Smile Survey 2010

The Oral Health of Washington's Children

Washington State Department of Health

DOH 160-099 April 2011

DELTA DENTAL

Washington Dental Service Foundation

Community Advocates for Oral Health

Washington State Department of Early Learning

Superintendent of Public Instruction, Washington

Washington State Smile Survey 2010

March 2011

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Suggested Citation: Washington State Smile Survey 2010. Washington State Department of Health. Olympia, WA. 2010. DOH Pub No 160-099.

Acknowledgments

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Main Reference Sources

Association of State and Territorial Dental Directors. Basic Screening Survey for Children Packet. 2008.

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Glossary

Dental Caries (or Dental decay)
A dental disease process that can result in dental decay (cavity). When left untreated, dental decay can lead to pain, infection, and swelling (abscess).

Decay Experience
The presence of an untreated cavity, a filling or a permanent tooth that is missing because it was extracted due to decay. High rates of decay experience suggest missed opportunities for preventing dental decay at the population level.

Dental Sealants
Transparent or opaque plastic coatings placed on the top of permanent molar (back) teeth to help prevent dental decay. It is applied on first molars during first and second grade and on second molars during sixth or seventh grade.

Early Childhood Caries (or decay)
Presence of decay, fillings, or missing teeth due to decay in the top front baby teeth of children under six years of age. It can be due to the use of baby bottle continuously for nursing, bacterial saliva contamination from mother or caregiver, and/or frequent ingestion of sugar and starches.

Free and Reduced Lunch Program (FRL)
A program available in schools to eligible low-income children.

Need for dental care
Refers to the level of treatment urgency that the child is classified as determined by his or her oral health status, as follows:
Urgent care: when the child has pain, infection or swelling (abscess), and therefore needs to see a dental professional in 24-48 hours.
Early Care: when the child has untreated decay but has no pain or infection, and needs to see a dentist within the next several weeks or before their next regularly scheduled dental appointment. A child with a broken or missing filling, but no other untreated decay, would be classified as needing early dental care.
No need for dental care: when the child shows no obvious problems and can wait until the next regular dental checkup.

Rampant Decay
Presence of seven or more teeth that are untreated and/or have fillings. Represents high severity of dental decay and suggests low levels of both disease prevention and access to dental care.

Untreated Decay
A cavity or hole in the tooth that is at least ½ mm in size, with a brown to dark-brown color. Suggests difficulty in accessing dental care due to phobia, transportation, lack of insurance, or other issues.

Executive Summary

During the 2009-2010 school year, the Washington State Department of Health Oral Health Program conducted the fourth statewide oral health screening survey of three groups of children: (1) low-income preschoolers enrolled in Head Start/ECEAP, (2) public school kindergarteners, and (3) public school third graders. Key findings are as follows:

Oral health disparities were identified

- Children from low income families were more likely to have more decay experience, rampant decay, and treatment needs than those from families with higher incomes.
- Children who were Hispanic and spoke another language at home (especially Spanish) were second most likely to have more decay experience, rampant decay, and treatment needs.

Compared to 2005

- Head Start/ ECEAP preschoolers in 2010 had lower rates of untreated decay and need for dental treatment.
- Third graders in 2010 had lower rates of untreated decay.
- There was no overall difference in sealant rates for all third graders in 2010. However, racial/ethnic minorities, especially those speaking Spanish at home, showed significantly higher dental sealant rates in 2010.

Compared to the national Healthy People 2020 Oral Health Objectives, Washington State

- Continues to have statistically significant higher rates of decay experience for preschoolers and third graders.
- Has met the objectives related to untreated decay and sealant rates for preschoolers and third graders.

Washington State is fortunate to count on many public-private partnerships and a State Oral Health Plan that can be useful in addressing several of the findings of the Smile Survey 2010.

Brief Results of Smile Surveys 2005 and 2010

	Head Start/ECEAP Preschoolers (n=1,597)		Public School Kindergarteners** (n=2,858)	Public School Third Graders (n=2,875)	
	SS 2005 (%)	SS 2010 (%)	SS 2010 (%)	SS 2005 (%)	SS 2010 (%)
Decay experience	46	40	39	60	58
Untreated decay	26	13*	14	19	15*
Rampant decay	16	17	15	21	19
Dental sealants	Not applicable	5	5	50	51
Need for dental care	23	12*	13	17	15

* Statistically significant different from Smile Survey 2005 results at 0.05 level.
** Kindergarten was not surveyed in 2005.

Facts About Childhood Tooth Decay[1]

Childhood dental decay is a significant chronic disease. In the US, dental decay is the number one chronic health condition of childhood and is on the rise among young children (primary teeth) for the first time in 40 years.[2]

Dental decay impacts child health and development, self-esteem, and learning. Children who experience chronic dental decay and related pain and infection can suffer from growth and development disturbance, speech problems, lost school days, poor self-esteem, unhealthy adult teeth and high costs for dental treatment throughout life.[3]

Low-income children are disproportionately affected by dental decay. Over three-quarters of untreated decay in permanent teeth are found in roughly 25 percent of children who are 5 to 17 years old, mostly low-income children. However, low-income and racial/ethnic minority children experience the highest rates of dental decay and the lowest rates of dental care.[2]

Dental decay is preventable and manageable. Cavities are the outcome of an infectious and transmissible disease called dental decay. This is preventable early in life and can be managed without expensive interventions.

Untreated dental cavities are costly. Nationally, annual costs for dental services (all ages) were $95.3 billion in 2007 and are expected to increase in the next decade. The costs to Medicaid are much higher than those for children with private insurance coverage.[4]

Proven prevention interventions can save costs. Dental costs are 40 percent lower for children enrolled in Medicaid for five continuous years who have their first preventive dental visit by age one ($263 compared to $447) than for children who receive their first dental visit after age one.[5] Every $1 invested in community water fluoridation, $38 is saved in dental treatment costs.[6] School-based dental sealant programs save costs when they are delivered to children at high-risk for dental decay.[7]

Dental decay interventions need to be be risk-based. For greatest efficiency, it has been recommended that prevention initiatives be combined with intervention efforts to target those children at high-risk for the disease.

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1 National Oral Health Policy Center. TrendNotes, April 2010, p. 2. At http://www.cdhp.org/system/files/TrendNotes%20April%202010%20Final.pdf

2 Dye BA and al. Trends in oral health status: U.S. 1988-94 and 1999-2004. Vital Health Stat 11, 2007, 248:1-92

3 National Maternal and Child Oral Health Resource Center. Oral Health and Learning: When children's oral health suffers, so does their ability to learn.2nd ed. 2003.

4 Centers for Medicare and Medicaid Services, US DHHS. National health expenditures by type of service and source of funds, 1960-2007. At https://www.cms.gov/nationalhealthexpenddata/02_nationalhealthaccountshistorical.asp#topofpage

5 Savage MF, Lee JY, Kotch JB, Vann WF Jr. Early preventive dental visits: effects on subsequent utilization and costs. Pediatrics 2004;114:e418-23.

6 Centers for Disease Control and Prevention. Oral Health Resources Fact Sheet. Cost Savings of Community Water Fluoridation.

7 Maternal and Child Health Advisory Board. 2009. Dental Sealants. Nevada State Health Division, Oral Health Initiative. At http://health.nv.gov/PDFs/MCHAB/Dental_Sealants.pdf

Dental decay is largely preventable through early risk assessment and comprehensive prevention strategies at the community level, such as water fluoridation and school sealant programs. As with other chronic diseases, it would be more cost-effective to focus on preventing dental disease with low cost measures than to wait for disease to start and then treat it at much higher costs. Treatment is good, prevention is better.

By recognizing and understanding the oral health needs of Washington's children, programs and policies can be initiated and advanced to ensure good oral health for all Washington children.

More information on how oral health impacts general health and wellbeing, refer to Appendix A.

Survey Methodology

To identify and track the oral health needs of Washington's children, the Washington State Department of Health, Oral Health Program conducts the Smile Survey every five years. The Smile Survey provides useful surveillance information to support the development of programs and policies that focus on ensuring that all children in Washington are healthy and ready to learn.

Previous Washington Smile Surveys were done in 1994, 2000, and 2005.[1] During the 2009-2010 school year, the fourth Smile Survey was conducted.

Dentists and dental hygienists, who attended a one day training session, screened school children using gloves, a disposable dental mirror and penlight. Screenings were completed at:

- 48 randomly selected Head Start/ECEAP sites (in 1,597 preschoolers) and
- 53 randomly selected elementary schools (in 2,858 kindergarteners and 2,875 third graders).

Response rates were 76 percent for Head Start/ECEAP preschoolers, 82 percent for kindergarteners and 80 percent for third graders.

Detailed survey methodology is available in Appendix B.

Lists of participating schools and respective response rates are available in Appendix C.

Survey results by grade are available in Appendix D.

1 Washington State Smile Surveys at www.doh.wa.gov/cfh/oralhealth/datapubs

Key Finding #1—Disparities

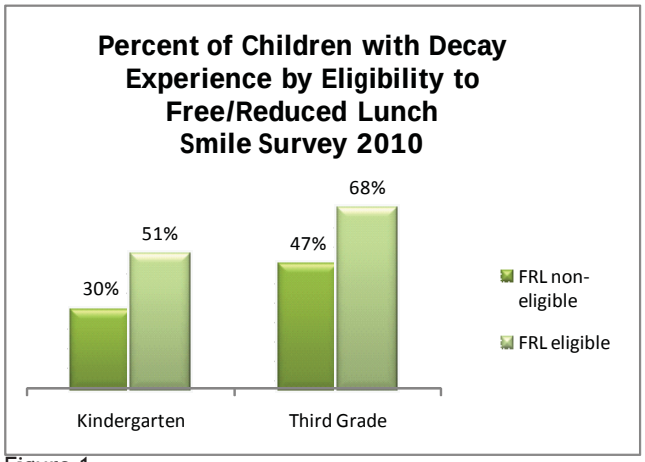
Note: Survey results by grade (with confidence intervals) are available in Appendix D.

In 2010, children from low income families were more likely to have more decay experience, rampant decay, and treatment needs than those from families with higher incomes. Children who were Hispanic and spoke another language at home (especially Spanish) were second most likely to have more decay experience, rampant decay, and treatment needs.

A student's eligibility for the Free/Reduced Price Lunch (FRL) School Program is traditionally used as a proxy for family income. Washington children who were eligible for FRL showed poorer oral health outcomes than children stratified by any other characteristic. For example, kindergarteners and third graders who were eligible for FRL were more likely to have decay experience than their non FRL eligible counterparts.

Race/ethnicity (most commonly, Hispanic) and speaking another language at home (most commonly, Spanish) were also associated with poorer outcomes. For example, Head Start preschoolers, kindergarteners and third graders who had a racial/ethnic minority background were more likely to have rampant decay than their White Non-Hispanic counterparts.

A basic principle of public health is that all people have a right to health. Differences in the incidence and prevalence of health conditions and health status between population groups are commonly referred to as health disparities. Most health disparities affect groups marginalized because of socioeconomic status, race/ethnicity, sexual orientation, gender, disability status, geographic location, or some combination of these. People in such groups not only experience worse health but also tend to have less access to the social determinants or conditions that promote health.[1]



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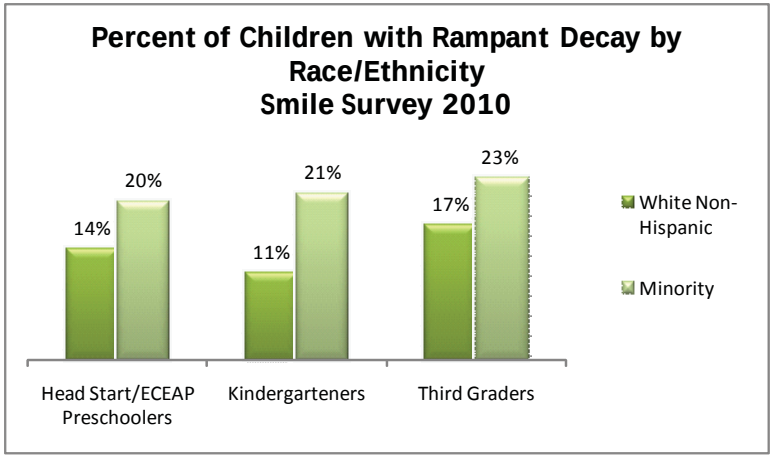


Figure 2.

1 Centers of Disease Control and Prevention Promoting Health Equity. 2008. At http://www.cdc.gov/NCCDPHP/DACH/chaps/pdf/SDOHworkbook.pdf

Key Finding #2—Untreated Decay and Treatment Need

Compared to 2005:

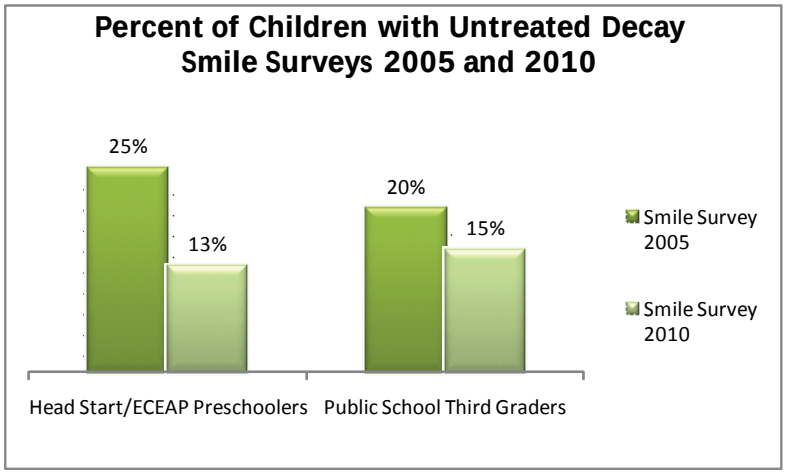
- Untreated decay rates decreased for both Head Start/ ECEAP preschoolers and third graders in 2010.
- Treatment need rates decreased for Head Start/ECEAP preschoolers in 2010.

Between 2005 and 2010, rates of untreated decay have lowered from 25 percent to 13 percent for Head Start/ECEAP preschoolers and from 20percent to 15 percent for third graders.

In 2010, there were still approximately 14 percent of preschoolers, kindergarteners and third graders with untreated decay. This rate increased to 20 percent for those children who were eligible for free/reduced lunch (FRL).

Need for early or urgent treatment rates have improved for Head Start/ECEAP preschoolers, decreasing from 23 percent to 12 percent in 2005 and 2010, respectively.

In 2010, 12 percent of these preschoolers did not have access to early or urgent dental treatment possibly due to lack of insurance, phobia, transportation, or other access-related issues.



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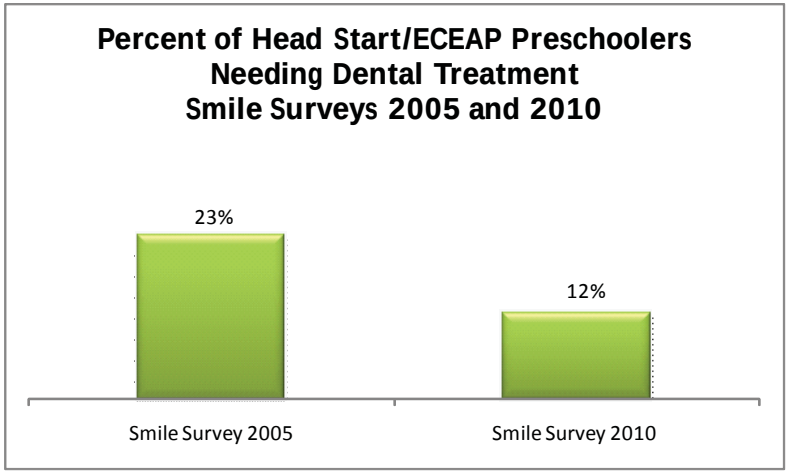


Figure 4.

Key Finding #3—Sealants

Compared to 2005, there was no overall difference in sealant rates for all third graders in 2010. Sealant rates were 50% and 51%, respectively. However, in 2010, minority third graders showed a higher sealant rate (56%) than their White Non-Hispanic counterparts (48%).

The increased rate among minority third graders may be due to the increased promotion of sealants at the state and national levels. Initiatives that have been promoting school sealant programs nationwide are listed at the Centers for Disease Control and Prevention website.[1] At the state level, the Washington State School Sealant Guidelines have been in place since 1995.[2]

Dental sealants are thin plastic coatings applied to the grooves on the chewing surfaces of the back teeth as soon as they erupt in the mouth. The back teeth are where most dental decay in children and teens occurs. Sealants significantly reduce a child's risk for having decay. In some cases, sealants can even stop dental decay that has already started.[3] School dental sealant programs are especially important for reaching children from low-income families who are less likely to receive dental care otherwise.

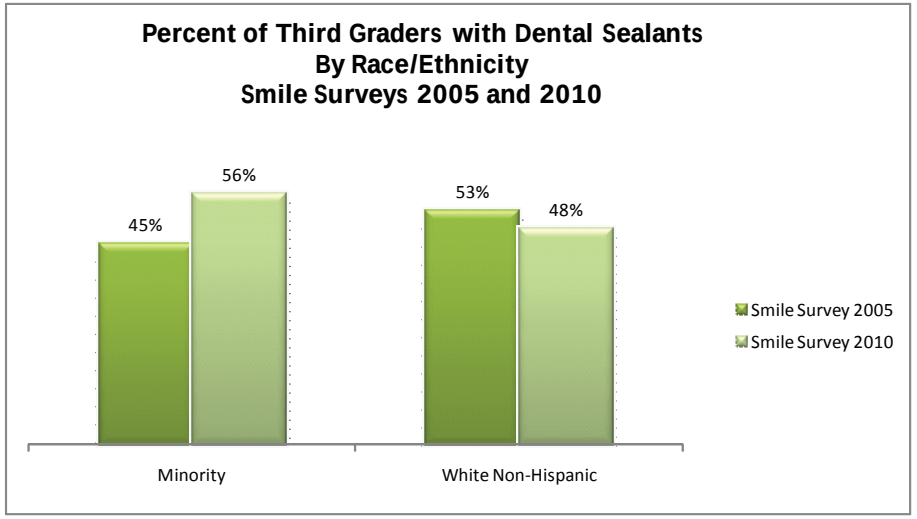


Figure 5.

1 Centers for Disease Control and Prevention, School Sealant Programs at http://www.cdc.gov/oralhealth/topics/dental_sealant_programs.htm

2 Washington State has its own Guidelines for School Sealant Programs at http://doh.wa.gov/cfh/oralhealth/sealants/.

3 American Dental Association. Evidence-based Clinical Recommendations for Dental Sealants 2009 at http://www.ada.org/4194.aspx?currentTab=2

Key Finding #4—Healthy People 2020[1] Oral Health Objectives

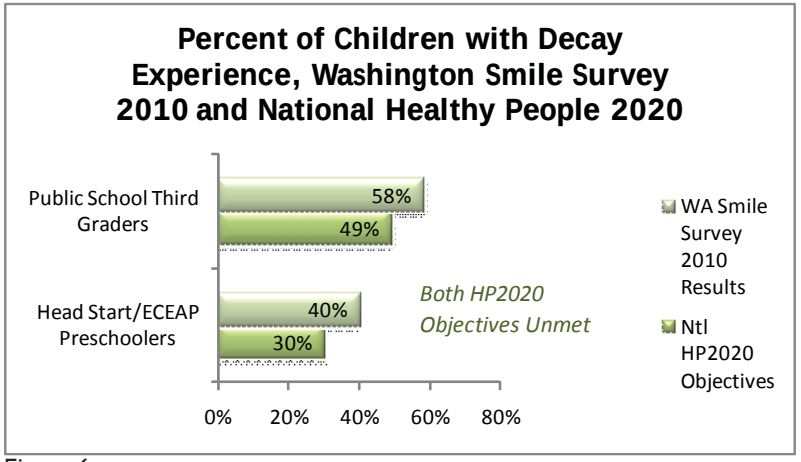
In comparison to the national Healthy People 2020 Oral Health Objectives, Washington State:

- Continues to have statistically significant higher rates of decay experience for preschoolers and third graders.
- Has successfully met the objectives related to untreated decay and sealant rates.

Decay experience was present in 40 percent of preschoolers and 58 percent of third graders in 2010. Washington is far from reaching the respective national Healthy People 2020 Objectives of 30 percent and 49 percent, respectively. High rates of decay experience signals missed opportunities to prevent decay at the population level.

Washington has successfully met the national Healthy People 2020 Objectives for untreated decay (21 percent for preschoolers and 26 percent for third graders). Washington's rates were 13 percent for Head Start/ECEAP preschoolers and 15 percent for third graders in 2010.

Washington has also successfully met the national Healthy People 2020 objectives for dental sealants (1.5 percent for preschoolers and 28 percent for third graders). Washington's rates were 2.4 for 5 years old in kindergarten and 51 percent for third graders.



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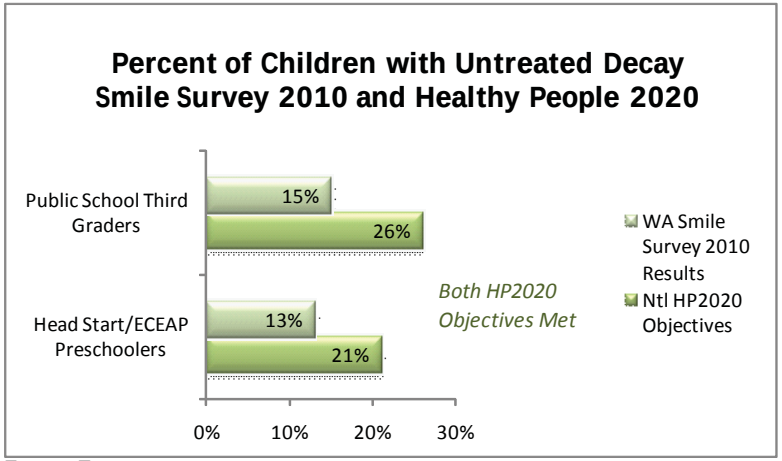

Figure 7.

1 Healthy People provides science-based, 10-year national objectives for improving the health of all Americans. The Healthy People 2020 Oral Health Objectives are available at http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=32.

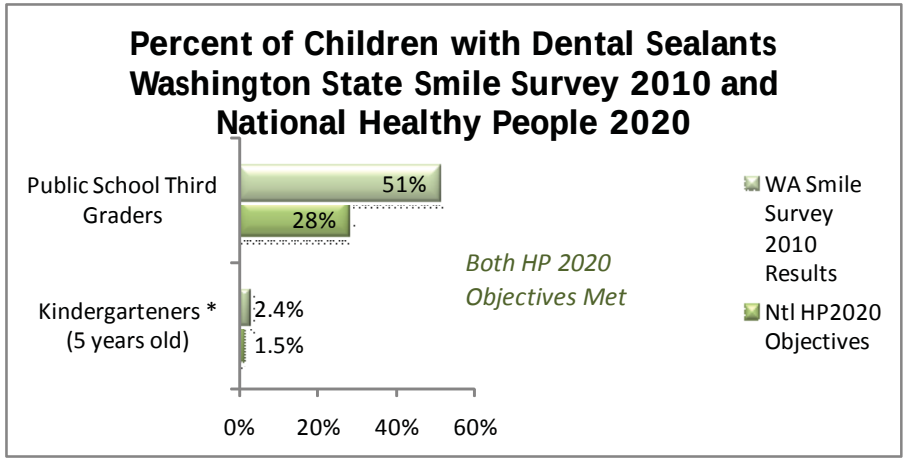

Figure 8.

Dental decay is largely preventable through measures that can be taken at home and school, such as brushing twice a day with fluoride toothpaste, drinking water with fluoride at the recommended levels, applying dental sealants in molar teeth, applying topical fluorides, and reducing the frequency of consuming sugars and carbohydrates. For more information on how to prevent dental decay, visit www.doh.wa.gov/cfh/oralhealth.

Next Steps

Washington State counts on several state initiatives and programs that work to promote significant and lasting improvements in oral health for all Washington residents. Below is a summary of such initiatives.[1]

- **Skilled Workforce.** Washington's oral health workforce is robust. It includes approximately 6,000 licensed dentists, 5,000 dental hygienists, 10,000 registered dental assistants, 150 denturists, and 100 new licensed expanded-function dental auxiliaries. Of the total estimated 3,300 primary care pediatricians and family medicine physicians, 850 primary care physican assistants, and 2,000 primary care nurse practitioners, more than 1,000 have received special training in pediatric oral health prevention. A growing number of in-home caregivers are trained in oral health services for seniors. Dental professionals are not adequately distributed to serve all populations in need; in 2009, 34 of the 39 Washington counties were considered dental health professional shortage areas.
- **Education**. Quality training to the state's workforce is provided by one dental school, nine dental hygiene schools, five expanded-function dental assistants (EFDA) programs, nine dental assisting programs, and one denturist program.
- **Dental Public Health Infrastructure.** By working together, the State Oral Health Program and the 35 Local Oral Health Programs have been able to collect state and local oral health data (including this Smile Survey), provide oral health education to communities, promote preventive oral health services (school dental sealants and fluorides) and make dental referrals for the underserved.
- **Initiatives to encourage providers to work in underserved areas**. These include: loan repayment and scholarship programs, University of Washington (UW) Programs, such as Educational Partnerships and Diversity, Regional Affairs Outreach, Regional Initiatives in Dental Education – RIDE, and the Yakima's Northwest Dental Residencies.
- **Programs that provide direct oral health services to underserved populations.** These include: Medicaid dental providers, Washington State Health Care Authority Community Health Services Program, community health centers, free clinics, Department of Corrections' dental facilities, multiple University of Washington dental programs, dental hygiene clinics, dental residencies, mobile dental clinics, tribal dental clinics, the Volunteer/Retired Program, Oral Health Connections, Washington State Dental Association Outreach, and various charitable and low-cost care programs. The degree to which dental services are offered within these programs varies from only preventive services to comprehensive care.
- **Financing.** State grants are available from Health Care Authority to community health clinics to accept uninsured and underserved patients. Increased reimbursement for dental and medical providers that serve Medicaid children 0-5 years old through the ABCD Program. This program emphasizes the importance of early intervention, provides training to dentists and their staff, and connects families to dental care.
- **Collaborations and Coalitions.** Washington counts on the State Oral Health Coalition and many local oral health coalitions that work collaboratively to enable the implementation of the Washington State Oral Health Plan.

1 Washington Oral Health Workforce Report. 2009. At http://www.ws-ohc.org/plan/CHWS_FR130_Skillman.pdf

State Oral Health Plan Strategies

A variety of public and private organizations and hundreds of community members and health care professionals have provided input to the first Washington State Oral Health Plan.[1] This Plan proposes systemic strategies to address the oral health needs of our state, several of which relate to children. Below are examples of such strategies.

For Individuals, Families and Caregivers:

- Provide information that is supportive of healthy lifestyle choices made at home and community levels, educates about the links between oral and general health, and informs about how to find and use dental care.

For Health Care and Social Service Providers:

- Educate to engage all providers about their role in the link between oral health and general health.
- Increase the number of providers working to prevent dental disease and eliminate oral health disparities.

For System Infrastructure:

- Share relevant population's oral health status information with decision makers.
- Increase the number of community groups and services related to oral health.
- Promote preventive activities, such as: water fluoridation, sealants, fluorides, oral health education, tobacco cessation, healthy nutrition and oral cancer screenings.
- Rebuild capacity in dental public health at the state, regional and local levels.
- Increase public-private partnerships to mobilize resources to sustain these strategies.

1 Washington State Oral Health Plan. 2009-2014. At www.ws-ohc.org/plan.htm

Appendix A

The Impact of Oral Health on General Health and Wellbeing[1]

Oral health is an important public health issue; oral diseases have a significant impact on individuals, communities, health systems, economies and society at large. Oral health refers to the entire mouth, not just the teeth. It includes the gums, the hard and soft palate, the linings of the mouth and throat, the tongue, the lips, salivary glands, chewing muscles, and the upper and lower jaws. The World Health Organization defines oral health as "a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity. Risk factors for oral diseases include unhealthy diet, tobacco use, harmful alcohol use, and poor oral hygiene."[2] Poor oral health impacts children and adults' performance at school[3] and at work.

The mouth is part of the body

Oral health is an essential and integral component of overall health. Oral diseases can have an impact on general health and other chronic diseases. Many systemic diseases can have early manifestations in the mouth. For this reason, the mouth is used as a mirror of the body and an important early warning system for health practitioners. For example, mouth lesions and other oral conditions may be the first sign of HIV infection and can be used as indicators to follow its progression to AIDS. An oral examination can also reveal other diseases, general health status, and habits such as tobacco and other drug use.

Chronic diseases, including oral diseases, are of long duration, generally progressing slowly and usually non-communicable. Major risk factors, such as tobacco use, physical inactivity, and a diet high in fat, salt and sugar, contribute to a range of chronic diseases, such as obesity, diabetes, cardiovascular diseases, and oral diseases. The risk factors for chronic diseases compound over time, resulting in higher levels of chronic disease as age increases. Poverty and chronic disease are linked into a vicious cycle; chronic diseases can exacerbate poverty and the poor have greater exposure to risk factors and less access to health services. Supportive policies, a healthy environment and individual behavior contribute to reducing the major risk factors. Many risk factors are results of broader determining factors, such as lifestyle, socio-economic status, or living conditions.

> **"You are not healthy without good oral health."**
> **C. Everett Koop, Former Surgeon General**

As an interrelated part of the body, the mouth shows patterns of disease that mirror those of many other chronic diseases. Inequalities in both general and oral health are very similar. These similarities highlight the close association between oral and general health. Oral and general health are linked and jointly influenced by psychosocial factors such as stress, behaviors such as diet and smoking, and broader socio-environmental factors. The evidence to date highlights the need for future oral health preventive programs to be more integrated with general health promotion activities.

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1 This section adapted from the World Oral Health Atlas 2009 and the Connecticut's Every Smile Counts 2007 report.

2 World Health Organization, Oral Health. At http://www.who.int/topics/oral_health/en/

3 National Maternal and Child Oral Health Resource Center. When Children's Oral Health Suffers, So Does Their Ability to Learn. 2nd ed., 2003.

Keeping teeth for life

The development of the human dentition is a complex process, with a primary (baby) set of 20 teeth and a permanent (adult) set of 32 teeth. Primary (also known as baby, milk or deciduous) teeth start to form between six and eight months in the womb, and permanent teeth begin to form in the 20th week in the womb.

Babies get their first teeth at around six to eight months of age, usually starting with the lower two front teeth. The remaining baby teeth erupt at regular intervals and usually all 20 baby teeth have erupted by the age two-and-a-half. Like adult teeth, primary teeth are important for both eating and appearance, and they also act as a stimulus for the jaws and face to grow and maintain spaces for the permanent teeth to erupt from underneath. Early loss of baby teeth as a result of accidents or dental decay often leads to overcrowding of the permanent teeth (known as "crooked teeth".)

The permanent teeth start to erupt around the age of six to eight and again, the front lower teeth are usually the first to appear. The last common permanent teeth (second molars) erupt in the mouth by age 13. Wisdom teeth (third molars) may erupt by age 18. Therefore, between ages six and 13, children will have a mix of primary and permanent teeth in their mouth.

"Tooth decay is the most common chronic disease on the planet, yet it is preventable."
The Oral Health Atlas, 2009

While the outer coating of the tooth (enamel) is the hardest tissue of the human body, teeth have two interior layers that are softer. The first is the tubular dentin, and the second is the pulp - the softest layer with nerves and blood vessels. Throughout life, tooth wear causes loss of enamel or underlying dentin. When tooth decay occurs and is left untreated it can penetrate the dentin and the pulp, leading potentially to abscess and tooth loss.

In the absence of dental decay, gum diseases, and other diseases that cause tooth loss, it is possible to retain a functioning full set of teeth for a lifetime.

Dental decay – A largely preventable disease

Dental decay is an ancient disease. Levels of decay rose during the 17th century and reached epidemic proportions in the 19th and 20th centuries. Over the last three decades, decay rates have dropped in high-income countries mainly as the result of the widespread use of fluoride. Decay rates are highest where sugar consumption is high and access to prevention and care is low.[1]

During childhood, dental decay remains the single most common chronic disease, five times more common than asthma.[2] Despite being largely preventable, dental decay still affects more than half of all U.S. children by the third grade; by the time children finish high school, about 80% have dental decay.[3]

Sometimes, the public perception is that dental decay is a natural and minor occurrence that deserves little attention or dollars. However, if left untreated, dental decay can lead to several unwanted consequences:[4]

- **Pain.** Dental decay can cause constant intense pain. Many children do not know that teeth are not supposed to hurt.
- **Infection.** Infected teeth are reservoirs of bacteria that spread through the rest of the body, leaving the child prone to many other childhood infections, including ear

1 FDI World Dental Federation. Global Oral Health Atlas 2009 at www.oralhealthatlas.org

2 Edelstein B, Douglass C. Dispelling the cavity free myth. Public Health Reports 1995, 110:522-30

3 Hyatsville, MD: Centers for Disease Control and Prevention, unpublished data.

4 Dental Health Foundation, "Mommy, it hurts to chew: the California Smile Survey", February 2006.

infections and sinus infections. Antibiotic therapy is often not successful for other infections when dental decay is not treated.

- **Poor Nutrition.** Chronically painful and infected teeth make chewing and swallowing an uncomfortable and difficult chore. Children with dental disease often do not get the nutrition they need to grow.
- **Tooth loss.** Chronic childhood dental disease often makes children's "baby" teeth fall out before their adult teeth are ready to take their place.
- **Sleep deprivation.** Children with chronically painful teeth have trouble getting a good night's sleep.
- **Slower social development.** Ugly or missing teeth can make it difficult to talk and can greatly affect a child's self-esteem and socialization. When a child's front teeth are damaged or missing in crucial early years of development, they often can't form words correctly and tend to retreat into shyness and silence.[1]
- **Attention problems.** Children with infected and painful teeth have a hard time relaxing, sitting still and paying attention in class.
- **Missed school days.** Children with dental issues, such as infected and painful teeth, miss more school days than other children, again disrupting their educational and social experiences and cost school districts money. In 1996, 51 million hours of school were lost in the US due to dental problems.[2]
- **High cost of dental care.**

There is no way to revert the dental decay process; the best strategy is to prevent it from starting. Dental decay is largely preventable through measures that can be taken at home and school, such as:

- brushing twice a day with fluoride toothpaste,
- drinking fluoridated water at recommended levels,
- sealing the pits and fissures of molars,
- applying topical fluorides, and
- reducing the frequency of consuming sugars and carbohydrates.

1 Surgeon General's Report on Oral Health. 2000. At http://silk.nih.gov/public/hck1ocv.@www.surgeon.fullrpt.pdf

2 National Health Interview Survey, 1996 (Vital and Health Statistics; Series 10, Data from the National Health Survey # 200). Hyatsville, MD: US Department of Health and Human Services, 1996.

Appendix B

Survey Methodology in Detail

The Smile Survey 2010 tracked the oral health of three children groups: Head Start/ECEAP preschoolers (3-5 years old), public school kindergarteners, and public school third graders.

An attempt was made to include students with special needs, but the resulting sample was not representative of this population group and is not presented here. Lessons were learned from this attempt, which will be useful as future surveys are planned. Oral health is considered by parents the first unmet health care need of children with special needs.[1]

Sampling

Head Start and ECEAP Sites and Preschoolers (3-5 years old).

Two data files, both for the 2008-2009 school year, were obtained from the Department of Early Learning (DEL). One file listed all Head Start sites and the second file listed all ECEAP sites. A single electronic data file of all Head Start and ECEAP programs in Washington was then developed from the two separate data files.. The file created contained the following information for each program: site name, contractor which ran the program, and contact information. Some Head Start and ECEAP sites had the same address, indicating that they were dual, co-located sites. Such dual sites were included on both lists, so the final merged list underwent a de-duplication process.

The resulting list contained 563 eligible sites. A sample size calculation taking the design effect of clustering and an estimate of the expected non-response rate (both based on the last survey's data), was undertaken and resulted in a sample size of 1,760 children. Dividing this total by the average statewide program size resulted in a final sample size of 48 programs. The list was then sorted on a randomly generated number and a systematic random sample of 48 Head Start/ECEAP sites was chosen. The preschool programs selected were contacted and invited to participate. If they declined to participate the next program on the list was contacted and invited until a replacement was identified. All attendees of a selected preschool program were eligible to be surveyed (screened). The final sample size was 1,597 preschoolers. A final list of all participating schools and preschool sites is shown in Appendix C.

Public School Kindergarteners and Third Graders

An electronic data file of all elementary schools in Washington was obtained from the Office of Superintendent of Public Instruction (OSPI). The data file, which was for the 2008-2009 school year, contained the following information for each school: district, county, total enrollment, Kindergarten and third grade enrollment, and percent of children participating in the free or reduced price lunch (FRL) program. This file included all 2,260 public elementary schools in Washington State. All schools with at least 15 children each in both kindergarten and third grade were included in the sampling frame (n=1,020 schools). Schools were sorted by the percent of children eligible for the free or reduced price lunch (FRL) program. A sample size calculation taking the design effect of clustering and an estimate of the expected non-response rate (both based on the last survey's data) was undertaken and resulted in a sample size of 3,709 children. Dividing this total by the average statewide class size resulted in a final sample size of 53 elementary schools. All schools were sorted by proportion of students being served free/reduced lunch, from lowest to highest. Probability systematic sampling was used to select 53 schools. Selecting a sample using this implicit stratification process assures that the sample is representative of the state's

1 National Survey of Children with Special Health Care Needs, 2005

schools in terms of free/reduced lunch participation. As with the Head Start/ECEAP sites, all selected schools were contacted and invited to participate in the survey. If a school declined to participate, the next school in the sorted sample frame was chosen until a replacement was secured. All students in kindergarten and third grade of the selected school were eligible to be surveyed (screened). The final total sample size was 5,741 elementary school children, with 2,877 third graders and 2,864 kindergarteners.

Screening Methods

All selected participating Head Start/ ECEAP sites and elementary schools (kindergarten and third grades) used a passive consent approach. Letters in English and Spanish were sent home to parents explaining the purpose of the survey and let parents know that they would be notified if their child was found to have dental decay that needed prompt treatment. Parents were instructed to return a signed form only if they did not want their child screened. Information on age, race, language spoken at home and eligibility for the free or reduced lunch program among elementary school students was obtained from the school or site directly. All children enrolled and present on the day of the screening were examined unless a parent/guardian returned the consent form specifically requesting that the child not take part in the survey.

Prior to the beginning of data collection (screening), dentists and dental hygienists attended a full-day training session which included a didactic review of the diagnostic criteria along with a hands-on calibration session. The diagnostic criteria outlined in the Association of State and Territorial Dental Director's publication Basic Screening Surveys: An Approach to Monitoring Community Oral Health were used. On the screening day for each school, dentists and/or dental hygienists screened the children using gloves, penlights, and disposable mouth mirrors. Data were collected using paper forms and entered into electronic databases later. Preschools and elementary schools used different data collection forms appropriate to the age group being screened.The overall response rate was 76 percent for preschoolers, 82 percent for kindergarteners, and 80 percent for third graders.

Data Management and Analysis

Data entry was completed using Epi Info Version 3.5.1. Epi Info is a public access software program developed and supported by the Centers for Disease Control and Prevention. Data presented in this report were analyzed using STATA version 11. Data analysis was conducted taking the clustering effect of the sampling methodology into account. The school or preschool program was used as the primary sampling unit. In addition, the data were adjusted for non-response within each school/program. For the non-response sampling weight, the number of children enrolled in each school/program was divided by the number of children screened. Comparisons between the 2005 Smile Survey and the 2010 Smile Survey were limited to preschool and third grade respondents from both surveys. Kindergarten age children were only surveyed in 2010.

For eight of the children surveyed, the age information that was provided was discordant with the generally accepted age range from the grade they were reported to be part of. Six were from Kindergarteners and two were third graders. These kids were excluded from the respective grade data analyses.

Screening Forms

Smile Survey 2010
Head Start / ECEAP
Preschoolers

Student # ☐☐☐ *All boxes must contain a valid code.* School # ☐☐

Grade ☐	Child's Age ☐☐	Gender ☐ 1=Male 2=Female
Language at Home ☐ 1=English 3=Other 2=Spanish 4=Unknown	F/R Lunch ☐ 0=Not eligible 1=Eligible 2=Unknown	Race/Ethnicity ☐ 1=White 3=Hispanic 5=AI/AN 7=Unknown 2=Black 4=Asian 6=Other
Untreated Cavities ☐ 0=No untreated cavities 1=Primary only 2=Primary & Permanent 3=Permanent only		Treated Cavities ☐ 0=No untreated cavities 1=Primary only 2=Primary & Permanent 3=Permanent only
History of Rampant Caries ☐ 0=No Rampant Caries 1=Rampant ≥ 7 teeth		Sealants on Permanent Molars ☐ 0=No sealants present 1=Sealants present
Whitespot Lesions ☐ 0=No White spots on maxillary anteriors 1=White spots on maxillary anteriors		Treatment Urgency ☐ 0=No obvious problem 1=Early dental care 2=Urgent care

Smile Survey 2010
Public Elementary School
Kindergartners and Third Graders

Student # ☐☐☐ *All boxes must contain a valid code.* School # ☐☐

Grade ☐	Child's Age ☐☐	Gender ☐ 1=Male 2=Female
Language at Home ☐ 1=English 3=Other 2=Spanish 4=Unknown	F/R Lunch ☐ 0=Not eligible 1=Eligible 2=Unknown	Race/Ethnicity ☐ 1=White 3=Hispanic 5=AI/AN 7=Unknown 2=Black 4=Asian 6=Other
Untreated Cavities ☐ 0=No untreated cavities 1=Primary only 2=Primary & Permanent 3=Permanent only		Treated Cavities ☐ 0=No untreated cavities 1=Primary only 2=Primary & Permanent 3=Permanent only
History of Rampant Caries ☐ 0=No Rampant Caries 1=Rampant ≥ 7 teeth		Sealants on Permanent Molars ☐ 0=No sealants present 1=Sealants present
Treatment Urgency ☐ 0=No obvious problem 1=Early dental care 2=Urgent care		Comments

Appendix C

Participating Head Start/ECEAP Sites and Elementary Schools

Table 2. Participating Head Start/ECEAP sites (preschool)

Head Start Name	County	# Children Screened	Response Rate
O'Costa ECEAP	Grays Harbor	22	67%
Benton Franklin Head Start - Central Pasco	Franklin	87	66%
Chelan Douglas Child Services Association	Chelan	29	81%
The EEU ECEAP	King	22	61%
Tiny Tots Development Center	King	13	77%
Denise Louie Education Center - Lake Washington Site Head Start	King	29	73%
Center for Families Head Start	Snohomish	64	89%
North County 2 Head Start	Snohomish	24	67%
Fruit Valley Head Start	Clark	13	77%
St. Johns Head Start/ECEAP	Clark	34	69%
McLane School ECEAP	Thurston	24	65%
Discovery Center Head Start	Grays Harbor	15	100%
West Valley Head Start	Yakima	42	79%
Burton ECEAP	Clark	25	35%
Family Services of Grant County Head Start	Grant	79	73%
Fruitland ECEAP	Benton	76	95%
North Kitsap Preschool	Kitsap	16	100%
Parkway Head Start	Asotin	26	72%
Goldendale Head Start	Klickitat	59	69%
Yacolt Head Start	Clark	13	81%
Peninsula College Early Head Start	Clallam	9	64%
Givens Head Start	Kitsap	11	100%

Head Start Name	County	# Children Screened	Response Rate
Wolfe Head Start	Kitsap	26	100%
Omak ECEAP	Okanogan	46	74%
ACAP Head Start	King	14	61%
Clover Park Idlewood	Pierce	25	66%
Country Kids Child Development	Yakima	54	83%
Hugs, Tugs, & Luvs - PLU	Pierce	20	100%
Northshore Woodin Head Start	King	10	53%
Artondale Elementary ECEAP	Pierce	27	75%
Clarkmoor Elementary ECEAP	Pierce	30	83%
E.P.I.C. ECEAP	Benton	29	97%
Panther Lake Community Church ECEAP	King	34	94%
Broadview-Thompson Head Start	King	30	75%
Woodmont Elementary ECEAP	King	26	72%
Colville Head Start	Stevens	57	79%
Emerson Head Start	King	18	90%
Central Whidbey	Island	48	100%
Washington Head Start	Skagit	14	87%
Lake Stevens S.D. ECEAP	Snohomish	83	100%
Raymond School District	Pacific	18	95%
Lyon Head Start	Pierce	36	100%
NVCCF - Sumas	Whatcom	15	83%
Hillyard Center Head Start/ECEAP	Spokane	68	48%
Mattawa Elementary ECEAP Program	Grant	29	85%
Riverside ECEAP Chattaroy	Spokane	24	67%
Pacific Place Head Start	Skagit	28	78%
Quincy Child Development Center	Grant	56	81%

Total: 48 sites and 1,597 Head Start/ECEAP preschoolers

Table 3. Participating elementary schools (kindergarten and third grade)

School Name	County	# Children Screened	Response Rate
Lewis & Clark Elementary School	Chelan	145	90%
Robert Gray elementary	Cowlitz	149	94%
Ritzville Grade School	Adams	31	63%
Morton Elementary School	Lewis	40	77%
Catlin Elementary	Cowlitz	77	85%
Garfield Elementary School	Yakima	112	81%
Larson Heights Elementary School	Grant	118	81%
Sand Hill Elementary	Mason	134	92%
East Ridge Elementary	King	82	68%
McGilvra Elementary School	King	80	94%
Centennial Elementary School	Thurston	142	97%
Briarwood Elementary School	King	106	85%
Rose Valley Elementary School	Cowlitz	48	86%
Maywood Hills Elementary	King	128	93%
Fairwood Elementary School	King	94	79%
Clear Lake Elementary	Skagit	31	67%
John Rogers Elementary School	King	88	66%
Maple Grove Primary School	Clark	193	84%
The New School at South Shore	King	106	94%
Broadview-Thompson Elementary School	King	142	76%
John Muir Elementary School	King	97	71%
Bordeaux Elementary School	Mason	157	81%
Meadow Ridge Elementary	King	138	100%
Armin Jahr Elementary School	Kitsap	152	100%
Sunnycrest Elementary School	King	114	88%
Brighton Elementary School	King	85	52%
Paschal Sherman Indian School	Okanogan	24	53%
Madrona Elementary School	King	157	93%
South Colby Elementary	Kitsap	116	79%
Cougar Valley Elementary School	Kitsap	115	77%

School Name	County	# Children Screened	Response Rate
Orchard Heights Elementary School	Kitsap	116	63%
Mossyrock Elementary School	Lewis	65	94%
Willapa Elementary	Pacific	49	77%
James McGee Elementary	Franklin	193	75%
Camas Prairie Elementary School	Pierce	124	78%
Bryant Elementary School	Pierce	103	90%
Chester Elementary School	Spokane	90	95%
Thornton Creek Elementary	King	85	84%
Westgate Elementary School	Snohomish	96	78%
Tukes Valley Primary School	Clark	162	69%
Allen Creek Elementary School	Snohomish	155	94%
Tapteal Elementary School	Benton	92	54%
Sherwood Elementary School	Snohomish	107	79%
David Wolfe Elementary School	Kitsap	81	69%
Sunset Elementary School	Spokane	117	81%
Columbia Elementary School	Chelan	115	79%
Littlerock Elementary School	Thurston	111	100%
Lakes Elementary School	Thurston	152	82%
Rainer Elementary School	Thurston	108	76%
McLane Elementary School	Thurston	86	89%
Franklin Elementary School	Whitman	87	81%
Mountain View Elementary School	Yakima	79	85%
McClure Elementary School		167	80%

Total: 53 schools, 2,864 kindergarteners and 2,877 third graders

Appendix D

Survey Results by Grade

Head Start/ECEAP Preschool (3-5 years old)

Table 4: Participation of Head Start/ECEAP Preschoolers 3-5 years old in the Smile Survey 2010

	Number of Sites	Enrollment	Number Screened	Response Rate
Participating Sites	48	2,105	1,597	76%

Table 5: Characteristics of Participating Head Start/ECEAP Preschoolers, Smile Survey 2010

	Number of Preschoolers	On FRL (%)	White (%)	African-America (%)	Asian (%)	Other Race (%)	Hispanic (%)
Enrolled in all 322 Head Start Sites in Washington (sampling frame)*	11,963	100	40	11	5	44	39
Enrolled in all 260 ECEAP Sites in Washington (sampling frame)*	9,163	100	35	6	3	56	41
Enrolled in the 48 Head Start/ECEAP sites participating in the Smile Survey 2010	2,105	100	-	-		-	-
Screened in the Smile Survey 2010**	1,597	100	44	10	4	4	38

* Data on Head Start and ECEAP provided by the Washington State Department of Early Learning (DEL). “Hispanic” report as an ethnicity, not race.
** In the Smile Survey 2010, “hispanic” is classified as a racial group.
Note: There are several Head Start/ECEAP programs that operate together on the same site. The total number of sites included in the sampling frame was 563, which adjusts for the dual co-located sites.

Table 6: Demographics of Head Start/ECEAP Preschoolers Screened, Smile Survey 2010

Variable	3-5 Year Olds Only (n=1552)	
	Number	%
Age		
3 years	204	13.2
4 years	806	51.2
5 years	542	35.6
Missing/Unknown		
Gender		
Male	777	50.2
Female	771	49.8
Missing/Unknown	4	
Language Spoken at Home		
English	1053	68.5
Spanish	400	26.0
Other	84	5.5
Missing/Unknown	15	
Race/Ethnicity		
White	680	44.2
African American	151	9.8
Hispanic	610	39.6
Asian	56	3.6
American Indian/Alaska Native	29	1.9
Other	13	0.8
Missing/Unknown	13	

Table 7: Oral Health Status of Head Start/ECEAP Preschoolers Screened, Smile Survey 2010

Variable	3-5 Year Olds Only (n=1,552)		
	%	95% CI	
Free of dental decay	59.7	56.2	63.0
Decay experience	40.3	37.0	43.8
Untreated decay	13.0	10.7	15.6
Rampant decay (or a history of)	17.2	14.6	20.2
Early childhood cavities	15.5	12.6	19.0
White spot lesions	20.5	16.4	25.5
Treatment Need			
No obvious problem	88.0	85.5	90.1
Early dental care needed	11.0	8.9	13.5
Urgent dental care needed	**		

** Data suppressed due to RSE >.30

Table 8: Oral Health Status of Head Start/ECEAP Preschoolers Screened, by Race and Ethnicity, Smile Survey 2010

Variable	White Non-Hispanic (n=680) Reference Group			Minority (n=859)			African American (n=151)			Hispanic (n=610)		
	%	95% CI		%	95%CI		%	95% CI		%	95% CI	
Decay experience	37.7	33.5	42.2	42.4	38.0	46.8	27.0†	19.3	36.3	46.5†	41.5	51.5
Untreated decay	14.4	11.3	18.1	11.9	9.5	14.9	9.9	5.6	17.1	12.5	9.7	15.9
Rampant decay	13.7	11.3	16.5	20.2†	16.7	24.2	8.6	5.1	14.4	22.9†	19.1	27.1
Early childhood decay	11.2	9.0	13.9	19.2†	15.2	23.9	8.4	4.8	14.1	21.6†	17.1	26.9
White spots	20.6	15.5	26.8	20.7	15.8	26.6	25.3	17.1	35.7	17.5	12.9	23.1
Need early or urgent treatment	13.2	10.2	17.1	11.0	8.7	13.9	9.9	5.6	17.1	11.5	8.8	14.9
Need urgent treatment	**			**			**			**		

†Statistically significant different from reference group at at 0.05 level
** Data suppressed due to RSE >.30
Note: Other races were not included due to small sample size.

Table 9: Oral Health Status of Head Start/ECEAP Preschoolers Screened, by Language Spoken at Home, Smile Survey 2010

Variable	English (n=1,053) Reference Group			Other Language (n=484)		
	%	95% CI		%	95% CI	
Decay experience	36.9	33.0	41.0	47.7†	42.6	52.9
Untreated decay	12.9	9.9	16.6	13.3	10.8	16.3
Rampant decay	14.7	12.4	17.3	23.0†	18.7	27.9
Early childhood decay	12.3	10.2	14.6	22.8†	17.3	29.4
White spots	19.4	14.8	25.0	22.9	16.2	31.4
Need early or urgent treatment	11.9	9.0	15.6	12.4	10.2	15.0
Need urgent treatment	**			**		

†Statistically significant different from reference group at at 0.05 level
** Data suppressed due to RSE >.30

Table 10: Oral Health Status of Head Start/ECEAP Preschoolers Screened, Smile Surveys 2005 and 2010

Variable	2005 (n=1,172) Reference Group			2010 (n=1,552)		
	%	95% CI		%	95% CI	
Decay experience	45.8	39.4	52.3	40.3	37.0	43.8
Untreated decay	26.2	21.1	32.2	13.0†	10.7	15.6
Rampant decay	15.6	12.0	20.0	17.2	14.6	20.2
Early childhood decay	17.7	14.0	20.1	15.5	12.6	19.0
White spots	22.8	16.5	30.7	20.5	16.4	25.5
Need early or urgent treatment	22.7	17.3	29.2	12.0†	9.9	14.5
Need urgent treatment	4.8	3.1	7.3	**		

†Statistically significant different from reference group at at 0.05 level
** Data suppressed due to RSE >.30

Kindergarten

Table 11: Participation of Public School Kindergartners in the Smile Survey 2010

	Number of Schools	Number Enrolled	Number Screened	Response Rate
Participating Schools	53	3,471	2,858*	82%

* This number excludes 6 children with incorrect age information.

Table 12: Characteristics of Participating Public School Kindergarteners, Smile Survey 2010

	Number of Kindergartners	FRL (%)	White (%)	African-American (%)	Other Race (%)	Hispanic (%)
Enrolled in the 1,020 public elementary schools in the sampling frame*	68,115	Not applicable	60	5	18	18
Enrolled in the 53 public elementary schools participating in the Smile Survey 2010	3,471	Not applicable	59	7	16	18
Screened in the Smile Survey 2010	2,858	45	64	7	12	17

*Data provided by the Office of Superintendent of Public Instruction (OSPI). “Hispanic” reported as a race.
**Not applicable: FRL data is not available at the grade level.

Table 13: Demographics of Kindergarteners Screened, Smile Survey 2010

Variable	Kindergarten (n=2,864)	
	Number	%
Age		
5 years	1416	49.9
6 years	1393	49.1
7 years	30	1.0
Missing/Unknown	25	
Gender		
Male	1443	50.5
Female	1414	49.5
Missing/Unknown	7	
Free/Reduced Lunch Eligibility		
Not eligible	1561	54.9
Eligible	1283	45.1
Missing/Unknown	20	
Language Spoken at Home		
English	2293	84.8
Spanish	272	10.1
Other	139	5.1
Missing/Unknown	160	
Race/Ethnicity		
White	1849	65.0
African American	190	6.7
Hispanic	495	17.3
Asian	173	6.1
American Indian/Alaska Native	56	2.0
Other	82	2.9
Missing/Unknown	19	

Table 14: Oral Health Status of Kindergartners Screened, Smile Survey 2010

Variable	Kindergarten (n=2,858)		
	%	95% CI	
Free of dental decay	60.7	57.1	64.3
Decay experience			
- primary and/or permanent teeth	39.3	35.7	42.9
- permanent teeth only	1.7	0.9	3.2
Untreated decay	13.8	12.0	15.9
Rampant decay	14.5	12.0	17.4
Dental sealants	5.1	3.8	6.7
Treatment Need			
No obvious problem	86.7	84.5	88.6
Early dental care needed	11.9	10.1	13.8
Urgent dental care needed	1.4	0.9	2.2

Table 15: Distribution of Decay Experience and Untreated Decay in Kindergartners Screened, Smile Survey 2010

Variable	Kindergarten (n=2,858)
	%
Decay Experience	
No decay experience (caries free)	60.7
Primary teeth only	37.6
Primary and permanent teeth	1.5
Permanent teeth only	0.2
Untreated Decay	
No untreated decay	86.2
Primary teeth only	13.0
Primary and permanent teeth	0.6
Permanent teeth only	0.3

Table 16: Oral Health Status of Kindergarteners Screened, by Race and Ethnicity, Smile Survey 2010

Variable	White Non-Hispanic (n=1,848) Reference Group			Minority (n=991)			African American (n=188)			Hispanic (n=492)			Asian (n= 173)		
	%	95% CI		%	95% CI		%	95% CI		%	95% CI		%	95% CI	
Decay experience - primary and/or perm teeth	33.5	30.1	37.1	49.8†	44.9	54.7	36.0	31.2	41.0	56.7†	50.7	62.5	44.5†	36.5	52.9
- permanent teeth only	**			**			**			**			**		
Untreated decay	11.6	9.7	13.9	18.1†	15.3	21.2	18.3†	14.9	22.3	16.9†	13.3	21.1	20.3†	14.1	28.5
Rampant decay	10.8	8.6	13.4	21.3†	17.3	26.0	12.0	7.6	18.6	26.6†	21.5	32.4	17.5†	12.1	24.7
Need early or urgent treatment	11.3	9.1	13.8	17.3†	14.5	20.4	17.3†	13.8	21.4	15.9	12.1	20.5	21.2†	15.0	29.2
Need urgent treatment	1.1	0.6	2.0	2.1	1.3	3.5	**			**			**		

†Statistically significant different from reference group at at 0.05 level
** Data suppressed due to RSE >.30

Table 17: Oral Health Status of Kindergarteners Screened, by Language Spoken at Home, Smile Survey 2010

Variable	English (n=2,289) Reference Group			Other Language (n=409)		
	%	95% CI		%	95% CI	
Decay experience - primary and/or perm teeth	36.4	32.9	40.0	55.1†	47.6	62.4
- permanent teeth only	**			**		
Untreated decay	13.2	11.3	15.3	19.5†	15.6	24.0
Rampant decay	11.9	9.8	14.4	25.5†	20.0	32.1
Need early or urgent treatment	12.6	10.7	14.9	18.2†	13.8	23.6
Need urgent treatment	1.5	0.9	2.5	**		

†Statistically significant different from reference group at at 0.05 level
** Data suppressed due RSE > .30

Table 18: Oral Health Status of Kindergarteners Screened, by Student Eligibility for Free/ Reduced Lunch Program, Smile Survey 2010

Variable	Not Eligible (n=1,559) *Reference Group*			Eligible (n=1,279)		
	%	95% CI		%	95% CI	
Decay experience - primary and/or perm teeth	30.1	26.9	33.4	50.6†	46.8	54.5
- permanent teeth only	**			**		
Untreated decay	10.6	8.8	12.7	17.9†	15.3	20.8
Rampant decay	8.3	6.6	10.4	22.1†	18.8	25.8
Need early or urgent treatment	10.6	8.6	12.9	16.8†	14.0	20.0
Need urgent treatment	**			1.8	1.2	2.8

†Statistically significant different from reference group at at 0.05 level
** Data suppressed due to RSE >.30

Third Grade

Table 19: Participation of Public School Third Graders in the Smile Survey 2010

	Number of Schools	Number Enrolled	Number Screened	Response Rate
Participating Schools	53	3,585	2,875*	80%

*This number excludes 2 children with incorrect age information.

Table 20: Characteristics of Participating Third Graders, Smile Survey 2010

	Number of Third Graders	On FRL (%)	White (%)	African-American (%)	Other Race (%)	Hispanic (%)
Enrolled in the 1,020 Public Elementary Schools in the sampling frame*	70,708	Not applicable**	61	5	17	17
Enrolled in the 53 Public Elementary Schools participating in the Smile Survey 2010*	3,585	Not applicable**	60	8	16	16
Screened in the Smile Survey 2010	2,875	50	62	8	15	15

*Data provided by the Office of Superintendent of Public Instruction (OSPI). “Hispanic” reported as a racial group.
**Not applicable: FRL data is not available at the grade level

Table 21: Demographics of Third Graders Screened, Smile Survey 2010

Variable	Third Grade (n=2,877)	
	Number	%
Age		
8 years	1342	46.9
9 years	1470	51.4
10 years	47	1.6
Missing/Unknown	18	
Gender		
Male	1470	51.3
Female	1396	48.7
Missing/Unknown	11	
Free/Reduced Lunch Eligibility		
Not eligible	1418	49.4
Eligible	1450	50.6
Missing/Unknown	9	
Language Spoken at Home		
English	2366	86.0
Spanish	193	7.0
Other	193	7.0
Missing/Unknown	125	
Race/Ethnicity		
White	1804	63.6
African American	224	7.9
Hispanic	444	15.6
Asian	194	6.8
American Indian/Alaska Native	67	2.4
Other	105	3.7
Missing/Unknown	39	

Table 22: Oral Health Status of Third Graders Screened, Smile Survey 2010

Variable	Third Grade (n=2,875)		
	%	95% CI	
Free of dental decay	42.1	38.3	46.0
Decay experience			
- primary and/or perm teeth	57.9	54.0	61.7
- permanent teeth only	14.9	11.0	20.0
Untreated decay	14.9	12.7	17.5
Rampant decay	19.2	16.4	22.4
Dental sealants	51.2	45.7	56.7
Treatment Need			
No obvious problem	85.1	82.5	87.4
Early dental care needed	12.7	10.8	14.9
Urgent dental care needed	2.2	1.3	3.6

Table 23: Distribution of Decay Experience and Untreated Decay in Third Graders Screened, Smile Survey 2010

Variable	Third Grade (n=2,875)
	%
Decay Experience	
No decay experience (caries free)	42.1
Primary teeth only	43.0
Primary and permanent teeth	13.8
Permanent teeth only	1.1
Untreated Decay	
No untreated decay	85.1
Primary teeth only	11.2
Primary and permanent teeth	2.5
Permanent teeth only	1.3

Table 24: Oral Health Status of Third Graders Screened, by Race and Ethnicity, Smile Survey 2010

Variable	White Non-Hispanic (n=1,803) Reference Group			Minority (n=1,033)			African American (n=224)			Hispanic (n=444)			Asian (n= 193)		
	%	95% CI		95	95% CI		%	95% CI		%	95% CI		%	95% CI	
Decay experience - primary and/or perm teeth	54.2	49.8	58.4	64.3†	59.2	69.1	53.3	46.6	59.8	71.6†	65.0	77.3	60.2	50.8	68.8
- permanent teeth only	15.5	10.7	22.0	13.9	10.3	18.5	14.1	8.8	21.7	15.5	10.1	23.1	9.6	5.5	16.0
Untreated decay	13.6	11.0	16.6	17.4†	15.2	19.8	17.4	14.1	21.2	13.4	10.7	16.7	21.1†	15.1	28.7
Rampant decay	16.9	13.9	20.3	23.1†	19.4	27.2	15.3	9.2	24.5	28.7†	22.8	35.5	18.6	12.2	27.2
Need early or urgent treatment	13.6	11.0	16.7	17.2	14.8	19.8	17.7†	14.5	21.5	12.9†	10.0	16.7	21.1†	15.1	28.7
Need urgent treatment	2.3	1.4	3.7	**			**			**			**		
Third Graders Only															
Dental sealants	48.4	42.6	54.3	56.3	49.5	62.9	56.8	44.7	68.1	58.2†	52.1	64.1	55.2	42.6	67.2

†Statistically significant different from reference group at at 0.05 level
** Data suppressed due to RSE >.30

Table 25: Oral Health Status of Third Graders Screened, by Language Spoken at Home, Smile Survey 2010

Variable	English (n=2,364) Reference Group			Other Language (n=386)		
	%	95% CI		%	95% CI	
Decay experience - primary and/or perm teeth	57.2	53.0	61.2	64.6	56.8	71.8
- permanent teeth only	15.2	10.7	21.2	14.1	11.1	17.7
Untreated decay	14.6	12.1	17.4	18.7	15.5	22.3
Rampant decay	17.8	15.0	21.1	27.6†	21.8	34.3
Need early or urgent treatment	14.4	11.9	17.4	18.9†	15.7	22.7
Need urgent treatment	2.3	1.4	3.9	2.1	1.1	3.7
Dental Sealants	49.5	43.9	55.2	63.2†	53.3	72.1

†Statistically significant different from reference group at 0.05 level

Table 26: Oral Health Status of Third Graders Screened, by Student Eligibility for Free/ Reduced Lunch Program, Smile Survey 2010

Variable	Not Eligible (n=1,416) Reference Group			Eligible (n=1,450)		
	%	95% CI		%	95% CI	
Decay experience - primary and/or perm teeth	47.4	43.3	51.6	68.1†	64.9	71.1
- permanent teeth only	10.9	7.1	16.3	18.9†	14.3	24.6
Untreated decay	10.7	8.7	13.2	18.9†	15.8	22.6
Rampant decay	12.2	9.6	15.4	26.1†	22.4	30.1
Need early or urgent treatment	10.8	8.6	13.4	18.8†	15.7	22.3
Need urgent treatment	**			3.2	1.9	5.1
Dental Sealants	52.0	46.0	57.9	50.4	44.1	56.7

† Statistically significant different from reference group at 0.05 level
** Data suppressed due to RSE >.30

Table 27: Oral Health Status of Third Graders Screened, Smile Surveys 2005 and 2010

Variable	2005 (n=3,632) Reference Group			2010 (n=2,875)		
	%	95% CI		%	95% CI	
Decay experience						
- primary and/or perm teeth	59.7	56.5	62.8	57.9	54.0	61.7
- permanent teeth only	23.8	19.3	28.9	14.9†	11.0	20.0
Untreated decay	19.1	16.8	21.6	14.9†	12.7	17.5
Rampant decay	21.2	18.0	24.7	19.2	16.4	22.4
Dental Sealants	50.4	46.8	54.0	51.2	45.7	56.7
Minority students	45.2	39.5	51.1	56.3	49.5	62.9
Non-minority students	52.5	49	55.9	48.4	42.6	54.3

†Statistically significant different from reference group at 0.05 level