs varied with respect to applying fluoride varnish on teeth when sealants were placed. Approximately half of all children who had sealants placed on their teeth also had fluoride varnish applied.

The average SDSP cost per child provided sealants was $113; the average cost per sealant placed was $37.

B. Program Utilization

Among children who had sealants applied to their teeth, the number of sealants placed varied by the children’s status with regard to existing decay and having sealants already placed on their first molar teeth. Approximately 75 percent of screened children (n=3,673) did not have any decay in their first molars. Among these children, 71% had sealants placed. The average number of teeth sealed among these children was 3.3. The number varied by whether or not they already had sealants placed.

- Fifty percent of screened children (n=2,458) had neither decay nor existing sealants on their first molar teeth. Among these children 86% had sealants placed and their average number of teeth sealed was 3.6.
- The others (i.e., approximately 25 percent of screened children, n=1,215) did not have existing decay yet had sealants on one or more first molar teeth. Only 39% of these children had sealants applied; the average number of teeth sealed among these children was 2.0.

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3 Program participation was assessed for six of the 10 providers that reported data on the number of consent forms distributed.
Twenty-five percent of screened children (n=1,249) had existing decay in their first molar teeth. Table 2 provides detailed information about program utilization for these children. Among these children, the average number of decayed first molar teeth was 2.0. Approximately two-thirds (n=788) of these children had sealants applied; the average number of teeth sealed was 2.3. Nearly 30 percent of children with existing decay already had sealants on one or more first molars; they had a lower number of sealants placed on their teeth.

C. Program Delivery

Table 3a provides SDSP reported information on SDSP time spent providing dental sealant services by program activity. This information may be used to estimate the time a SDSP provider requires for an event. The average number of hours reported to plan an event (i.e., a program at one school) was 4.4 and varied across SDSP. The average number of minutes spent conducting an oral health screening for a child was approximately six minutes; the average number of minutes spent applying sealants for one child was 23 minutes. This value ranged between 17-26 minutes for most providers.

Time needed to setup and breakdown equipment and supplies per event is influenced by the number of days the SDSP providers are at a school. The reported setup and breakdown time per event varied substantially across providers. We concluded there may be issues with the quality of these data for some providers. We were not able to report on time spent for retention checks since many providers did not report such data. This may be due to the fact that retention checks for children who had sealants placed during the 2009-2010 academic year occur during the following academic year. Although many providers reported time spent for oral health education, we concluded there may be issues with the quality of these data for some providers and did not report on these data in Table 3a.

Table 3b provides information on SDSP personnel time by program activity for all paid and non-paid dental and other personnel. The number of hours reported for each activity is the total number of hours spent on that activity by all SDSP personnel. For example, if two personnel conducted screenings and applied sealants for 20 children and the time spent per child averaged 25 minutes, the total time spent conducting screenings and applying sealants would be 1,000 minutes, or nearly 17 hours. Differences across providers in reported personnel time reflect differences in staffing patterns (i.e., the number of providers who perform the task), program volume (i.e., the number of children provided services), service delivery (e.g., the time required for screenings and sealant application), and data quality.

According to data in Table 3b, the average number of persons applying dental sealants to the children’s teeth per event was 1.3; this number ranged from one to two or more persons. The average number of personnel minutes reported to conduct an oral health screening was
approximately nine minutes per child screened. The average number of personnel minutes per child screened for both screening and sealant placement was 36 minutes.

D. Program Costs

SDSP reported program costs are provided in Table 4 by cost category. The data include total program costs, the percent of costs reported by cost category, and the average cost per child provided dental sealants. Costs varied substantially across providers. There did not appear to be a relationship between SDSP staffing patterns reported in Table 3b (e.g., the average number of persons providing sealant services) and the average cost per child. This may be due to provider differences in the delivery of services and the approach used to estimate labor, equipment, instrument, consumable, administrative, and other costs.
<table>
<thead>
<tr>
<th>Program type</th>
<th>Provider</th>
<th>Number of events</th>
<th>Number of consent forms distributed at schools</th>
<th>Number of children screened</th>
<th>Participation rate: Percent of children screened</th>
<th>Number of children who had sealants placed</th>
<th>Percent of children screened who had sealants placed</th>
<th>Average number of teeth sealed per child who had sealants placed</th>
<th>Percent of children who had fluoride varnish applied of all children who had sealants placed</th>
<th>Total costs</th>
<th>Cost per event</th>
<th>Average cost per child sealed</th>
<th>Average cost per sealant placed</th>
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</thead>
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<tr>
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<td>Laurie Ghigler</td>
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<td>296</td>
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<td>3.5</td>
<td>100%</td>
<td>$8,042</td>
<td>$149</td>
<td>$113</td>
<td>$32.69</td>
</tr>
<tr>
<td>Total or average value</td>
<td></td>
<td>220</td>
<td>8,790</td>
<td>4,922</td>
<td>49.6%</td>
<td>3,389</td>
<td>68.9%</td>
<td>3.1</td>
<td>49%</td>
<td>$355,718</td>
<td>$1,976</td>
<td>$113</td>
<td>$36.80</td>
</tr>
</tbody>
</table>

AHEC: Area Health Education Center

1 Participation rate is the number of children screened divided by the number of program consent forms distributed at the schools. The average participation rate was calculated using data for programs that included both numbers.

2 The number of children screened is used as the number of children served by the event.

Some dental sealant providers did not report program costs. Program costs for the RE-1 Valley School District were not validated and are excluded from this table.
Table 2. Utilization of school dental sealant services by children with existing caries. Academic year 2009-2010.

<table>
<thead>
<tr>
<th>Program type</th>
<th>Provider</th>
<th>Number of children screened</th>
<th>Number of children with first molar tooth decay</th>
<th>Percent of children with first molar tooth decay</th>
<th>Average number of decayed teeth</th>
<th>Number of children who had sealants placed</th>
<th>Percent of children who had sealants placed</th>
<th>Average number of teeth sealed per child who had sealants placed</th>
<th>Total number of children with both existing decay and first molar sealants</th>
<th>Percent of children with existing sealants among all children with existing decay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large urban providers</td>
<td>Denver Health</td>
<td>1809</td>
<td>543</td>
<td>30.0%</td>
<td>2.0</td>
<td>359</td>
<td>66.1%</td>
<td>2.2</td>
<td>138</td>
<td>25.4%</td>
</tr>
<tr>
<td></td>
<td>Kids in Need of Dentistry</td>
<td>2074</td>
<td>455</td>
<td>21.9%</td>
<td>1.9</td>
<td>310</td>
<td>68.1%</td>
<td>2.4</td>
<td>128</td>
<td>28.1%</td>
</tr>
<tr>
<td>AHEC providers</td>
<td>Centennial AHEC</td>
<td>172</td>
<td>48</td>
<td>27.9%</td>
<td>1.9</td>
<td>36</td>
<td>75.0%</td>
<td>2.1</td>
<td>11</td>
<td>22.9%</td>
</tr>
<tr>
<td></td>
<td>Western Colorado AHEC</td>
<td>147</td>
<td>31</td>
<td>21.1%</td>
<td>1.9</td>
<td>13</td>
<td>41.9%</td>
<td>2.1</td>
<td>17</td>
<td>54.8%</td>
</tr>
<tr>
<td>Other organizational providers</td>
<td>San Juan Basin Health Department</td>
<td>69</td>
<td>22</td>
<td>31.9%</td>
<td>2.0</td>
<td>4</td>
<td>18.2%</td>
<td>2.8</td>
<td>6</td>
<td>27.3%</td>
</tr>
<tr>
<td></td>
<td>Summit County Care Clinic</td>
<td>74</td>
<td>23</td>
<td>31.1%</td>
<td>2.6</td>
<td>14</td>
<td>60.9%</td>
<td>2.3</td>
<td>1</td>
<td>4.3%</td>
</tr>
<tr>
<td>Independent hygienist providers</td>
<td>Laurie Ghigler</td>
<td>115</td>
<td>33</td>
<td>28.7%</td>
<td>2.0</td>
<td>13</td>
<td>39.4%</td>
<td>2.4</td>
<td>11</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>Shelby Kahl</td>
<td>259</td>
<td>58</td>
<td>22.4%</td>
<td>1.9</td>
<td>15</td>
<td>25.9%</td>
<td>2.3</td>
<td>34</td>
<td>58.6%</td>
</tr>
<tr>
<td>Other models</td>
<td>RE-1 Valley School District</td>
<td>120</td>
<td>27</td>
<td>22.5%</td>
<td>1.9</td>
<td>17</td>
<td>63.0%</td>
<td>2.8</td>
<td>9</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>Rocky Mountain Youth Clinics (van)</td>
<td>83</td>
<td>9</td>
<td>10.8%</td>
<td>1.6</td>
<td>7</td>
<td>77.8%</td>
<td>3.0</td>
<td>2</td>
<td>22.2%</td>
</tr>
<tr>
<td>Total or average value</td>
<td></td>
<td>4922</td>
<td>1249</td>
<td>25.4%</td>
<td>2.0</td>
<td>788</td>
<td>63.1%</td>
<td>2.3</td>
<td>357</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

AHEC: Area Health Education Center.
<table>
<thead>
<tr>
<th>Program type</th>
<th>Provider</th>
<th>Number of children screened</th>
<th>Organizational hours per event</th>
<th>Minutes per child for an oral health screening</th>
<th>Minutes per child for sealant placement</th>
<th>Set-up/Breakdown time per event (hours: minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large urban providers</td>
<td>Denver Health</td>
<td>1809</td>
<td>8.3</td>
<td>3.7</td>
<td>21</td>
<td>6:20</td>
</tr>
<tr>
<td></td>
<td>Kids in Need of Dentistry</td>
<td>2074</td>
<td>5.0</td>
<td>4.5</td>
<td>26</td>
<td>1:49</td>
</tr>
<tr>
<td>AHEC providers</td>
<td>Centennial AHEC</td>
<td>172</td>
<td>5.3</td>
<td>25.3</td>
<td>20</td>
<td>1:20</td>
</tr>
<tr>
<td></td>
<td>Western Colorado AHEC</td>
<td>147</td>
<td>2.5</td>
<td>8.1</td>
<td>17</td>
<td>1:30</td>
</tr>
<tr>
<td>Other organizational providers</td>
<td>San Juan Basin Health Department</td>
<td>69</td>
<td>3.8</td>
<td>45.9</td>
<td>46</td>
<td>2:00</td>
</tr>
<tr>
<td></td>
<td>Summit County Care Clinic</td>
<td>74</td>
<td>10.0</td>
<td>3.2</td>
<td>16</td>
<td>4:30</td>
</tr>
<tr>
<td>Independent hygienist providers</td>
<td>Laurie Ghigler</td>
<td>115</td>
<td>1.1</td>
<td>5.2</td>
<td>11</td>
<td>3:30</td>
</tr>
<tr>
<td></td>
<td>Shelby Kahl</td>
<td>259</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other models</td>
<td>RE-1 Valley School District</td>
<td>120</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Rocky Mountain Youth Clinics (van)</td>
<td>83</td>
<td>0.5</td>
<td>11.0</td>
<td>28</td>
<td>0:17</td>
</tr>
<tr>
<td>Total or average value</td>
<td></td>
<td>4922</td>
<td>4.4</td>
<td>5.8</td>
<td>23</td>
<td>2:29</td>
</tr>
</tbody>
</table>

1 The number of organizational hours may include hours spent by different personnel. The average time spent to conduct an oral health screening or apply sealants is reported per child. For some events, SDSP may have used more than 1 provider to screen children and/or apply sealants.

AHEC: Area Health Education Center
<table>
<thead>
<tr>
<th>Program type</th>
<th>Provider</th>
<th>Oral health screenings</th>
<th>Dental sealant placement</th>
<th>Average number of personnel minutes for screening and sealant placement per child screened</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total dental personnel hours</td>
<td>Total other personnel hours</td>
<td>Total personnel hours</td>
</tr>
<tr>
<td>Large urban providers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Denver Health</td>
<td>110</td>
<td>0</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Kids in Need of Dentistry</td>
<td>188</td>
<td>0</td>
<td>188</td>
</tr>
<tr>
<td>AHEC providers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Centennial AHEC</td>
<td>112.5</td>
<td>14.5</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>Western Colorado AHEC</td>
<td>39.6</td>
<td>39.6</td>
<td>79.2</td>
</tr>
<tr>
<td>Other organizational providers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>San Juan Basin Health Department</td>
<td>53</td>
<td>53</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>Summit County Care Clinic</td>
<td>8</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Independent hygienist providers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laurie Ghigler</td>
<td>20.5</td>
<td>0</td>
<td>20.5</td>
</tr>
<tr>
<td></td>
<td>Shelby Kahl</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other models</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RE-1 Valley School District</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Rocky Mountain Youth Clinics (van)</td>
<td>21</td>
<td>27</td>
<td>48</td>
</tr>
<tr>
<td>Total or average value</td>
<td></td>
<td>552.6</td>
<td>134.1</td>
<td>686.7</td>
</tr>
</tbody>
</table>

* The personnel hours reflect the total number of personnel hours for paid and non-paid personnel. ¹ For some events, programs may have used more than 1 provider to screen children and/or apply dental sealants. AHEC: Area Health Education Center.
### Table 4. School dental sealant program costs by category. Academic year 2009-2010.

#### Section 1: Program Costs

<table>
<thead>
<tr>
<th>Provider type</th>
<th>Provider</th>
<th>Total</th>
<th>Labor</th>
<th>Equipment</th>
<th>Instruments</th>
<th>Administrative</th>
<th>Consumables</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large urban providers</td>
<td>Denver Health</td>
<td>$202,453</td>
<td>$103,562</td>
<td>$0</td>
<td>$0</td>
<td>$91,200</td>
<td>$7,308</td>
<td>$383.00</td>
</tr>
<tr>
<td></td>
<td>Kids in Need of Dentistry</td>
<td>$100,675</td>
<td>$47,934</td>
<td>$9,888</td>
<td>$514</td>
<td>$22,432</td>
<td>$12,652</td>
<td>$7,254.00</td>
</tr>
<tr>
<td>AHEC providers</td>
<td>Centennial AHEC</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Western Colorado AHEC</td>
<td>$7,007</td>
<td>$3,675</td>
<td>$206</td>
<td>$191</td>
<td>$1,470</td>
<td>$1,103</td>
<td>$363.00</td>
</tr>
<tr>
<td>Other organizational providers</td>
<td>San Juan Basin Health Department</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Summit County Care Clinic</td>
<td>$12,025</td>
<td>$984</td>
<td>$573</td>
<td>$120</td>
<td>$9,906</td>
<td>$442</td>
<td>0</td>
</tr>
<tr>
<td>Independent hygienist providers</td>
<td>Laurie Ghigler</td>
<td>$8,213</td>
<td>$4,856</td>
<td>$1,328</td>
<td>$257</td>
<td>$629</td>
<td>$737</td>
<td>$405.41</td>
</tr>
<tr>
<td></td>
<td>Shelby Kahl</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other models</td>
<td>RE-1 Valley School District</td>
<td>$17,304</td>
<td>$4,235</td>
<td>$2,309</td>
<td>$1,389</td>
<td>$7,726</td>
<td>$868</td>
<td>$777.26</td>
</tr>
<tr>
<td></td>
<td>Rocky Mountain Youth Clinics (van)</td>
<td>$8,042</td>
<td>$3,492</td>
<td>$483</td>
<td>$662</td>
<td>$2,805</td>
<td>$60</td>
<td>$540.00</td>
</tr>
</tbody>
</table>

| Total                  | $355,718                  | $168,738| $14,787 | $3,133    | $136,168    | $23,170       | $9,723     |

#### Section 2: Percent of Costs

<table>
<thead>
<tr>
<th>Provider type</th>
<th>Provider</th>
<th>Total</th>
<th>Labor</th>
<th>Equipment</th>
<th>Instruments</th>
<th>Administrative</th>
<th>Consumables</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large urban providers</td>
<td>Denver Health</td>
<td>100%</td>
<td>51.2%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>45.0%</td>
<td>3.6%</td>
<td>0.2%</td>
</tr>
<tr>
<td></td>
<td>Kids in Need of Dentistry</td>
<td>100%</td>
<td>47.6%</td>
<td>9.8%</td>
<td>0.5%</td>
<td>22.3%</td>
<td>12.6%</td>
<td>7.2%</td>
</tr>
<tr>
<td>AHEC providers</td>
<td>Centennial AHEC</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Western Colorado AHEC</td>
<td>100%</td>
<td>52.4%</td>
<td>2.9%</td>
<td>2.7%</td>
<td>21.0%</td>
<td>15.7%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Other organizational providers</td>
<td>San Juan Basin Health Department</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Summit County Care Clinic</td>
<td>100%</td>
<td>8.2%</td>
<td>4.8%</td>
<td>1.0%</td>
<td>82.4%</td>
<td>3.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Independent hygienist providers</td>
<td>Laurie Ghigler</td>
<td>100%</td>
<td>59.1%</td>
<td>16.2%</td>
<td>3.1%</td>
<td>7.7%</td>
<td>9.0%</td>
<td>4.9%</td>
</tr>
<tr>
<td></td>
<td>Shelby Kahl</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other models</td>
<td>RE-1 Valley School District</td>
<td>100%</td>
<td>24.5%</td>
<td>13.3%</td>
<td>8.0%</td>
<td>44.6%</td>
<td>5.0%</td>
<td>4.5%</td>
</tr>
<tr>
<td></td>
<td>Rocky Mountain Youth Clinics (van)</td>
<td>100%</td>
<td>43.4%</td>
<td>6.0%</td>
<td>8.2%</td>
<td>34.9%</td>
<td>0.7%</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

#### Section 3: Cost per child provided dental sealants

<table>
<thead>
<tr>
<th>Provider type</th>
<th>Provider</th>
<th>Total</th>
<th>Labor</th>
<th>Equipment</th>
<th>Instruments</th>
<th>Administrative</th>
<th>Consumables</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large urban providers</td>
<td>Denver Health</td>
<td>$159</td>
<td>$82</td>
<td>$0</td>
<td>$0</td>
<td>$72</td>
<td>$6</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>Kids in Need of Dentistry</td>
<td>$66</td>
<td>$31</td>
<td>$6</td>
<td>$0</td>
<td>$15</td>
<td>$8</td>
<td>$5</td>
</tr>
<tr>
<td>AHEC providers</td>
<td>Centennial AHEC</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Western Colorado AHEC</td>
<td>$100</td>
<td>$53</td>
<td>$3</td>
<td>$3</td>
<td>$21</td>
<td>$16</td>
<td>$5</td>
</tr>
<tr>
<td>Other organizational providers</td>
<td>San Juan Basin Health Department</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Summit County Care Clinic</td>
<td>$236</td>
<td>$19</td>
<td>$11</td>
<td>$2</td>
<td>$194</td>
<td>$9</td>
<td>$0</td>
</tr>
<tr>
<td>Independent hygienist providers</td>
<td>Laurie Ghigler</td>
<td>$132</td>
<td>$78</td>
<td>$21</td>
<td>$4</td>
<td>$10</td>
<td>$12</td>
<td>$7</td>
</tr>
<tr>
<td></td>
<td>Shelby Kahl</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other models</td>
<td>RE-1 Valley School District</td>
<td>$199</td>
<td>$49</td>
<td>$27</td>
<td>$16</td>
<td>$89</td>
<td>$10</td>
<td>$9</td>
</tr>
<tr>
<td></td>
<td>Rocky Mountain Youth Clinics (van)</td>
<td>$113</td>
<td>$49</td>
<td>$7</td>
<td>$9</td>
<td>$40</td>
<td>$1</td>
<td>$8</td>
</tr>
</tbody>
</table>

AHEC: Area Health Education Center. Some dental sealant providers did not report program costs. Program costs for the RE-1 Valley School District were not validated.
IV. Overview of School Dental Sealant Providers by Provider Type

A. Denver School Dental Sealant Programs

The two largest SDSP in Colorado provide services in Denver Public Schools.

Denver Health

2009-2010 Program Overview

- Denver Health provided services for 1,809 children in 48 elementary schools.
- Services are provided throughout the academic year. At each school, oral health screenings are generally conducted on the first day of the event and sealant services are provided during the following days.
- The hygienists use a 2-handed delivery technique. The average number of persons providing sealant services was 1.0.
- In general, Denver Health did not report using non-dental paid or non-paid personnel to assist with oral health screenings and the provision of sealant services.
- Nearly all children were provided fluoride varnish.

Information on 2009-2010 Program Costs

Due to depreciation, no costs for instruments and equipment were reported. As with other providers, consumables may be purchased during one year and a percentage of them may be used during the following year. Adjustments were made to account for such costs. The program does not use donated supplies or consumables.

Kids in Need of Dentistry

2009-2010 Program Overview

- Kids in Need of Dentistry (KIND) provided services for 2,074 children in 62 elementary schools. The program is referred to as the Chopper Topper program.
- Services are provided throughout the academic year. At each school, oral health screenings are generally conducted on the first day of the event and sealant services are provided during the following days.
- The average number of personnel providing sealant services was 1.4. KIND personnel conducted outreach to families by telephone to facilitate access to services.
• In general, KIND did not report using non-dental paid or non-paid personnel, other than dental hygiene students, to assist with oral health screenings and the provision of sealant services.
• KIND providers did not apply fluoride varnish to the children’s teeth.

*Information on 2009-2010 Program Costs*

Program personnel include three dental hygienists, dental hygiene students, a dental assistant, a van driver, and occasionally, a dentist. Program labor costs included a percentage of their salaries. KIND’s labor costs were lower than that of many other providers. Although KIND program staff included dental hygiene students, lower labor costs were not thought to be due to use of hygiene students to provide services since the students worked for a limited number of hours per week.

**B. Area Health Education Center School Dental Sealant Programs**

**Centennial Area Health Education Center**

*2009-2010 Program Overview*

• The Centennial Area Health Education Center (Centennial AHEC) provides SDSP in seven counties in northeastern Colorado.
• Centennial AHEC provided services for 172 children in 21 elementary schools.
• The average number of persons providing sealant services was 1.3.
• Centennial AHEC reported using non-dental paid and non-paid personnel to assist with oral health screenings and the provision of sealant services.
• Nearly all children were provided fluoride varnish.

*Information on 2009-2010 Program Costs*

No program cost data were provided.

**Western Colorado Area Health Education Center**

*2009-2010 Program Overview*

• The Western Colorado Area Health Education Center (Western AHEC) SDSP operated in western Colorado, serving children in Garfield, Delta, Cortez, and Gunnison.
• Western Colorado AHEC provided services for 147 children during five events.
Western Colorado AHEC SDSP personnel included 12 dental hygienists who worked as independent contractors. The average number of dental and non-dental personnel providing sealant services was 3.8 per event.

Nearly all children were provided fluoride varnish.

C. Other Organizations that Provide School Dental Sealant Programs

San Juan Basin Health Department

2009-2010 Program Overview

- The San Juan Basin Health Department provides a school sealant program called Southwest Smile Makers.
- The program provided services for 69 children in 10 schools that were predominantly located in rural areas. Low program participation was thought to be due to program service charges. In the 2010-2011 academic year, no fees were assessed and program participation increased to over 100 children.
- Program personnel included a dentist, paid at the hygienist hourly rate, and a hygienist. The average number of personnel providing sealant services was 2.0.
- Nearly all children were provided fluoride varnish.

Information on 2009-2010 Program Costs

No program cost data were provided.

Summit Community Care Clinic

2009-2010 Program Overview

- The Summit Community Care Clinic sealant program provides school dental sealant services in Summit County. The non-profit clinic serves uninsured, underinsured, and workers/residents of Summit County who are eligible to receive care based on income requirements.
- A Summit hygienist provided services for 74 children at two schools.
- The average number of personnel providing sealant services was 2.0.
- Children were not provided fluoride varnish.
D. Independent Dental Hygienist School Dental Sealant Programs

Laurie Ghigleri’s School Smiles program

2009-2010 Program Overview

- Ms. Ghigleri provided services for 115 children in six schools in the greater Colorado Springs area.
- Although she conducted the oral health screenings, a dental assistant provided assistance with sealant application. The average number of personnel providing sealant services was 2.3.
- Nearly all children were provided fluoride varnish.

Information on 2009-2010 Program Costs

Ms. Ghigleri’s dental assistant provided assistance with administrative tasks, such as entering utilization data in the tracking database, and service delivery.

Shelby Kahl

2009-2010 Program Overview

- Shelby Kahl is an independent provider who provided services for 259 children in nine schools in the Windsor area.
- Approximately one-third of children who had sealants placed were provided fluoride varnish.

Information on 2009-2010 Program Costs

No program cost data were provided.
E. School Dental Sealant Programs with Unique Delivery Models

RE-1 Valley School District

2009-2010 Program Overview

- The RE-1 Valley School District (RE-1) provided sealant services for children attending schools in northeastern Colorado. RE-1 transported students to a dental clinic to obtain services.

Information on 2009-2010 Program Costs

As noted above, we did not attempt to contact the provider to obtain information on program delivery and costs.

Rocky Mountain Youth Clinic

2009-2010 Program Overview

- The Rocky Mountain Youth Clinics (RMYC) is a nonprofit organization dedicated to providing accessible, affordable, high-quality healthcare to children and adolescents, regardless of insurance status or family's ability to pay. The RMYC provides services in community centers, residential treatment centers, schools, and shelters.
- RMYC uses a mobile dental van to provide preventive and treatment dental services for children attending schools in rural areas. The clinic provides services for children in all grades whose parents schedule appointments and provide written consent. The preventive services include prophylactic services, x-rays, fluoride applications, and sealant applications.
- The van is usually at each school for a few days throughout the academic school year. Program staff apply dental sealants to first molar teeth of one or two second grade children during each school visit. During this reporting year, RMYC provided services for 83 second grade children at 54 school events.

Information on 2009-2010 Program Costs

A few years ago, RMYC personnel estimated the average cost of applying a dental sealant from general operating cost data. The 2009-2010 reported costs were estimated from those data. Equipment costs were low as the van was donated by the Ronald McDonald Center.
V. Discussion

This is the first detailed analysis of SEALS data for 10 Colorado SDSP. During the past year, the SDSP providers learned of approaches that may be used to improve the accuracy of program delivery metrics and cost data. Program cost data for the 2011-2012 academic year will no doubt be more accurate than that reported for the previous academic year. Despite these data limitations, the findings concerning program participation, delivery of services, and costs may be used to identify strategies to enhance service delivery, promote financial sustainability and the expansion of services, and inform state and local policymakers about the programs.

School dental sealant programs increase access to dental sealant services for children who may not otherwise have sealants applied to their permanent molars. Even though dental sealants are clinically effective at preventing caries, access to SDSP by at-risk children in Colorado is limited. Increased access and participation in SDSP will improve the oral health of children in Colorado, and may ultimately contribute to reductions in income-related oral health disparities.

Translating clinical practices into effective and financially sustainable public health programs is an ongoing process that requires incorporating information learned from existing programs in Colorado and in other states. SEALS data may be used to understand existing patterns of program enrollment; how delivery models vary by provider, geographic area, and school enrollment; reasons children enrolled in the programs have fewer than four dental sealants applied to their teeth; and program costs. Based on our review of the data, we describe below a number of initiatives that could positively influence SDSP effectiveness. Some are currently being implemented. Many require additional resources. Given the clinical effectiveness of dental sealants in preventing caries and cost savings associated with their use, it is important to assess the value of these and other initiatives that may increase the effectiveness and financial sustainability of SDSP in Colorado.

A. Overview of Initiatives that could Influence SDSP Participation, Program Delivery and Effectiveness, and Program Costs and Financial Sustainability

1. Program Participation

The SDSP participation rate, or the number of children screened divided by the number of consent forms distributed at the schools, was 50% during the 2009-2010 academic year. Participation rates are influenced by parent and guardian (hereafter we refer to both as parent) knowledge about the program, children having dental sealants previously applied, and children having a dental home and/or dental coverage which facilitates their accessing sealant services elsewhere. It may be possible to increase program enrollment through the following three initiatives listed below.
Participate in school registration activities at the beginning of an academic year. The shorter SDSP enrollment forms are generally sent home from school with the children, signed by parents, and returned to school. Despite an eight-page consent form that had to be signed by a parent at the school, the Healthy Smiles for Students Program, a University of Colorado Denver study that involved the provision of education and fluoride varnish applications for elementary school children, had enrollment rates slightly over 50%. We believe participation in the Healthy Smiles program was related to program staff participation in school registration events at the beginning of the academic year. A similar approach may increase SDSP participation. A person affiliated with a SDSP, a person who conducts Medicaid or CHP+ enrollment, or a person knowledgeable about the program could attend school registration events to provide SDSP enrollment information, including the SDSP event dates, and enroll children in the program.

Develop informative and colorful program materials for children and their parents: Many SDSP provide second grade children and families information on dental sealants on white or colored Xeroxed paper. We suggest using materials that include colorful posters; a four-page 8.5 by 11 inch booklet that could be printed in color and distributed to first and second grade children and their families; and SDSP program-specific information that could be Xeroxed on white or colored paper. Posters and SDSP program-specific information could provide information about SDSP-specific events and enrollment options. Given the cost of printing materials in color and economies of scale, it may be worthwhile developing posters and booklets that may be used throughout the state. Such materials could include a statewide program name and logo. The Healthy Smiles for Student program used color posters and booklets, each containing the program logo. Parents recognized the logo and expressed familiarity with the program during enrollment sessions. The information should be at an appropriate reading level for young children and their families, include pictures of children who obtain such services, and provided in both Spanish and English. The materials will increase family awareness of the program prior to enrollment. Gaining knowledge of positive oral health options in advance affords parents more time to understand program benefits and reach an action stage of change (i.e., program enrollment).

Coordinate SDSP activities with school and school district health and wellness efforts: SDSP providers experience varying levels of program support in the schools they serve. Such support influences program participation. It may be possible to influence SDSP support by teachers and other school/district personnel by providing information by means of face-to-face meetings and printed materials provided during meetings or by email. Having a statewide program name and

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4 If this is not possible, SDSP could participate in other school activities that include parents and are scheduled at the beginning of the school year.
5 A section of the poster could be left blank to provide SDSP-specific or event-specific information.
logo, as mentioned above, may reduce school personnel confusion about various oral health programs. It is important to provide school personnel information to supplement that provided for families and children. However, it must be provided in a concise manner. Such information could be compiled at the state level for use throughout Colorado, and include national and Colorado-specific data. Although school teachers and other personnel understand the impact poor oral health may have on a child’s ability to learn, they often do not have information on the magnitude of the problem, the effectiveness of dental sealants in preventing caries, and other key SDSP characteristics (e.g., existing participation at their school as compared to others, cost savings).

2. Program Delivery

**Develop a relationship with school and school district personnel:** School and school district support is vital for the success of school public health programs. On-going SDSP contact with school/school district personnel is critical to assessing ways to improve SDSP delivery at the schools and to reduce the burden on school personnel who must juggle school implementation of many such public health programs. A school/school district program advocate for a SDSP could facilitate increased understanding by school/school district personnel of oral health preventive services and their impact, and related program participation.

**CDPHE and AHEC continue to provide technical support and information to SDSP providers on methods to improve program delivery.** It is important that existing SDSP providers, as well as organizations and dental hygienists who are considering implementing such programs, have support. Five of the ten SDSP providers, that submitted SEALS data for this report, held fewer than ten events during the 2009-2010 academic year. These providers may require support that differs from that needed by programs that serve more schools, including those in large urban areas.

**Conduct a process evaluation:** A process evaluation may be used to assess optimal delivery methods to increase program efficiency or reduce program costs. The data in Table 3 on program delivery indicate that there is substantial variation among providers. While some of the variation is due to service delivery model differences and some, data quality; the findings indicate there may be opportunities to enhance program delivery. A process evaluation, conducted by CDPHE or another organization, could include an assessment of program delivery methods, ways to minimize the program burden to school personnel, missed opportunities for enrollment, and allocation of SDSP tasks by personnel type (e.g., use of personnel who are compensated at a lower rate than dental hygienists to conduct enrollment and bill Medicaid and CHP+ for dental sealant services).
Findings from a process evaluation may vary, to some extent, by provider type as SDSP operating in large urban areas have different opportunities and challenges than those in smaller rural areas. Finally, a process evaluation may be used to identify opportunities to facilitate program expansion. For example, it may be possible for existing AHEC SDSP, and other AHECs, to work with dental hygienists in rural areas to expand SDSP to other rural elementary schools.

3. SDSP Effectiveness

Increase access to prevention programs among children less than eight years old. During the 2009-2010 academic year, 25.4% of children screened in SDSP had existing decay. The average number of decayed teeth among these children was 2.0. Children with existing decay who had sealants placed had, on average, only two sealants placed on their first molars. If children who participate in SDSP have less decay on their first molars, more dental sealants may be applied and the effectiveness of SDSP will increase, SDSP cost per child enrolled may decrease, and cost savings associated with SDSP may increase. Programs that provide oral health education for children and families, and fluoride varnish for young children, may reduce caries among children in second grade and increase the number of teeth sealed.

4. Program Costs and Sustainability

CDPHE and AHEC continue to provide technical support and information to SDSP providers on methods to account for program costs and bill for program services. It is important that SDSP providers understand the costs of providing SDSP, and understand issues related to obtaining Medicaid and CHP+ reimbursement for the provision of program services (e.g., oral health screening, dental sealant application, fluoride varnish application, and education).

CDPHE and AHEC could continue to provide technical assistance to ensure providers understand and account for their program costs to their organizations and to the state by means of the SEALS software. The assistance could include 1) distributing the Excel file developed by one dental hygienist to track use of program resources and costs; 2) providing consultation on tracking personnel, administrative, and other program costs; 3) identifying opportunities to purchase equipment and supplies at lower costs; and 5) providing consultation to increase providers’ ability to bill and obtain reimbursement. Such assistance will improve the ability of programs to be financially sustainable, and the ability of CDPHE to provide relevant information to state and other policymakers using SEALS data.
VI. Literature Cited


Appendix A

Recommendations for SEALS Child and Event-level Data Forms

Below are recommendations concerning the SEALS child and event-level forms and the SEALS 2011 Program Cost Beta Excel File, a beta version of an excel file that may be used to track and report school dental sealant program (SDSP) event costs. The recommendations are based on analysis of Colorado SEALS data for 2009-2010 and discussions with the SDSP providers about their programs and data.

I. Event-level Form

*Event Form Question #9 a-c:* Add a field to allow SDSP providers to report the total number of days, including a proportion of a day, the SDSP provider was at the event. The form should provide a section for providers to describe their service delivery model (e.g., conduct screenings on the same day as sealant application, provide education to a class or for individual students) and time spent on each activity (e.g., set-up and breakdown, education, screening, sealant application, and retention checks). These data reflect time spent at the school from the school’s perspective (e.g., how long it took to screen two classes with 25 students each).

Program Costs

**Labor: Reported Hours and Costs**

1. To improve the accuracy of reported cost data, we think it useful to use a table on the form to list the names of persons who participated in an event and the number of hours they worked by activity.

   Below we provide an example of such a table. This table could be placed on the form just after the sections listed above so that the data align.

   The following questions concern the SEALS 2011 Program Cost Beta Excel File.

   - Should labor costs include time spent for travel or should those costs be reported under travel costs?
   - Where should education costs be reported?
   - Should labor hours and costs for retention checks, and possibly sealant reapplication, for third grade children be reported as part of an event that involves sealant application for second grade children?
2. The SEALS 2011 Program Cost Beta Excel File could include a worksheet to record labor and other costs associated with the program but not with a specific event. For example, the worksheet could be used to report the percentage of time or number of hours that an organization’s director, administrator, or clinical consultant worked on an SDSP.

One suggestion is to create one or more worksheets in an excel file to track such labor costs as well as other general SDSP costs (e.g., those of various type of consumables, office supplies, administrative costs), which are not specific to an individual event but used across events. The beta file could include guidance for allocating such costs across events (e.g., allocate based on days at a school or based on the number of children served).

3. The beta file could provide guidance on methods to report salaries for situations in which persons do not perform their usual work (e.g., a dentist who applies sealants, a parent who volunteers).

4. Event Form Question #8: Currently providers report number of hours spent on oral health education and the number of children provided education. The form should include a field for SDSP providers to report the education format (e.g. classroom presentation, provide video for class/child, provide one-on-one or small group education while child/children are provided sealants).
Administrative Costs

1. The beta file could include guidance on how to record administrative costs related to office space (office, utilities, etc.) for organizations and independent providers (e.g., some providers may work from a home office) based on specific characteristics (e.g., square footage, location). Similarly, the beta file could include cost estimates for office equipment (e.g., computers, fax machines, copiers).

2. The beta file could list typical types of office supplies to standardize what types of supplies are accounted for.

Equipment and Consumable Costs

1. Many providers may use supplies across program years. The beta file could include guidance on appropriate costs (e.g., those for consumables) to carry over from year-to-year.

2. The beta file could provide further guidance on reporting equipment and other fixed costs if providers own the equipment or rent/lease it (e.g., depreciation when providers use vans, dental chairs, and other equipment that is older than eight years and typical rates of depreciation indicate that $0 costs be recorded).

Other Costs

1. Two SDSP use vans that provide restorative care and prophylactic services to children of all ages at a specific school. If a van provider applies dental sealants for a second grade child as part of his or her general prophylactic services, what provider costs should be included in the CDC beta file?

2. The beta file or event form could include a field to record mileage traveled by staff and the number of trips.

Process and Program Delivery

Sealant Delivery

1. The event form could include fields for SDSP providers to report the sealant delivery method (e.g., 2- and 4-handed technique) for an event.

2. If a dentist is at an event, should a field be added to the event form to indicate the dentist’s role (e.g. supervision, delivery)?

II. Child Form
Child

*Question #9:* The question and response format allow for only one race/ethnic group to be reported per child. Given that some children have multiple ethnicities, is it possible for the form and software to allow more to be reported?

*Question #11:* Include a field to report that a child has private dental insurance.

*Questions 12-16:* Allow for *Questions #12-16* to be continuous variables rather than dichotomous variables to distinguish between the number of sealants placed prior to the event and the number of new sealants.

*Question #13:* Include more fields so the providers may record more detail about caries experience (e.g., active decay and restorations).

Tooth

*Question #21:* Modify the fields so that providers may record whether the child had all or just some of their needs addressed based on referral from the screening (Section 1: screening).
POSITION STATEMENT

INTEGRATING ORAL HEALTH SERVICES INTO COLORADO SCHOOL-BASED HEALTH CENTERS

September 2011
POSITION STATEMENT:

INTEGRATING ORAL HEALTH SERVICES INTO COLORADO SCHOOL-BASED HEALTH CENTERS
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This position statement was researched and written for the Colorado Association for School-Based Health Care by Maureen Daly, M.D., M.P.H., with assistance from Neil Daly, M.Ed. We would like to thank those who contributed time and knowledge to inform the findings of this report, including: Erin Major, R.D.H., Clinic Manager, Summit Youth Services Center; Marcy Bonnet, M.P.M, Policy Specialist, Colorado Department of Health Care Policy and Financing; Alan S. Kislowitz, M.S.H.A., Health Plan Manager, Colorado Department of Health Care Policy and Financing; Theresa Anselmo, M.P.H, R.D.H., former Director, Oral Health Unit, Colorado Department of Public Health and Environment; and Deborah Borek, R.D.H, Child and School Oral Health Program Coordinator, Colorado Department of Public Health and Environment.
INTRODUCTION

Dental decay is nearly 100 percent preventable, and yet, it is the most prevalent unmet health care need of children and adolescents in this country. Poor and minority children are disproportionately affected by this disease. Left untreated, dental decay has immense health, economic, education, and social implications. School-based health centers (SBHCs) can be instrumental in diminishing the burden of this disease. This paper will outline cost effective and evidence-based approaches for integrating preventive oral health services in Colorado SBHCs.

DOCUMENTING THE NEED FOR PREVENTIVE ORAL HEALTH SERVICES

DENTAL CARIES

Dental caries disease is an infectious disease in which simple sugars in the mouth are processed into acid by bacteria. The acid erodes the enamel of teeth and causes decay. Although nearly 100 percent preventable, dental caries disease is the most prevalent unmet health care need of children.\(^3\) It is five times more common in children than asthma and seven times more common than hay fever.\(^4\) Over 50 percent of children ages 5 to 9 years, and 78 percent of children under 17 years of age, have had at least one cavity.\(^5\)

ORAL HEALTH DISPARITIES

Poor and minority children are disproportionately affected by this disease. Nationally, poor children have about twice the rate of untreated decay as their more affluent peers.\(^6\) It is estimated that low-income children account for 80 percent of total childhood tooth decay.\(^7\) Forty-nine percent of Mexican-American school-aged children have had caries, compared to 40 percent of non-Hispanic white children the same age. Mexican-American and black school-aged children are more likely to have untreated tooth decay than their white peers.\(^8\)

These disparities hold true in Colorado. Among students attending schools where more than half the students qualify for the National School Lunch Program, 58 percent of kindergartners and 72 percent of third-graders have experienced dental decay compared to 34 percent and 47 percent (respectively) of students attending more affluent schools.\(^9\) Among Hispanic children, nearly 60 percent of kindergartners and over 70 percent of third-graders have experienced dental decay compared to 34 percent and 48 percent (respectively) of white, non-Hispanic kindergartners and third graders.\(^10\) Poor and minority students in Colorado are also more likely to have untreated dental decay.\(^11\)

**Nationally:**\(^1\)

- 41% of children ages 2 to 11 years have had caries in their primary teeth and 21% have untreated caries.
- 42% of children ages 6 to 19 years have had caries in their permanent teeth and 14% have untreated caries.

**In Colorado:**\(^2\)

- 45% of kindergarteners and 57% of third graders have had caries.
- 23% of kindergarteners and 25% of third graders have untreated caries.
Children without dental insurance are two and one-half times less likely to receive dental care than insured children. However, having dental insurance does not assure dental care. Nationally, in 2004, only about 30 percent of children enrolled in Medicaid received dental services, compared with 55 percent of children who have access to commercial dental insurance. In Colorado, only 44 percent of Colorado’s Medicaid-enrolled children received dental services in 2009.

In many communities in Colorado, there is a paucity of dental providers. Forty-three counties or sub-county regions are designated as geographic or population-based Dental Health Professional Shortage Areas with nine counties having no practicing dentist. Additionally, only 20 percent of dentists in both urban and rural Colorado accept Medicaid patients.

**IMPACT OF DENTAL DECAY**

**HEALTH AND SOCIAL WELFARE**

Untreated dental caries can result in substantial suffering. In addition to pain, infection, and tooth loss, untreated dental caries can also impair speech development, affect eating, and lead to poor self esteem.

In a study published in Pediatric Dentistry in 2006, Edelstein et. al. found that “parents of children seeking emergency dental care reported that 19 percent of the children experienced interference with play, 32 percent with school, 50 percent with sleeping, and 86 percent with eating.” Additionally, oral diseases have been linked to other serious health conditions. The Surgeon General’s report on oral health, published in 2000, documented linkages between oral diseases and ear and sinus infections, weakened immune systems, diabetes, heart and lung disease, and other serious health conditions.

**EDUCATIONAL**

Nationally, more than 51 million school hours are lost each year to dental-related illness. “An estimated 7.8 million hours of school are lost annually in Colorado due to acute oral pain and infection.” These figures do not account for the millions of Colorado students who attend school but are unable to concentrate, communicate effectively, and learn due to poor dental health.

**ECONOMIC**

Americans spent an estimated $102 billion annually on dental services in 2009. In 2003, Coloradans spent well over a billion dollars on services provided in dental offices. These estimates did not include dental service expenditure in other settings, such as hospitals. Substantial savings could be realized through early prevention of oral diseases. The Centers for Disease Control and Prevention (CDC) estimates that “the average dental costs of children who receive early preventive care are 40 percent lower than those of children who do not receive early care.”

**SCHOOL-BASED HEALTH CENTERS HELP PREVENT DENTAL DISEASE IN CHILDREN**

**COMMUNITY AND SCHOOL-WIDE APPROACHES**

*Community Water Fluoridation*

The most effective way to prevent and even reverse early dental decay is fluoridation of the water supply. Fluoridation has been shown to reduce dental caries in primary teeth by 40 to 50 percent and permanent teeth by 50 to 60 percent. Fluoridation also decreases cavities in adults. The per capita cost of
Fluoridation over a lifetime is less than the cost of a single filling and yet more than 100 million Americans do not have an optimally fluoridated water supply. In Colorado, 71 percent of the population lives in communities with a fluoridated water supply.

Fluoride works through a variety of mechanisms. Through ingestion, it is incorporated into the enamel of teeth before they erupt. Topically it inhibits demineralization, enhances re-mineralization, and inhibits bacterial activity in dental plaque.

At times there has been controversy over the fluoridation of community water systems because of health concerns. In a report published by the Public Health Service in 1991, the agency concluded that “optimal fluoridation of drinking water does not pose a detectable cancer risk to humans as evidenced by extensive human epidemiological data,” nor is it associated with birth defects. Chronic, excessive exposure to fluoride during tooth development can cause fluorosis, a discoloration or white mottling of the teeth. Therefore, care should be taken to minimize this risk. Fluorosis, however, is only a cosmetic concern and does not have a functional effect.

Colorado SBHCs can determine if their county water system(s) is optimally fluoridated by contacting their local water utility. Up-to-date water system level information regarding fluoridation can also be found through the National Center for Chronic Disease Prevention and Health Promotion. For areas that are not fluoridated, SBHCs can take an active role in promoting water fluoridation in their community.

School Sealant Programs

Sealant application is an evidence-based strategy for preventing dental decay among school-aged children. The vast majority (90 percent) of caries occur in the chewing surfaces of permanent molars. Sealants are thin plastic coatings applied to the chewing surfaces. School-based sealant programs have been shown to be a cost effective and a proven evidence-based way to reduce the incidence of caries in school-aged children. They have been shown to decrease caries by 60 percent in the posterior teeth. They also can prevent progression of the severity of the disease. Claims data has shown that placement of sealants on first and second permanent molars in children and adolescents reduce the need for subsequent restorative services. Yet only 37 percent of Colorado third-graders and 27 percent of low-income third-graders have dental sealants, far below the Healthy People 2010 goal of 50 percent.

In Colorado, sealants can be applied by either a dentist or dental hygienist. A dentist may delegate the application of sealants to dental assistants but the dentist must still first perform the oral health assessment. The four-handed technique is recommended for the application of sealants. Therefore, dentists and hygienists usually work with an assistant when applying sealants.

Portable dental equipment is needed to implement a school-based sealant program, including a dental unit, air compressor, dental chair, dental light, dental hygienist and assistant stools, sterilizer, and ultrasonic cleaner. Portable dental equipment may exhibit more variation in cost and quality than traditional dental equipment. Cost of dental equipment can range from $7,600 to $18,000. Sealant material and supplies average about $4.75 per child.

Sealant programs targeting high-risk schools have been shown to reduce racial and economic disparity in sealant use. School-based sealant programs often are implemented in schools where at least 50 percent of the students are eligible for the National School Lunch Program. Second graders are typically targeted because this is when it is most likely that the first permanent molars have erupted but are not yet carious.
Sealant retention is assessed one year later and reapplied if lost. Second molars generally erupt between sixth and eighth grade and therefore it is less clear-cut as to which grade to target. Sixth graders (age 12 years) are usually selected because of higher rates of participation than seventh and eighth graders.

**School-wide or Classroom-based Oral Hygiene and Nutrition Education**

Providing school-wide or classroom-based health education is a successful method for teaching children about the importance of oral hygiene and the impact of good nutrition. For younger children, oral health education should include information on how and when to brush as well as the relationship between refined carbohydrates and cavities. “Frequent exposure to small amounts of fluoride each day is the best way to reduce the risk for dental caries.” Therefore, twice daily brushing with fluoride toothpaste should be recommended. As “adolescence can be a critical period in the human being’s periodontal status,” the importance of flossing as a preventive measure is an important topic to include for this age group. In addition, the oral and systemic consequences of tobacco use should be included as part of oral health education. There are many dental health educational materials that can be obtained at no cost for classroom use.

**PATIENT-CENTERED APPROACHES**

According to the American Academy of Pediatrics, every child should be seen regularly by a dentist for oral health care starting six months after the first tooth erupts or by 12 months of age. However, the reality is this is not always possible. Many families do not have the financial means to pay for dental care. In addition, particularly in rural areas, there is a shortage of dental providers. Geographical and cultural barriers can also prevent children from getting needed care.

With funding, training and the necessary supplies, SBHC personnel are ideally positioned to positively impact the oral health of children and decrease the incidence of caries among the students they serve. Oral health risk assessments and exams, dental hygiene instruction, dietary counseling, the application of fluoride varnishes, and consideration of the need for fluoride supplements can easily be integrated into a well-child exam.

**Getting Started: Setting up a Dental Referral Network**

In planning for preventive oral health services, it is advisable to partner with a local dental provider (dentist and/or hygienist) to serve as a consultant and guide. Likewise, before implementing preventive oral health services, it is necessary to set up a referral network of community dental providers. This is essential so that students found to need restorative care can be referred for appropriate dental treatment.

**Incorporating Oral Health Exam, Risk Assessment, Hygiene Instruction, and Case Management into Clinic Visits**

Oral health is an integral part of general health. Well-child/well-adolescent visits should include an oral health exam and risk assessment. The well-child exam is also an opportunity to provide age-appropriate dental health education and hygiene instruction (anticipatory guidance) based on the risk assessment and oral health exam. The exam and risk assessment guide treatment that may be necessary. Risk status can change over time so children should be evaluated regularly.
An oral health exam takes less than two minutes to conduct. The purpose of the exam is to identify any problems needing treatment, assess the risk of future problems, and provide anticipatory guidance. Equipment needed includes a good lighting source, gloves, tongue depressor, gauze, and a mouth mirror (which is helpful but not required).

In addition to inspecting the face and palpating the neck for adenopathy, the provider does a visual exam, looking in the child’s mouth with a tongue depressor. The gums, teeth (front and back), tongue, palate and posterior pharynx are assessed. Any plaque, white spots or other discoloration, gingivitis, and damaged teeth are noted. The presence of dental fillings and/or dental sealants is noted and oral hygiene assessed. The child is classified as to the urgency of dental care needed based on the conditions present in the mouth.

In addition to visualization of the mouth, nonclinical risk factors are considered in assessing risk. There are different tools available for assessing and classifying a child’s risk for caries. For children found to be low risk for caries, fluoridated water and fluoride toothpastes may be enough to prevent dental decay. For children and adolescents who are moderate to high-risk for caries, topical fluoride should be applied at least every six months (see below).

**Case Management: Referral and Follow-up**

As resources permit, SBHCs can partner with local dental practices, federally qualified health centers, public health departments, and local dental associations to ensure that students without a source of dental care receive needed services. Formal partnerships facilitate the establishment of referral systems, care coordination and communication. During the oral health exam, students will be identified who need dental referral. Through referral and case management, SBHCs can ensure the timely receipt of restorative care (fillings, extractions, etc.) and orthodontia.

**Applying Fluoride Varnishes**

For those at moderate to high risk for dental caries, the regular application of fluoride varnishes also helps reduce risk. The application of fluoride varnishes has been found to be “effective in preventing caries in the primary and permanent dentition of children and adolescents.” Studies have shown that twice a year application of fluoride decreased caries by 25 percent in the permanent teeth of children living in non-fluoridated communities. Fluoride varnishes have been widely used in Europe since the 1980s. The varnish enables a high concentration of fluoride to remain in close contact with the teeth for several hours. This strengthens tooth enamel preventing the initiation of disease and even reversing early dental decay.

**Risk factors for dental caries include:**

<table>
<thead>
<tr>
<th>Dental</th>
<th>Medical</th>
<th>Behavioral</th>
<th>Socio-environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental caries within last 2 to 3 years</td>
<td>Special health care needs</td>
<td>Poor oral hygiene</td>
<td>Low socioeconomic status</td>
</tr>
<tr>
<td>Many multi-surface restorations</td>
<td>Eating disorders</td>
<td>Poor family dental health</td>
<td>Suboptimal systemic or topical fluoride exposure</td>
</tr>
<tr>
<td>Enamel or dentin defects</td>
<td>Drug or alcohol abuse</td>
<td>Frequent consumption of refined carbohydrates</td>
<td>Irregular dental care</td>
</tr>
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</table>
Fluoride varnishes are advantageous to other topical fluoride vehicles, such as gels, rinses, and foams. They are inexpensive and safe, particularly in younger children, who are less likely to swallow varnish than gel. The risk of fluorosis with varnish application is minimal. Varnishes are also better tolerated, without an offensive taste. There is no waiting period for eating and drinking after the application.

Varnishes do not require special preparation of the teeth and application is quick and easy, taking less than 5 minutes to apply. Minimal equipment is needed and includes: toothbrush and toothpaste; fluoride varnish; disposable applicator (included with the product); gauze sponges; disposable tongue depressor or mouth mirrors (optional); gloves; and a good light source. “The average cost of fluoride varnish application is four dollars, thus making it one of the most cost-effective fluoride treatments available.”

The benefit of applying varnishes every six months has been well established for children and adolescents at moderate to high risk for caries. Those at low risk “may not receive additional benefit from professional topical fluoride application.” Fluoride varnishes, although approved by the Federal Drug Administration (FDA) for the treatment of dentin hypersensitivity, are not yet approved for the prevention of caries. However, fluoride varnishes are endorsed by the American Dental Association for use in cavity prevention. “A prescribing practitioner can use fluoride varnish for caries prevention as an off-label use, based on professional judgment.”

In Colorado, physicians, nurse practitioners and physician assistants may apply varnishes in the primary care setting. Trained medical personnel may also apply varnishes under the supervision of a prescribing practitioner. In order to provide this service and receive reimbursement under Medicaid, medical providers must have participated in on-site training from Cavity Free at Three or Smiles for Life.

Prescribing Fluoride Supplements
Dietary fluoride supplements are used when the fluoride in the drinking water is suboptimal. There is good evidence to support its use in preventing dental caries among school-aged children (6 to 16 years of age). The body of evidence for prescribing supplementation for children older than six years of age is less well established.

Prescribing supplements requires the provider to know the fluoride content of the child’s primary drinking water. If the fluoride content of the main source of water for cooking and drinking cannot be determined, supplemental fluoride should not be prescribed because it can increase the risk for fluorosis.

“Consideration should also be given to other sources of water (e.g., home, child care settings, school, or bottled water) and to other sources of fluoride (e.g., toothpaste or rinses), which can complicate the prescribing decision.” Supplements are expensive and compliance can be an issue. For all these reasons, the benefit must be carefully weighed before prescribing supplements.

The currently recommended fluoride schedule (see Figure 1), was jointly established by the American Dental Association (ADA), the American Academy of Pediatric Dentistry (AAPD), and the American Academy of Pediatrics (AAP) in 1994.
**Figure 1: Recommended Fluoride Supplement Schedule**

<table>
<thead>
<tr>
<th>AGE</th>
<th>Fluoride Concentration in Community Drinking Water</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0–6 months</td>
<td>&lt;0.3 ppm*</td>
<td>0.3-0.6 ppm</td>
<td>&gt;0.6 ppm</td>
</tr>
<tr>
<td>6 months–3 years</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>3 years–6 years</td>
<td>0.25 mg/day</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>6 years–16 years</td>
<td>1.0 mg/day</td>
<td>0.50 mg/day</td>
<td>None</td>
</tr>
</tbody>
</table>

*parts per million

**REIMBURSABLE SERVICES UNDER MEDICAID AND CHP+**

Colorado Medicaid will reimburse trained medical providers (physicians, nurse practitioners, and physician assistants) for a risk assessment/oral health evaluation and fluoride varnish application provided to children birth through four years of age (see Figure 2) in conjunction with a well-child visit. Medical providers are currently not reimbursed when these services are rendered to older children. The Cavity Free at Three risk assessment form must be completed and included as part of the medical record. Medical providers are reimbursed for an oral evaluation (D0145 or D1330/D0999) and varnish (D1206) when provided together, or an oral evaluation when provided alone. However, they are not reimbursed for application of varnish in the absence of an oral exam. Other trained medical personnel employed by the SBHC can provide these services and bill using the Medicaid provider number of a supervising physician or nurse practitioner. Varnishes may be applied up to three times a year per eligible and high risk child enrolled in Medicaid.

Under Child Health Plan Plus (CHP+), when a medical provider performs an oral evaluation and applies varnish it is considered a medical service; when a dental hygienist or dentist performs an oral evaluation and applies varnish, it is considered a dental service. Billing for medical services and dental services are distinct. In addition, CHP+ enrollees receive care either through a contracted managed care plan or through the state’s managed care network depending on where they live. For those assigned to the state’s managed care network, the Medicaid rules regarding medical services cited above apply, except that varnish is a benefit only two times a year. For managed care network members, fluoride varnish application is built into the capitation rate (per member per month fee) received by primary care providers, and therefore, there is no additional reimbursement for rendering that service.

**Figure 2: Dental Services Provided By Trained Medical Providers**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Procedure Code</th>
<th>Medicaid Fees as of 7/1/11</th>
<th>Medicaid Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topical fluoride varnish (risk assessment must be included)</td>
<td>D1206</td>
<td>$14.96</td>
<td>Children ages birth to 5 years who have moderate to high caries risk</td>
</tr>
<tr>
<td>Oral evaluation for children under 3 years of age and counseling with primary caregiver</td>
<td>D0145</td>
<td>$28.41</td>
<td>Children ages birth to 3 years</td>
</tr>
<tr>
<td>Unscheduled diagnostic procedure</td>
<td>D0999*</td>
<td>$14.85</td>
<td>Children ages 3 to 4 years</td>
</tr>
</tbody>
</table>

* The code D1330 was replaced with D0999, dental screening, as of July 1, 2011.

Under CHP+, Delta Dental of Colorado administers all dental benefits when provided by a dental hygienist or dentist. There is no distinction in the administration of benefits between children enrolled in a
contracted managed care plan, or through the state’s managed care network. The CHP+ benefit is capped at a maximum of $600 allowable per child per calendar year.

Unsupervised dental hygienists (licensed hygienists without the supervision of a licensed dentist) can provide dental care within their scope of practice and bill both Medicaid and CHP+ (through Delta Dental of Colorado) for dental screenings, topical fluoride application, and sealants for children and adolescents. No additional training is required, but is encouraged. Medical and dental personnel are strongly encouraged to communicate with one another.

Hygienists employed by a private office or clinic may also bill Medicaid under their employer’s Medicaid provider number for covered services rendered to Medicaid enrollees, or Delta Dental of Colorado for covered services provided to CHP+ members.

**CONCLUSION**

An oral health exam with risk assessment and age-appropriate dental health education and hygiene instruction (anticipatory guidance) should be incorporated into routine well-child and well-adolescent visits as well as other care visits when appropriate. SBHCs should assure that students with identified needs receive treatment in a timely manner. This can only be done by establishing a formal referral network in the community, and managing cases to ensure that appointments are made and kept.

Fluoride varnishes and school-based sealant programs are cost effective and proven strategies for preventing dental decay among school-aged children. With training and funding for basic supplies, SBHC providers should apply fluoride varnishes every six months to students found to be at moderate to high risk for dental caries. With additional funding and in partnership with dental providers, school-based health centers should facilitate sealant programs to prevent dental decay among students.

Currently, Medicaid only reimburses trained medical providers for oral health evaluations and fluoride varnish application provided to children aged birth through four years. The Colorado Association for School-Based Health Care, in partnership with SBHCs, should advocate for reimbursement of these services when delivered to at risk school-aged children as well. Lastly, SBHCs should understand their community’s water fluoridation policy, and be strong advocates for fluoridation where none exists.
**HELPFUL WEBSITES**

**Oral Health Awareness Colorado!**  
http://www.beasmarthmouth.com/  
Oral Health Awareness Colorado! is a Colorado coalition of federal, state, and community organizations. Educational materials are available for parents and children on their website.

**Colorado Department of Public Health and Environment**  
www.cdphe.state.co.us/pp/oralhealth/oralhealth.html  
The Oral Health Program has many great resources on their website.

**National Assembly on School-Based Health Care**  
http://www.nasbhc.org/oralhealth

**Center for Health and Health Care in Schools: School-Based Dental Health**  
http://www.healthinschools.org/Health-in-Schools/Health-Services/School-Based-Dental-Health.aspx

**National Maternal and Child Oral Health Resource Center**  
http://www.mchoralhealth.org/  
Educational materials/brochures for consumers as well as factsheets and practice guides for providers can be ordered (at no cost) from this site.

**Cavity Free at Three**  
www.cavityfreeatthree.org

**Smiles for Life: A National Oral Health Curriculum**  
http://www.smilesforlife2.org/default.aspx?tut=555&pagekey=62948&s1=1186276

**American Academy of Pediatrics**  
http://www.aap.org/healthtopics/oralhealth.cfm

**American Academy of Pediatric Dentistry**  
http://www.aapd.org

**American Dental Association**  
http://www.ada.org

**Bright Smiles, Bright Futures**  
This is a Colgate-sponsored website. It contains free educational materials for teachers and dental professionals.

**Colorado Health Foundation**  
http://www.coloradohealth.org/school-based_health_care.aspx

**Caring for Colorado**  
http://www.caringforcolorado.org/

**CDC’s My Waters Fluoride:**  
http://apps.nccdc.cdc.gov/MWF/Index.asp  
This site includes fluoride levels for local water systems.
REFERENCES


Keeping children healthy, in school, and ready to learn
Oral Health

Protecting Your Family's Smile
Oral Health and Pregnancy

- Hormone changes can make your gums sore and swollen and cause bleeding.
- Pregnant moms with dental disease are 7 times more likely to have premature or low birth weight babies.
- Dental treatment is important and safe during pregnancy.
Oral Health and Pregnancy
Baby Teeth are Important!

- Baby teeth are important! for chewing, speaking, jaw development and self-esteem.
- Check your child’s teeth monthly to look for signs of decay.
- Healthy teeth are shiny and smooth.
- Early signs of decay may appear as a white spot or general loss of reflectiveness of the enamel (like flat paint or frosted glass).
- Brown, black or yellow spots are more obvious symptoms of cavities.
- Treating tooth decay or replacing teeth costs a lot of money in the US. Preventing cavities is better than treating them.
Baby Teeth are Important

Healthy Teeth

White Spots

Moderate Decay

Severe Decay
No Bottles in Bed!

- Always put your baby to sleep without a bottle or sippy cup, not even one filled with water.
- Bottle feeding in bed is a hard habit to break.
- The contents of the bottle (usually milk or juice) can remain in the mouth for hours, a common cause of early childhood caries.
- Always hold the infant while giving the infant a bottle. Never “prop” the bottle in the baby’s mouth.
No Bottles in Bed
Wean from Bottle to Cup by 1 year
Wean from Bottle to Cup by 1 Year
Don’t Share Germs

- Use a separate toothbrush for each member of the family.

- Adults can spread the germs that cause cavities. Do not put anything in the child’s mouth if it has been in yours. Examples: Pacifier, spoon, finger

- Parents should also receive regular dental care.
Don't Share Germs
Visit the Dentist

- First dental visit by first birthday.

- Visit the dentist on a regular basis, as often as your dentist recommends, usually twice a year.
Visit the Dentist
Brush Every Day

- Clean infant gums and first teeth with a moist cloth or small soft toothbrush.
- For small children (ages 0-2) use only a “smear” of toothpaste. Use a pea-sized amount for young children.
- Do not rinse the mouth with water after brushing. Instead, spit out the toothpaste. The small amount that remains will help prevent tooth decay.
- Brush teeth 2 or 3 times a day, especially in the morning and right before bedtime.
- Use fluoride toothpaste. Fluoride is a mineral that protects the teeth.
- Buy a new toothbrush every three months.
- Always use “soft” bristled toothbrushes.
- Use dental “floss” or string to remove food remaining between the teeth.
Assist with Brushing

- A child needs an adult’s help in brushing their teeth until they are 7-8 years old.
Assist with Brushing up to Age 8.
Limit Sugar

- Stop the Pop!
- Soda, sweet drinks, candy and other sweets can cause cavities that hurt.
- Snacks like cheese, yogurt, fruit and vegetables are better for your child’s teeth than chips, crackers, or cereal.
- After your child eats sweets, chips, crackers or juice, brush their teeth or rinse the teeth with water.
- Dilute juices with an equal amount of water.
Limit Sugar
Prevent Injury

- Children should wear helmets when riding tri/bicycles.
- Use car seats.
- Child-proof the home for electrical cord safety and poison control.
- Keep emergency numbers handy.
Prevent Injury

Helmets

Seat Belts

Mouth Guards
Betle Nut, Tobacco and Other Drugs

- Can cause gum disease, bad breath, and stained teeth.
- Linked to oral cancer.
- Oral cancer can occur at any age.
- You are more likely to get oral cancer if you chew or smoke tobacco.
Betle Nut, Tobacco and Other Drugs