The Impact of Oral Disease on the Lives of Washingtonians

The Washington State
Oral Disease Burden Document

July 2007

Washington State Department of Health
Office of Maternal and Child Health
Oral Health Program

The Impact of Oral Disease on the Lives of Washingtonians

The Washington State Oral Disease Burden Document

July 2007

DOH 160-001 July 2007

For more information contact:
MCH Oral Health Program
Washington State Department of Health
PO Box 47835, Olympia, WA 98504-7835
Phone: (360) 236-3507
Fax: (360) 236-2323
Email: oral.health@doh.wa.gov

This report is posted on the Department of Health MCH Oral Health Program website in a pdf format. The website URL is: http://www.doh.wa.gov/cfh/Oral_Health/burden.htm

For persons with disabilities, this document is available on request in other formats. To submit a request, please call (1-800) 525-0127 (TTY/TDD 711 or 1-800-833-6388).

Mary C. Selecky
Secretary of Health

Maxine Hayes, MD, MPH
State Health Officer

Patty Hayes, RN, MN
Assistant Secretary, Division of Community and Family Health

Jan Fleming, MN
Director, Office of Maternal and Child Health

Joseli Alves-Dunkerson, DDS, MS, MPH, MBA
Senior Oral Health Consultant, MCH Oral Health Program

Divesh Byrappagari, DDS, MSD
Oral Health Consultant, MCH Oral Health Program

Suggested Citation

Byrappagari D, Alves-Dunkerson J, Chamie C, Peters R. The Impact of Oral Disease on the Lives of Washingtonians – The Washington State Oral Disease Burden Document. Washington State Department of Health. Olympia, WA. July 2007.
DOH Pub No. 160-001.

Contents

Contents

Acknowledgments

Primary Authors

Divesh Byrappagari, DDS, MSD, Oral Health Consultant
Joseli Alves-Dunkerson, DDS, MS, MPH, MBA, Senior Oral Health Consultant
Oral Health Program, Office of Maternal and Child Health, Community and Family Health

Chara Chamie, MPH, Epidemiologist
Riley Peters, PhD, MPA, Senior Epidemiologist and Manager
Assessment Section, Office of Maternal and Child Health, Community and Family Health

Any questions should be directed to the authors listed above.

Report Production

Alice Porter, Editor
Alessandro Leveque, Graphic Designer

Content Contributors and Reviewers

From the Department of Health:

Maxine Hayes, MD, MPH, *Washington State Health Officer*

Offices of the Assistant Secretaries
Patty Hayes, RN, MN, Assistant Secretary, Community and Family Health
Victor Colman, JD, Senior Policy Advisor, Community and Family Health
Kelly Cooper, Legislation and Policy Affairs Manager, Environmental Health
Karen Jensen, Senior Health Policy Analyst, Health Services Quality Assurance

Office of Maternal and Child Health, Community and Family Health
Jan Fleming, MN, Director
Diane Bailey, RN, MPH, Maternal and Infant Health
Tom Bell, PhD, Epidemiologist, Assessment Section
Teresa Cooper, RN, MN, MPH, Child and Adolescent Health
Stacey De Fries, MSW, Children with Special Health Care Needs Program
Patricia deHart, Sc.D, Epidemiologist, Assessment Section
Tabitha Harrison, MPH, Genetics
Nancy Reid, MSW, Child and Adolescent Health
Teresa Vollan, MPH, Epidemiologist, Assessment Section
Candy Wines, MPH, Legislative and Communications Coordinator

Office of Infectious Disease and Reproductive Health, Community and Family Health
Richard Aleshire, MSW, Manager of HIV Client Services
Maria Courogen, MPH, Section Manager/Senior Epidemiologist
Darren Layman, MA, Consortia and Case Manager Programs Supervisor
Mark Stenger, MA, Epidemiologist

Office of Community Wellness and Prevention, Community and Family Health
Sue Grinnel, Director
Mike Boysun, MPH, MPA, Epidemiologist, Tobacco Prevention and Control
Gail Brandt, Rd, MPH, EdD, Manager of Basic Nutrition Education
Janet Charles, BA, MSW, Manager of WIC Program
Kathleen Clark, MS, Rd, CDE, Manager of Diabetes Prevention and Control
Pam Hayes, MPA, Manager of Asthma
Lauren Jenks, MPH, CHES, Manager of Cancer Prevention and Control
Amy Manchester-Harris, MPA, Manager of Steps to a Healthier Washington
Jan Norman, RD, CDE, Manager of Chronic Disease Prevention Program
Miriam Patanian, MPH, Manager of Heart Disease and Stroke Prevention
Terry Reid, MPH, Manager of Tobacco Prevention and Control
Susan Richardson, BS, Evaluation Support, Tobacco Prevention and Control
Kyle Unland, MS, RD, Manager of Nutrition and Physical Activity

Office of Data Resource Management, Information Resource Management
Craig Erickson, GIS Administrator

Office of Drinking Water, Environmental Health
Denise Clifford, BS, Director
Stephen Baker, BS. Water Treatment Operations Specialist
Richard Pedlar, BA, RS, Public Health Advisor
Leslie Thorpe Gates, MPA, Manager of Constituent Relations

Office of Environmental Health Assessments, Environmental Health
Robert Duff, Director
Koenraad Marien, PhD, Senior Toxicologist
Milo Strauss, MS, Manager of Toxicology and Chemical Hazards

Office of Community and Rural Health, Health Systems Quality Assurance
Kristina Sparks, RN, MSN, Director
Diana Ehri, BS, MA, Manager
Mary Looker, BA, Manager of Primary Care Office
Laura Olexa, CHES, Health Care Access Analyst
Vince Schueler, MBA, Research Investigator
Juno Whittaker, MPA, Community Development Manager

Office of Health Professions Quality Assurance, Health Systems Quality Assurance
Joy King, BS, Executive Director
Lisa Anderson, Health Professions Manager
Vicky Brown, Health Professions Manager

Center for Health Statistics, Health Statistics and Public Health Laboratories
Katrina Simmons, PhD, BRFSS Coordinator

From other Agencies and Organizations:

Community Services Program, Health Care Authority
Connie Mix-Clark, RDH, Dental Program Manager

Department of Corrections
Arnold Mike Morton, DDS, Chief of Dental Services

Health and Recovery Services Administration, Department of Social and Health Services
John Davis Sr., DDS, JD, Chief of Dental Services
Cathie Ott, Chief of Medicaid Systems and Data
Gary Coats, MA, BS, Information Technology Specialist
Faith Lai, PhD, Database Manager
Taik Lee, Information Specialist

Health Resources and Services Administration, Department of Human and Health Services
Forrest Peebles, DDS, Region X Dental Consultant

Snohomish Health District
LeeAnn Hoaglin Cooper, RDH, Public Health Dental Hygienist

University of Washington Schools of Dentistry and Medicine
Martha Somerman, DDS, PhD, Dean
Wendy Mouradian, MD, MS, Professor and Director of Regional Initiatives in Dental Education (RIDE)

Washington Association of Community and Migrant Health Centers
Molly Belozer, MPH, Director of Policy

Washington State Dental Association
David Hemion, MPA, Associate Executive Director

Washington State Dental Hygiene Association
Gene Patterson, MA, Executive Director

Washington Dental Service Foundation
Laura Smith, Deputy Director

Within Reach (formerly Healthy Mothers Healthy Babies)
Bill Laaninen, Direct Services Manager

Yakima Valley Farm Workers' Northwest Dental Residency
Mark Koday, DDS, Dental Director
Linda Selsted, Clinic Director, Children's Village

Executive Summary

The U.S. Surgeon General characterizes good oral health as a prerequisite for people's general health and quality of life. Yet many barriers prevent some Americans from having optimal oral health. Oral health affects people both physically and psychologically. It influences how they grow, enjoy life, look, speak, chew, taste food, and socialize. Poor oral health brings negative effects to children and adults in all settings— home, school, work, and social activities.

Oral diseases, such as dental caries and periodontal disease, are important public health issues because they are common and have high socioeconomic costs. Fortunately, most oral diseases can be prevented with simple and effective measures.

This report, *The Impact of Oral Disease on the Lives of Washingtonians*, is a new, comprehensive document that provides an overview of the oral disease burden in Washington State. It also describes the state's dental workforce, the preventive measures available to promote the oral health of all who live here, as well as existing resources for dental care and its financing. The main section presents statewide data, while the appendices have more information at the county level, especially for those counties that completed their own oral health needs assessments (Smile Survey) in 2005.

The information in this report comes from a variety of sources. Oral disease data come from the newly established Washington State Oral Disease Surveillance System, which contains the results of national and state surveys.[1] Information on workforce and resources for care and financing are the generous contribution of several public and private oral health partners. The Department of Health plans to update this document as new data become available.

This document can be used to:[2]

- Raise awareness among the public, health professionals, and policy makers about the importance of oral health to general health and quality of life.
- Understand the effect and cost of oral diseases on individuals and communities.
- Track the trends of oral diseases and related disparities among Washingtonians.
- Measure Washington State's progress toward national public health objectives.
- Learn about workforce issues and resources available, such as preventive and treatment programs and services at the state and county levels.
- Highlight existing community initiatives.
- Identify and pursue partnerships within existing oral health resources and other public health areas such as tobacco prevention and nutrition.
- Provide information to decision-makers on the successes, challenges, gaps, and opportunities related to oral health in our state.
- Aid in the planning of efficient and effective oral health promotion and disease prevention programs.

---

[1] *A public health surveillance system "is the ongoing, systematic collection, analysis and interpretation of health-related data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those responsible for prevention and control."*

[2] *Source: D'Angelo D, Colley Gilbert B, editors. From Data to Action: Using Surveillance to Promote Public Health, Examples from PRAMS. Atlanta, GA: Division of Reproductive Health, National Centers for Chronic disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2002.*

As a collection of oral health data, this document will serve as the evidence base for the development of a state oral health plan. This plan will bring together a variety of partners to define goals and strategies to address issues and achieve optimal oral health for all.

The ultimate goal of this report is to help prevent unnecessary suffering from oral diseases, especially when so much is known about how to prevent them and their consequences.

This report, as well as summary fact sheets, are available in an electronic format at the Oral Health Program website http://www.doh.wa.gov/cfh/Oral_Health/burden.htm.

Background

How to use this burden document

The main section of this online document contains summarized statewide data on oral diseases, preventive measures, workforce, and dental services. The appendices contain more detailed information, including technical notes and data sources, a glossary of terms, additional data tables, and county oral health profiles. Web addresses are available to get to related documents, such as the 2005 Smile Survey and others.

When appropriate, state data are compared to national public health objectives, such as the Healthy People 2010 (HP2010) oral health objectives.

(Disclaimer: This report was completed in July 2007. Some web links may have changed since then).

What are the most common oral (dental) diseases?

Oral diseases are of several types, including dental caries (decay or cavities), periodontal (gum) disease, tooth loss, oral cancer, oral lesions, and cleft lip and palate. Among these, dental caries and periodontal disease are the most common and prevalent among children and adults, not only in our state but also nationally and worldwide.

Dental caries

Dental caries is the most common chronic disease in children, five times more common than asthma and seven times more common than hay fever.[1] Left untreated, dental caries can lead to unnecessary pain and suffering, sleepless nights, social embarrassment, mood swings, poor performance and learning at school, missed days at work, and expensive treatment, among other problems.

Dental caries is considered both an infectious and a chronic disease. It is infectious because it is caused by several bacteria, especially *Streptococcus mutans*, and it is transmissible between mother and baby. It is chronic because of its close relationship to genetics, environmental factors such as availability of insurance, exposure to fluoride, etc., and behaviors such as consumption of sweets, poor oral hygiene etc.

Periodontal disease

Periodontal diseases vary from initial gingivitis (bleeding gums) to periodontitis (bone destruction and loosened teeth). If untreated, periodontitis can lead to tooth loss.
Periodontal diseases are also common among adults and are linked to a variety of other chronic diseases, such as diabetes and cardiovascular diseases.

The risk factors for oral diseases are basically the same ones that affect several other chronic diseases: diet and nutrition, hygiene, smoking, alcohol, and lack of access to care. Poverty represents the greatest threat to health overall. [1]

What does our state look like?

- **Population.** Washington's estimated population in 2005 was 6,256,400. Seventy-two percent of the population growth over the past decade occurred in western Washington, where the majority of the population lives. Most of the state's rural counties are located in eastern Washington. Rural county residents tend to have lower median household incomes, higher poverty rates, and higher unemployment rates than do people living in more urban areas.

- **Race and ethnicity.** The majority of the state's population (81.8percent) reported its race as white and non-Hispanic. But the state's other race and ethnic populations increased rapidly in the last decade, especially in some counties. Counties with large proportions of Hispanics are in rural areas of eastern and central Washington (Adams, Franklin, and Yakima counties), but the largest number of Hispanics live in King, Pierce, and Snohomish counties. African Americans and Asian/Pacific Islanders are predominantly located in the urban areas west of the Cascade Mountains; about 50 percent of each of these populations in Washington resides in King County alone. Representatives of 29 federally recognized American Indian tribes live in Washington, with varying populations and land areas. (Please see the Technical notes and data sources section of the Appendix for a discussion of how this document identifies racial and ethnic groups across different data sources).

- **Languages.** About 15 percent, or 168,000 of Washington's children ages 5-17 years, speak a language other than English at home. Of these children, 43 percent speak Spanish, 29 percent speak Asian and Pacific Islander languages, 26 percent speak other Indo-European languages, and four percent speak other languages. A similar figure of 14 percent (about 512,000) of the adult population ages 18-64 years does not speak English at home.

- **Family income.** In 2006, an estimated 22.1 percent of Washington households had a family income below 200 percent of the Federal Poverty Level (FPL), compared to 24.5 percent in 2004, and 18.8 percent in 2002. An estimated 8.0 percent of households had an income below 100 percent of the FPL. [2] In 2004, an estimated 38 percent (about 640,985) of children in Washington were living below 200 percent of the FPL. Another 19 percent (about 322,188) of children were estimated to be living below 100 percent of FPL, and 10 percent (about 169,573) were living at or below 50 percent of FPL.[3]

- **Women at reproductive age.** Nearly 22 percent, or 1.3 million of the estimated 5.9 million people in Washington in 2000, were women of reproductive age (15-44 years). A state forecast predicts that over the next 30 years, as the children of "baby boomers" reach adulthood, the number of women of reproductive age will increase substantially. The school-age population (5-17 years) is expected to remain stable through 2010 and then gradually increase. In 2004, an estimated 1.1 million children ages 5 to 17 years lived in Washington State.[4]

- **Health and dental insurance.** The percentage of Washington residents without health insurance is increasing. Among the general population (under age 65 years), 8.4 percent reported being uninsured in 2002, 9.9 percent in 2004, and 9.3 percent in 2006 (an 11 percent increase from 2002). In 2006, the percentage of uninsured children was 4.4 percent, amounting to more than 68,000 uninsured children in Washington.[5] About 90.7 percent of Washington adults had some type of private or public dental insurance coverage in 2006.[2]

National Oral Health Objectives

When looking at the burden of oral disease, it is important to take into consideration the objectives developed by the nation to improve people's health; more specifically, those of the Healthy People 2010 (HP2010).

The federal Department of Health and Human Services published the first Healthy People document in 1979, and it contained objectives for the year 2000. It was developed through a broad consultation process, built on the best scientific knowledge and designed to measure public health programs over time. The Healthy People objectives can be used by states, communities, professional organizations, and others to develop programs to improve the public's health.

The overarching goals of HP2010 are to: 1) increase quality and years of healthy life, and 2) eliminate health disparities.[6] HP2010 also acknowledges that most of the activities associated with the core public health functions of assessment, assurance, and policy development occur at the state level. HP2010 includes evidence-based and cost-effective activities that can lead to better oral health, such as community water fluoridation and school-based or school-linked dental sealants programs. Table 1 shows Washington State's current progress towards the HP2010 oral health objectives.

Table 1: National objectives for oral health and current status in Washington State.

Oral Health Indicators	National Objectives		
	Healthy People 2010	WA State Status	Data Source and Year
21.1 Dental caries experience			
Young children, ages 2-4	11%	45%	Smile Survey (2005)
Children, ages 6-8	42%	59%	Smile Survey (2005)
Adolescents, age 15	51%	—	—
21.2 Untreated caries			
Young children, ages 2-4	9%	25%	Smile Survey (2005)
Children, ages 6-8	21%	20%*	Smile Survey (2005)
Adolescents, age 15	15%	—	—
Adults, ages 35-44	15%	—	—
21.3 Adults with NO tooth loss, ages 35-44	42%	71%*	BRFSS (2004)
21.4 Adults who lost ALL teeth, ages 65-74	20%	14%*	BRFSS (2004)
21.5 Periodontal (gum) diseases			
Gingivitis, ages 35-44	41%	—	—
Destructive periodontal diseases, ages 35-44	14%	—	—
3.6 Oro-pharyngeal cancer death rate per 100,000 (age-adjusted)	2.4	3.1%	WA Cancer Registry (2003)
21.6 Oral and pharyngeal cancers detected at earliest stages	50%	43%	WA Cancer Registry (2003)
21.7 Oral and pharyngeal cancer exam within past 12 months, age 40+	20%	—	—

Oral Health Indicators	National Objectives		
	Healthy People 2010	WA State Status	Data Source and Year
21.8 Dental sealants			
Children (1st molars), ages 6-8	50%	44%	Smile Survey (2005)
Adolescents (1st & 2nd molars), age 14	50%	---	---
21.9 Population served by fluoridated water systems	75%	58%	DOH Office of Drinking Water (2006)
21.10 Dental visit within past 12 months			
Children and adults ages 2+	56%	---	---
21.11 Long-term care residents who use the oral health care system each year	25%	---	---
21.12 Low-income children and adolescents receiving preventive dental care during past 12 months, ages 0-18	57%	---	---
5.15 Diabetics with annual dental examinations [18+]	75%	60%	BRFSS (2004)
21.13 School-based health centers with oral health component, K-12	---	0%	---
21.14 Community-based health centers and local health departments with oral health components	75%	100%* LHJs, 57% CMHCs	---
21.15 System for recording and referring infants and children with cleft lip and cleft palate	100% of states and District of Columbia	Yes*	---
21.16 Oral health surveillance system	100% of states and DC	Yes*	---
21.17 Tribal, state, and local dental programs with a public health trained director	100% of states and DC	10% (state and three local)	---
1.8 Increase racial and ethnic representation in health professions (dentistry)	a) Alaska Native: 1% b) Asian: 4% c) African American: 13% d) Latino: 12%	---	---

Note: Sources and years in which data were collected differ for national and state data; therefore, comparisons need to be done with caution.

The Burden Of Oral Diseases

This section displays data with the most notable or significant results. For more detailed tables and information, please see the appendices with corresponding data sources.

Dental caries

Dental caries is the most common chronic disease across all age groups. Children and adults can develop caries in the crowns of their teeth, but adults may also present it on the root surfaces after gingival recession. Fortunately, dental caries is completely preventable by measures that are widely available.

Every five years, the Washington State Smile Survey looks at the prevalence of caries in low-income preschoolers, second and third graders, and children in tribal communities. This survey was initially developed in Washington in 1994, and repeated statewide in 2000 and 2005. More information on the Smile Survey can be found at http://www.doh.wa.gov/cfh/Oral_Health/Data_and_pubs.htm.

Low-income preschool children (Head Start and ECEAP)

- **Caries experience.** Caries experience among Head Start and Early Childhood Education and Assistance Program (ECEAP) children has significantly increased since 1994. In 2005, 45 percent of these preschoolers had experienced dental caries, a level that is significantly higher than the HP2010 target of 11 percent and significantly higher than 1994 levels (38.3 percent).
- **Treatment needs.** Washington experienced a significant decrease in the percent of low-income pre-school children needing early dental care, from 21.5 percent (20.0, 23.1) in 2000 to 18.0 percent (17.1, 18.9) in 2005.
- **Untreated caries.** In 2005, 25 percent of preschool children had untreated caries. Untreated caries, rampant caries, and early childhood caries decreased from 2000 to 2005 but are still higher than 1994 levels.
- **Disparities.** Minority and low-income pre-school children continue to experience the highest levels of caries, untreated caries, early childhood caries, and incipient dental caries, when compared to white non-Hispanic children.
  - Native American children have higher prevalence of untreated caries, rampant caries, and early childhood caries than their white counterparts.

Figure 1: Dental caries experience among Head Start and ECEAP children (3-5 years old) in Washington (2005 WA Smile Survey unadjusted) compared to 2-4 year-olds in the HP2010 objectives.

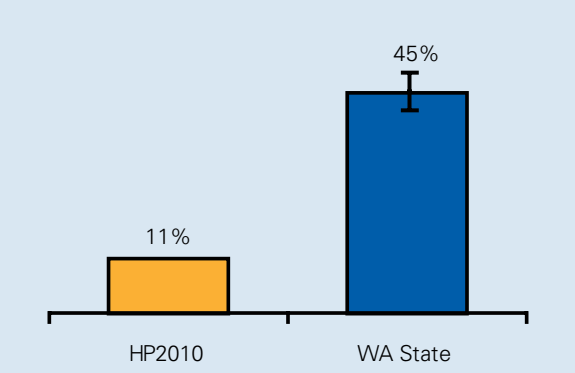


Figure 2: Untreated caries among Head Start and ECEAP children (2005 WA Smile Survey unadjusted), compared to the HP2010 Objectives.

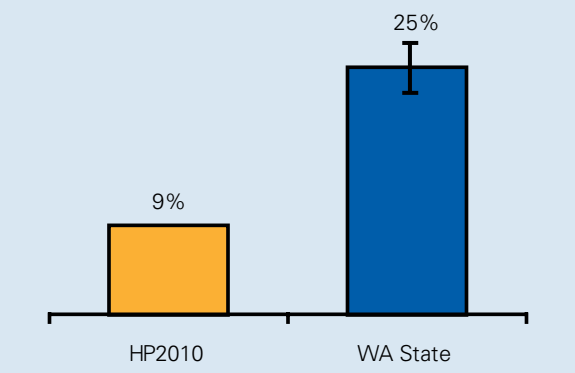


Table 2: Trends in the prevalence of caries experience, untreated dental caries, rampant caries, and treatment needs among Head Start and ECEAP children.

Important note: *The data presented in this table are unadjusted for non-response. Further, caution should be taken when comparing trends over time between the three Smile Surveys. The same diagnostic criteria were used among all three surveys, but the sampling methods and type of consent varied. (See Appendix for details.)*

Head Start and ECEAP children (3-5 years old)	Smile Survey 1994	Smile Survey 2000	Smile Survey 2005
Percent with caries experience	38.3 (35.4-41.2)	41.5 (36.0-47.0)	45.1 (42.3-48.0)
Percent with rampant caries (or a history of)	11.2 (9.3-13.1)	16.4 (12.3-20.5)	15.3 (13.4-17.6)
Percent with untreated caries	20.7 (18.3-23.2)	26.7 (21.8-31.6)	25.0 (22.6-27.6)
Type of treatment needed			
Percent needing early dental care	21.1 (18.7-23.6)	28.9 (23.9-34.0)	21.5 (19.2-24.0)
Percent needing urgent dental care	7.2 (5.6-8.7)	5.5 (2.9-8.0)	4.5 (3.4-5.9)

Figure 3: Oral health status of Head Start and ECEAP children by race and ethnicity (unadjusted), 2005 WA Smile Survey.

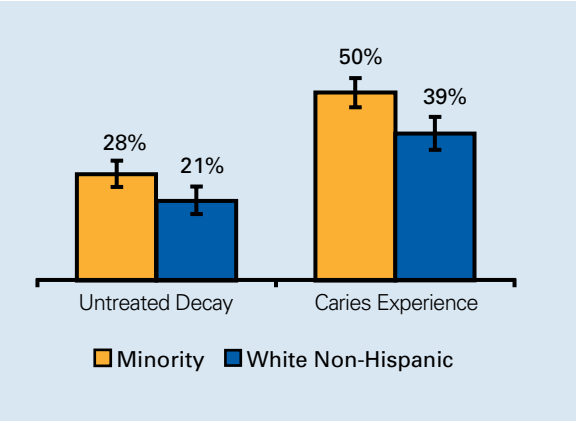


Figure 4: Oral health status of Head Start and ECEAP children by language spoken at home (unadjusted), 2005 WA Smile Survey.

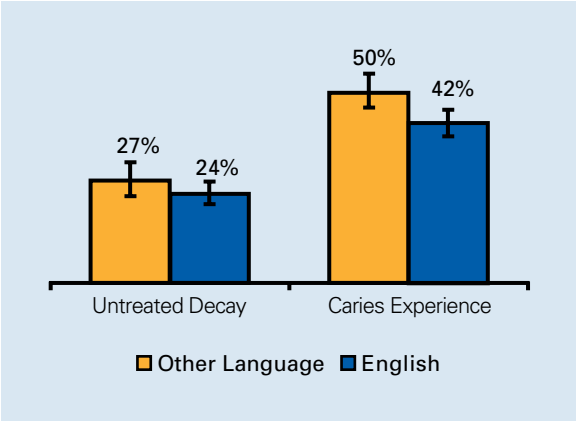
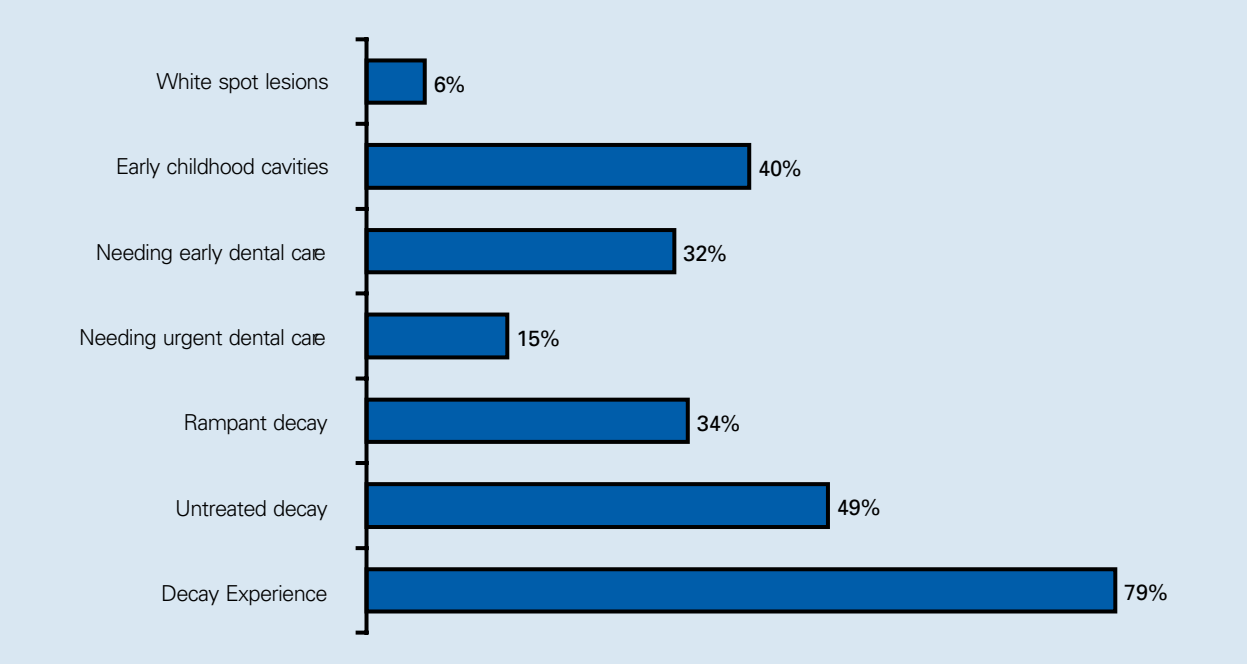


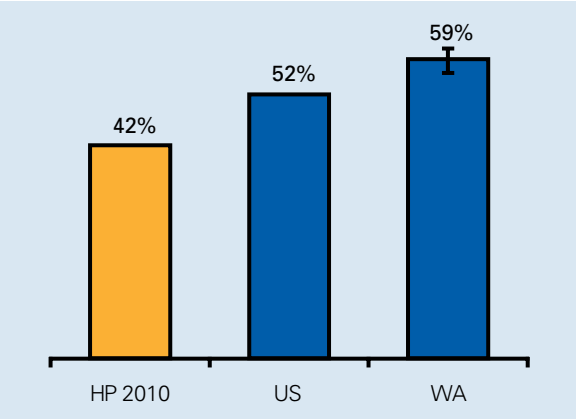
Figure 5 : Oral health status of Native American children in tribal Head Start, 2005 WA Smile Survey



Elementary school-age children (second and third graders)

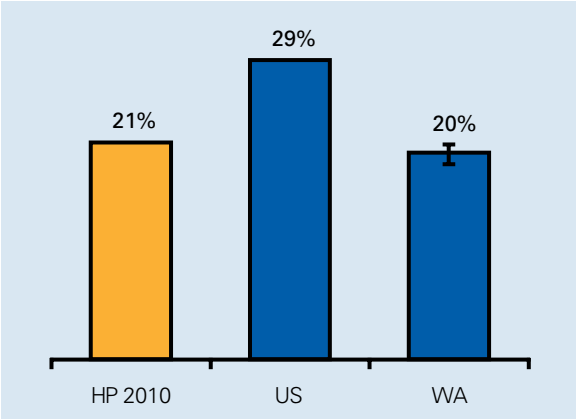
- **Caries experience.** The prevalence of caries experience in this age group significantly increased since 2000, along with the prevalence of rampant caries compared to previous years. In 2005, 59 percent of elementary school-age children had experienced dental caries, a significantly higher level than the national HP2010 objective of 42 percent.
- **Treatment needs.** Early and urgent treatment needs decreased from the levels seen in 2000, with those needing treatment showing a significant decrease. In 2005, 15 percent needed dental care, and three percent needed urgent dental care.
- **Untreated caries.** The percent of untreated caries and early childhood caries decreased in 2005 from the 2000 level. Washington State has met the HP2010 objective of 21 percent in this indicator for white children.
- **Disparities.** In 2005, minority, low-income, and non-English speaking children continue to experience the highest levels of dental disease.
  - Elementary school-age children eligible for federal free and reduced-price meal programs were more likely to have a history of dental caries and untreated caries compared to children from higher-income households.
  - Twenty percent of elementary school-age children had untreated caries, compared to the HP2010 objective of 21 percent. However, 28 percent of children from minority racial and ethnic groups had untreated caries.
  - Children from minority racial and ethnic groups and non-English speaking families had a significantly higher prevalence of caries experience, untreated caries, rampant caries, and dental treatment needs.
  - Native American elementary school-age children were significantly more likely to have a history of dental caries, and they were more than twice as likely to have untreated dental caries than white children.

Figure 6: Dental caries experience among elementary school-age children (second and third graders) in Washington (2005 WA Smile Survey adjusted), compared to 6-8 year-olds in the United States and the HP2010 objectives.



Note: *It should be noted that the 2005 Smile Survey was not designed to be representative of all 2-4 year-old and 6-8 year-old children; with the majority of Washington's preschool and elementary school-age children screened being 3-5 years and 7-9 years of age, respectively.*
Source: *HP2010, NHANES 1999-2002, Washington State Smile Survey 2005. The HP2010 objectives refer to 2-4 and 6-8 year-olds.*

Figure 7: Untreated caries among elementary school-age children (second and third graders) in Washington (2005 WA Smile Survey adjusted), compared to 6-8 year-olds in the United States and the HP2010 objectives.



Note: *It should be noted that the 2005 Smile Survey was not designed to be representative of all 2-4 year- old and 6-8 year-old children; with the majority of Washington's preschool and elementary school-age children screened being 3-5 years and 7-9 years of age, respectively.*
Source: *HP2010, NHANES 1999-2002, Washington State Smile Survey 2005.*

Figure 8: Oral health status of elementary school-age children (second and third graders) by race and ethnicity (adjusted), 2005 WA Smile Survey.

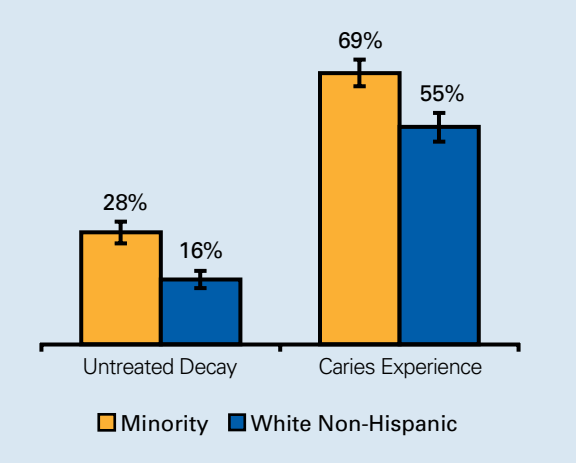


Figure 9: Oral health status of elementary school-age children (second and third graders) by language spoken at home (adjusted), 2005 WA Smile Survey.

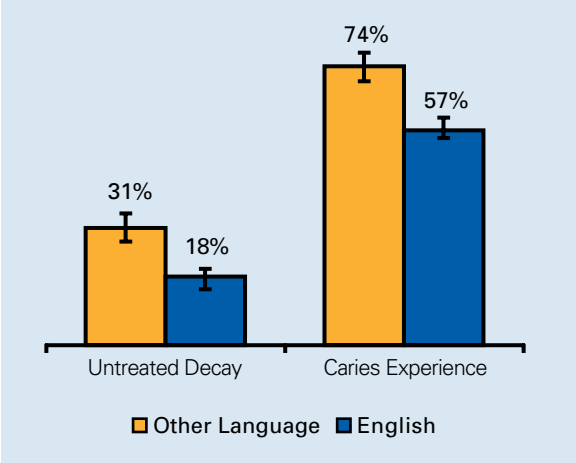
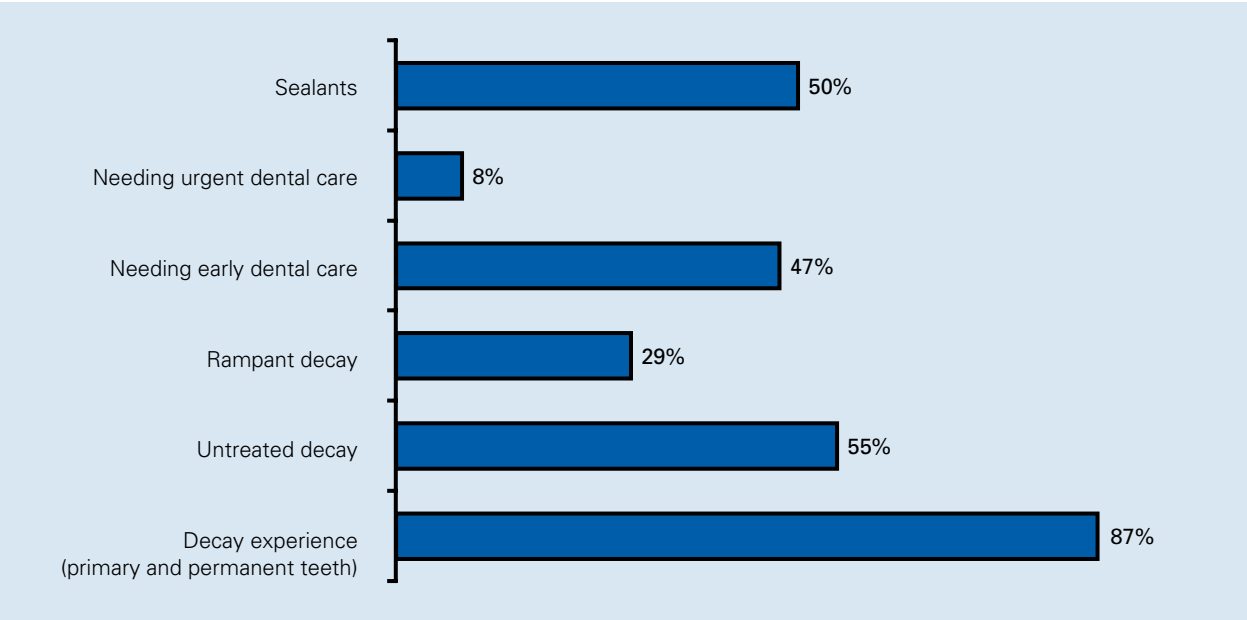


Table 3: Trends in the prevalence of caries experience, untreated dental caries, rampant caries, and treatment needs among elementary school-age children.

Important note: *The data presented in this table are unadjusted for non-response, to allow for comparisons between years, but as a rule adjusted rates should be used. Therefore, caution should be taken when comparing trends over time between the two Smile Surveys. The same diagnostic criteria were used among both surveys, but the sampling methods and type of consent varied. (See Appendix for details.)*

Elementary school-age children (second and third graders)	Smile Survey 2000	Smile Survey 2005
Percent with caries experience—primary and/or permanent teeth	55.6 (53.7-57.4)	59.0 (57.9-60.1)
Percent with caries experience— permanent teeth	15.3 (14.0-16.8)	22.1 (21.1-23.0)
Percent with rampant caries (or a history of)	15.2 (13.9-16.7)	21.6 (20.6-22.5)
Percent with untreated caries	20.9 (19.4-22.5)	19.8 (18.9-20.8)
Percent with dental sealants	47.2 (45.3-49.1)	44.6 (43.4-45.7)
Type of treatment needed		
Percent needing early dental care	21.5 (20.0-23.1)	18.0 (17.1-18.9)
Percent needing urgent dental care	3.5 (2.8-4.2)	3.3 (2.9-3.7)

Figure 10 : Oral health status of Native American children in tribal elementary schools (second and third graders), 2005 WA Smile Survey.



Adolescents, pregnant women, adults, seniors, children with special health care needs, and individuals with disabilities.

The HP2010 objectives include targets for caries experience in adolescents and for adults 35-44 years old. But as yet, no oral health screening surveys are in use for adolescents, pregnant women, adults, seniors, and CSHCN and individuals with disabilities. The numbers presented in this section come mostly from national studies.

Adolescents
The HP2010 objective for caries in adolescents is 51 percent with caries experience and 15 percent with untreated caries. National data from 1999 – 2002, show that 50 percent of 12-15 year-olds in the United States have caries experience and 16 percent of 12-15 year-olds have untreated caries. Adolescents from low-income families, regardless of race or ethnicity, have a higher percentage of untreated caries than those in higher income groups. [7]

Pregnant women
Hormonal changes during pregnancy can affect a woman's periodontal (gum) health and her level of self-care. A recent national study shows no significant correlation between the number of previous pregnancies and the incidence of caries. [8]

Adults
The HP2010 objective calls for 15 percent of untreated caries in adults 35-44 years old. Not only do adults experience dental caries, but also, a substantial proportion of that disease is untreated at any point in time. NHANES data from 1999 – 2002. Among dentate adults aged ≥ 20 years, 91 percent had caries experience and 23 percent had untreated dental caries. [7]

Seniors
Older people are keeping their natural teeth longer than ever before. About a third of adults ages 65 years and older have untreated dental caries, with sharp differences by income level.

Children with special health care needs (CSHCN) and individuals with disabilities
In Washington State, currently, no data are available for prevalence of dental caries among these groups. In a recent study, Special Olympics athletes from the poorest states were significantly more likely to have restorations and less likely to have received preventive treatment. [9]

Tooth loss

Full dentition is defined as having 28 natural teeth, exclusive of third molars and teeth removed for orthodontic treatment or as a result of trauma. As teeth are lost, a person's ability to chew and speak decreases, and social functioning may be compromised. Oral diseases such as dental caries and periodontal disease are the primary reasons for tooth loss. [10] Tooth loss can also result from infection, unintentional injury, and head and neck cancer treatment. In addition, certain orthodontic and prosthetic services sometimes require the removal of teeth.

Despite an overall U.S. trend toward losing fewer teeth, not all groups have benefited to the same extent. African Americans lose more teeth than Non-Hispanic white and Hispanic adults. Low educational attainment has been found to have the strongest and most consistent association with tooth loss.

Adults who have had no tooth loss

In Washington State:

- About 71 percent of adults, ages 35-44 years, have had no tooth loss, which is better than the HP2010 Objective (42 percent). The national average is 61 percent.
- No tooth loss is more often seen in males, those with higher education, white, Asians, Native Hawaiian/Pacific Islanders, and Hispanics.

Adults who have lost all natural teeth

In Washington State:

- The number of adults (65-74 years old) who have lost all their teeth (14 percent) is smaller than the national rate (20 percent) and better than the HP2010 objective (20 percent).
- Complete tooth loss is most prevalent among smokers, those with less than a high school education, Native Hawaiian/Other Pacific Islander, followed by African Americans and Native Americans.
- In 2001, individuals with disabilities (>18 years old) were more likely to have lost all their teeth than those without disabilities (nine percent vs. three percent, respectively). [11]

Table 4: Proportion of adults ages 35-44 years who have lost NO teeth and proportion of adults ages 65-74 who have lost ALL natural teeth, by selected demographic characteristics, 2004 BRFSS.

Demographics	Ages 35-44 years No tooth extractions[1] HP2010 = 42%		Ages 65-74 years Lost all natural teeth[2] HP2010 = 20%	
	Washington (%)	United States (%)	Washington (%)	United States (%)
Race and ethnicity				
American Indian or Alaskan Native	73.4	47.7	19.9	24.1
Asian	66.8	58.5	11.3	12.0
Native Hawaiian/Other Pacific Islander	54.7	56.4	40.3	§
Black or African American	57.6	41.5	20.8	23.0
Hispanic or Latino	71.7	62.9	13.8	18.2
White	72.2	64.5	13.8	17.5
Gender				
Female	68.9	60.5	17.3	18.8
Male	72.6	61.0	10.7	17.1
Education level				
Less than high school	49.4	37.7	35.3	39.1
High school graduate	54.7	47.4	22.8	21.4
At least some college	78.4	70.5	8.1	9.2

Note: *(§) represent data where the Relative Standard Error (RSE) is >30%; therefore the data is too unreliable to report.*

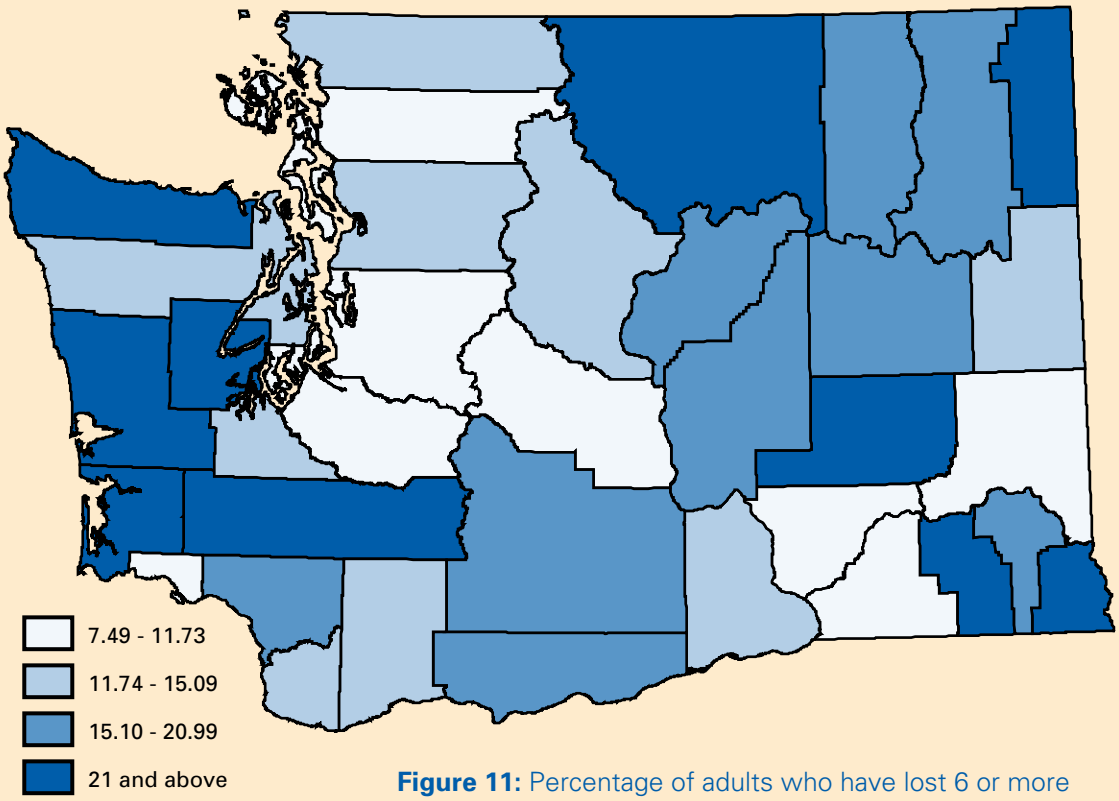


Figure 11: Percentage of adults who have lost 6 or more teeth by county, 2004 BRFSS.

Periodontal (gum) diseases

Periodontal (gum) diseases are very common. Globally, most children and adolescents have signs of gingivitis, and about 20 percent have aggressive periodontitis, a severe periodontal condition that may lead to premature tooth loss. [12]As for adults, many of them show the initial stages of periodontal diseases. In developed countries, moderate periodontitis affects 44-57 percent of adults; advanced periodontitis, which may result in tooth loss, affects 5-20 percent of adults. [13, 14] Minority and economically disadvantaged groups are affected the most.

Plaque causes periodontal disease, which means that without proper at-home oral hygiene and regular dental visits, the risk of developing periodontal disease necessarily increases. Other risk factors that are thought to increase the risk, severity, and speed of periodontal disease development include tobacco use, general health conditions, medications, stress, genetics, hormonal changes, and poor nutrition.

Removal of dental plaque from the teeth on a daily basis is therefore extremely important to prevent gingivitis, which can progress to destructive periodontal disease. Progress in reducing periodontal diseases has not been as successful as reduction in dental caries, perhaps because there are no widely available population based intervention measures to prevent them. Given the relationship between periodontal diseases and general health, this situation raises serious concerns.

The two most common types of periodontal disease are gingivitis and periodontitis. Gingivitis is characterized by localized inflammation and swelling and bleeding gums without a loss of the bone that supports the teeth. Gingivitis usually is reversible with good oral hygiene.

Periodontitis (destructive periodontal disease) is characterized by loss of the tissue and bone that support the teeth. It places a person at risk of eventual tooth loss unless appropriate treatment is provided. Among adults, periodontitis is a leading cause of bleeding, pain, infection, loose teeth, and tooth loss.[15]

Cases of gingivitis likely will remain a substantial problem and may increase as tooth loss from dental caries declines as a result of the use of some systemic medications. The prevalence of gingivitis is highest among American Indians and Alaskan Natives, Hispanics, and adults with less than a high school education. Although not all cases of gingivitis progress to periodontal disease, all periodontal disease starts as gingivitis. Therefore, the major method available to prevent destructive periodontitis is to prevent the precursor condition of gingivitis, and thereby its progression to periodontitis.

HP2010 calls for reducing prevalence of gingivitis to 41 percent and of destructive periodontal disease (periodontitis) to 14 percent for adults 35-44 years old. Nationwide, rates average 48 percent and 20 percent, respectively.

Oral and pharyngeal cancers

Cancer of the oral cavity or pharynx (oral cancer) is the fourth most common cancer in African American males and the seventh most common cancer in white males in the United States.[16] Nearly 90 percent of cases of oral cancer in the United States occur among persons ages 45 years and older. The 2004 age-adjusted U.S. incidence rate of oral cancer was 10.4 per 100,000 people. An estimated 28,000 new cases of oral cancer and 7,200 deaths from these cancers occurred in the United States in 2004.[17]

Survival rates for oral cancer have not improved substantially over the past 25 years. More than 40 percent of persons diagnosed with oral cancer die within five years of diagnosis, although survival varies widely by stage of disease when diagnosed. The five-year relative survival rate for persons with oral cancer diagnosed at a localized stage is 81 percent. In contrast, the five-year survival rate is 42 percent once the cancer has spread to regional lymph nodes at the time of diagnosis, and 17 percent for those with distant metastasis. [18]

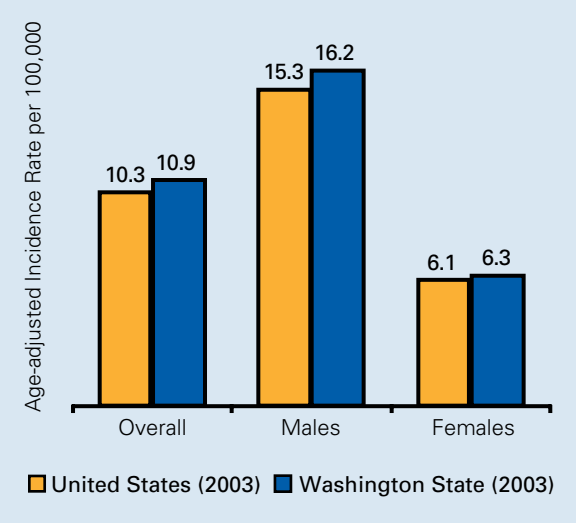
Cigarette smoking and alcohol use are the major known risk factors for oral cancer in the United States, accounting for more than 75 percent of oral cancers. [19]Using other forms of tobacco, including smokeless tobacco [20] and cigars [21], also increases the risk for oral cancer. Dietary factors, particularly low consumption of fruit and some types of viral infections have been implicated as risk factors for oral cancer. [22-26] Radiation from sun exposure is a risk factor for lip cancer. [27]

Incidence and mortality of oral and pharyngeal cancers

In Washington State:

- Oral cancers are relatively rare in individuals younger than 40.
- In 2003, 660 new cases of oral cancer were reported.
- The oral cancer incidence rate is about 2.5 times higher in males compared to females, which is similar to the national trend.
- The 2003 age-adjusted oral cancer incidence rate was 10.9 per 100,000, and the mortality rate was 3.1 per 100,000.
- American Indian/Alaska Natives have significantly higher incidence rates than whites.
- Hispanic adults have significantly lower oral cancer incidence rates compared to non-Hispanic adults.

Figure 12: Oral cancer incidence by gender and overall, 2003 WA State Cancer Registry and 2003 United States (National Cancer Institute, SEER).



Note: *Rates per 100,000 have been adjusted to the 2000 U.S. standard population.*
Note: *Incidence data were obtained from the Washington State Cancer Registry using primary site ICD-03 codes C00.0-C14.8, excluding histology codes 9140, 9590-9989.*
Note: *National incidence rates for American Indian/Alaska Natives and Hispanics are not comparable to Washington data.*
Note: *National data was obtained from the National Cancer Institute, SEER Registry, and reflects the most current data available at the time. Updates occur regularly and the website should be checked for most current data.*

Figure 13: Oral cancer incidence rates by race and ethnicity, 2001-03 WA State Cancer Registry and 2000-03 United States (National Cancer Institute, SEER).

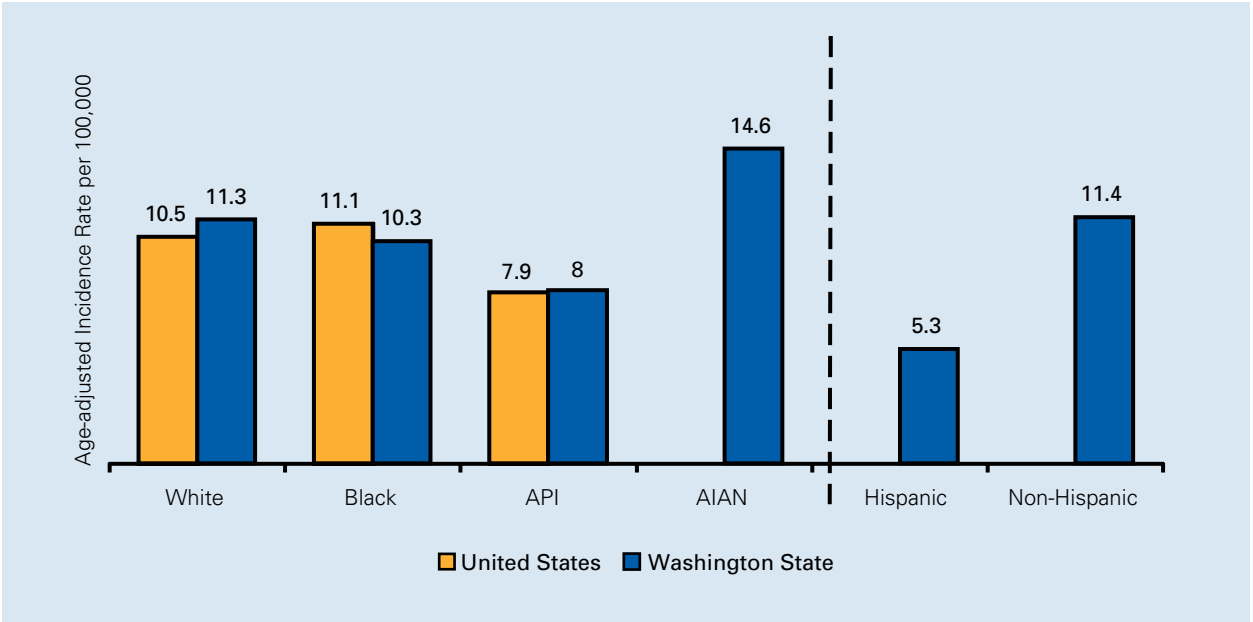
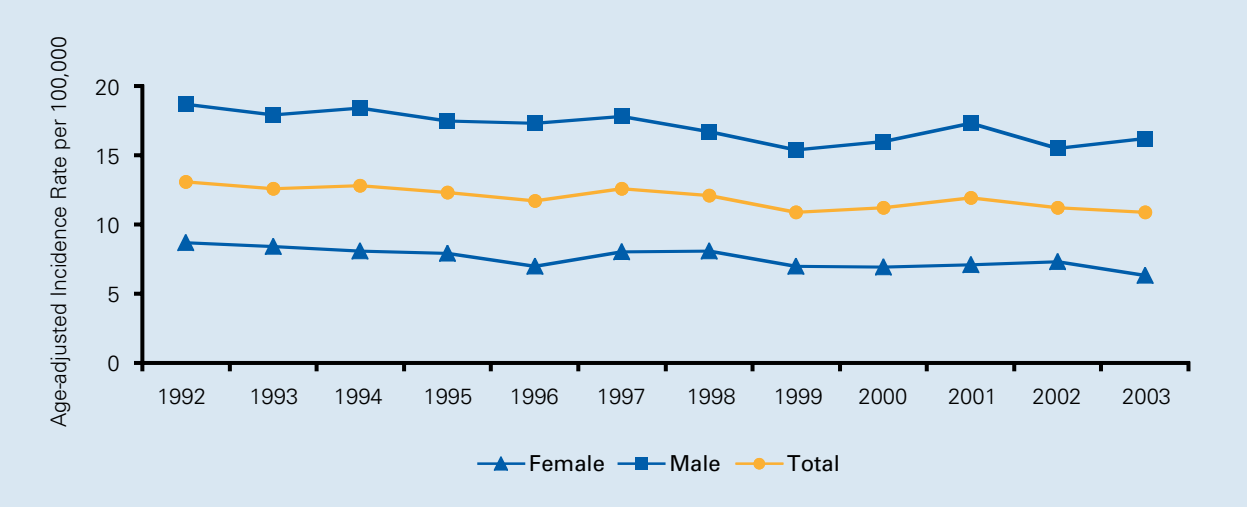


Figure 14: Oral cancer incidence trends by gender, 1992-2003 (WA State Cancer Registry).

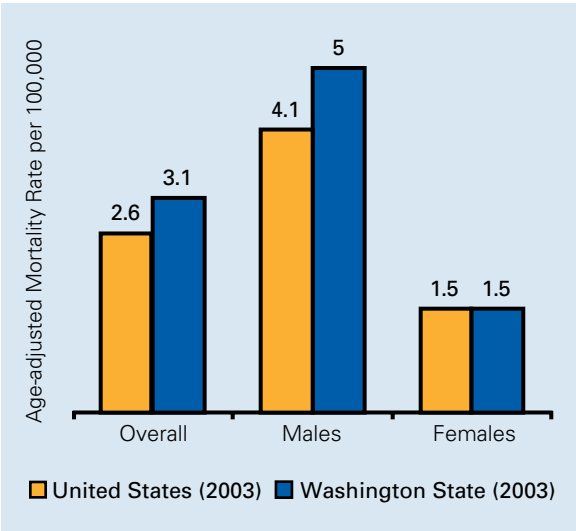


Mortality of oral and pharyngeal cancers

In Washington State:

- In 2003, 181 deaths from oral cancer were reported.
- Cancer mortality rates are still far from the HP2010 objective (HP2010 Objective of 2.4 per 100,000).
- Mortality rate is higher among males than females.

Figure 15: Oral cancer mortality rates by gender and overall, 2003 WA State Cancer Registry and 2003 United States (National Cancer Institute, SEER).



Note: *Rates per 100,000 have been adjusted to the 2000 U.S. standard population.*
Note: *Mortality data were obtained from Washington State death certificates using the underlying cause of death ICD-9 codes 140.0-149.9 (1992-1998), ICD-10 codes C00-C14 (1999-2003).*
Note: *Due to small numbers (cases ≤5), Hispanic and Non-Hispanic rates are not shown.*

Table 5: Age-adjusted oral cancer incidence rates per 100,000, 2001- 03 WA Cancer Registry.

Type of cancer	Age-adjusted incidence rate per 100,000 (2001-03)
Tongue	3.2
Gum/other mouth	1.9
Tonsil	1.5
Salivary gland	1.0
Lip	1.1
Mouth floor	0.9
Nasopharynx	0.5
Oropharynx	0.4
Hypopharynx	0.3
Other cavity	0.3

Figure 16: Oral cancer mortality rates by race and ethnicity, 2001-03 WA Cancer Registry and 2000-03 United States (National Cancer Institute, SEER).

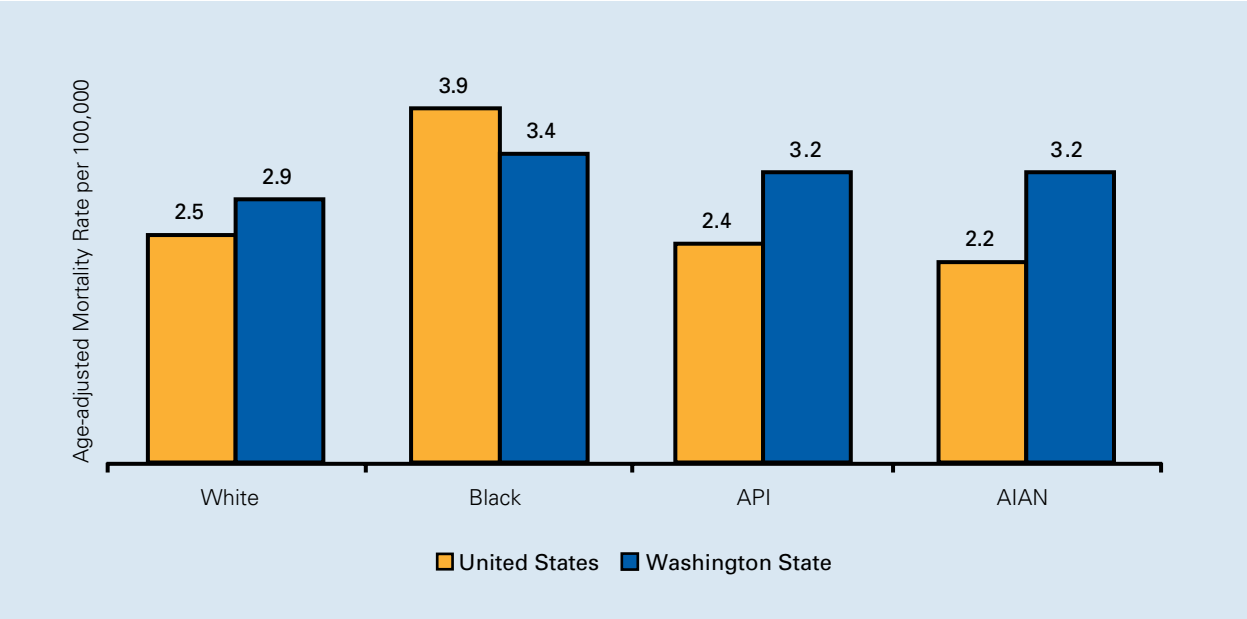
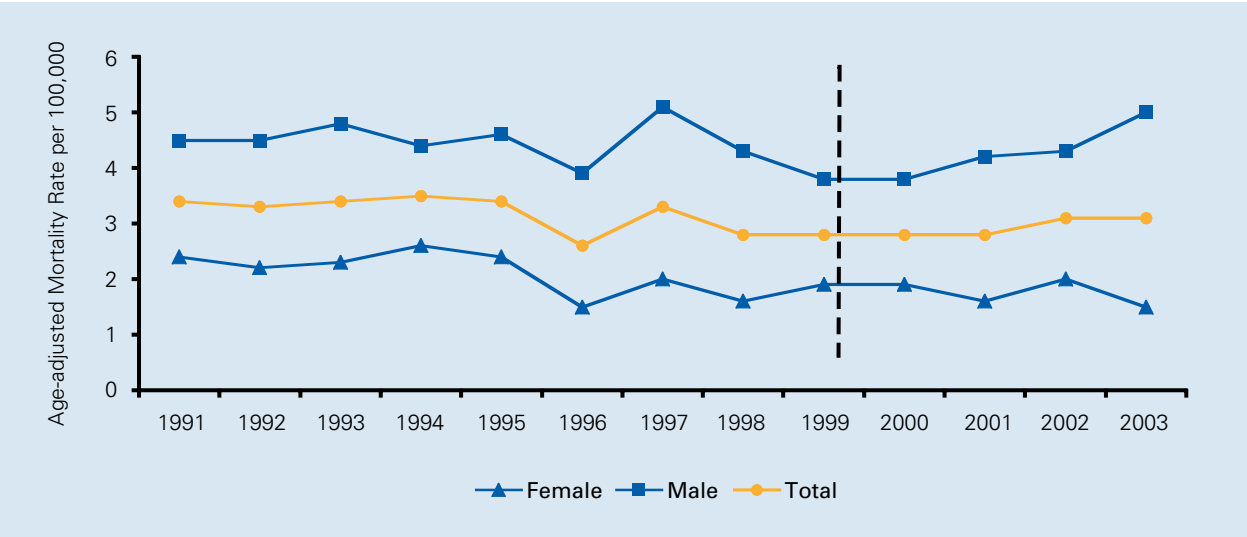


Figure 17: Oral cancer mortality trends by gender, 1992-2003 WA State Cancer Registry.



Note: *The coding for causes of death changed in 1999. These changes do not substantively affect the trends for cancer mortality.*
Note: *Rates per 100,000 have been adjusted to the 2000 U.S. standard population.*

Cancer stage at diagnosis and screening

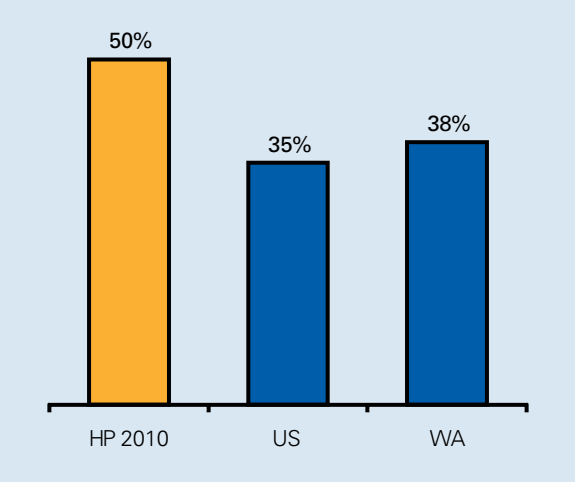
In Washington State:

- About 38 percent of oral cancers were diagnosed as localized (Stage 1) compared to the HP2010 objective of 50 percent.
- Among African Americans, 35 percent were diagnosed as early stage (in situ and localized), and 63 percent were diagnosed as advanced (regional or distant). The percentages for whites were 42 percent in situ and localized, and 53 percent advanced.

Cancer screening

HP2010 calls for 20 percent of adults 40 years and older to have received a pharyngeal cancer exam (screening) within the past year. The national average for this measure is 13 percent. In Washington State, there is no survey addressing this objective.

Figure 18: Oral and pharyngeal cancers detected at earliest stage (stage 1, localized). 2001 -03 WA State Cancer Registry and 2000-03 United States (National Cancer Institute, SEER).



Note: *HP2010 goal 21-6 categorizes earliest stage as stage 1, localized. Unless directly compared to the HP2010 goal, the remaining figures define earliest stage as localized/in situ.*

Cleft lip and palate

Cleft lip and cleft palate are two of the most common oral congenital anomalies. Infants with clefts have difficulty with vital oral functions such as feeding, breathing, speaking, and swallowing. They are also susceptible to repeated respiratory infections. Cleft lip and palate can occur independently or as a part of a larger syndrome. Apart from genetic predisposition, a number of environmental agents (teratogens), as well as deficiencies in essential nutrients such as folic acid, can cause these birth defects. Maternal smoking during pregnancy also increases the risk. [28] Children born with these birth defects need extensive surgical and rehabilitative treatment involving a multidisciplinary team of health professionals.

HP2010 calls for all states to maintain systems recording and referring infants and children with cleft lip and cleft palate. Washington State has already achieved this objective. DOH also supports effective referral services that coordinate care for infants and children born with oral facial anomalies through three maxillofacial teams located in Spokane, Tacoma, and Yakima.

Table 6: Cleft lip and palate prevalence estimates, 2003-04 Washington State Birth Defects Surveillance System.

	National prevalence (1999-01) (rate per 10,000)	WA prevalence (2003-04) (rate per 10,000)	Estimated number of Washington children
Cleft lip and palate	10.48	17.4	146

Note: *ICD-9 CM Codes Used: Cleft Lip with or without palate: 749.1-749.14, 749.2749.25; Cleft Palate: 749.0-749.04. Caution should be taken when comparing national and state data, since the years are different.*

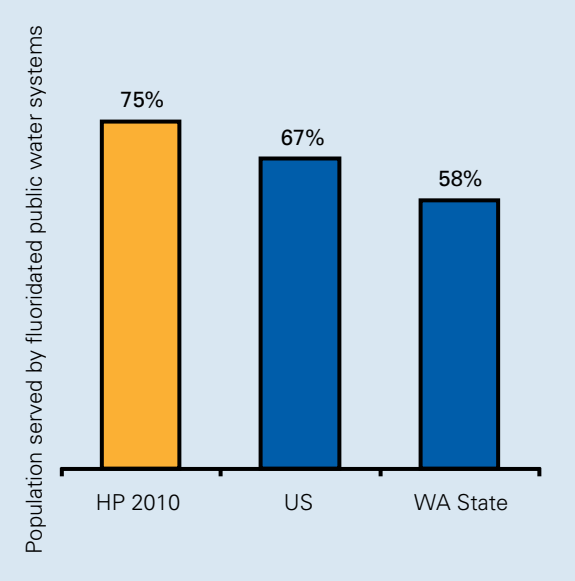
Oral Disease Prevention

The two most effective community preventive interventions for dental caries are community water fluoridation and school-based sealant programs. These measures have been recommended by the U.S. Centers for Disease Control and Prevention (CDC) as evidence-based and cost-effective based on several systematic reviews. [29]

Community water fluoridation

Community water fluoridation is the process of adjusting the natural fluoride concentration of a community's water supply to a level that is best for the prevention of dental caries. In the United States, community water fluoridation has been the basis for the primary prevention of dental caries for 60 years and has been recognized by the CDC as one of ten great achievements in public health of the 20th century. [30] It is an ideal public health method because it is effective, safe, inexpensive, requires no behavior change by individuals, and reaches everyone indiscriminately. Water fluoridation reduces or eliminates disparities in preventing dental caries among different socioeconomic, racial, and ethnic groups. Fluoridation helps individuals retain their teeth throughout life and helps lower the cost of dental care and dental insurance to individuals and health systems. [31]

Figure 19: Population served by fluoridated public water systems, 2006 DOH Office of Drinking Water data.



HP2010 calls for 75 percent of the U.S. population served by community water systems to receive optimally fluoridated water (0.8-1.2 parts per million). The national rate in 2002 was 67 percent (162 million people). Washington State's rate was 58 percent (or more than 3 million people) in 2006.

Not only does community water fluoridation effectively prevent dental caries, but it also offers a significant cost savings in nearly all communities. [32]

Information about the level of fluoride in public water systems can be obtained from the DOH Office of Drinking Water website - Sentry Internet at http://www.doh.wa.gov/ehp/dw/our_main_pages/data.htm.

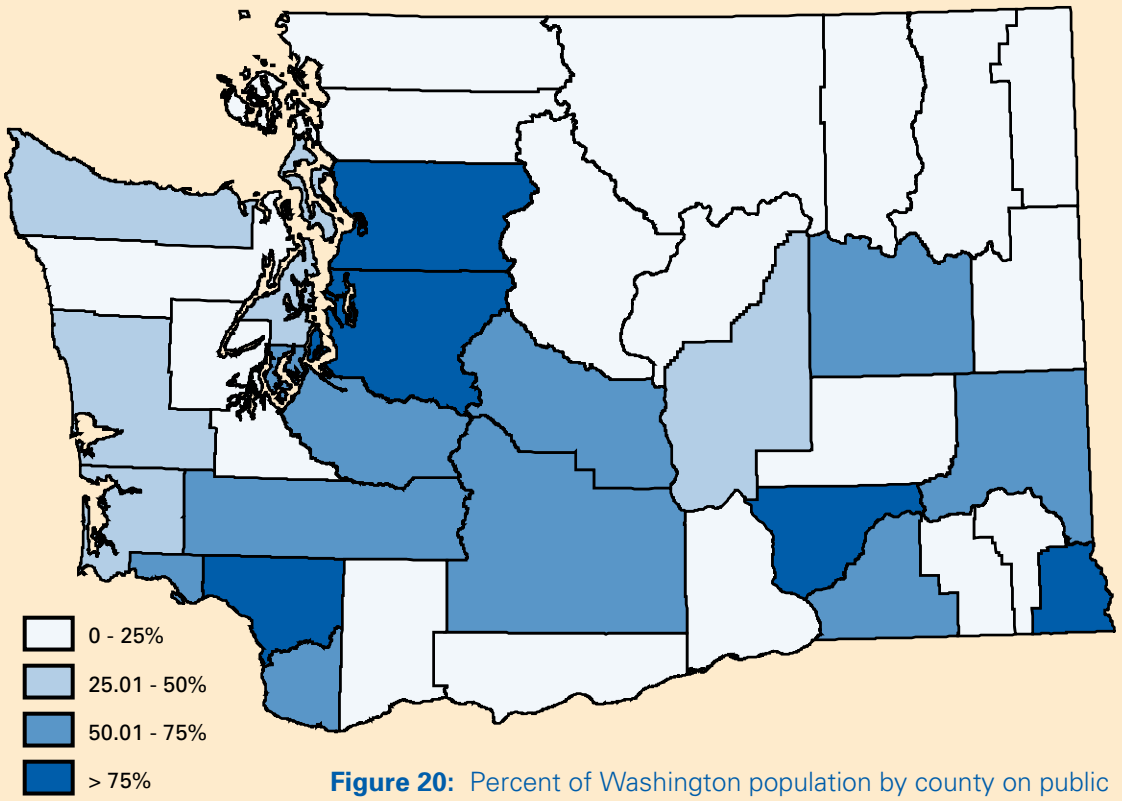


Figure 20: Percent of Washington population by county on public water systems receiving optimally fluoridated water (0.8-1.3ppm).

Dental sealants

Dental sealants—thin plastic coatings that are applied to the chewing surfaces (pits & fissures) of the molars— are considered an effective preventive measure for dental caries in children and adolescents. The first molars usually come into the mouth when a child is about six years old. Second molars appear at about age 12 years. Placing sealants on these teeth shortly after their eruption protects them from the development of caries. When sealants are applied routinely to susceptible tooth surfaces in conjunction with the appropriate use of fluoride, most dental caries in children can be prevented. [33] Sealants are 100 percent effective when fully retained. [34, 35]

Since the early 1970s, childhood dental caries on smooth tooth surfaces has declined markedly because of the widespread exposure to fluorides. Today, most caries (90 percent) among children occurs in pits and fissures.

School-based or school-linked sealant programs are an effective way to provide sealants to children who are otherwise unlikely to receive them, and therefore, to help decrease disparities. Children of racial and ethnic minority groups are about three times more likely to have untreated caries and teeth missing due to caries than are non-Hispanic white children, but they are about a third as likely to receive sealants. A CDC fact sheet reports that 29 states have dental sealant programs serving 193,000 children; this number represents only about three percent of poor children who could receive sealants. [36]

Prevalence of dental sealants

The HP2010 target for sealants is 50 percent for eight year-olds and 14 year-olds. The national average is 23 percent and 15 percent, respectively. In Washington State as in most states, there are no data for the 14 year-olds.

In Washington State:

- About 45 percent of eight year-olds had dental sealants in 2005 compared to 48 percent in 2000.
- Lower rates of sealants were found in:
- African American, Hispanic, and Asian children.
- Children from non-English speaking families.
- Children eligible for the free and reduced-price lunches.

The trend in prevalence of dental sealants in Washington shows that between 1994 and 2000, the state experienced a significant increase in the prevalence of dental sealants among second graders. But this trend did not continue, with sealant rates dropping in 2005.

Figure 21: Elementary school-age children (second and third graders) with sealants in first molars, 2005 WA Smile Survey.

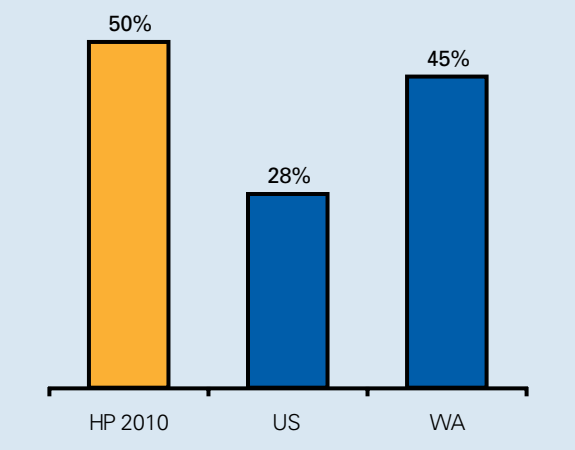


Table 7: Trends in the prevalence of dental sealants among elementary school-age children in Washington (unadjusted for non-response), 2000 & 2005 WA Smile Survey.

Important note: *The data presented in this table are unadjusted for non-response. Caution should be taken when comparing trends over time between the three Smile Surveys. The same diagnostic criteria were used among all three surveys, but the sampling methods and type of consent varied. See Appendix for more details.*

Race or ethnicity	Smile Survey year	Percent with sealants	
		Second grade	Second and third grade
All	2000	40.7 (38.0-43.2)	47.2 (45.3-49.1)
	2005	38.9 (37.3-40.5)	44.6 (43.4-45.7)
White Non-Hispanic	2000	42.1 (39.0-45.2)	49.4 (47.2-51.7)
	2005	41.2 (39.3-43.1)	47.1¥ (43.6-50.5)
Racial and ethnic minorities	2000	38.1 (33.2-43.1)	42.0 (38.4-45.6)
	2005	33.5 (30.7-36.5)	39.5¥ (35.0-44.0)

¥ *Adjusted for non-response*

Figure 22: Dental sealants among elementary school-age children (second and third graders) by eligibility for free and reduced-price lunches and language spoken at home (adjusted for non-response), 2005 WA Smile Survey.

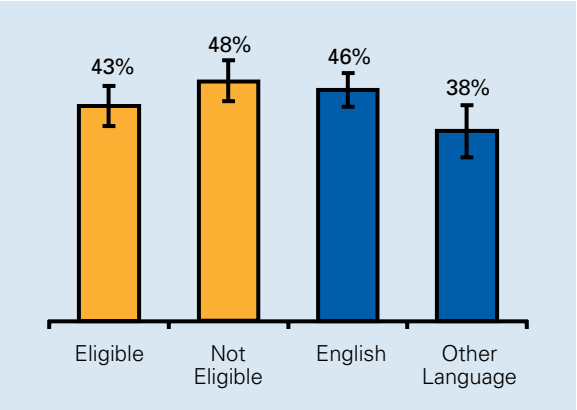
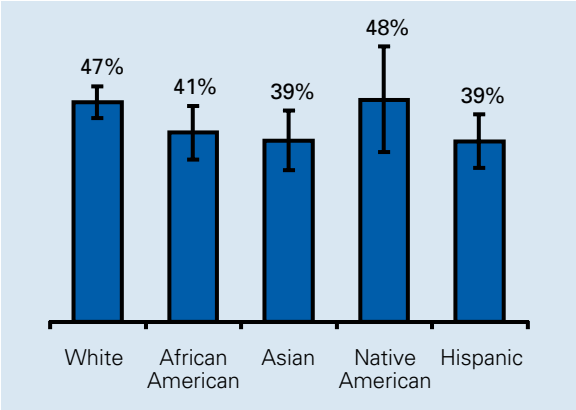


Figure 23: Dental sealants among elementary school-age children (second and third graders) by race and ethnicity (adjusted for non-response), 2005 WA Smile Survey.



School-based dental sealant programs

The U. S. Task Force on Community Preventive Services documented a 60 percent decrease in dental caries on the chewing surface of molar teeth up to five years after sealant application. This Task Force

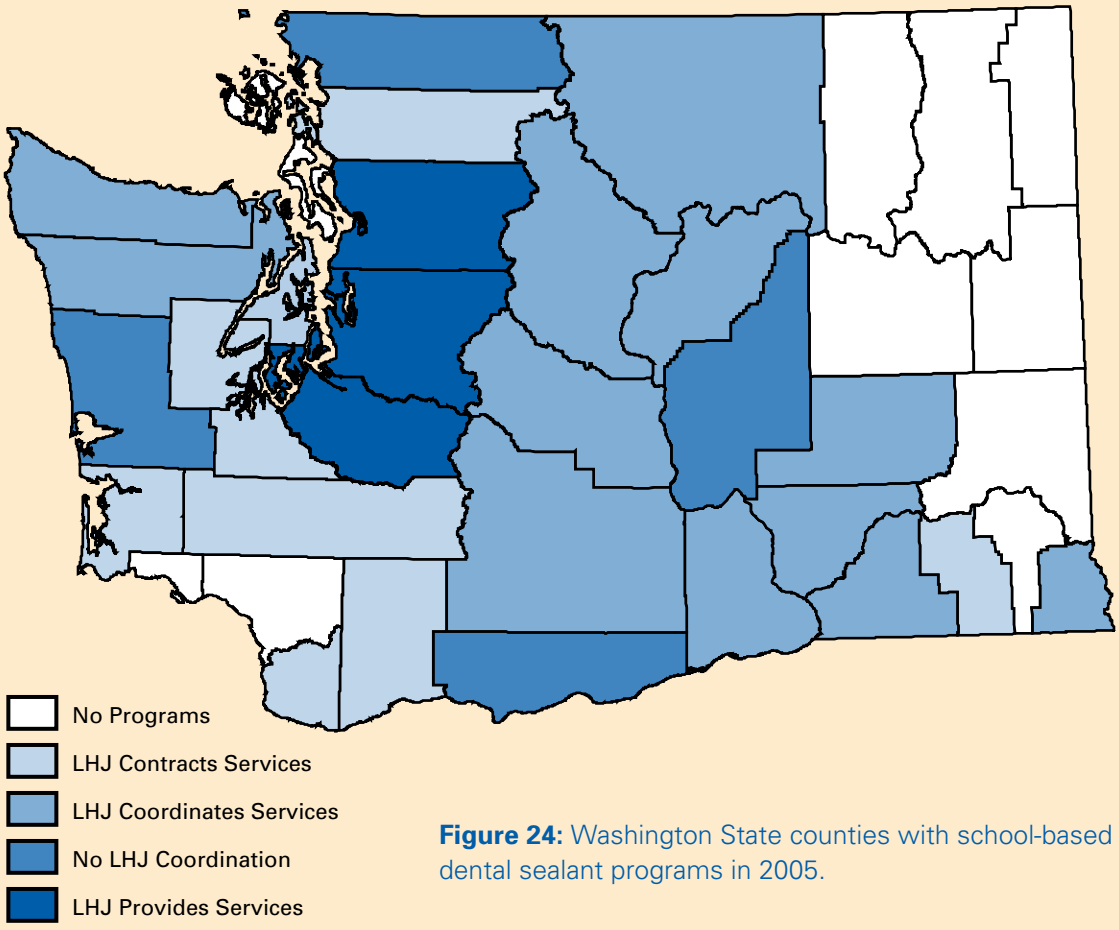


Figure 24: Washington State counties with school-based dental sealant programs in 2005.

strongly recommended school-based or school-linked sealant programs for the prevention and control of dental caries. [29] School-based or school-linked sealant programs are considered very cost-effective measures [37] and can reach low-income children who otherwise would not receive them.

In Washington State:

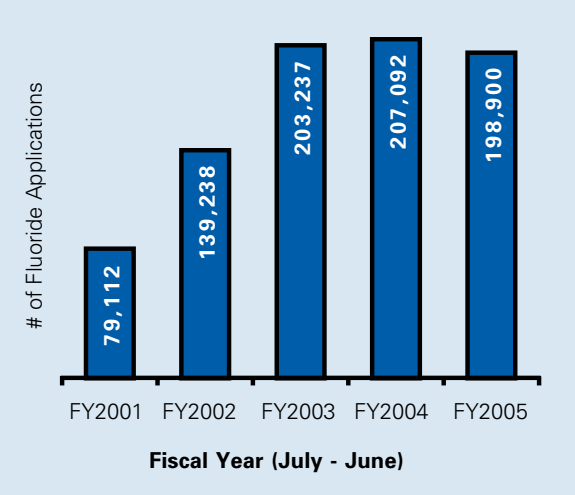
- DOH Dental Sealant Program Guidelines recommend that schools with more than 30 percent low-income children (eligible for the free and reduced-price meals), be targeted for sealant programs. These guidelines also assist health professionals and schools in other aspects of planning, implementing, and evaluating school-based sealant programs.
- Substitute Senate Bill (SSB) 6020 (RCW 18.29.220) passed in 2001, allows for school-linked sealant programs where unsupervised dental hygienists or supervised dental assistants can apply sealants. But there is no reporting mechanism so far that connects these clinicians with the local health departments, which makes it difficult to assess how many children are receiving sealants in schools.
- As a result of SSB 6020, the number of counties with schoo-based or school-linked sealant programs has increased to 28 in 2005. [38] In contrast, the number of Washington schools that had a school-based or school-linked dental sealant program dropped from 219 in 2004 to 174 in 2005.

Topical fluorides and fluoride supplements

Because frequent exposure to small amounts of fluoride each day can best reduce the risk for dental caries in all age groups, all people should drink water with an optimal fluoride concentration and brush their teeth with fluoridated toothpaste. [39] Topical fluorides include: toothpastes, mouth rinses, gels and varnishes.

For communities that do not receive fluoridated water and persons at high risk for dental caries, additional fluoride measures might be needed upon consultation with a dental professional. Community measures include fluoride mouth rinse or tablet programs, which are typically conducted in schools. Individual measures include professionally applied topical fluoride gels or varnishes for persons at high risk for caries.

Figure 25: Professionally applied fluorides (gels, foams, and varnishes) for children younger than 18 years, 2001-05 Washington State Medicaid data.



In Washington, fluoride varnishes are provided through school-based programs. Four fluoride varnish programs operate in Head Start preschools. [38] Washington State Department of Social and Health Services reports indicate that professional fluoride applications have increased dramatically in the past few years.

Preventive visits

Maintaining good oral health requires repeated efforts on the part of the individual, caregivers, and health care providers. Daily oral hygiene routines and healthy lifestyle behaviors play important roles in prevention of oral diseases.

Regular preventive dental care can reduce the development of disease and facilitate early diagnosis and treatment. HP2010 includes a target of 57 percent for low-income children and adolescents to receive any preventive dental service during the past year.

General population (children and adults)

In Washington State:

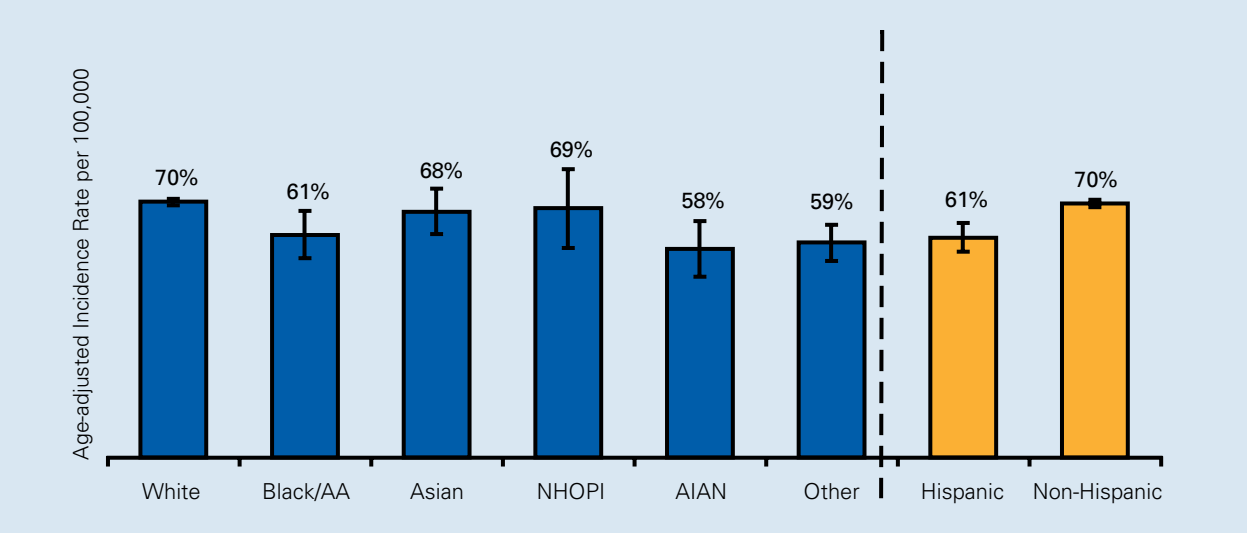
- Between 1999 and 2004, the state experienced an overall decrease in the percent of adults who had a preventive dental visit.
- Even lower rates of preventive visits were observed in individuals who were Hispanic, from low-income families, or who had attained less than a high school education.

Table 8: Percentage of people who had their teeth cleaned within the past year, 2004. BRFSS

U.S. status 2004 (≥18 years)	Washington status 1999 (≥18 years)	Washington status 2004 (≥18 years)
69%	74%	69%

Source: *National data from BRFSS 2004 (2002=69%, 1999=70%); state data from BRFSS 1999 and 2004 (2002 = 68.8%).*

Figure 26: Percentage of people (≥18 years) who had their teeth cleaned within the past year by race and ethnicity.†, 2004 WA BRFSS.



†Race and ethnicity in this chart are mutually exclusive.

Figure 27: Percentage of adults (≥18 years) who had their teeth cleaned within the past year by annual household income, 2004 WA BRFSS.

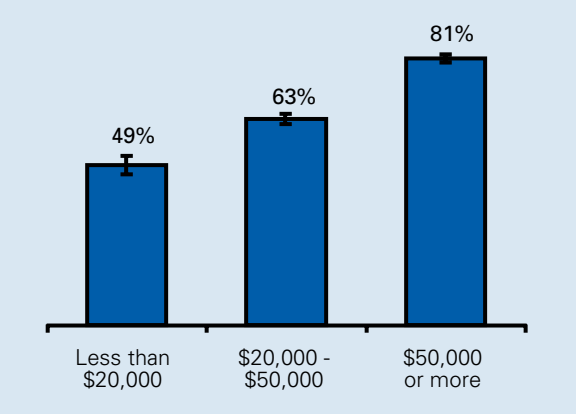
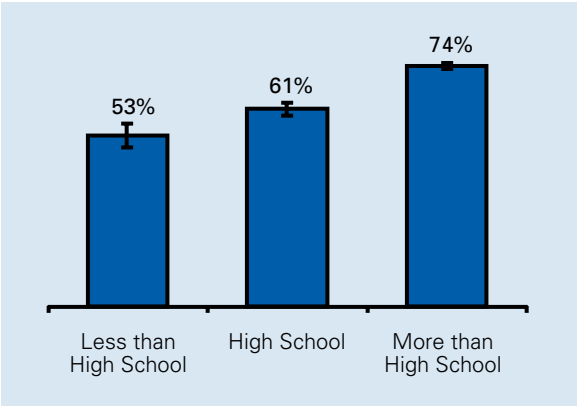


Figure 28: Percentage of adults (≥18 years) who had their teeth cleaned within the past year by educational level, 2004 WA BRFSS.



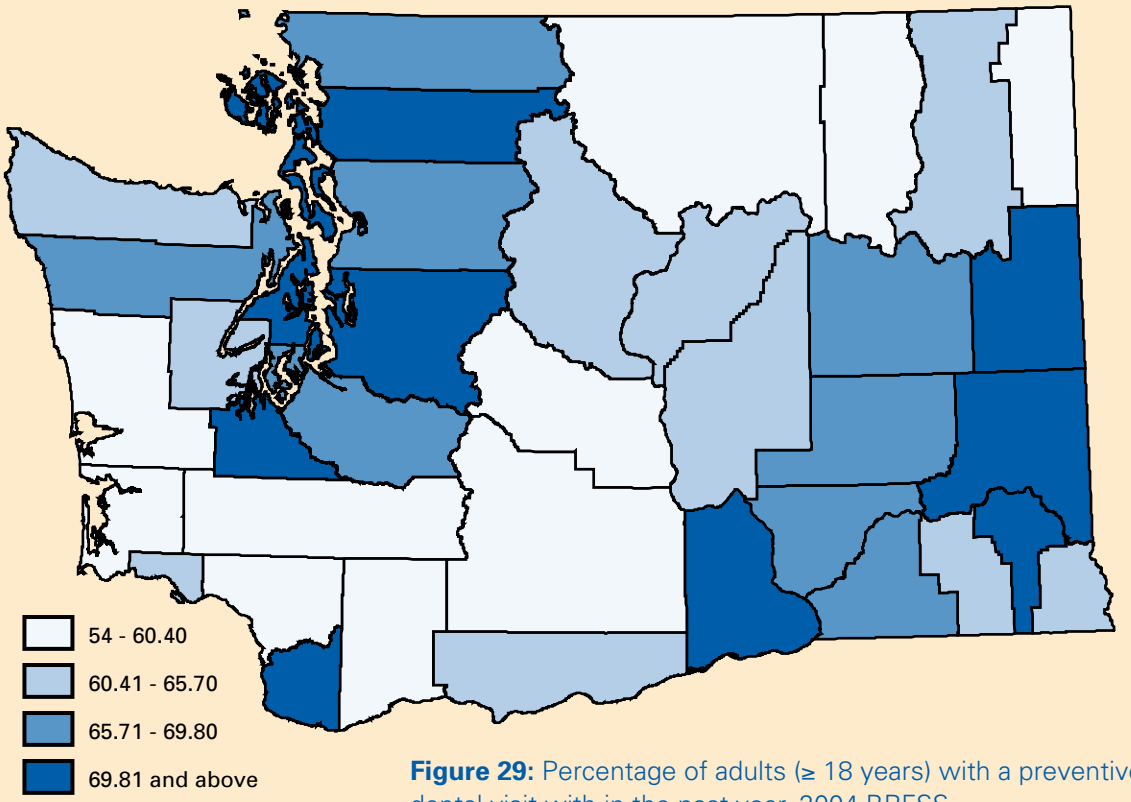


Figure 29: Percentage of adults (≥ 18 years) with a preventive dental visit with in the past year, 2004 BRFSS.

Table 9: Percentage of children who saw a dentist within the past year for a routine preventive visit, 2003 WA National Survey of Children's Health.

Demographics	Routine preventive dental visit within past year
Race	
White	94.3 (92.2-95.8)
Black	95.4 (82.6-98.9)
Multiracial	95.3 (88.7-98.1)
Other	96.1 (85.7-99.0)
Maternal education	
Less than 12 years	81.7 (69.1-89.9)
12 years	84.6 (77.5-89.8)
More than 12 years	96.9 (95.5-97.9)
Poverty level	
<100% FPL	84.5 (74.8-90.9)
100-185% FPL	90.3 (84.8-94.0)
185-200% FPL	93.1 (80.0-97.8)
200-400% FPL	95.9 (93.5-97.4)
400+% FPL	97.5 (95.3-98.7)

Pregnant women

Studies show that it is safe for pregnant women to visit dentists and have their teeth cleaned. There is a need to inform physicians, dentists, and pregnant women about the importance of dental visits during pregnancy. [40]

In Washington State:

- Overall, 71 percent of pregnant women have had a preventive visit within the past year.
- Native American pregnant women had fewer preventive visits (58.5 percent) than did white and other minority women.

Table 10: Percentage of pregnant women receiving preventive oral health care information from a dental or other health care professional during a health visit and preventive visit, by selected demographic characteristics, 2001-03 WA PRAMS.

Demographics	Received preventive oral health care information	Teeth cleaning visit in the past year
Race and ethnicity		
White	45.4 (42.6-48.3)	69.2 (66.5-71.8)
African American	49.2 (45.6-52.8)	71.2 (37.7-74.4)
Asian / Pacific Islander	47.2 (44.1-50.4)	76.2 (73.3-78.8)
Native American	43.1 (39.4-46.9)	58.5 (54.5-62.4)
Hispanic	51.2 (47.9-54.5)	75.7 (72.6-78.5)
Age		
15-17 years	53.2 (40.7-65.3)	79.9 (69.6-87.3)
18-19 years	38.0 (30.2-46.5)	65.4 (56.5-73.3)
< 20 years	43.1 (36.4-50.2)	70.0 (63.1-76.2)
20-24 years	42.9 (38.8-47.1)	64.8 (60.4-69.0)
25-29 years	44.3 (40.3-48.3)	69.0 (65.0-72.7)
30-35 years	49.2 (45.1-53.4)	72.9 (68.9-76.5)
35+ years	54.1 (48.8-59.3)	78.7 (74.1-82.6)
Education		
<12 years	44.2 (39.6-49.0)	69.3 (64.2-73.9)
12 years	41.2 (37.3-45.1)	63.2 (59.1-67.2)
13+ years	49.8 (46.9-52.8)	74.3 (71.6-76.8)

Children with special health care needs and individuals with disabilities

In Washington State:

- Children with special health care needs were significantly less likely to report excellent or very good oral health (64 percent) compared to other children (73 percent).
- About 95 percent (89.5-97.5) of children with special health care needs had visited a dentist within the past year for routine preventive care, compared to about 94 percent (92.2-95.3) of other children.
- Compared to adults (≥18 years) individuals without disabilities, those with disabilities were: [11]
  - Less likely to have visited their dentist for any reason in the past year (72 percent vs. 62 percent).
  - Less likely to have had their teeth cleaned in the past year (71 percent vs. 61 percent, respectively).

Table 11: Condition of teeth for children with special health care needs and other children, 2003 WA National Survey of Children's Health.

Condition of teeth	Children with special needs	Other children
Good/fair/poor	36.0% (29.9-42.6)	26.9% (24.3-29.6)
Excellent/very good	64.0% (57.4-70.1)	73.1% (70.4-75.7)

Table 12: Percentage of children with special health care needs who had seen a dentist within the past year for a routine preventive visit, 2003 WA National Survey of Children's Health.

Demographics	Preventive dental visit within past year
Race and ethnicity	
White	93.9 (87.5-97.1)
Black	§
Multiracial	95.5 (73.0-99.4)
Other	§
Hispanic	95.9 (84.1-99.1)
Gender	
Male	91.9 (82.3-96.6)
Female	97.5 (90.5-99.4)
Maternal education	
Less than 12 years	95.3 (67.4-99.5)
12 years	82.1 (57.7-93.9)
More than 12 years	97.3 (93.1-99.0)
Poverty Level	
<100% FPL	82.9 (42.1-97.0)
100-185% FPL	94.8 (82.6-98.6)
185-200% FPL	§
200-400% FPL	95.3 (87.4-98.4)
400+% FPL	97.0 (85.7-99.4)
Age	
0-4 years	94.6 (69.7-99.3)
5-9 years	97.1 (86.5-99.4)
10-14 years	97.3 (91.2-99.2)
15-17 years	90.4 (75.4-96.7)

Note: (§) represent data where the Relative Standard Error (RSE) is >30%; therefore the data is too unreliable to report.

Tobacco control

Tobacco use is the leading cause of preventable death in Washington State and across the nation. About 8,000 people die each year in Washington from tobacco-related illnesses. Of the $1.5 billion in medical costs associated with tobacco use, $508 million is covered by the state Medicaid program. The use of any form of tobacco—including cigarettes, cigars, pipes, and smokeless tobacco—has been established as a major cause of oral and pharyngeal cancer. [12] The evidence is sufficient to consider smoking a causal factor for adult periodontitis. [12] Half of the cases of periodontal disease in this country may be attributable to cigarette smoking. [13] Tobacco use substantially worsens the prognosis of periodontal therapy and dental implants, impairs oral wound healing, and increases the risk for a wide range of oral soft tissue changes. [14, 41]

Consequently, comprehensive tobacco control could have a large impact on oral health status. The DOH Tobacco Prevention and Control Program works with local health agencies, tribes, schools, and

community-based organizations to deliver a comprehensive, integrated approach to preventing tobacco use. The goal of comprehensive tobacco control programs is to reduce disease, disability, and death related to tobacco use by:

- Preventing the initiation of tobacco use among young people.
- Promoting quitting among young people and adults.
- Eliminating non-smokers' exposure to secondhand tobacco smoke.
- Identifying and eliminating the disparities related to tobacco use and its effects among different population groups.

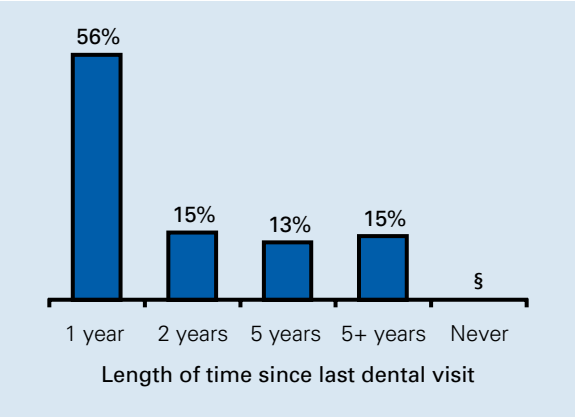
In Washington State:

- Prevalence of smoking and smokeless tobacco use increases as students grow older.
- About 19 percent of adults are currently smokers.
- Among current adult smokers, 56 percent visited a dentist within the past year.
- Among adolescent smokers (tenth grade), 63 percent visited a dentist within the past year.

Table 13: Prevalence of cigarette smoking and smokeless tobacco use among adolescents, 2004 WA HYS.

Grade	Smokeless tobacco use (%)	Smoked within past 30 days (%)
Grade 6	1.0 (0.8- 1.2)	2.0 (1.6- 2.4)
Grade 8	2.8 (2.4- 3.4)	7.8 (6.8- 8.9)
Grade 10	4.9 (4.3- 5.6)	13 (11.7-14.4)
Grade 12	7.6 (6.6- 8.7)	19.7 (17.7- 21.9)

Figure 30: Dental visits among adult smokers, 2004 WA BRFSS.



Note: § – Numbers too small to report.

Since a substantial number of tobacco users visit a dentist, the dental office is an excellent setting for providing tobacco intervention services. Dental patients are particularly receptive to health messages at periodic check-up visits, and the oral effects of tobacco use provide visible evidence and a strong motivation for tobacco users to quit. Dentists and dental hygienists are well-trained and can be effective in treating tobacco use and dependence. For these reasons, the identification, documentation, and treatment of every tobacco user should become a routine practice in every dental office and clinic. [42] National data from the early 1990s indicated that only 24 percent of smokers who had seen a dentist in the past year were advised to quit, and only 18 percent of smokeless tobacco users reported that their dentists ever advised them to quit. In Washington State, no data are available that show whether patients are receiving tobacco cessation advice from dental professionals.

Table14: Dental visits by tobacco use among adolescents (12-17 years), 2004 WA HYS.

Length of time since last dental visit	Non-smokers (%)	Cigarette smoker (%)	Smokeless tobacco users (%)	Smokers (cigars, pipe, bidis, or clove cigarettes) (%)
Grade 8				
During past year	75.1 (72.0-78.0)	66.0 (61.0-71.4)	64.5 (54.4-73.5)	57.7 (51.4-63.8)
Within 1-2 years	9.4 (8.2-10.8)	9.9 (7.0-13.9)	14.0 (7.6-24.3)	12.3 (8.9-16.8)
Within 2+ years	4.9 (4.0-6.0)	7.3 (4.7-11.0)	§	7.9 (5.2-11.7)
Never	1.5 (1.1-2.1)	5.3 (3.4-8.2)	§	9.9 (6.9-14.0)
Unsure	9.0 (7.7-10.5)	11.6 (8.2-16.0)	§	12.3 (9.1-16.3)
Grade 10				
During past year	77.0 (74.2-79.6)	63.1 (58.7-67.3)	71.7 (62.3-79.6)	61.3 (56.9-65.5)
Within 1-2 years	10.3 (9.0-11.9)	15.9 (13.3-19.0)	8.3 (4.9-13.6)	15.8 (12.7-19.6)
Within 2+ years	5.7 (4.8-6.8)	10.3 (7.5-13.9)	6.9 (3.8-12.1)	9.6 (7.0-12.9)
Never	1.5 (1.2-2.0)	2.5 (1.5-4.2)	§	§
Unsure	5.4 (4.5-6.5)	8.2 (5.6-11.8)	9.0 (5.0-15.5)	10.4 (7.7-14.02)
Grade 12				
During past year	75.2 (72.0-78.1)	65.9 (61.6-70.0)	70.2 (63.5-76.1)	67.5 (63.3-71.4)
Within 1-2 years	12.1 (10.3-14.2)	16.9 (14.0-20.1)	14.4 (10.2-19.8)	16.3 (13.3-19.7)
Within 2+ years	7.3 (6.0-8.9)	9.2 (6.8-12.3)	8.3 (5.3-12.8)	8.5 (6.3-11.4)
Never	2.1 (1.5-2.9)	3.4 (2.1-5.4)	5.0 (2.9-8.5)	3.2 (2.1-5.1)
Unsure	3.3 (2.5-4.4)	4.7 (3.1-6.9)	§	4.5 (3.2-6.3)

***Note:** (§) represent data where the Relative Standard Error (RSE) is >30%; therefore the data is too unreliable to report.*

Oral health education

Oral health education is an important primary prevention measure that informs, motivates, and helps people to adopt and maintain beneficial health practices and lifestyles. It includes promotion of environmental changes, professional training, and research work. [43] Although health information or knowledge alone does not necessarily lead to desirable health behaviors, it increases awareness, and

coupled with empowerment and motivational interviewing approaches, can help people and communities make educated lifestyle choices.

Washington State Bright Futures Oral Health Project

The national Bright Futures project was initiated in 1990 by the Maternal and Child Health Bureau of the federal Health Resource and Services Administration (HRSA). It is now under the leadership of the American Academy of Pediatrics. The Bright Futures mission is to promote and improve the health and well-being of infants, children, and adolescents through educational materials and partnerships. Bright Futures provides comprehensive, culturally effective, family-centered, community-based child health supervision guidelines consistent with the needs of families and health professionals. Bright Futures Oral Health contains messages targeted at pregnant women, infants, children, and adolescents.

The Washington State Department of Health has successfully used Bright Futures educational materials in the areas of mental health, physical activity, and others. Therefore, promoting Bright Futures Oral Health helps to integrate oral health with general health. For this reason, the MCH Oral Health Program is developing a project based on Bright Futures Oral Health that will enable communities, families and health professionals to access simple, consistent, and evidence-based oral health fact sheets. Motivational Interviewing (MI) methodology will also be incorporated. MI has been used by health care providers to promote an environment in which the patient is engaged in the process of health education and lifestyle choices (risk reduction). Patients are provided the opportunity to learn and understand the health information, discover how such information is relevant to their lives, evaluate their own risks and benefits, and decide to change behaviors themselves rather than being persuaded by dental providers. For more information, visit the Oral Health Program's website at: http://www.doh.wa.gov/cfh/Oral_Health/education.htm.

Tooth Tutor

The MCH Oral Health Program, the state Office of Superintendent of Public Instruction, the School Nurse Organization of Washington State, and Public Health-Seattle & King County created Tooth Tutor in 1990 as an oral health curriculum for use by school nurses and elementary school teachers. Tooth Tutor was developed in response to requests from school nurses and local health jurisdictions (LHJs) for a practical and simple guide for presenting evidence-based, age-appropriate, oral health messages to children. The materials and curriculum were introduced to school nurses in a statewide interactive video training in 1995. The state of Vermont has also successfully implemented Tooth Tutor as a best practice in its school system.

The Tooth Tutor and the Tooth Tote (an accompanying set of visual aids) are available in all Washington counties, either at schools, local health departments, or Educational Service District libraries. LHJs offer training and support in using the materials. Evaluation of the Tooth Tutor indicates that the use of the materials varies across counties and schools. A review and update of Tooth Tutor is happening in 2007.

Oral health education of other health professionals

During 2003-04, DOH contracted with the Washington Dental Service Foundation to train primary care physicians and their staff in providing dental screening for underserved children. In doing so, Washington State became one of the first states to seek integration of oral health and primary health care services. This effort was intended to improve access to dental care for very young children in Washington. During this project, more than 110 primary care professionals received training.

Dental Workforce

Dental workforce capacity

The oral health care workforce is critical to meet society's need for high quality dental care in the United States. Health policies that intend to expand access to services, improve quality, or constrain costs must account for issues of supply, distribution, preparation, and utilization of the workforce. Nevertheless, estimating workforce numbers is a complex endeavor. Different methodologies lead to different estimates. This document presents a summary of state and federal estimates for Washington in a chronological manner.

The DOH Office of Health Professions Quality Assurance (HPQA) is responsible for licensing and regulating nearly 300,000 health care providers, including dentists and dental hygienists in the state. HPQA data show that in November 2006, there were 5,648 dentists and 4,913 dental hygienists licensed in Washington. Of these, 4,473 dentists and 4,271 dental hygienists practiced in the state (i.e., had an address in Washington). Dentist-to-population ratios ranged from one dentist per 948 people in urban King County to one dentist per 12,300 people in rural Pend Oreille County. The maps below depict HPQA's license registration data from November 2006.

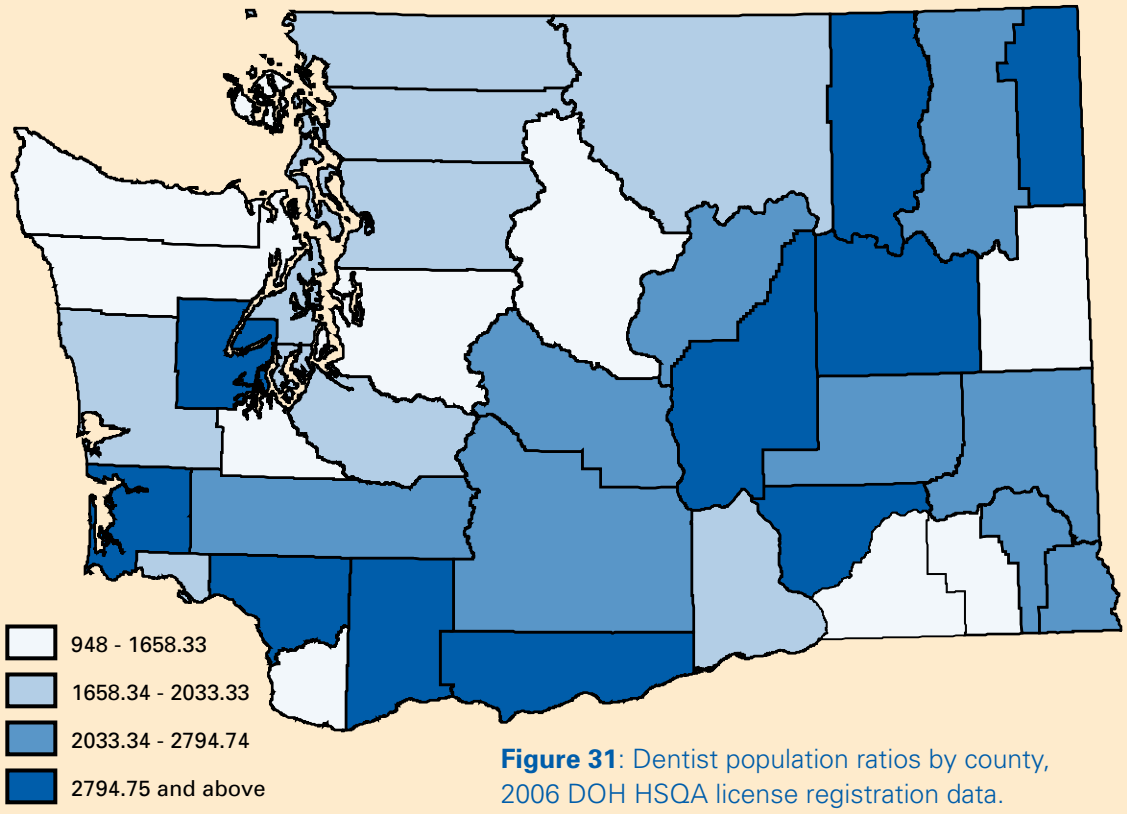


Figure 31: Dentist population ratios by county, 2006 DOH HSQA license registration data.

Note: *Address reported during license registration might not be the actual location of practice.*

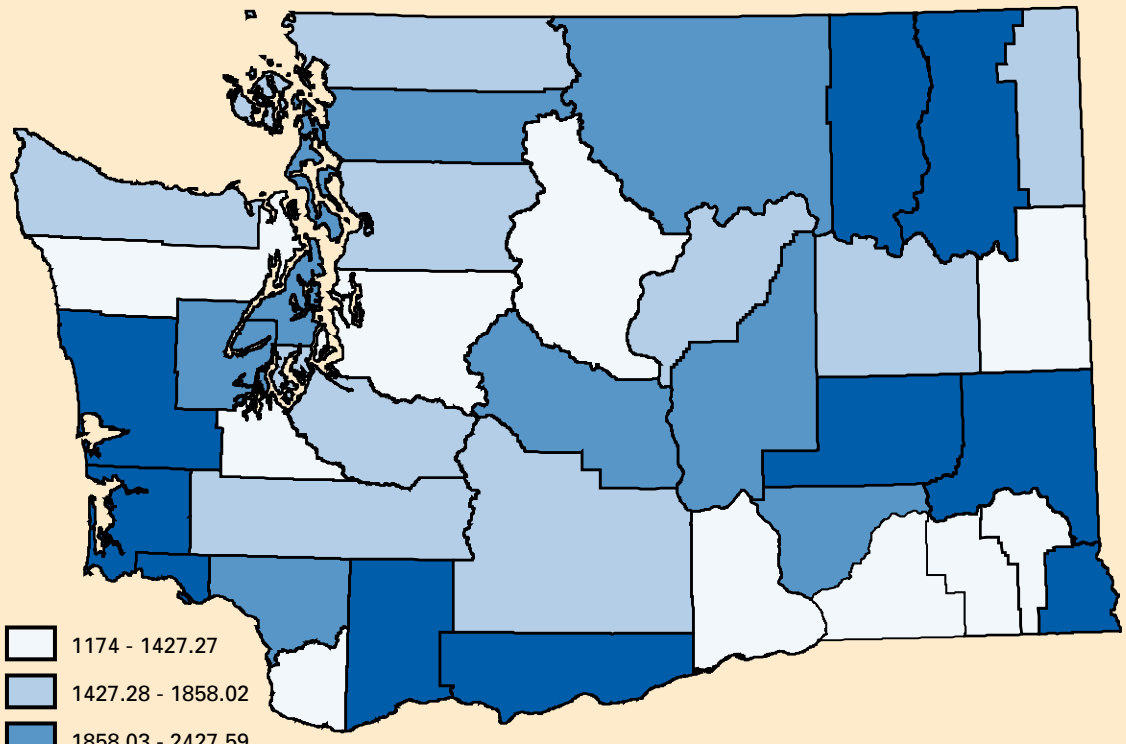


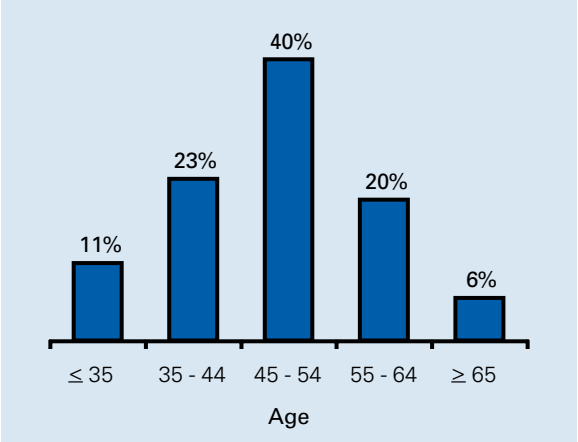
Figure 32: Dental hygienist to population ratios by county, 2006 DOH HSQA license registration data.

Note: *Address reported during license registration might not be the actual location of practice.*

The federal Health Resources and Services Administration (HRSA) published state dental workforce profiles that included: all dental professionals in the state, including those without a state address, those not practicing, and dental students and residents. It is important to notice that these numbers tended to be an overestimate of the dental workforce in several states, including Washington. The study concluded that: [44]

- Washington ranked seventh in the nation for dentists per capita (76.6 dentists per 100,000 v. the national rate of 63.6 per 100,000). Washington also had a higher than average rate for dental hygienists and dental assistants.
- The number of dentists grew 56 percent from 1991 to 2000, while the state's population grew 18 percent. The result was a 32 percent increase in dentists per capita compared to a 16 percent increase for this period nationwide.

Figure 33: Age distribution of all private practice dentists, 2001 Dental Workforce Survey (For all private practice dentists, N=1,708).



The Washington State Dental Association (WSDA) and the University of Washington (UW) –Center for Health Workforce Studies (CHWS) surveyed all active licensed dentists in 2001, showing that: [45]

- Out of the 4,805 active licenses, only 3,913 dentists were actually practicing in the state. The number decreased to 3,647 when dental residents, inactive dentists and old dentists close to retirement were excluded.
- Out of these, 84 percent (3,085) worked full-time (average 37.5 hours per week) as general dentists, and 16 percent as specialists.
- About 66 percent of dentists surveyed were older than 45 years.
- The rate was 53 dentists for 100,000 people.
- About 50 percent of full-time general dentists planned to retire by 2013. In the state's rural areas, this rate reached 57 percent.
- The largest relative shortages of dentists were in rural areas, where only 13 percent of full-time general dentists and 20 percent of part-time general practice dentists were located.

The DOH Primary Care Office (PCO) represents the needs of the underserved populations and the providers who serve them. This advocacy and support work is focused on health care planning and technical assistance. Primary care includes medical, dental, and mental health services. According to the PCO, Washington's statewide ratio of population to primary care dental full-time equivalent (FTE) was 1,918 to 1 in 1998. While this is considerably better than the federal standard for dental shortages (5,000 to 1), providers' geographic distribution remained a key concern. A seventh of the state's health service areas fell short of the federal standard. [46]

Also in 1998, the UW–CHWS calculated the gap between supply and effective demand for dental services at 162 dentists and 58 hygienists in the areas that fell short of the federal standard. Nearly twice this number of additional providers would be needed in these areas to meet the HP2010 goal of 83 percent of the population making one annual dental visit. [47] The distribution of dental FTEs mirrors the distribution of FTEs for primary medical care. The highest ratios (3,530 to 1) are found in urban fringe areas, and the lowest ratios (1,675 to 1) are found in urban core areas. Small, isolated rural areas (2,947 to 1) and large towns (2,467 to 1) have lower staffing levels than urban areas. [46]

New dental workforce legislation

The 2007 state legislative session resulted in some important policy changes in the regulation of dental providers. Substitute House Bill (SHB) 1099 requires registration of dental assistants (an estimated group of 10,000 individuals) in Washington State. This same legislation also creates a new category of dental provider called "expanded function dental auxiliaries ("EFDA"). Both of these providers are to work under the supervision of a dentist licensed in Washington State. A review of the impact of these newly created professional categories will be undertaken by DOH by November 15, 2012.

SHB1298 relates to dental hygienist employed by health care facilities and in contractual agreements with schools and local health jurisdictions in the sealant programs. Dental hygienists may work in certain health care facilities, that will now include senior centers, to perform authorized dental hygiene operations and services with off-site supervision by a dentist licensed in Washington State. SHB1298 also allows dental hygienists providing sealants and fluoride varnish in schools to also remove deposits and stains from teeth surfaces. For all these activities, dental hygienists are required by the legislation to collect patient data on age, treatments rendered, insurance coverage, if any, and patient referral to dentists; such data will be forwarded to the State Department of Health quarterly. A report based on the data received will be provided to the Legislature in December 2008.

For more information on these newly enacted bills, refer to HYPERLINK "http://www.doh.wa.gov/cfh/Oral_Health/legislative.htm" http://www.doh.wa.gov/cfh/Oral_Health/legislative.htm.

Dental Health Professional Shortage Areas (dental HPSAs)

A Health Professional Shortage Area (HPSA) designation is needed for initial eligibility for certain state and federal programs. The DOH Office of Community and Rural Health (OCRH) collaborates with local partners and health jurisdictions to gather provider data for analysis. The shortage area requirements are quite complex. An area can have a county or partial-county designation. Qualifications are typically met if the population to provider ratio exceeds the required threshold and if care is not available or are beyond capacity in the surrounding areas. If an area meets these general requirements, OCRH prepares and submits a designation request for review by the Shortage Designation Bureau. These designations are voluntary and renewed every four years. In December 2006, there were 37 (one new request and 36 approved or pending renewal) dental HPSA designations in Washington.

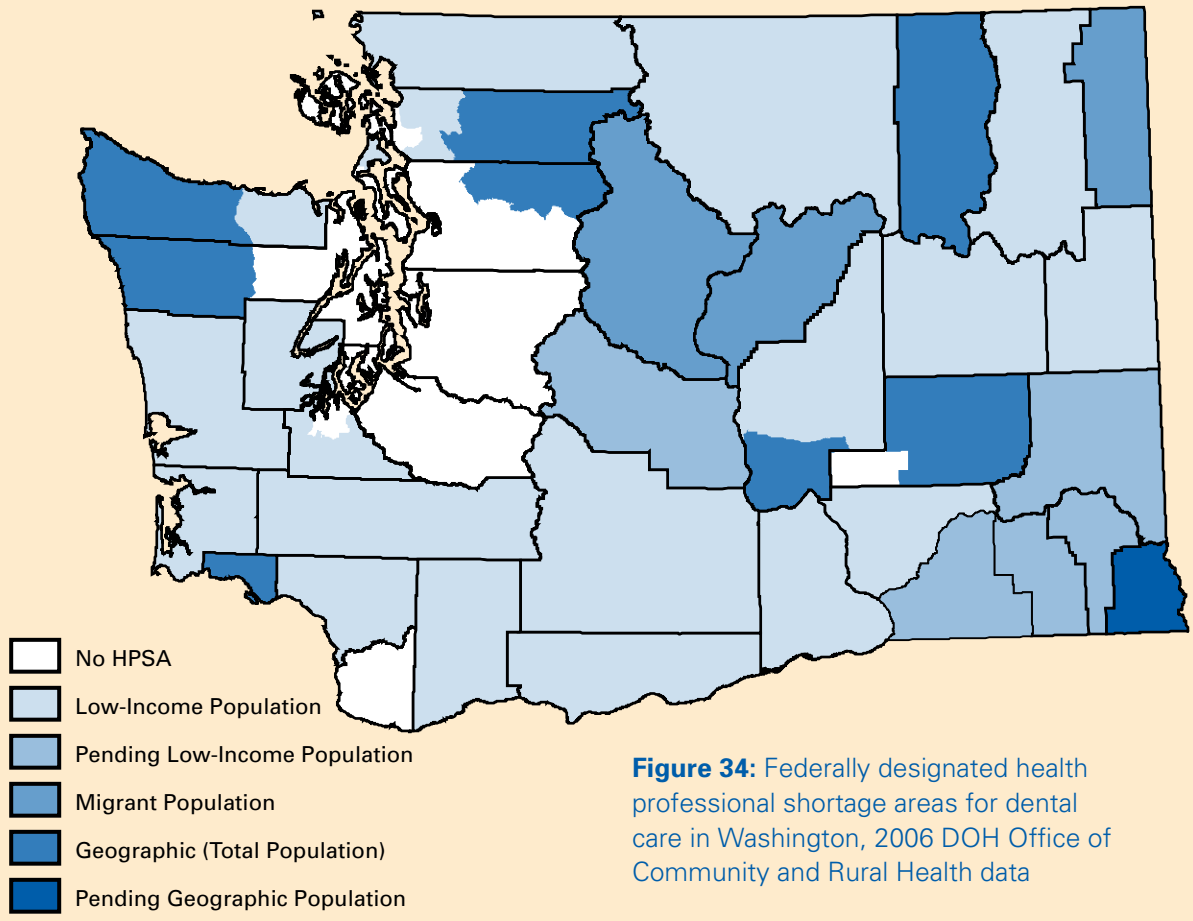


Figure 34: Federally designated health professional shortage areas for dental care in Washington, 2006 DOH Office of Community and Rural Health data

Dental educational institutions

Washington State has one dental school, eight dental hygiene programs, and seven dental assisting programs.

Dental school

The UW School of Dentistry was established in 1945. In addition to the Doctor of Dental Surgery (DDS) degree, the school offers Master of Science and DDS/PhD programs. The school enrolls 55 dental students a year, and its clinics, with 230 dental chairs, provide 66,000 patient visits a year. The school is also involved with several community service activities, including:

- Dental Education in Care of Persons with Disabilities (DECOD), which treats persons with severe disabilities and prepares dental professionals to meet their special oral health needs. DECOD provides more than 3,500 dental visits per year.
- The Pipeline Community-based Dental Education Program, which is designed to increase access to dental care for underserved populations and to increase recruitment and retention of disadvantaged and underrepresented minority students into dentistry.
- The Community-based Clinical Training Program, through which fourth-year dental students provide care in more than 15 community-based clinics statewide.
- The Oral Health Collaborative, which creates and delivers models for oral health education and prevention that involve local partners and can be replicated and sustained at the community level to improve the oral health of underserved children statewide.
- The Regional Initiatives in Dental Education (RIDE) program, a strategic partnership aimed at increasing the dental workforce and meeting oral health needs in the northwest region. RIDE will create regional training sites in areas lacking dental schools by partnering with regional universities, dentists, dental associations, community health centers, and others.

A pioneer initiative of the UW Schools of Dentistry and Medicine has been the creation and implementation of an oral health curriculum for medical students. Children are more likely to have medical than dental insurance, and oral diseases can be almost totally avoided by simple preventive measures. Therefore, physicians are in a unique position to influence oral health outcomes in vulnerable populations. This can be accomplished through the performance by physicians of oral health screening examinations, preventive interventions, patient counseling, and dental referral and collaboration. [48]

For more information about the UW School of Dentistry, visit its website at http://www.dental.washington.edu/.

Yakima Valley Farm Workers' dental residencies

The Yakima Valley Farm Workers Clinic and the University of Washington have created and currently operate two dental residency programs: one in General Dentistry and another in Pediatric Dentistry.

The Northwest Dental Residency is an Advanced Education in General Dentistry (AEGD) residency that started in 2006 with five residents placed in dental clinics in Spokane, Yakima, and Toppenish. The residency teaches comprehensive dentistry with an emphasis on practicing in rural communities, public health, cultural competency, and multidisciplinary health issues. The program enhances residents' ability to provide treatment using dental auxiliaries (hygienists and assistants) in an expanded-duty capacity. Residents are also exposed to mobile dental clinics that provide emergent and urgent dental care to underserved communities in the state. A new state law offers the residents an alternative path for dental licensure instead of the regional dental board examination to obtain a license in Washington State. Expansion is planned for the coming years. For more information, see http://www.aegdnorthwest.org/.

The Pediatric Dentistry Residency is based at the View Crest Pediatric Dentistry clinic and Children's Village, where dental services are provided for children with special health care needs. For more information, visit their website at: www.yvfwc.com.

Dental hygiene programs

Washington State has eight dental hygiene programs offering either baccalaureate or associate degrees. Together these schools graduate 247 professionals a year. The programs have clinics that offer oral hygiene services to their communities and the clinical activities of the students are supervised by faculty of dentists. Overall, they have dentists on staff to supervise the clinical activities of the students in training. The following websites provide more information about each dental hygiene program:

Undergraduate education

Clark College
www.clark.edu/academic_programs/technical/heoc/dental/

Eastern Washington University
www.csmt/ewu.edu.csmt/dnhy/dnhydept.htm

Lake Washington Technical College
www.lwtc.ctc.edu

Pierce College
www.pierce.ctc.edu/denthyg

Shoreline Community College
http://elmo.shore.ctc.edu/dental/

Yakima Valley Community College
www.yvcc.cc.wa.us/academics/workforceed/dental%20hygiene/

Columbia Basin College
www.cbc2.org/careers/dental/

Seattle Central Community College
http://www.seattlecentral.org/

Degree completion programs

University of Washington
http://depts.washington.edu/dhyg/

Eastern Washington University
www.csmt.ewu.edu/csmt/dnhy/expndgree.htm

Dental assisting programs

Washington has eight schools of dental assisting:

Apollo College
http://www.apollocollege.edu/dental_asst.asp

Bates Technical College
http://www.bates.ctc.edu/page.asp?view=151

Bellingham Technical College
http://www.btc.ctc.edu/CourseDocs/Programs/pDentalAssisting.asp

Clover Park Technical College
http://www.cptc.edu/wrl.asp?iSRN=11034&t=wrl

Lake Washington Technical College
http://lwtchost.ctc.edu/programs2/dental/dental/index.htm

Renton Technical College
http://www.rtc.edu/Programs/TrainingPrograms/DentalAssistant

Seattle Vocational Institute
http://sviweb.sccd.ctc.edu/p_ah_dent-as.htm

South Puget Sound Community College
http://www.spscc.ctc.edu/programs_of_study/dentalassist_ata_degree.html

Dental workforce diversity

One cause of oral health disparities is lack of access to oral health services among under-represented racial and ethnic groups. Increasing the number of dental professionals from these groups is an integral part of national efforts to improve access to care. [33]

HP2010 calls for increased diversity in the dental workforce. Suggested targets include: one percent for Alaska Natives, four percent for Asians, 13 percent for African Americans, and 12 percent for Latinos. Nationally, a 1997 survey conducted by the American Dental Association [49] showed that only 1.9 percent of active dentists in the United States identified themselves as black/African American, who comprise 12.1 percent of the U.S. population. About 2.7 percent of U.S. dentists are Hispanic/Latino, compared to 10.9 percent of the population. No state data are currently available on the diversity of the practicing dental workforce.

The low number of ethnic and racial minorities in dental school is a national issue. The UW School of Dentistry has taken several innovative approaches to increase its number of minority students over the years.

- In 1999-2000, a federal HRSA study indicated that in Washington: [44]
  - The majority of dental school graduates (65 percent), dental hygienist graduates (91 percent), and dental assistant graduates (79 percent) were non-Hispanic white.
  - Ten percent of the dentists in practice in 2000 were women, and 34 percent of the dental school graduates in 1999-2000 were women.
  - Nationally, 96 percent of dental hygienists and 99 percent of dental assistants were women.
- In 2006, 42 percent of dental school enrollees were women, and 71 percent of the enrollees were non-Hispanic white.

Table 15: University of Washington School of Dentistry enrollees by selected demographic characteristics, 2002-04 American Dental Education Association Reports and 2005-06 University of Washington School of Dentistry.

Total dental school enrollees	2002	2003	2004	2005	2006
Race and ethnicity					
White	35	37	40	36	39
African American	1	2	1	1	1
Native American/Alaska Native	0	0	0	0	1
Asian/Pacific Islander	9	15	10	14	12
Hispanic	1	1	4	5	1
Other †	10	0	0	0	1
Gender					
Male	32	34	35	35	32
Female	23	21	20	21	23
Residence status					
In-state	40	40	47	49	46
Out of State	15	15	8	7	9

† Categories "Other" and "Not reported" combined into "Other."

Dental Services

Use of dental services

Although appropriate self-care at home and population-based prevention are essential to prevent the onset of oral diseases, professional care also can help maintain optimal oral health. Regular dental visits provide opportunities for the early diagnosis, prevention, and treatment of oral diseases and conditions for people of all ages, as well as for the assessment of self-care practices.

Children (0-17 years)

Use of dental services is an important component of care. HP 2010 includes specific targets for use of dental services by children at least two years old (56 percent).

In Washington State:

- About 44 percent of children younger than five years have never visited a dentist.
- Hispanic children are more likely to have never visited a dentist than are other children.
- About 90 percent of children ages 12-17 years visited a dentist within the past 12 months. [50]
- Adolescents who do not speak English at home were significantly less likely to have visited a dentist within the past 12 months and

Figure 35: Use of oral health system by children, 2003 NSCH.

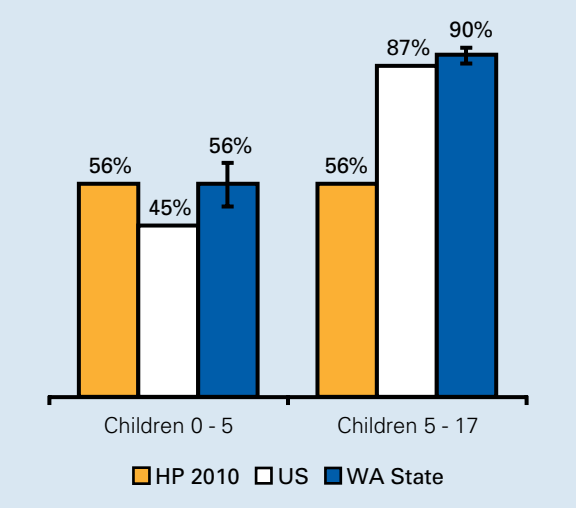


Table 16: Proportion of Washington children (0-17 years) who visited a dentist within the past year, 2003 NSCH.

Demographics	Dental visit < 1 year Children (0-17) (%)
Age	
0-4 years	52.7 (47.0-58.5)
5-9 years	90.5 (87.1-93.1)
10-14 years	89.4 (85.4-92.4)
15-17 years	90.1 (84.9-93.6)
Race	
White	82.5 (80.0-84.7)
Black	83.0 (69.9-91.1)
Multiracial	79.8 69.4-87.3)
Other	78.5 (66.0- 87.3)
Hispanic	
Yes	78.0 (70.5- 84.0)
No	82.4 (80.0- 84.5)
Poverty level	
<100% FPL	72.0 (64.2- 78.7)
100-185% FPL	77.6 (71.1- 83)
185-200% FPL	83.7 (71.5- 91.3)
200-400% FPL	84.0 (80.2- 87.3)
400+% FPL	86.1 (82.8- 88.8)
Maternal education	
Less than 12 years	84.1 (73.6-90.9)
12 years	75.3 (68.2-81.3)
More than 12 years	83.3 (80.9-85.4)

also significantly more likely to have never visited a dentist.

- About one in four adolescents in the eighth, tenth and twelfth grade reported that they had not been to a dentist in the past 12 months. [51]

Table 17: Dental visits among Washington eighth, tenth and twelfth grade adolescents by language spoken at home, 2004 WA HYS.

Time since last dental visit	Language spoken at home	Eighth grade (%)	Tenth grade (%)	Twelfth grade (%)
≤12 months	English	75.5 (72.8- 78.0)	77.2 (74.8- 79.5)	76.2 (76.7- 78.6)
	Other	58.1 (53.6- 62.5)	55.5 (50.7- 60.1)	53.0 (48.1- 57.8)
Never	English	1.6 (1.2- 2.1)	1.4 (1.0- 2.0)	1.6 (1.1- 2.2)
	Other	6.3 (4.6- 8.4)	5.1 (3.3- 7.7)	7.4 (5.4- 10.0)

Adults (≥ 18 years)

Adults who do not receive regular professional care may develop oral diseases that eventually require complex treatment, leading to tooth loss and other health problems. People who have lost all their natural teeth are less likely to seek periodic dental care than those with teeth, a situation that decreases the likelihood of early detection of oral cancer or soft tissue lesions from medications, medical conditions, and tobacco use; or from poor fitting or poorly maintained dentures.

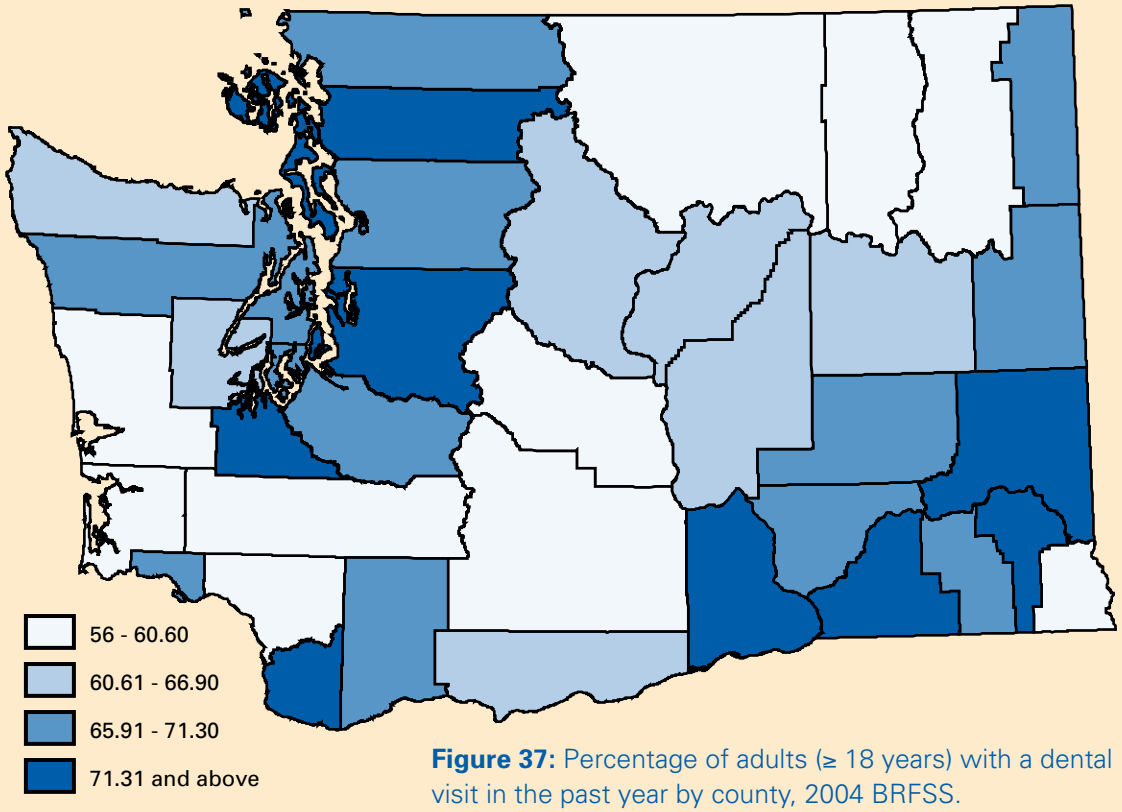
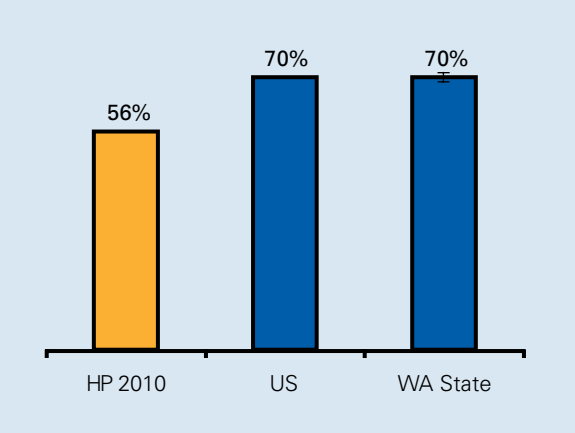


Figure 37: Percentage of adults (≥ 18 years) with a dental visit in the past year by county, 2004 BRFSS.

In Washington State:

- In 2004, about 70 percent of adults had visited a dentist within the past 12 months.
- American Indians, Hispanics, and those with high school or lower educational levels were among those people who were significantly less likely to have visited a dentist.

Figure 36: Use of oral health system by adults (18 years and older), 2004 BRFSS



Pregnant women

Studies documenting the effects of hormones on the oral health of pregnant women suggest that 25 percent to 100 percent of these women experience gingivitis, and up to 10 percent may develop more serious oral infections. [52, 53] Recent evidence suggests that oral infections such as periodontitis during pregnancy may increase the risk for preterm or low birth weight deliveries. [54] During pregnancy, a woman may be particularly amenable to disease prevention and health promotion interventions that could enhance her own health or that of her infant. [55] Pregnant women are strongly recommended to visit a dental professional during pregnancy for teeth cleaning and urgent services.

In Washington State:

- From 2001-2003, about 28 percent of pregnant women reported needing to see a dentist for a problem.
- Compared to white women, Native American and African American women were less likely to visit a dentist during their pregnancy when they had a dental problem.

Table 18: Dental visits during pregnancy by selected demographic characteristics, 2001-03 WA PRAMS.

Demographics	Had a problem/ Did not go to dentist (%)	Had a problem/ Did go to dentist (%)
Race and ethnicity		
Hispanic	8.0 (6.3-10.0)	29.2 (26.3-32.4)
African American	10.7 (8.7-13.2)	20.3 (17.5-23.3)
Native American	16.5 (13.8-19.6)	23.6 (20.6-26.8)
Asian Pacific Islander	7.0 (5.5-8.8)	20.3 (17.8-23.0)
White	8.1 (6.6-9.8)	16.0 (14-18.3)
Age		
15-17 years	§	20.3 (11.5-33.4)
18-19 years	14.0 (8.8-21.4)	19.8 (13.7-27.6)
< 20 years	13.2 (9.0-19.0)	19.8 (14.6-26.3)
20-24 years	11.8 (9.3-15.0)	21.7 (18.4-25.3)
25-29 years	9.1 (7.0-11.8)	19.0 (16.1-22.2)
30-34 years	5.6 (4.0-7.7)	16.6 (13.9-19.7)
35+years	2.8 (1.7-4.7)	17.1 (13.6-21.3)
Rural/urban		
Rural	9.1 (7.2-11.4)	19.1 (16.6-21.9)
Urban	7.8 (6.5-9.3)	18.6 (16.8-20.7)
Maternal education		
< 12 years	9.1 (6.8-12.2)	23.7 (20.2-27.7)
12 years	12.6 (10.1-15.6)	22.4 (19.2-26.0)
13+ years	5.6 (4.4-7.2)	14.5 (12.6-16.6)

Note: *(§) represent data where the Relative Standard Error (RSE) is >30%; therefore the data is too unreliable to report.*

Children with special health care needs and individuals with disabilities

Children with special health care needs and individuals with disabilities often have complex oral health conditions. Underlying congenital anomalies, as well as an inability to receive the personal and professional health care needed to maintain their oral health, may cause continuing problems.

Nationally, 78 percent of CSHCN reported needing dental care in the past 12 months in 2003, which was second only to prescription medications in the frequency of need. Of those who reported a dental care need, an estimated 755,581 or 10.4 percent of CSHCN did not receive all of the dental care they needed. Dental care is the most prevalent unmet health care need for CSHCN. Dental care should be an integral and explicitly stated part of the comprehensive coordinated services that the Medical Home aims to provide for CSHCN. [56]

Table 19: Percentage of children with special health care needs who had seen a dentist within the past year, 2003 WA NSCH.

Demographics	Percent who saw a dentist within past year
Race and ethnicity	
White	86.2 (80.4-90.4)
Black	§
Multiracial	95.3 (72.5-99.4)
Other	70.8 (31.2-92.9)
Hispanic	97.4 (89.4- 99.4)
Gender	
Male	83.5 (74.0- 90.0)
Female	89.4 (82.2-93.9)
Maternal education	
Less than 12 years	88.3 (44.1-98.6)
12 years	73.4 (52.6-87.3)
More than 12 years	89.5 (84.4-93.0)
Poverty level	
<100% FPL	67.8 (44.6-84.7)
100-185% FPL	80.8 (58.6-92.6)
185-200% FPL	§
200-400% FPL	87.9 (79.4-93.2)
400+% FPL	94.6 (89.6- 97.3)
Age	
0-4 years	63.7 (46.4-78.1)
5-9 years	88.6 (77.8-94.5)
10-14 years	85.9 (71.2-93.8)
15-17 years	95.0 (85.0-98.5)

***Note:** (§) represent data where the Relative Standard Error (RSE) is >30%; therefore the data is too unreliable to report.*

In Washington State:

- Children with special health care needs are more likely to have seen a dentist within the past year (86 percent) than are other children (82 percent).
- Adults with disabilities (age 18 years and older) were less likely to have seen a dentist in the past year compared to those without disabilities (63 percent vs. 72 percent, respectively). [11]

Long-term care residents

Residents of long-term care facilities have less access to dental providers. [57] HP2010 sets a target of 25 percent for use of the oral health system by adults in long-term care, compared with a current nationwide rate of 19 percent. There are currently no state data available on access to dental care by this population group.

HIV/AIDS

In Washington State:

- In 2006, about 14 percent (12,17 percent) of 18-65 year olds got tested for HIV in the past 12 months. [58]
- In the 2006 Statewide HIV Care Services Comprehensive Needs Assessment, providers considered oral health one of the two major gaps in access to services, and consumers considered oral health one of their four top health priorities.

Table 20: HIV/AIDS oral health service needs, 2006 HIV Care Services Comprehensive Needs Assessment.

Oral health services	Washington State (excluding Seattle-King County)				Seattle-King County			
	Consumer (n=518)		Provider (n=109)		Consumer (n=436)		Provider (n=187)	
	Rank¥	%	Rank¥	%	Rank¥	%	Rank¥	%
Service priority	2	65%	5	42%	4	62%	10	28%
Service gap	3	38%	1	41%	4	28%	2	48%
Service utilization	5	56%	N/A	N/A	6	59%	N/A	N/A

¥ Ranges from 1 to 10, where 10 is least important.

Financing of dental services

Dental insurance

Insurance coverage can help improve access to care when providers are willing to accept insured patients and to offer them regular examinations and needed treatment. About 16 percent of Americans were without medical insurance in 2005. [59] Rates of dental insurance coverage tend to be traditionally lower than those for medical insurance coverage—itself a major national concern.

Table 21: Dental insurance coverage for Washington children, 2003 NSCH.

Age	Washington State (%)	National (%)
Younger than 5 years	82.6 (78.9- 85.9)	75.7 (74.8-76.6)
5-9 years	87.0 (82.9-90.1)	84.1 (83.3-84.9)
10-14 years	86.9 (82.9-90.0)	83.1 (82.2-83.9)
15-17 years	88.6 (84.6-91.7)	81.7 (80.6-82.6)
Total (0-17 years)	86.1 (84.2-87.8)	81.1 (80.6-81.5)

In Washington State:

- About 86 percent of children ages 0-17 years were reported to have some type of dental coverage in 2003. [50]
- Approximately 70 percent of adults (ages 18 years and older) had some dental coverage in 2001. Only 34 percent of people older than 65 years reported having dental coverage. [60]

Nationally, only 22 percent of older persons were covered by dental insurance in 1995; most elderly dental expenses are paid out-of-pocket. [61] People with disabilities (59 percent) were significantly less likely than other people to report having dental insurance (68 percent). Lack of insurance was strongly related to whether someone recently used dental care. [60]

Table 22: Dental insurance coverage for Washington adults, 2001 WA BRFSS.

Demographics	Percent with dental coverage
Gender	
Male	70 (67-72)
Female	67 (65-69)
Race and ethnicity	
White	67 (66-69)
Black or African American	77 (67-87)
Asian	81 (75-88)
Native Hawaiian or other Pacific Islander	64 (43-86)
American Indian or Alaskan Native	75 (64-86)
Hispanic	63 (54-72)
Non-Hispanic	68 (67-70)
Age	
18-24 years	67 (61-73)
25-34 years	76 (73-80)
35-44 years	80 (77-83)
45-54 years	77 (74-80)
55-64 years	67 (63-72)
65+years	34 (30-37)

Dental Medicaid for children and adults

National perspective

Medicaid is a significant source of financing for oral health services, particularly for children and adolescents. Nearly all state Medicaid programs have identified access to dental care as a significant and persistent problem for enrolled persons with Medicaid. [62]

Oral health status and access to dental services are issues for all populations served by Medicaid. Dental caries are concentrated in low-income children, who are most likely eligible for Medicaid coverage. Recent surveys indicate that Medicaid-eligible children have three times the level of unmet dental care than do children in higher-income families. [62] Medicaid provides health care coverage for about a fourth of all children in the United States and plays a significant role in providing access to health care for other population groups, including low-income women, pregnant women, adults with disabilities, and the elderly. Medicaid is also the only insurance that covers both dental and medical services, which is a significant benefit to CSHCN and individuals with disabilities.

In a 1999 survey of Medicaid dental programs, nearly all responding states (42 of 44) indicated problems with access to dental care for Medicaid-enrolled children. Reflecting the priority placed by states on improving access to dental services, nearly every state has undertaken efforts to improve access to dental care for Medicaid beneficiaries. [62]

The significant barriers that low-income people face to accessing dental services include:

- State budget limits that make it difficult for Medicaid to match mainstream dental insurance in terms of reimbursement levels and covered services.
- Low or declining participation of dentists in Medicaid.
- A declining supply of dentists and dental hygienists for the general population, particularly in inner city and rural areas.
- Inadequate dental service capacity of “safety net” providers.
- Administrative procedures (including coverage and billing) that are incompatible between Medicaid and other dental insurance.

- Dentists' negative perception of Medicaid enrollees.
- Burdensome authorization procedures or billing requirements in some Medicaid programs.

Services provided

Washington's dental Medicaid program is designed to provide quality dental and dental-related services to eligible Medicaid clients. Although most Medicaid clients are enrolled in managed care plans for health services, all oral health services are delivered on a fee-for-service basis. The two major types of dental coverage through Medicaid in Washington are:

- Comprehensive dental coverage for young children (age 0-5 years) and school-age children (age 6-17 years)
- Limited coverage for adults (18 years and older), which excludes crowns, posterior root canals, and some surgical procedures. Some services require prior authorization, such as dentures and anterior surgical extractions. (Several state programs provide no adult services.) Washington is one of the 11 states that still provide dental services for adults.

For more information, refer to the website www.dshs.wa.gov; searching for the dental Medicaid program.

Eligibility and utilization

Eligibility for Medicaid is governed by both national and state criteria. People who are not U.S. citizens may qualify for Medicaid to cover only the costs of responding to life-threatening medical emergencies. Dental services are required as a benefit for most Medicaid-eligible individuals 21 years and younger as part of the federal Early Periodic Screening, Diagnosis, and Treatment (EPSDT) Program. Services must include, at a minimum, relief of pain and infections, restoration of teeth, and maintenance of dental health. Dental services may not be limited to emergency services for EPSDT recipients.

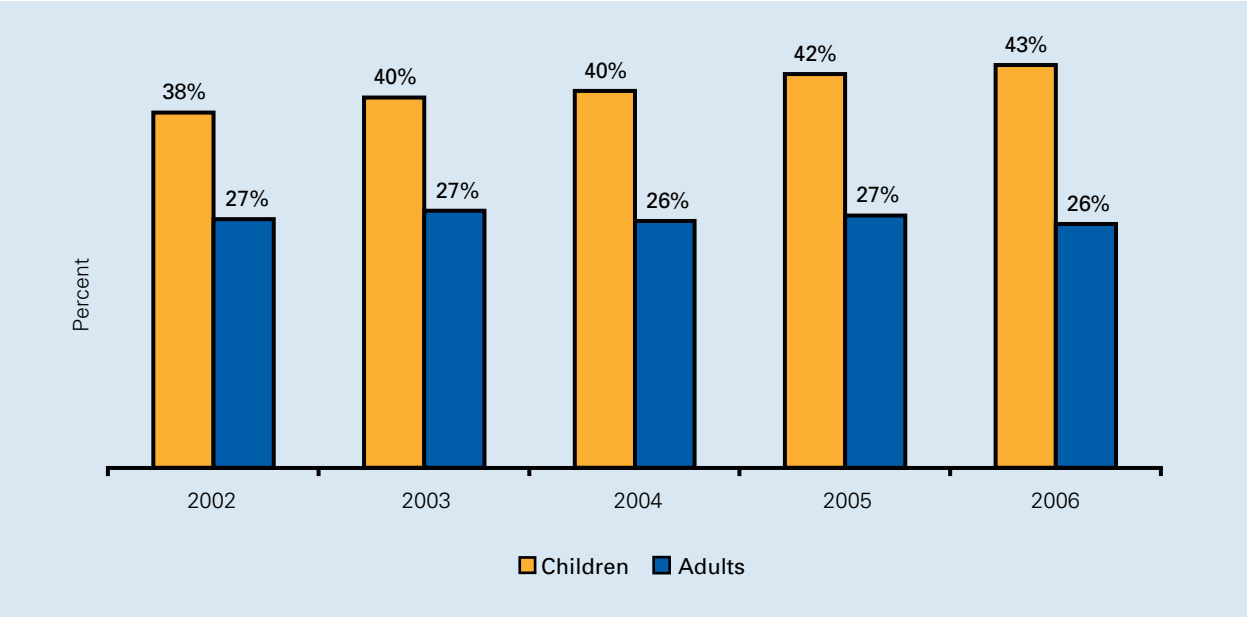
In 2005, Medicaid covered pregnant women up to 185 percent of the FPL and for the costs of prenatal care and deliveries for about 48 percent of births in Washington State. [63]

The State Children's Health Insurance Program (SCHIP) provides Medicaid coverage for children of families with incomes between 200 percent and 250 percent of FPL.

Of Washington's FY 2005 total Medicaid enrollment of about 1.1 million individuals, about 36 percent used Medicaid-financed dental services. For at least one month of the year, 650,000 children were enrolled in Medicaid, and 28,000 were enrolled in SCHIP.

The following graph shows that the percentage of Medicaid users in Washington has increased over time.

Figure 38: Dental users as a percentage of people eligible for Medicaid in Washington, 2002-06 WA Medicaid data.



Expenditures

Nationally, federal Medicaid expenditures for dental care totaled $2.3 billion in 2003, or three percent of the $74.3 billion spent on dental services nationally. [64] In Washington, total Medicaid payment for dental care has decreased for adults, but it increased for children during 2004-06. See Figure 40 for details. In 2006, Medicaid payments per user per year were $283 for those ages 0-5 years, $277 for those ages 0-20 years, and $280 for those ages 21 and older.

Figure 39: Annual Medicaid expenditures by age, FY 2002-06 WA Medicaid data

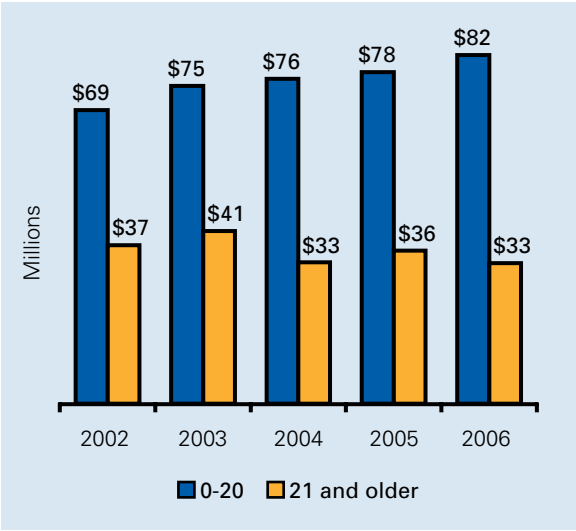
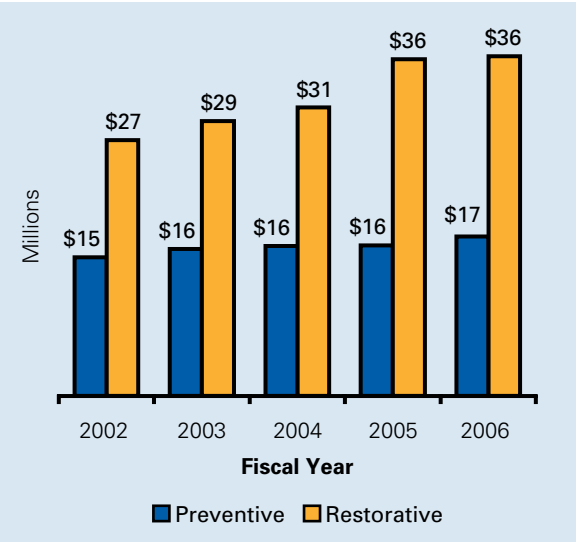


Figure 40: Annual Medicaid payments by type of procedure, FY 2002-06 WA Medicaid data



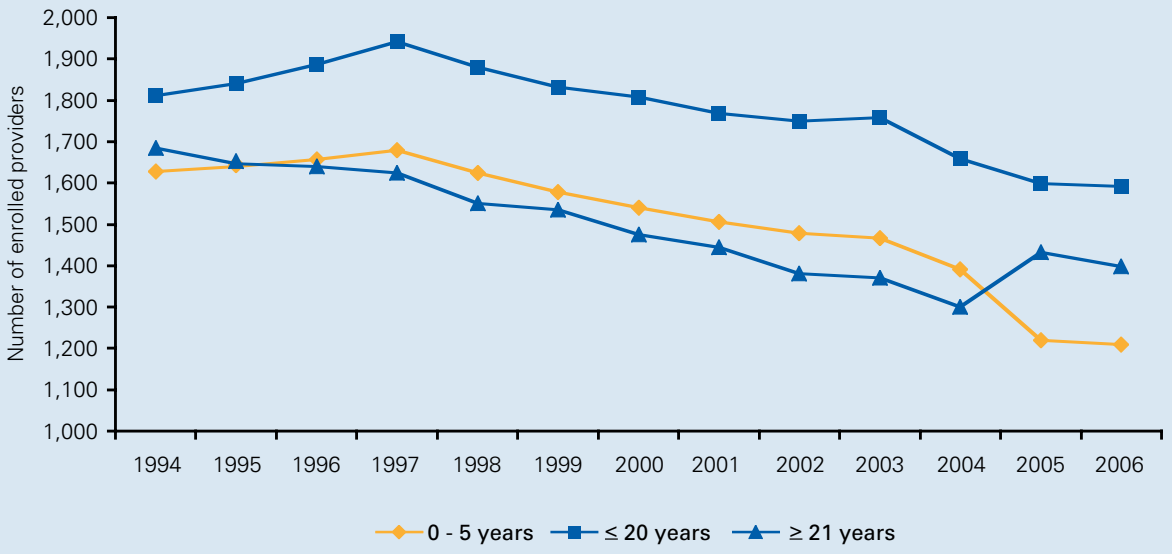
Providers enrolled

The declining participation of dental providers in Medicaid is a national problem. In Washington, one county (Skamania) had no Medicaid dental providers as of December 2006.

States have considered a variety of approaches to improving access to dental services for Medicaid enrollees. Strategies include the following:

- Adequate coverage for enrollees.
- Adequate payment for providers.
- Improved dentist participation.
- Enrollment outreach to eligible persons.
- Expanding eligibility standards through Medicaid and SCHIP. [62]

Figure 41: Dental provider participation in Washington Medicaid, 1994-2006 WA Medicaid data

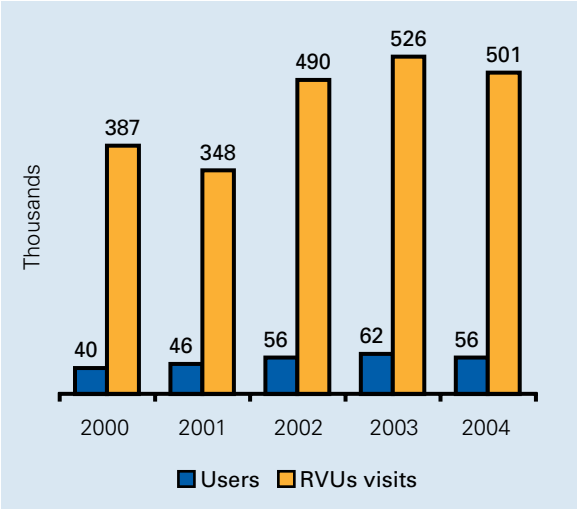


Community Health Services grant program (Health Care Authority)

The Washington State Health Care Authority Community Health Services (CHS) Program supports clinics that serve people without health insurance. Contracting with 33 clinics in 2005, CHS helped to provide medical, dental, and migrant services for low-income and special populations throughout Washington. The target populations for these grant-funded services are people with incomes within 200 percent of FPL with no other health care coverage.

In 2005, the number of "sliding fee" clinic visits and patients decreased, a drop attributed to changes in Medicaid and to a reduction in the number of appointments available.

Figure 42: Number of relative value unit (RVU) visits in Washington Community Health Services clinics, 2000-04.



Oral health programs and services

The Oral Health Program is organizationally placed within the Office of Maternal and Child Health at the Department of Health. This program focuses on prevention through assessment, policy development, and assurance.

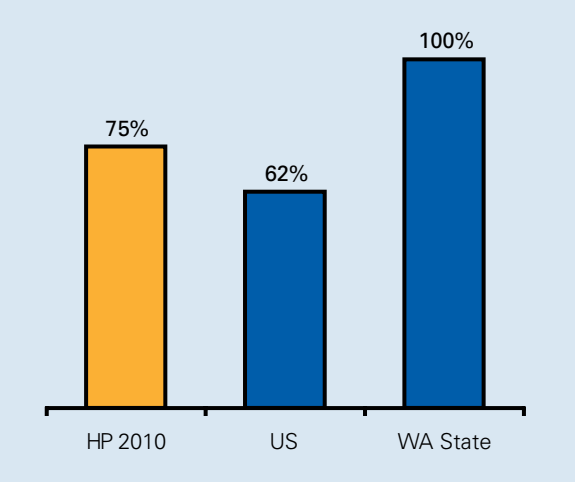
Although the State Oral Health Program does not provide direct clinical services, it works in close cooperation with 35 local health jurisdictions to address local oral health issues. Other organizations that provide dental public health services include: primary care safety net dental clinics (community and migrant health centers, free clinics, Public Health—Seattle & King County dental clinics), Indian Health Services dental clinics, correction facilities, mobile dental services, faith-based and charitable organizations, the ABCD Program, and Kids Get Care.

Local Health Jurisdictions (LHJs)

The MCH Oral Health Program relies on the close cooperation with local health jurisdictions (LHJs) to respond to public health issues. The LHJs are local government agencies, not satellite offices of the state Department of Health.

Local oral health activities supported by the state include surveys, coalition building, strategic planning, oral health education, school-based sealant programs, and referrals for high risk children. Local oral health coordinators facilitate communication with local agencies and technical assistance to facilitate the integration of services at the local level. This work helps build a network to assist children and families in navigating through the state's dental public health system.

Figure 43: Local health departments with oral health components in Washington.



HP2010 encourages all state and local health departments to have oral health components and oral health programs to have a dental director with a public health background.
In Washington State:

- The Department of Health has an Oral Health Program under the Office of Maternal and Child Health. The program's staff includes two dentists with graduate degrees in public health.
- All 35 LHJs have oral health programs, and all but five of these programs have a full-time oral health coordinator who provides and coordinates local oral health services. Among these staff are 11 dental hygienists and 25 public health professionals, such as nurses or health educators. Three of the 35 local oral health coordinators hold graduate degrees in public health.

Primary care safety net dental clinics

Primary care safety net providers are clinics and facilities with the explicit mission and mandate to serve low-income and uninsured individuals with services that include dental care. In Washington State, these providers include:

- Twenty-five community and migrant health centers (23 federally qualified and 2 look-alikes) with a total of 130 sites, 53 of which offer dental services.
- Twenty-one free clinics, three of which provide dental services.

- Six public health clinics in Seattle and King County, all of which offer dental services.

This list does not include entities that have a supporting role, such as tribal health clinics, federally certified rural health clinics, or campus health clinics.

For a complete list of the safety net dental clinics, refer to the DOH Office of Community and Rural Health website at http://www.doh.wa.gov/hsqa/ocrh/har/safetynet.xls

HP 2010 objective requires 75 percent of local health departments and community-based health centers—including community, migrant and homeless health centers to have an oral health component. Nationally, this rate was 62 percent in 2002. [65]

Figure 44: Dental encounters and dental users at CMHCs, 2000–05
WA Health Care Authority data.

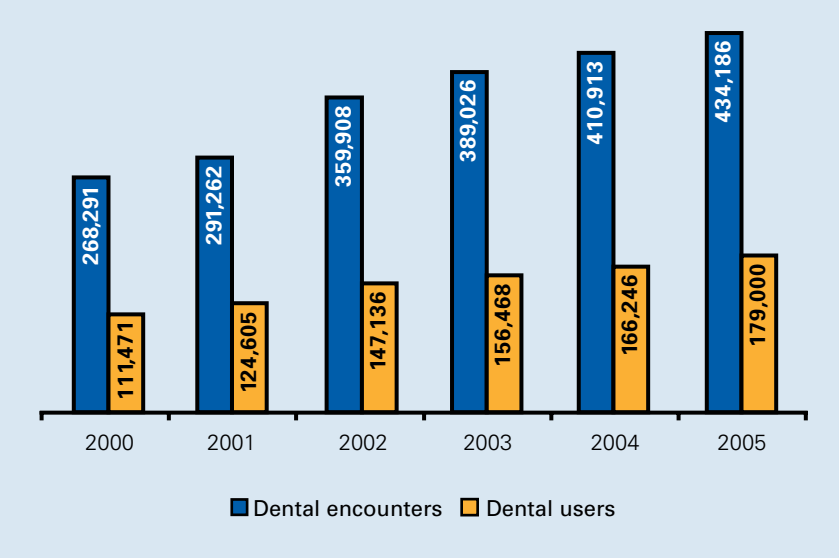
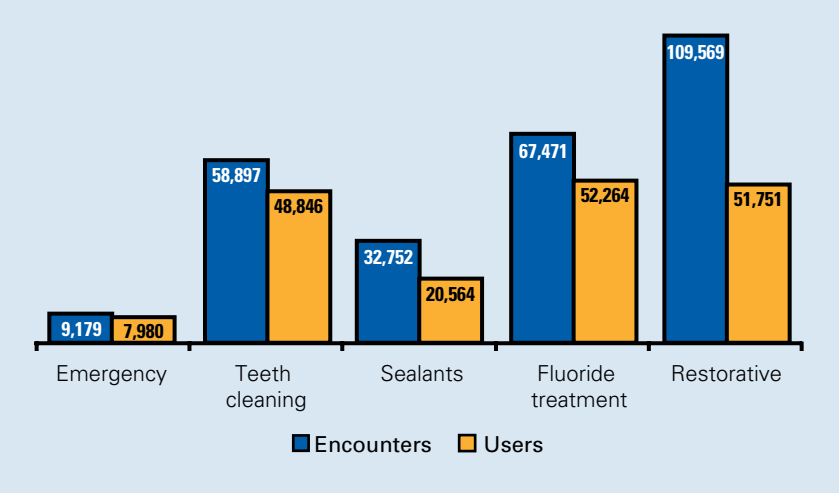


Figure 45: Dental encounters and users by services provided at CMHCs, 2004 WA HCA data.



In Washington State:

- Fifty-seven percent of Community and Migrant Health Centers (CMHCs) have an oral health component. The range of services provided varies.
- Since 2000, dental encounters in CMHCs have increased 54 percent due in part to additional dental providers—including a 38 percent increase in uninsured dental patients. In 2005, CMHC dental providers served over 179,000 dental patients (a total of 434,186 dental encounters), with an average of 940 Medicaid dental patients per provider. Most of these dental encounters were for restorative services. Nearly 9,200 encounters were for emergency dental services.

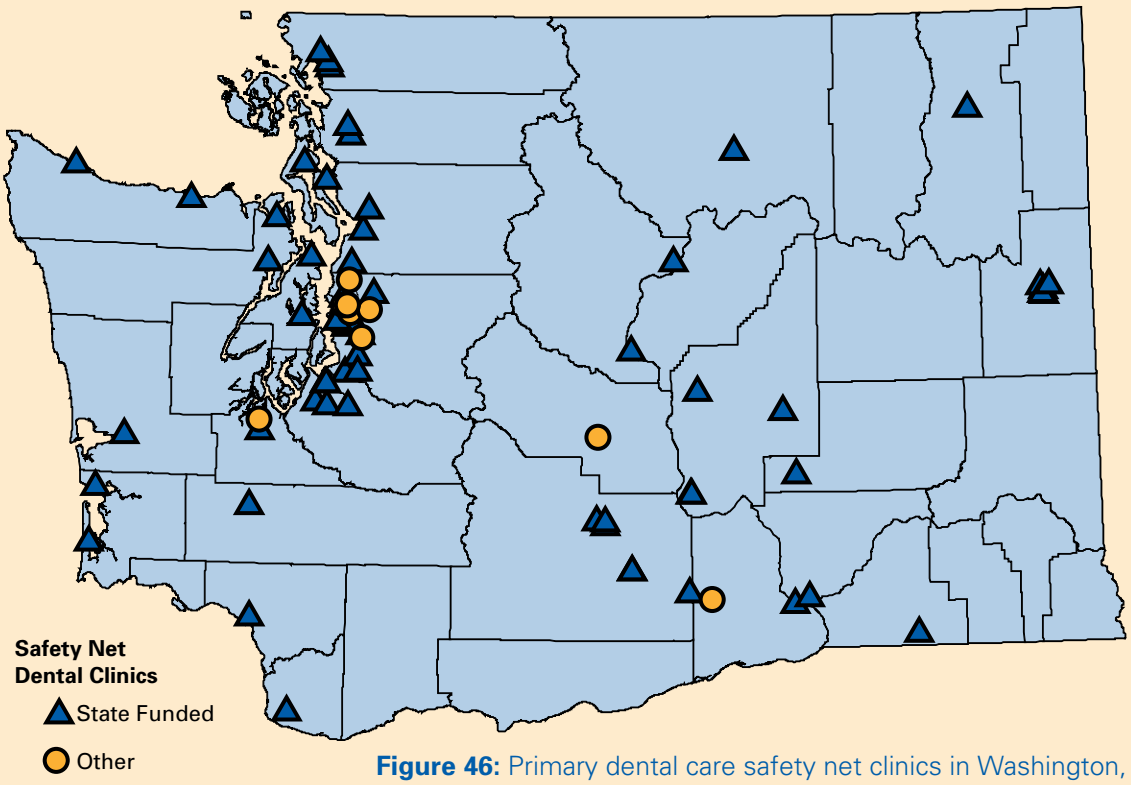


Figure 46: Primary dental care safety net clinics in Washington, 2005 DOH Office of Community and Rural Health.

Indian Health Services dental clinics

There are 29 federally recognized tribes, all of which provide health services to their members. Of these, 23 provide dental services, ranging from preventive to comprehensive care. For more information, refer to the 2005-07 American Indian Health Care Delivery Plan, July 2005 (http://www.aihc-wa.org/AIHCDP/aihcdp.htm).

Correction facilities

Of Washington's 15 prisons, ten have their own dental clinics. The Department of Corrections (DOC) employs 14 dentists and three dental hygienists who are full-time state employees and an additional six dentists and two dental hygienists who contract with the agency to provide care to inmates. Locations of these facilities and population data can be found on the DOC website at www.doc.wa.gov.

The primary mission of these dental clinics is to provide acute and urgent care for offenders. Treatments, for the most part, address infection, traumatic injuries, and severe pain. The major facilities provide routine dental screening and restorative care such as fillings, extractions, and treatment of infections for offenders housed for more than two years.

The major oral health issues common among offenders center on the dental effects of drug abuse. These include the elevated levels of serious caries among users of illegal drugs such as methamphetamine, as well as the effects of legal substances such as tobacco.

Dental mobile services

Mobile dental vans provide dental care to community residents, CSHCN, and individuals with disabilities in areas without access to other dental care providers. Some vans are operated by:

- Northwest Medical Teams International: four mobile dental clinics that served 7,055 people in Western Washington during FY 2005-06: http://nwti.convio.net/site/PageServer?pagename=what_mobile.
- Yakima Valley Farm Workers Clinic: http://www.yvfwc.com/mobile.html.
- Olympic Community Action Program: http://www.olycap.org/index.html.
- University of Washington DECOD Program (for persons with disabilities). They provide basic dental care, including fillings, extractions, prosthetic appliances (dentures and partials), preventive procedures (prophy/fluoride), routine exams, and X-rays in Seattle, Snohomish, Centralia, Clarkston, and Walla Walla: http://www.dental.washington.edu/departments/oralmed/decod/.
- Southwest Washington's Mobile (free) Clinic serves people age 21 years and younger and families, providing basic urgent dental care twice a month: http://www.freeclinics.org/.
- SmileMobile by the Washington Dental Service Foundation provides comprehensive dental care to approximately 2,100 children each year in about 33 underserved communities statewide. http://www.deltadentalwa.com/wdsfoundation/w_5.htm.
- Interfaith Community Health Center, Whatcom County: http://www.interfaithchc.org/DentalService.htm.

This list will be updated as we learn more about other mobile services around the state.

Access to Baby and Child Dentistry (ABCD) program

This program supports a collaborative approach to increasing the number of Medicaid providers serving children ages 0-5 years and improving access to preventive and restorative care starting at age one for Medicaid-eligible children. For more information, refer to http://www.abcd-dental.org/.

Kids Get Care

This program ensures that children in King County, regardless of insurance status, receive early integrated preventive physical, oral, mental, and developmental health services through attachment to a Medical Home. For more information, refer to http://www.metrokc.gov/health/kgc/.

Oral Health Disparities

One of the two major goals of Healthy People 2010 is to decrease disparities. Despite some of the gains in oral health status for Washingtonians as a whole, disparities persist.

Race and ethnicity. Non-Hispanic Blacks, Hispanics, and American Indians/Alaska Natives generally have the poorest oral health of any of the racial and ethnic groups in the United States. African American adults are more likely than other racial or ethnic minorities to have periodontal disease. Compared to whites, African Americans are more likely to develop oral or pharyngeal cancer, are less likely to have it diagnosed at early stages, and will have lower five-year survival rates. Racial and ethnic minorities in general are also more likely to be uninsured and have poor access to dental care.

Gender. Most oral diseases and conditions are complex and represent the combination of interactions between genetic, socioeconomic, behavioral, environmental, and general health influences. Multiple factors may act together to place some women at higher risk for oral diseases. For example, the comparative longevity of women, compromised physical status over time, and the combined effects of multiple chronic conditions, often with multiple medications, can result in increased risk of oral disease. [66] A greater share of women than men have oral-facial pain, including pain from oral sores, jaw joints, face and cheek pain, and burning mouth syndrome. But many statistical indicators also show women to have better oral health status compared to men. [1] Adult women are less likely than men of every age group to have severe periodontal disease. Both African American and white women have a substantially lower incidence rate of oral and pharyngeal cancers compared to African American and white males, respectively. Also, females tend to visit the dentist more frequently than do men.

Age. Most children at all income levels are covered by private insurance or through Medicaid and related programs. This is not the case for adults. Washington State provides limited Medicaid coverage for low-income adults, and adults working full-time usually receive health insurance through their employers. But adults living just above the federal poverty level and part-time employees generally are not covered by any dental insurance plan. This situation leads to untreated oral diseases in adults, which can cause pain, infection, missing days at work, low productivity, and low self-esteem. Washington's 2005 Smile Survey shows that disparities continue in terms of caries and sealants for children.

Rural and urban. People living in rural areas have a higher disease burden due primarily to difficulties in accessing preventive and treatment services. Nationally, dental care utilization differs between rural and urban residents, with rural residents tending to underutilize dental care. [67] National and state rural health experts have identified oral health as the third major rural health priority. [68] Access to dental care is further undermined in rural areas because of a shortage of dental professionals and difficulties with transportation. Additionally, a higher proportion of dentists are expected to retire by 2013 in the rural areas (57 percent) than in the urban areas of Washington (50 percent).

Individuals with disabilities and children with special health care needs (CSHCN). Overall caries rates are higher among those with disabilities than those without. [1] Access to dental care is also compromised for this group of individuals because insurance coverage may not always be sufficiently comprehensive, and it may be difficult to find dental professionals trained to provide care.

Income level. People living in low-income families bear a disproportionate burden from oral diseases and conditions. For example, despite progress in reducing dental caries in the United States, individuals in families living in poverty experience more dental caries than those who are economically better-off. The caries seen in these individuals are more likely to be untreated than caries in those living above FPL. Nationally, 37 percent of low-income children ages 2-9 have one or more untreated caries in primary teeth, compared to 17 percent of other children. [1] Poor adolescents ages 12-17 years in each racial and ethnic group have a higher percentage of untreated decayed permanent teeth than the corresponding, non-poor adolescent group. Poor Hispanics (47.2 percent) and poor non-Hispanic black adolescents (43.6 percent) have more than twice the proportion of untreated decayed teeth than poor non-Hispanic white adolescents (20.7 percent). For non-poor adolescents, the proportion of untreated decayed permanent teeth is highest in non-Hispanic black adolescents (41.7 percent)—a proportion only slightly lower than for this group's poor counterparts (43.6 percent). The mean number of permanent teeth affected by dental caries (decayed or filled) for this age group is similar among Hispanics (2.7), non-Hispanic whites (2.5), and non-Hispanic blacks (2.3). As income level increases, the percentage of adolescents with decayed teeth decreases and the proportion of decayed teeth that have been filled increases. [69]

At every age, a higher proportion of those at the lowest income level have periodontitis than do those at higher income levels. Adults with only a high school education or less are 2 to 2.5 times more likely to have destructive periodontal disease than those with some college education. [33] Overall, a higher percentage of Americans living below the poverty level are edentulous (lost all their natural teeth) than are those living above. [1] Among persons ages 65 years and older, 40 percent with less than a high school education were edentulous in 2004, compared with 10 percent of persons with at least some college education. People living in rural areas also have a higher disease burden due primarily to difficulties in accessing preventive services and treatment.

Community Initiatives: Oral Health Coalitions

A community coalition represents a diverse group of individuals and organizations who work together to reach a common goal. Coalitions help build community partnerships, increase resources for oral health activities, promote advocacy, educate, increase visibility and recognition of oral health, and combine resources to implement joint strategies to address unmet local oral health needs and eliminate disparities.

Successful coalitions include representatives from the community and from the public and private sectors. These include: community leaders, government agencies, dental professional organizations, social service organizations, non-government organizations, community health centers and clinics, colleges and universities, faith-based organizations, businesses, insurance companies, foundations, and other public health programs.

With accurate local needs assessment information at hand, oral health coalitions can serve a variety of purposes:

- Educate others and raise awareness within the community about local and state oral health needs and help strengthen the state and local oral health programs.
- Assist in formulating plans with strategies to address their oral health needs.
- Recommend oral health program activities to local or state oral health programs.
- Identify additional financial resources within the community.

Coalition goals are as varied as coalitions themselves, but they often contain elements of one or more of the following activities:

- Influencing or developing public policy, usually around a specific issue.
- Changing people's behavior (reducing smoking or drug use, for example).
- Building a healthy community by addressing issues of the community's *physical health* (including not only medical and preventive or wellness services but also the environment, community planning, housing, hunger, substance abuse, and other factors) and its *social and psychological health* (encompassing diversity, education, culture and the arts, violence prevention, youth development, employment, economic development, mental health, and other human services).

The MCH Oral Health Program supported the creation of the Washington State Oral Health Coalition (WSOHC) in 1989 and today promotes the development of county-based (local) oral health coalitions as a source of local oral health expertise. The state coalition counts on almost 100 members, and there are also 32 smaller county-level oral health coalitions throughout Washington. These coalitions play a vital role in building local infrastructure to improve the oral health and overall health status of their communities.

The Washington State Community Roots Guide for Oral Health Coalitions is considered a national landmark in the field.

The WSOHC is a broad-based group of organizations and individuals whose mission is to promote and advocate for optimal oral health for all Washington State residents.

In support of the WSOHC mission, the coalition's guiding principles are:

- Universal access to oral health care.
- Promoting oral health services that are community-based, preventive and culturally appropriate.
- Creating partnerships with public, private, and community-based stakeholders, decision-makers, and the public regarding oral health issues.
- Clear and open communication with all stakeholders to facilitate mutual goals and objectives.
- Both the right and responsibility of individuals to participate in decisions affecting their own oral health.
- Encouraging creative approaches to oral health issues.
- Advocating for and promoting oral health intervention strategies based upon sound scientific principles.
- Recognizing the value and strength of the current dental delivery system.
- Accomplishing our mission through teamwork and continuous improvement.

Oral Diseases And Other Systemic Conditions

Impact of oral diseases on general health and quality of life

Oral health means much more than beautiful teeth. It means freedom from chronic oral-facial pain, oral and throat cancers, oral soft tissue lesions, birth defects such as cleft lip and palate, and other diseases and disorders that affect the craniofacial complex. These are tissues whose functions are often taken for granted but are essential to the quality of our daily living. They allow us to speak, smile, sigh, and kiss; smell, taste, touch, chew, and swallow; cry out in pain; convey feelings and emotions through facial expressions; and do well at school and at work. They also provide protection against microbial infections and environmental insults. These functions can be applicable to the foods we choose to eat, our social interactions, our employment opportunities, and our self-esteem. [1]

Given the importance of the mouth and teeth in verbal and nonverbal communication, diseases that disrupt their functionality are likely to damage self-image and alter the ability to sustain and build social relationships and life satisfaction. [1] Poor oral health causes unnecessary pain and discomfort that can affect children's learning, concentration and performance at school, as well as their ability to thrive. [70, 71]

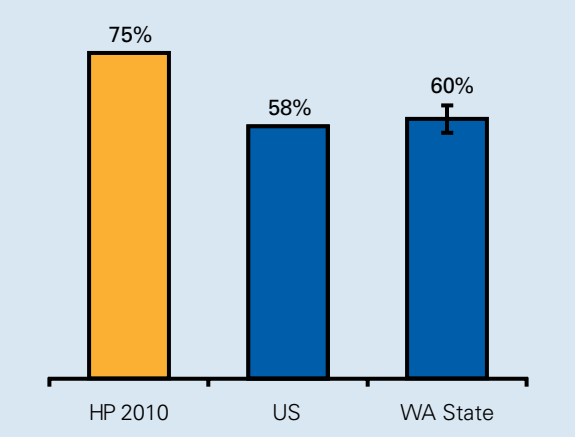
Adults can also suffer from poor oral health and fail to be productive at work. Many systemic diseases and conditions manifest themselves initially in the mouth. Therefore, early diagnosis by a dental professional can lead to early referral to the appropriate health professional.

Impact of oral diseases on systemic diseases

The mouth—the lungs, intestines, and genitourinary tract—are potential entry sites through which a multitude of bacteria may gain access to the body. [72] If a patient's general condition is weakened for any reason, normally harmless oral bacteria may become detrimental and initiate a local opportunistic infection or affect other parts of the body. [73, 74]

Several systemic diseases can result from infectious oral microbes, especially in patients with immunological and nutritional deficiencies, where oral microbes are granted systemic access. Therefore, the control of existing oral infections is clearly of great importance and a necessary precaution to prevent systemic complications. [75] More research is being conducted in this area.

Figure 47: Adults with diabetes who had an oral exam last year, BRFSS 2004.



Diabetes

Diabetes is a serious disease with considerable economic costs for individuals and health systems. Its incidence is increasing because of rising rates of obesity and the aging of the population. [76] The two-way relationship between diabetes and oral health has been widely studied. Given their compromised ability to respond to infections,

people with diabetes are more susceptible to periodontal disease [75, 77, 78] and have an earlier onset of severe periodontal disease than do non-diabetics. [79-81] Diabetics with periodontal disease have more difficulty in controlling their blood sugar and therefore suffer from worsened diabetes. And diabetics react to periodontal infection with aggravated destructive responses [82-84] that include reduced immune response and reduced ability for tissues to heal.

HP2010 requires 75 percent of diabetics to have had an annual dental examination; the national average is 58 percent.

In 2004, 6.4 percent of Washington adults (ages 18 years and older) reported having diabetes, and about one percent of women reported gestational diabetes. About 60 percent of adults with diabetes had a dental visit in the previous year. Also, tooth loss was more likely to occur in adults with diabetes.

Table 23: Last dental visit by diabetes status for Washington adults, 2004 WA BRFSS.

Diabetes	Last dental visit				
	Past year	Past two years	Past five years	More than five years	Never
Yes	59.7% (56.5%-62.9%)	11.8% (9.7%-14.0%)	10.4% (8.6%-12.2%)	17.4% (14.9%-19.9%)	0.7% (0.3%-1.1%)
Yes, gestational	69.2% (61.1%-77.2%)	12.2% (6.8%-17.5%)	§	§	§

***Note:** (§) represent data where the Relative Standard Error (RSE) is >30%; therefore the data is too unreliable to report.*

Table 24: Teeth lost by diabetes status for Washington Adults, 2004 WA BRFSS.

Diabetes	Teeth lost			
	None	Five or fewer	Six or more	All
Yes	37.8% (34.4%-41.2%)	29.3% (26.3%-32.4%)	19.2% (16.7%-21.7%)	13.7% (11.5%-15.8%)
Yes, gestational	65.6% (57.1%-74.1%)	25.3% (17.6%-32.9%)	§	§

***Note:** (§) represent data where the Relative Standard Error (RSE) is >30%; therefore the data is too unreliable to report.*

Cardiovascular diseases

Cardiovascular disease (CVD) is the second leading cause of death in the United States, and it has some of the highest economic costs. The American Heart Association reports that in 2004, 871,500 Americans died of CVD—these mortality data are for whites and African Americans only. The estimated prevalence of CVD among adults age 20+ is 79.4 million. [85]

Some studies have reported a moderate relationship between periodontal disease and cardiovascular disease. Because periodontal and cardiovascular diseases are highly prevalent in the population, periodontal disease is a public health problem worthy of attention, even though the strength of the association may only be moderate. [86]

About 30 percent (13,796) of all Washington deaths in 2005 were due to cardiovascular disease (stroke or heart disease). In 2005, the most common form of cardiovascular disease, coronary artery disease, had an age-adjusted mortality rate of 125 per 100,000, which was lower than the national age-adjusted rate of 151 per 100,000 *(US data is from 2004)*. In 2005, about 7.3 percent of adult Washingtonians reported having been told that they had cardiovascular disease, which the BRFSS defines as including heart attack, angina, coronary artery disease, or stroke.

Respiratory diseases

Several studies have shown an association between poor oral health and respiratory disease. Dental plaque seems to work as a reservoir of potential respiratory pathogens in high-risk patients, such as alcoholics, diabetics, and institutionalized or hospitalized people. These individuals may be prone to oropharyngeal colonization by potential respiratory pathogens due to their compromised swallowing reflexes. [75] Associations have been found with lung infections, pneumonia, and chronic obstructive pulmonary disease. With the continuing emergence of antibiotic resistant bacteria, pneumonia is likely to assume increasing importance in the near future. [75] Hence, even a modest effect of poor oral health on pneumonia would have great public health implications.

Preterm birth and low birth weight infants

Preterm birth and low birth weight babies are a major public health problem worldwide, with substantial associated morbidity, mortality, and societal costs. [1, 75, 87-89] In 2005, the rate of low birth weight for singletons (used so that factors other than plurality can be explored) was 4.8 percent, representing 3,902 births in Washington State, and the overall rate of low birth weight (including multiple births) was 6.2 percent (5,199 births). Comparably, 2004 national data shows a singleton rate of 7.0 percent and an overall rate of 8.1 percent [90] In Washington State, preterm deliveries have been increasing since 1993, for a total preterm delivery rate of 10.4 percent in 2005. The rate of singleton preterm births is almost twice the rate of singleton low birth weight rates. From 2001-03, about 70 percent of singleton preterm infants were also normal birth weight. Therefore, a variety of other factors are affecting preterm birth rates. [91]

Infections can be major risk factors in preterm birth. Some studies suggest a strong potential association between periodontal disease and preterm birth. During pregnancy, there are alterations in psychology and behavior, with a tendency toward lack of personal care, including oral hygiene. [92] Pregnant women also experience metabolic and hormonal changes, which could lead to pregnancy gingivitis and pyogenic granuloma. Increased attention to oral hygiene can help minimize the effects of these metabolic changes. [1, 75, 93] Toxins or other products generated by oral bacteria in the mother may reach the general circulation, cross the placenta, and harm the fetus. In addition, the response of the maternal immune system to the infection elicits the continued release of natural chemical defense mechanisms that can interfere with fetal growth and delivery. [88]

Bacteremia and endocarditis

The negative impact of oral infection on systemic health generally stems from the entry of oral microorganisms or their products into the bloodstream, which is known as bacteremia. It appears that accumulated periodontal bacteria or their products can directly invade the periodontal tissues, and from there, they gain access to the systemic circulation and adhere to damaged heart valves or heart surfaces. The best means to prevent bacteremia is by minimizing gingival inflammation and accumulation of periodontal bacteria through good oral hygiene. Dental and other surgical procedures predispose susceptible patients to endocarditis. [75] Antibiotics may be necessary before major oral surgical procedures to prevent endocarditis.

Impact of systemic diseases on oral health

Signs of several systemic diseases and conditions can be manifested in the mouth, which makes the oral cavity an important diagnostic tool for health professionals. [1]

Indeed, problems with speaking, chewing, taste, smell, and swallowing are common in some systemic diseases. For example, oral complications of AIDS include pain, dry mouth, mucosal infections, and Kaposi's sarcoma. Cancer therapy can result in painful ulcers, mucositis, and rampant dental caries. Periodontal disease is a complication of diabetes and osteoporosis. Several systemic factors have demonstrated effects on oral health, such as malnutrition, tobacco, stress, medications, diabetes, HIV/AIDS, and immunosuppression.

Dental professionals can be the first to identify these oral manifestations and make early referrals to the appropriate health professionals. This has been a common scenario for dental patients with HIV/AIDS, eating disorders [94], methamphetamine use, tobacco users, and potentially other diseases.

HIV/AIDS

Oral lesions occur in 40-50 percent of people who are HIV-positive and in up to 80 percent of those with a diagnosis of AIDS. [95] The lesions are among the first to manifest and serve not only as an HIV infection indicator but also as a predictor of the progression of HIV disease to AIDS. They can be used as entry or end-points in therapy and vaccine trials, determinants of opportunistic infection and anti-HIV therapy, and in staging and classification systems. [95] As new drug regimens increase the life expectancy of HIV patients, chronic disorders such as periodontal diseases are likely to become more important problems in the management of infected patients. [96]

Mental health diseases (stress, depression, eating disorders)

Studies have revealed associations between stressful environmental stimuli and periodontal status. [14] At sufficient levels, stress can increase circulating cortisol and suppress immunological responses. Depressed patients often have poor oral hygiene due to a lack of interest in self-care. Dry mouth can occur as a result of depression and the drugs used to treat it. [97] Eating disorders such as anorexia nervosa, bulimia, binge eating, and pica are characterized by serious disturbances in eating and psychological effects. [98] Only one in ten individuals with eating disorders receive treatment. Eating disorders may cause dental destruction (perimolysis), parotid swelling, and biochemical abnormalities in saliva. Research as yet provides few insights about the connection of oral lesions with nutritional deficiency and eating disorders. [99]

In Washington in 2004, about 30 percent of Washington youth in Grades 8, 10 and 12 reported struggling with depression in the previous year. In 2003, 18 percent of Washington parents with children ages 5-10 years and about 9 percent of parents with children ages 3-5 years reported that their child had difficulties with emotions, concentration, behaviors, or getting along with people. [91]

Medications

The mouth and its functions can be adversely affected by medications and other therapies used to treat systemic diseases and conditions. Prescription and nonprescription drugs often have the side effect of dry mouth, but other common consequences include stomatitis, reduced salivary flow, altered taste, oral ulcers, and difficulty in eating, chewing, and swallowing, all of which can affect nutrition, treatment compliance, and overall quality of life. [100] The elderly are at higher risk for xerostomia (dry mouth) due

to the larger amount of medications they use for managing their chronic conditions. With the aging of the world's population, this problem is likely to increase.

Osteoporosis

Systemic osteoporosis develops due to bone loss resulting in bone brittleness, a condition that can be seen in the facial bones. Periodontitis leads to loss of attachment and bone loss. Hence a patient with osteoporosis with low bone density of alveolar bones may be more susceptible to rapid progression of periodontitis. [101, 102]

In 2000, 40 percent of Washington residents who reported on the BRFSS that they had arthritis; 35 percent of them also reported having osteoporosis. [103, 104]

Diet and nutrition

Poor oral health can affect appetite and the ability to eat, result in malnutrition, and hence compromise general health and well-being. Indeed, inadequate food or nutrient intake may result from caries, periodontal disease, oral and dental pain, tooth loss, dry mouth, ill-fitting dentures, cracked or sore lips or tongue, and sensitivity to temperatures. [105, 106] A diet that is rich in fruits, vegetables, and whole grain foods and low in free sugars and fat is likely to benefit many aspects of oral health. [107] In 2004, about 20 percent of Washington's eighth, tenth and twelfth graders reported drinking at least two sodas per day. Additionally, only 26 percent of eighth graders, 23 percent of tenth graders, and 22 percent of twelfth graders ate the recommended five servings of fruits and vegetables per day. A reported 5-6 percent of youth in Grades 8, 10 and 12 reported vomiting or taking laxatives in the past 30 days to lose weight. [51]

Obesity

Obesity is a chronic disease with high mortality and co-morbidity. It is related to several aspects of oral health, such as caries, periodontitis, and xerostomia. Oral health professionals are increasingly concerned about how oral hygiene and preventive measures (fluorides) are being managed, given the poor quality and high amount and frequency of peoples' eating habits. [108]
In 2004, about 10 percent of Washington's eighth, tenth and twelfth graders self-reported being overweight. [51] In 2000, 40 percent of Washington adults ages 18 years and older reported that they were trying to lose weight. [104]

Alcohol use

In terms of etiology, the combined effects of tobacco use, heavy alcohol consumption, and poor diet account for more than 90 percent of cases of head and neck cancer. Alcohol synergizes with tobacco as a risk factor for all of the upper aero digestive tract. The increase in oral cancer in the Western world has been related to rising alcohol use. [109] Alcohol use has also been associated with increased risk of cleft palate. [110]

In 2004, about 10 percent of Washington's eighth graders, 19 percent of its tenth graders, and 26 percent of its twelfth graders reported binge drinking in the past two weeks (defined as consuming five or more alcohol beverages in a row). [51] During 2002-2004, about 15 percent of new mothers reported binge drinking three months before they became pregnant, but less than one percent reported binge drinking in the last three months of pregnancy. [111]

Recreational drug use

Methamphetamine (meth) is an inexpensive, easy-to-make, and highly addictive drug. Its use is increasing

in the U.S. and other countries. Meth causes rampant (severe) dental caries, probably due to the drug's acidic nature, dry mouth (which reduces the amount of protective saliva around the teeth), craving for high-calorie carbonated beverages, and a tendency to grind or clench the teeth. The drug's effect is of long duration (12 hours), during which users are not likely to clean their teeth. [112]

In 2004, about two to eight percent of Washington State youth in Grades 6, 8, 10 and 12 reported ever using methamphetamine, cocaine, ecstasy, or steroids in their lifetime. Further, tobacco and drug use are closely associated. For example, of tenth graders surveyed, about 38 percent of smokers reported using marijuana in the past 30 days compared to four percent of non-smokers. [51]

Traumatic injuries

The impact of sports, work, violence, traffic, household, and play accidents with dental trauma has been documented. These events can lead to severe physical and psychological trauma in children and adults. Teeth and facial structures can be affected, and treatment is generally extensive and expensive. Use of mouth guards and helmets for sports activities, safe playgrounds for children, seat belts while driving or riding in a car, canes or support devices for elderly, and a reporting system for abuse and neglect (known as Prevent Abuse and Neglect through Dental Awareness—PANDA) are some of the recommended preventive measures. Washington State has discontinued its PANDA Program. [113-115]

In 2003, Washington experienced a rate of unintentional nonfatal injury hospitalizations of 182 per 100,000 children ages 0-19 years (3,087). The three most common causes for unintentional injury hospitalizations for Washington children were motor vehicle transport, falls/jumps/pushes, and being struck by or against (including being accidentally struck by an object or person). [91]

Economic costs of oral diseases to individuals and society

The economic impact of oral diseases can be substantial given their relationship with so many important functions and systemic conditions.

Global costs

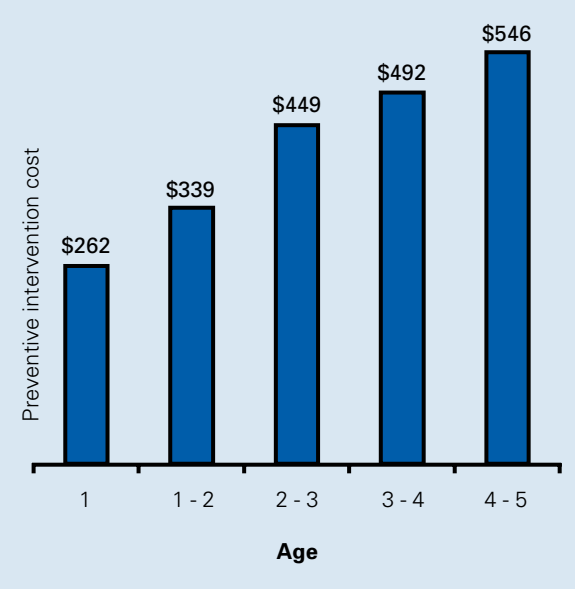
Traditional curative dental care (restorations or fillings) is a significant economic burden for many industrialized countries, where five to ten percent of public health expenditures are invested in oral health. A study conducted in 2002 reported that to treat the permanent dentition of the U.S. child population using the traditional method of amalgam restoration would cost between $1,600-$3,500 per 1,000 children ages 6-18 years old, and the total amount would exceed the public budget available for oral health in most countries. [116] These findings suggest that a rational plan to controlling caries would instead be a public health prevention and health promotion program to reduce the cause of caries and dental trauma. Strategies adopting preventive principles are more appropriate, affordable, and sustainable.

National costs

In the United States in 2003, expenditures for dental care among the civilian non-institutionalized (community) population were $67 billion, or 7.5 percent of total health care expenditures for the nation. The percentage of the population with a dental expense that year was 42.7 percent, which closely aligns with the population's experience in 1996, when 41.8 percent had a dental expense. Over the same period, the average dental expense per person increased 40.6 percent, from $384 to $540, an increase much greater than indicated by the Consumer Price Index. [117]

Dental expenditures differ from overall health expenditures in the distribution of sources of payment. In 2003, 42.4 percent of all medical expenditures were covered by private insurance, as were a similar proportion (43.1 percent) of dental expenditures. But government programs, such as Medicare and Medicaid, covered a much smaller amount of the cost of dental care. In addition, persons with a dental expenditure in 2003 paid 48.2 percent of the costs, out-of-pocket. This is about 2.5 times the rate paid out-of-pocket for overall health expenditures. [117]

Figure 48: Cost for first preventive dental visit per child by age, 1992–97 North Carolina Medicaid data [119].



For individuals with craniofacial disabilities, expected costs are even higher. Overall costs of chronic pain conditions are estimated to be $79 billion. [118] Other expenses include: tens of billions of dollars in direct medical care and indirect costs to treat chronic craniofacial pain conditions such as temporomandibular disorders, trigeminal neuralgia, shingles, or burning mouth syndrome; $100,000 minimum individual lifetime costs of treating craniofacial birth defects such as cleft lip and palate [1]; costs of oral and pharyngeal cancers; costs of autoimmune diseases; and costs associated with the unintentional and intentional injuries that affect the head and face. Finally, such outlays have social and psychological consequences.

A substantial number of young children with untreated caries are seen in hospital emergency departments, and for many it is their first dental visit. In 1996-97, the mean cost for dental care provided to hospitalized children was $1,508 compared with $104 for those who were not treated in a hospital operating room.

Prevention pays off. Preschool-age, Medicaid children who had an early preventive dental visit were more likely to use subsequent preventive services and experience lower dental costs. [120] This is important since preschool children have shown some of the greater increases in caries prevalence in the last few years. Among Medicaid enrolled children, the average cost per child based on the age at the time of the first preventive dental visit increases from as low as $262 at age 1 to $546 at age 4-5 years. See figure 49. [119].

Societal costs

Poor oral health can limit people's employability, and it can lower productivity for people who have jobs. In 1996, the United States experienced 3.7 days of restricted activity per 1,000 employed persons ages 18 years and older as a result of an acute dental condition. This compares to a rate of 624 restricted activity days per 100,000 for all acute conditions, but the total cost to society is nonetheless considerable. Restricted activity days were most prevalent among adults ages 18-24 years, women, blacks, and individuals with annual incomes of less than $10,000.

Oral and pharyngeal cancers have the highest mortality of all oral diseases. A 1988 study estimated that 16.2 years of life were lost per person dying of cancer of the oral cavity and pharynx [121], which exceeds the average of 15.4 years lost for all cancer sites

The cost of extensive dental caries on children's performance at school is less well established, but a U.S. study shows that in 1996, children lost 51 million school hours were lost each year because of oral health problems. Dental caries and the pain associated with it is a daily occurrence for school nurses in school systems with many children from minority groups and living in poverty. For youths 5-17 years old, 3.1 days of school are lost per year per student.

In 1996, a national survey showed that the percentage of all acute conditions that are medically attended for all ages was 68 percent, while for acute dental conditions, 60 percent were attended. Poor children have nearly 12 times more restricted-activity days because of dental-related illness than children from higher-income families. [1] Children whose teeth are in excellent or very good condition are less likely than other children to miss more than two weeks of school due to illness or injury. Of children who missed 11 days or more of school in the past year, 56.6 percent were reported to have teeth in excellent or very good condition, compared to 65.4 percent of children who missed ten days of school or fewer.

Opportunity costs

Many of the costs described above relate to dental caries, which is the most common chronic disease in children and largely preventable. Once established, dental caries generally requires treatment. A cavity grows larger and becomes more expensive to repair the longer it remains untreated. Prevention is a much more cost-effective and painless solution for caries. The CDC recommends two evidence-based public health activities to prevent caries: community water fluoridation and school based or school linked sealant programs.

Community water fluoridation refers to the adjustment of the natural fluoride in the water to a level that is effective to prevent tooth decay. Water fluoridation effectively prevents dental caries in communities with varying disease prevalence, does not require the presence of a dental provider, and is easily available to all citizens using public water systems. Children in communities with water fluoridation experience 29 percent fewer cavities. Children receiving dental sealants in school-based programs have 60 percent fewer new caries in pit and fissure surfaces in back teeth for up to two to five years after a single application. [1]

Not taking full advantage of these two mass preventive measures can lead to significant and unnecessary costs. A 2001 study showed that for every $1 invested in community water fluoridation, $38 is saved in averted costs. A 2003 study shows that Colorado was able to realize sizeable annual savings—$149 million or an average of $60 per person—from its community water fluoridation program. About 75 percent of Coloradans use fluoridated water through their public water system. If all Colorado public water systems were fluoridated, an estimated $47 million more could be saved. This estimate was based on the cost of water fluoridation per inhabitant which was 50 cents to $3, depending on the size of the community in 2002 and on the cost of services in dental offices, $306 per capita. [122] In Washington State, 58 percent of residents using public water systems receive fluoridated water.

School-based or linked sealants can also lead to financial savings. In 2005, 59 percent of Washington's second and third graders had caries experience (number of treated plus untreated caries), and 20 percent had untreated decay. At the same time, only 45 percent of Washington second and third graders had sealants. Studies have shown that sealant costs can vary from $6 if applied in schools to $27 in dental offices, and amalgam restoration costs about $74 at a dental office. [37]

Conclusion

This report is the first document to provide an overview of oral health in Washington State in a comprehensive manner. The information contained here shows that:

- Historically, Washington State has been a pioneer in several fronts, such as in the development of the Smile Survey, the Tooth Tutor curriculum, the State Oral Health Coalition and the "Community Roots for Oral Health Coalition" guide. All of these initiatives have been adopted by other states in some form. More recently, Washington State has developed its own oral disease surveillance system and its cleft lip and palate recording and referral system.
- Washington State has met the Healthy People 2010 objectives for untreated caries (more specifically for white children), tooth loss in younger and older adults, preventive dental visits for children, and use of dental services by children. Additionally, Washington has oral health programs in all of its 35 LHJs, 32 of which count on their own local oral health coalitions. The upcoming Bright Futures Oral Health Project will bring together all local oral health programs and MCH-related programs in an effort to develop basic, consistent and evidence-based oral health materials tailored to all our public health partners.
- However, Washington still rates low in terms of water fluoridation, school-based or linked sealant programs, and incidence and mortality for oral and pharyngeal cancers. Health disparities and dental workforce issues need to be addressed, especially in rural areas and for Medicaid patients. More awareness is needed for medical and dental providers about the importance of good oral health for pregnant women and children.
- To the extent possible, data collection needs to be expanded to address all HP2010 Oral Health Objectives. Examples are: caries status (of individuals with special health care needs, adolescents, adults, pregnant women, and seniors), periodontal (gum) diseases, oral cancer screening and tobacco cessation interventions by dental professionals, diversity of the dental workforce, use of dental services by long-term care residents, and dental insurance coverage. More information on the evaluation of existing dental public health programs is also needed.

Many opportunities lay ahead. The 2003 Surgeon General's *National Call to Action to Promote Oral Health* recommended five main actions and implementation strategies to help the country accomplish its HP2010 oral health objectives: change public perceptions of oral health; overcome barriers by replicating effective programs and proven efforts; build the science base and accelerating science transfer; increase oral health workforce diversity, capacity, and flexibility; and increase collaborations.

Multiple oral health strategies have the potential to improve the oral health conditions for the whole population and for groups at high risk. Although several efforts have been made in our state, much work remains to be done. This burden document represents an important step toward raising awareness for Washington's oral health problems and seeking collaborative solutions. The recommended next step is to begin a policy discussion that involves coalitions and organizations at state and local levels. These steps will lead to the creation of an environment that is better educated and conducive to the development of a collaborative state oral health plan with defined strategies and sound implementation and evaluation components. A state plan would provide strategic guidance to government, health professionals, educational institutions, businesses, and communities to improve the oral health and, thereby, the overall health of Washingtonians.

The Impact of Oral Disease on the Lives of Washingtonians will help statewide efforts to promote oral health programs and policy. We are confident that this document will inform many individuals and organizations and make oral health a priority in their agendas.

We would like to hear your feedback. Please let us know whether this document has been useful to you and your organization and if you have any suggestions or data for its next edition. An online survey will be available in the near future at http://www.doh.wa.gov/cfh/Oral_Health/burden.htm.

References

1. *Oral Health in America: A Report of the Surgeon General. 2000,* U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institute of Health.: Rockville, MD.
2. *2006 Washington State Population Survey,* Washington State Office of Financial Management, Editor. 2006.
3. *2004 Washington State Population Survey,* Washington State Office of Financial Management, Editor. December 2004.
4. *Forecast of the State Population by age and gender, 1990 to 2030,* Washington State Office of Financial Management, Editor. November, 2004.
5. Gardner, E., *"The Uninsured Population in Washington State." 2004 Washington State Population Survey Research Brief,* Washington State Office of Financial Management, Editor. March 2005.
6. *Healthy People 2010. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health 2 vols.* November 2000, U.S. Department of Health and Human Services; U.S. Government Printing Office: Washington, DC.
7. Beltran-Aguilar, E.D., et al., *Surveillance for dental caries, dental sealants, tooth retention, edentulism, and enamel fluorosis--United States, 1988-1994 and 1999-2002.* MMWR Surveill Summ, 2005. **54**(3): p. 1-43.
8. Radnai, M., et al., *Caries and periodontal state of pregnant women. Part I. Caries status.* Fogorv Sz, 2005. **98**(2): p. 53-7.
9. Pezzementi, M.L. and M.A. Fisher, *Oral health status of people with intellectual disabilities in the southeastern United States.* J Am Dent Assoc, 2005. **136**(7): p. 903-12.
10. *Total tooth loss among persons aged > or =65 years--selected states, 1995-1997.* MMWR Morb Mortal Wkly Rep, 1999. **48**(10): p. 206-10.
11. *Behavioral Risk Factor Surveillance System (BRFSS).* 2004, Washington State Department of Health: Olympia, Washington.
12. *The health consequences of smoking: a report of the Surgeon General.* 2004, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.: Atlanta, GA.
13. Tomar, S.L. and S. Asma, *Smoking-attributable periodontitis in the United States: findings from NHANES III. National Health and Nutrition Examination Survey.* J Periodontol, 2000. 71(5): p. 743-51.
14. Christen, A.G., *The impact of tobacco use and cessation on oral and dental diseases and conditions.* Am J Med, 1992. 93(1A): p. 25S-31S.
15. Burt, B.A. and B.A. Eklund, *Dentistry, dental practice, and the community.* 5th ed. 1999, Philadelphia: WB Saunders.
16. Ries, L., et al., *SEER Cancer Statistics Review, 1975-2001.* 2004, National Cancer Institute.: Bethesda, MD.
17. Ries LAG, M.D., Krapcho M, Mariotto A, Miller BA, Feuer EJ, Clegg L, Horner MJ, Howlader N, Eisner MP, Reichman M, Edwards BK, *SEER Cancer Statistics Review, 1975-2004.* 2007, National Cancer Institute: Bethesda, MD.
18. Gloeckler Ries LA, K.C., Hankey BF, Miller BA, Harras A, Edwards BK, *SEER cancer statistics review, 1973-1994.* 1997, US Department of Health and Human Services, Public Health Service, National Institutes of Health: Bethesda, MD.
19. Blot, W.J., et al., *Smoking and drinking in relation to oral and pharyngeal cancer.* Cancer Res, 1988. **48**(11): p. 3282-7.

20. *The health consequences of using smokeless tobacco: a report of the Advisory Committee to the Surgeon General.* 1986, U.S. Department of Health and Human Services.: Bethesda, MD.
21. Shanks, T. and D. Burns, *Disease consequences of cigar smoking. In: National Cancer Institute. Cigars: health efffects and trends. Smoking and Tobacco Control Monograph 9 edition.* 1998, US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute.: Bethesda, MD.
22. McLaughlin, J.K., et al., *Dietary factors in oral and pharyngeal cancer.* J Natl Cancer Inst, 1988. **80**(15): p. 1237-43.
23. De Stefani, E., et al., *Diet and risk of cancer of the upper aerodigestive tract--I. Foods.* Oral Oncol, 1999. **35**(1): p. 17-21.
24. Levi, F., *Cancer prevention: epidemiology and perspectives.* Eur J Cancer, 1999. **35**(14): p. 1912-24.
25. Phelan, J.A., *Viruses and neoplastic growth.* Dent Clin North Am, 2003. **47**(3): p. 533-43.
26. Herrero, R., *Chapter 7: Human papillomavirus and cancer of the upper aerodigestive tract.* J Natl Cancer Inst Monogr, 2003(31): p. 47-51.
27. Silverman, S., *Oral cancer.* 4th ed. 1998, Atlanta, GA: American Cancer Society.
28. Little, J., A. Cardy, and R.G. Munger, *Tobacco smoking and oral clefts: a meta-analysis.* Bull World Health Organ, 2004. **82**(3): p. 213-8.
29. *Recommendations on selected interventions to prevent dental caries, oral and pharyngeal cancers, and sports-related craniofacial injuries.* Am J Prev Med, 2002. **23**(1 Suppl): p. 16-20.
30. *Ten great public health achievements--United States, 1900-1999.* MMWR Morb Mortal Wkly Rep, 1999. **48**(12): p. 241-3.
31. *Populations receiving optimally fluoridated public drinking water--United States, 2000.* MMWR Morb Mortal Wkly Rep, 2002. **51**(7): p. 144-7.
32. Griffin, S.O., K. Jones, and S.L. Tomar, *An economic evaluation of community water fluoridation.* J Public Health Dent, 2001. **61**(2): p. 78-86.
33. *Oral Health. In: Healthy People 2010 (2nd ed.). With Understanding and Improving Health and Objectives for Improving Health. 2 vols.* 2000, U.S. Department of Health and Human Services, Government Printing Office.: Washington, DC.
34. *Consensus development conference statement on dental sealants in the prevention of tooth decay. National Institutes of Health.* J Am Dent Assoc, 1984. **108**(2): p. 233-6.
35. Llodra, J.C., et al., *Factors influencing the effectiveness of sealants--a meta-analysis.* Community Dent Oral Epidemiol, 1993. **21**(5): p. 261-8.
36. Division of Oral Health, C.f.D.C.a.P., *Preventing Dental Caries with Community Programs.* August 2005.
37. Griffin, S.O., et al., *Comparing the costs of three sealant delivery strategies.* J Dent Res, 2002. **81**(9): p. 641-5.
38. *Substitute Senate Bill 6020 Report to the Legislature - Access to Preventive Dental Care for Children: School-Based Dental Sealant and Fluoride Varnish Program.* December 2005, Washington State Department of Health.
39. *Recommendations for using fluoride to prevent and control dental caries in the United States. Centers for Disease Control and Prevention.* MMWR Recomm Rep, 2001. **50**(RR-14): p. 1-42.
40. *Oral Health Care During Pregnancy and Early Childhood Practice Guidelines.* August 2006, New York State Department of Health. p. 74.
41. *Position paper: tobacco use and the periodontal patient. Research, Science and Therapy Committee of the American Academy of Periodontology.* J Periodontol, 1999. **70**(11): p. 1419-27.
42. Fiore, M.C., *US public health service clinical practice guideline: treating tobacco use and dependence.* Respir Care, 2000. **45**(10): p. 1200-62.

43. Kressin, N.R. and M.B. De Souza, *Oral health education and health promotion, in Jong's Community Dental Health.* 2003, Mosby: St. Louis, MO. p. 277–328.
44. Bureau of Health Professions, N.C.f.H.W.I.A., *State Health Workforce Profiles: Washington,* US Department of Health and Human Services, Editor. December 2000.
45. *Dental Workforce Study.* 2001, Center for Health Worforce Studies, University of Washington. Washington State Dental Association: Seattle, WA.
46. *Health of Washington State,* Washington State Deaprtment of Health, Editor. 2002: Olympia, WA.
47. Wright GE, P.D., Baldwin L, et al., *Distribution of the dental workforce in Washington State: patterns and consequences.* March 2001, Center for Health Workforce Studies, University of Washington: Seattle, WA.
48. Mouradian, W.E., et al., *An oral health curriculum for medical students at the University of Washington.* Acad Med, 2005. **80**(5): p. 434-42.
49. *Distribution of Dentists in the United Stateds by Region and State.* 1997, American Dental association Survey Center, American Dental Association: Chicago, IL.
50. U. S. Department of Health and Human Services, H.R.a.S.A., Maternal and Child Health Bureau., *The National Survey of Children's Health 2003,* U. S. Department of Health and Human Services, 2005.: Rockville, Maryland.
51. *Washington State Healthy Youth Survey 2004.* 2005, Washington State Office of Superintendent of Public Instruction, Department of Health, Department of Social and Health Services, and Department of Community, Trade, and Economic Development and RMC Research Corporation: Olympia, WA.
52. Amar, S. and K.M. Chung, *Influence of hormonal variation on the periodontium in women.* Periodontol 2000, 1994. **6**: p. 79-87.
53. Mealey, B.L., *Periodontal implications: medically compromised patients.* Ann Periodontol, 1996. **1**(1): p. 256-321.
54. Offenbacher, S., et al., *Maternal periodontitis and prematurity. Part I: Obstetric outcome of prematurity and growth restriction.* Ann Periodontol, 2001. **6**(1): p. 164-74.
55. Gaffield, M.L., et al., *Oral health during pregnancy: an analysis of information collected by the pregnancy risk assessment monitoring system.* J Am Dent Assoc, 2001. **132**(7): p. 1009-16.
56. Lewis, C., A.S. Robertson, and S. Phelps, *Unmet dental care needs among children with special health care needs: implications for the medical home.* Pediatrics, 2005. **116**(3): p. e426-31.
57. Gift, H.C., G. Cherry-Peppers, and R.J. Oldakowski, *Oral health status and related behaviours of U.S. nursing home residents*, 1995. Gerodontology, 1997. **14**(2): p. 89-99.
58. *HIV/AIDS Surveillance Report.* May 2006, Washington State Department of Health, Infectious Disease and Reproductive Health.: Olympia, WA.
59. *Income, Poverty, and Health Insurance Coverage in the United States: 2005.* 2005, U. S. Census Bureau.
60. *Behavioral Risk Factor Surveillance System (BRFSS).* 2001, Washington State Department of Health: Olympia, Washington.
61. Vargas CM, K.E., Yellowitz JA., *The Oral Health of Older Americans. Aging Trends; No.3.* 2001, National Center for Health Statistics: Hyattsville, MD.
62. *Opportunities To Use Medicaid in Support of Oral Health Services,* Health Resources and Services Administration. U. S. Department of Health and Human Services, Editor. December 2000.
63. Cawthon, L., *Characteristics of Washington State Medicaid Women Who Gave Birth,* Research and Data Analysis. Washington State Department of Social and Human Services, Editor. October 2006.
64. *National Health Expenditure amounts by type of expenditure and source of funds: Calendar years 1965-2013.,* Centers for Medicare & Medicaid Services. and U.S. Department of Health & Human Services, Editors. October 2004.

65. *Healthy People 2010 progress review: oral health.* 2004, US Department of Health and Human Services: Washington, DC.
66. Redford, M., *Beyond pregnancy gingivitis: bringing a new focus to women's oral health.* J Dent Educ, 1993. **57**(10): p. 742-8.
67. Vargas, C.M., B.A. Dye, and K. Hayes, *Oral health care utilization by US rural residents, National Health Interview Survey 1999.* J Public Health Dent, 2003. **63**(3): p. 150-7.
68. Gamm, L.D., Hutchison, Linnae L., Dabney, Betty J. and Dorsey, Alicia M., *Rural Healthy People 2010: A Companion Document to Healthy People 2010.* 2003, The Texas A&M University System Health Science Center, School of Rural Public Health, Southwest Rural Health Research Center: College Station, Texas.
69. Vargas, C.M., J.J. Crall, and D.A. Schneider, *Sociodemographic distribution of pediatric dental caries: NHANES III, 1988-1994.* J Am Dent Assoc, 1998. **129**(9): p. 1229-38.
70. Peterson, J., L. Niessen, and G.M. Nana Lopez, *Texas public school nurses' assessment of children's oral health status.* J Sch Health, 1999. **69**(2): p. 69-72.
71. Reisine, S.T., *Dental health and public policy: the social impact of dental disease.* Am J Public Health, 1985. **75**(1): p. 27-30.
72. Hughes, R.A., *Focal infection revisited.* Br J Rheumatol, 1994. **33**(4): p. 370-7.
73. Meurman, J.H., *Dental infections and general health.* Quintessence Int, 1997. **28**(12): p. 807-11.
74. Rose, L., et al., *Periodontal Medicine.* 2000, Hamilton, Ontario, Saint Louis: Decker, BC. 294.
75. Scannapieco, F.A., *Position paper of The American Academy of Periodontology: periodontal disease as a potential risk factor for systemic diseases.* J Periodontol, 1998. **69**(7): p. 841-50.
76. King, G. *Diabetes and its complications: designing new therapies for this epidemic. in Public health implications of periodontal infections in adults: conference proceedings.* 2005. Atlanta, GA: Journal of Public Health Dentistry.
77. Nishimura, F., et al., *Periodontal disease as a complication of diabetes mellitus.* Ann Periodontol, 1998. **3**(1): p. 20-9.
78. Grossi, S.G. and R.J. Genco, *Periodontal disease and diabetes mellitus: a two-way relationship.* Ann Periodontol, 1998. **3**(1): p. 51-61.
79. Nelson, R.G., et al., *Periodontal disease and NIDDM in Pima Indians.* Diabetes Care, 1990. **13**(8): p. 836-40.
80. Emrich, L.J., M. Shlossman, and R.J. Genco, *Periodontal disease in non-insulin-dependent diabetes mellitus.* J Periodontol, 1991. **62**(2): p. 123-31.
81. Cianciola, L.J., et al., *Prevalence of periodontal disease in insulin-dependent diabetes mellitus (juvenile diabetes).* J Am Dent Assoc, 1982. **104**(5): p. 653-60.
82. Taylor, G.W., et al., *Severe periodontitis and risk for poor glycemic control in patients with non-insulin-dependent diabetes mellitus.* J Periodontol, 1996. **67**(10 Suppl): p. 1085-93.
83. Schmidt, A.M., et al., *Advanced glycation endproducts (AGEs) induce oxidant stress in the gingiva: a potential mechanism underlying accelerated periodontal disease associated with diabetes.* J Periodontal Res, 1996. **31**(7): p. 508-15.
84. Lee, T.S., et al., *Activation of protein kinase C by elevation of glucose concentration: proposal for a mechanism in the development of diabetic vascular complications.* Proc Natl Acad Sci U S A, 1989. **86**(13): p. 5141-5.
85. *Heart Disease and Stroke Statistics — 2007 Update.* 2007, American Heart Association: Dallas, Texas.
86. Beck, J. and S. Offenbacher, *Potential public health implications of periodontal disease and cardiovascular disease relationships.* Journal of Public Health Dentistry, 2005. **65**: p. 56-66.

87. Davenport, E.S., et al., *The East London Study of Maternal Chronic Periodontal Disease and Preterm Low Birth Weight Infants: study design and prevalence data.* Ann Periodontol, 1998. **3**(1): p. 213-21.
88. Slavkin, H.C., *First encounters: transmission of infectious oral diseases from mother to child.* J Am Dent Assoc, 1997. **128**(6): p. 773-8.
89. McCormick, M.C., *The contribution of low birth weight to infant mortality and childhood morbidity.* N Engl J Med, 1985. **312**(2): p. 82-90.
90. Martin JA, H.B., Sutton PD, et al., *Births: Final data for 2004. National vital statistics reports; vol 55 no 1.* September 2006, National Center for Health Statistics: Hyattsville, MD.
91. *Maternal and Child Health Data and Services Report.* January 2006, Washington State Department of Health: Olympia, WA. p. 250.
92. Machuca, G., et al., *The influence of general health and socio-cultural variables on the periodontal condition of pregnant women.* J Periodontol, 1999. **70**(7): p. 779-85.
93. Offenbacher, S., et al., *Potential pathogenic mechanisms of periodontitis associated pregnancy complications.* Ann Periodontol, 1998. **3**(1): p. 233-50.
94. DeBate, R.D., L.A. Tedesco, and W.E. Kerschbaum, *Knowledge of oral and physical manifestations of anorexia and bulimia nervosa among dentists and dental hygienists.* J Dent Educ, 2005. **69**(3): p. 346-54.
95. Coogan, M., J. Greenspan, and S. Challacombe, *Oral lesions in infection with human immunodeficiency virus.* Bulletin of the World Health Organization, 2005. **83**(9): p. 700-706.
96. Lamster, I.B., et al., *New concepts regarding the pathogenesis of periodontal disease in HIV infection.* Ann Periodontol, 1998. **3**(1): p. 62-75.
97. Little, J.W., *Dental implications of mood disorders.* Gen Dent, 2004. **52**(5): p. 442-50; quiz 451.
98. Gurenlian, J.R., *Eating disorders.* J Dent Hyg, 2002. **76**(3): p. 219-34; quiz 236-7.
99. Frydrych, A.M., G.R. Davies, and B.M. McDermott, *Eating disorders and oral health: a review of the literature.* Aust Dent J, 2005. **50**(1): p. 6-15; quiz 56.
100. Cassolato, S.F. and R.S. Turnbull, *Xerostomia: clinical aspects and treatment.* Gerodontology, 2003. **20**(2): p. 64-77.
101. Reddy, M.S., *Oral osteoporosis: is there an association between periodontitis and osteoporosis?* Compend Contin Educ Dent, 2002. **23**(10 Suppl): p. 21-8.
102. Jeffcoat, M.K., N.C. Geurs, and C.E. Lewis, *Osteoporosis and periodontal bone loss.* Clin Calcium, 2003. **13**(5): p. 577-81.
103. *Arthritis Action Plan for Washington State: 2001-2005.* May 2001, Washington State Department of Health: Olympia, WA.
104. *Behavioral Risk Factor Surveillance System (BRFSS).* 2000, Washington State Department of Health: Olympia, Washington.
105. Moynihan, P.J., *The role of diet and nutrition in the etiology and prevention of oral diseases.* Bull World Health Organ, 2005. **83**(9): p. 694-9.
106. Enwonwu, C.O. and C. Sanders, *Nutrition: impact on oral and systemic health.* Compend Contin Educ Dent, 2001. **22**(3 Spec No): p. 12-8.
107. *Diet, nutrition and the prevention of chronic diseases.* World Health Organ Tech Rep Ser, 2003. **916**: p. i-viii, 1-149, backcover.
108. Mathus-Vliegen, E.M., D. Nikkel, and H.S. Brand, *[Obesity and oral health].* Ned Tijdschr Tandheelkd, 2005. **112**(10): p. 396-401.
109. Johnson, N., *Tobacco use and oral cancer: a global perspective.* J Dent Educ, 2001. **65**(4): p. 328-39.
110. Lorente, C., et al., *Tobacco and alcohol use during pregnancy and risk of oral clefts. Occupational Exposure and Congenital Malformation Working Group.* Am J Public Health, 2000. **90**(3): p. 415-9.

111. *Washington Pregnancy Risk Assessment Monitoring System (PRAMS), 2001-2003,* Washington State Department of Health, Editor.
112. *For the dental patient. methamphetamine use and oral health.* J Am Dent Assoc, 2005. **136**(10): p. 1491.
113. Kellogg, N., *Oral and dental aspects of child abuse and neglect.* Pediatrics, 2005. **116**(6): p. 1565-8.
114. Gassner, R., et al., *Prevalence of dental trauma in 6000 patients with facial injuries: implications for prevention.* Oral Surg Oral Med Oral Pathol Oral Radiol Endod, 1999. **87**(1): p. 27-33.
115. Fos, P.J., J.R. Pinkham, and D.N. Ranalli, *Prediction of sports-related dental traumatic injuries.* Dent Clin North Am, 2000. **44**(1): p. 19-33, v.
116. Robert, Y. and A. Sheiham, *The burden of restorative dental treatment for children in Third World countries.* Int Dent J, 2002. **52**(1): p. 1-9.
117. Sommers, J.P., *Dental Expenditures in the 10 Largest States, 2003. Statistical Brief #112.* January 2006, Agency for Healthcare Research and Quality: Rockville, MD.
118. Bonica JJ, *General considerations of chronic pain.* The management of pain., ed. Bonica JJ, et al. Vol. 1. 1990, Philadelphia: Lea and Febiger.
119. Savage, M.F., et al., *Early preventive dental visits: effects on subsequent utilization and costs.* Pediatrics, 2004. **114**(4): p. e418-23.
120. Griffin, S.O., et al., *Dental services, costs, and factors associated with hospitalization for Medicaid-eligible children, Louisiana 1996-97.* J Public Health Dent, 2000. **60**(1): p. 21-7.
121. *From the Centers of Disease Control. Cigarette smoking among adults--United States, 1988.* Jama, 1991. **266**(22): p. 3113-4.
122. O'Connell, J.M., et al., *Costs and savings associated with community water fluoridation programs in Colorado.* Prev Chronic Dis, 2005. **2 Spec no:** p. A06.

Appendices

Technical notes and data sources

Technical notes

- **Confidence interval**
  These are used to measure the variability of the data. It is a range of values that describe the uncertainty around a quantitative point, such as a frequency or mortality rate. The wider the confidence interval, the greater the uncertainty that the point is due to chance alone. By convention, 95 percent is used as the chosen percentage, and it means that there is a 95 percent chance that the confidence interval covers the true value. This report provides confidence intervals for all survey data, including data from the Pregnancy Risk Assessment Monitoring System (PRAMS), the Healthy Youth Survey, the Behavior Risk Factor Surveillance System, the National Survey of Children's Health, the National Survey of Children with Special Needs, the National Immunization Survey, the Washington State Smile Survey and the Washington State Population Survey.

  Some of this information was taken from the *Washington State Department of Health - Assessment Guidelines* (or http://www.doh.wa.gov/data/guidelines/ConfIntguide.htm) website.

- **Race and ethnicity**
  Rates in this report are presented by race and ethnicity because we observe disparities across these groups in Washington. Race and ethnic disparities are believed to reflect a mix of social, cultural, and economic factors; not biology. One of the Healthy People 2010 goals is to reduce racial and ethnic disparities, and to monitor progress toward this goal. We must collect and present data by race and ethnicity. Current federal guidelines separate Hispanic ethnicity from race, and they report on race and ethnicity separately. Federal guidelines also currently specify using five racial groups: White, Black or African American, Asian, Native Hawaiian or Pacific Islander, and American Indian or Alaska Native. We attempted to use a standard race and ethnicity coding system that followed the federal guidelines, but the data sources used in this report use five different grouping systems.

  Data from the birth certificate use the federal guidelines and include the five race groups: White, Black, Asian, Native Hawaiian or Pacific Islander, and American Indian/Alaska Natives as well as a breakdown for Hispanics and Non-Hispanics. Data presented this way includes low birth weight, prenatal care, preterm delivery, and smoking during pregnancy.

  Washington State population files group Asians with Native Hawaiian or Pacific Islanders. Thus, the adolescent pregnancy, intentional injury, child mortality, and unintentional injury chapters use four race groups and the Hispanic ethnicity breakdown.

  The Healthy Youth Survey determines race and ethnicity from one question, so it is not possible to analyze data based on this survey with race separate from ethnicity. Data from the Healthy Youth Survey have seven groups: White, Black, Asian, Pacific Islander, Native American, Hispanic and Other. These data include: asthma, child weight and physical activity, food insecurity and hunger, and mental health.

The Pregnancy Risk Assessment Monitoring System (PRAMS) samples respondents based on their race and ethnicity. Thus, data from PRAMS reports on the five sampled groups: Hispanics, Non-Hispanic Whites, Non-Hispanic Blacks, Non-Hispanic Asian/Pacific Islanders, and Non-Hispanic American Indian/Alaska Natives. These data include alcohol use during pregnancy, perinatal behaviors, and births from unintended pregnancies.

The 2005 Smile Survey reports data on Non-Hispanic Whites, Non-Hispanic African Americans, Non-Hispanic Asians, Non-Hispanic Native Americans, and Hispanics.

Lastly, the National Survey of Children's Health and the National Survey of Children with Special Health Care Needs report data on Whites, Blacks, Multiple Race and Other.

This information is taken directly from the 2006 Washington State MCH Data and Services Report. Additional information can be obtained from the DOH website: http://www.doh.wa.gov/Data/Guidelines/Raceguide1.htm

- **Rates**
  A crude rate is the number of health events in a specified place and time period divided by the number of people at risk for the health event in the same place and time. An age-adjusted rate is a rate that uses a standard population to allow for comparisons between different populations. Age-adjusted rates should be used only for only comparison and do not reflect the true frequency of the population. These rates are often used when viewing a health condition across various populations, as with cancer, and in the case of this report oropharyngeal cancer. In this report, 2000 census data were used as the standard population. Rates are usually multiplied by a constant, such as 1,000 or 100,000 for ease of understanding, and they are then reported as rate per 1,000 or rate per 100,000. For additional information on calculating and interpreting rates, please see the DOH data guidelines at http://www.doh.wa.gov/Data/guidelines/Rateguide.htm.

- **Relative standard error**
  The relative standard error (RSE) is a measure of an estimate's reliability. The RSE of an estimate is obtained by dividing the standard error of the estimate (SE(r)) by the estimate itself (r). This quantity is expressed as a percent of the estimate and is calculated as follows: RSE=100 x (SE(r)/r). Estimates with large RSEs are considered unreliable. Additional information is available at http://www.cdc.gov/nchs/datawh/nchsdefs/relativestandarderror.htm

- **Small numbers**
  Small numbers should be viewed with caution, because they provide much less stability and power. When there are fewer than five events, data should not be presented. In this document, when there are fewer than 20 events, data has not been presented. When numbers are small, a note of caution is noted by the corresponding graph or table. Additional information is available at http://www.doh.wa.gov/Data/guidelines/Rateguide.htm.

Data Sources

- **Behavioral Risk Factor Surveillance System (BRFSS)**
  BRFSS is a national telephone survey of adults 18 years and older. This survey monitors modifiable risk factors such as nutrition, tobacco use, injury control, and preventive services as well as behaviors, demographics, access to health care, and overall health status. Topics vary annually as well as being core CDC topics or modules added by states. Households are randomly selected to participate by

phone, and when reached, only one adult is randomly chosen to answer the survey. Those individuals who are deaf, hard of hearing, or those with speech impediments may not participate, and therefore may not be representative of the populations in the survey results. Data are available by state or national level data. The Washington State BRFSS site is http://www.doh.wa.gov/EHSPHL/CHS/CHS-Data/BRFSS/BRFSS_homepage.htm

The CDC website is http://www.cdc.gov/brfss.

- **Birth certificates**
  Birth certificates are completed for all births occurring in Washington State, as well as incorporating births by Washington residents who are in other states. Therefore, data reflect Washington resident births, regardless of birth location. More information on the Washington State Birth Certificate can be found at http://www.doh.wa.gov/ehsphl/chs/chs-data/birth/bir_main.htm.

- **Healthy People 2010 Objectives (HP 2010)**
  Healthy People 2010 provides national health objectives for a variety of health outcomes to be achieved by 2010. Specific oral health-related objectives have been used in this document as a comparison group to Washington State's oral health outcomes. Additional information can be found at http://www.healthypeople.gov/document/.

- **Healthy Youth Survey (HYS)**
  The Healthy Youth Survey was first administered in October 2002, and it has since been re-administered every two years in the fall. The survey takes place in public schools located around Washington State, among 6th, 8th, 10th and 12th grades. It is a collaboration between DOH, the Department of Social and Health Services' Division of Alcohol and Substance Abuse, the Department of Community, Trade and Economic Development, and the Office of Superintendent of Public Instruction. Schools are randomly sampled, and all students at that school are asked to participate. Previously, several surveys were used by different groups, but the HYS was developed to coordinate the efforts more effectively. Topics include physical activity and nutrition, alcohol, tobacco, and substance use, other risk and protective factors, and violence and safety. Additional information can be found at http://www3.doh.wa.gov/HYS/.

- **HIV/AIDS Knowledge, Attitudes, Beliefs, and Behaviors (KABB) Survey**
  The 2006 KABB study consisted of a statewide telephone survey administered to 2,050 individuals ages 18 and over. The survey collected demographic information and asked questions about 1) HIV risk behaviors, 2) knowledge, beliefs and attitudes regarding HIV/AIDS, 3) personal experience with HIV testing, and 4) opinions regarding public policy.

- **National Survey of Children's Health (NSCH)**
  The National Survey of Children's Health was administered from January 2003 - July 2004 by telephoning randomly sampled households with children younger than 18 years old. Only one child was randomly selected to be the subject of the survey, by the adult in the household who knew the child best. Survey topics included physical, emotional, and social health of children. Conducted by the CDC National Center for Health Statistics, the survey used the state and local areas integrated telephone survey (SLAITS) methodology, and provided national and state level data. The next survey will be conducted in 2007. Additional information can be found at http://www.cdc.gov/nchs/about/major/slaits/nsch.htm

- **National Survey of Children with Special Health Care Needs (CSHCN)**
  The National Survey of Children with Special Health Care Needs was administered from October 2000-April 2002. This telephone survey screened a random sample of households for children with special needs. Only one child was selected to be the subject of the survey, by the adult in the household who knew the child best. Survey topics included physical, emotional, and social health; access to services, health insurance, and care coordination. Conducted by the CDC National Center for Health Statistics, the survey used the state and local areas integrated telephone survey (SLAITS) methodology, and provides national and state level data. The next survey will be conducted and data gathered by 2006. Additional information can be found at http://www.cdc.gov/nchs/about/major/slaits/cshcn.htm

- **Pregnancy Risk Assessment Monitoring System (PRAMS)**
  The Pregnancy Risk Assessment Monitoring System is an ongoing, population-based surveillance system conducted through mail and telephone surveys. It is sponsored by the CDC and the Washington State Office of Maternal and Child Health. Some topics include prenatal care, preventive visits, pregnancy intention, tobacco and alcohol use, physical abuse, breastfeeding, and infant health. The information gathered can be used for health and social services planning and policy development. Additional information can be found at http://www.cdc.gov/reproductivehealth/srv_prams.htm.

- **Smile Survey**
  Every five years, DOH conducts the Smile Survey. During the most recent survey, 67 public elementary schools and 39 Head Start or ECEAP sites were randomly selected across the state during the 2004-05 school year. All preschool children enrolled and present on the day of the screening were included in the sample unless the parent returned a consent form specifically opting out of the sample. Elementary schools could choose to use either an active or passive consent process. Each child participating in the survey received an oral screening exam to determine the child's caries experience, treatment need and urgency, and dental sealants needs. Many counties chose to supplement this survey with an over-sample or census of schools or Head Start and ECEAP sites in their own county. Additional information can be found at http://devwww/cfh/Oral_Health/index.htm.

  Caution should be taken when comparing trends over time between the three Smile Surveys. The same diagnostic criteria were used among all three surveys, but the sampling methods and type of consent varied. Greater detail can be found in the *2005 Smile Survey Report*.

- **State and Local Area Integrated Telephone Survey (SLAITS)**
  This is a survey methodology for collecting state-level health care data for policy-making activities and program development. Several national surveys from the National Center for Health Statistics have used this methodology, including the National Survey of Child Health, National Immunization Survey, and the National Survey of Children with Special Needs. Information about this methodology is available at http://www.cdc.gov/nchs/slaits.htm#Description

- **Washington State Population Survey**
  The Washington Office of Financial Management coordinates this survey, which questions a random sample of Washington households by telephone. Conducted every two years since 1998, it focuses on areas such as family poverty, health, health insurance coverage, and employment. Additional information is available at: http://www.ofm.wa.gov/sps/index/htm.

Glossary

- **Amalgam:** common filling material, also known as “silver fillings,” containing mercury (approx. 50 percent), silver, tin, copper, and zinc.
- **Anorexia nervosa:** a psychiatric diagnosis that describes an eating disorder characterized by low body weight and body image distortion. Individuals with anorexia often control body weight by voluntary starvation, purging, vomiting, excessive exercise, or other weight control measures, such as diet pills or diuretic drugs.
- **Bacteremia:** the presence of bacteria in the blood. It is most commonly diagnosed by blood culture.
- **Binge eating:** a psychiatric disorder in which a subject periodically does not exercise control over consumption of food.
- **Bright Futures:** a national health promotion initiative. It is a vision, a philosophy, a set of expert guidelines, and a practical developmental approach to providing health supervision for children and adolescents from birth through age 21. The mission of Bright Futures is to promote and improve the health, education, and well-being of infants, children, adolescents, families, and communities.
- **Bulimia:** a psychological condition in which the subject engages in recurrent binge eating followed by an intentional purging. Purging typically takes the form of vomiting; inappropriate use of laxatives, enemas, diuretics or other medication; excessive physical exercise, or fasting.
- **Burning mouth syndrome (BMS) or (Glossodynia):** a condition characterized by a burning or tingling sensation on the lips, tongue, or entire mouth. Possible causes include nutritional deficiencies, chronic anxiety or depression, type 2 diabetes, menopause, oral disorders such as thrush or dry mouth, or damaged nerves.
- **Cardiovascular disease:** class of diseases that involve the heart and/or blood vessels (arteries and veins).
- **Caries experience:** represented by a missing tooth or presence of a cavity or a filling, indicating that opportunities for primary prevention may have been missed.
- **Children with special health care needs (CSHCN):** a broader classification that encompasses children with a range of conditions and medical needs. The term can cover not only children with disabilities, but also children with chronic conditions that range from mild to severe. Children with chronic physical health conditions (such as asthma, juvenile diabetes, sickle cell anemia), developmental disabilities or delays (such as mental retardation or cerebral palsy), acquired disabilities (such as paralysis or brain injury), behavioral and mental health conditions (such as attention deficit disorder, hyperactivity disorder, depression), or a combination of conditions can all be considered CSHCN. (MCH Bureau).
- **Chronic obstructive pulmonary disease (COPD):** an umbrella term for a group of respiratory tract diseases that are characterized by airflow obstruction or limitation. The most common cause is tobacco smoking, but COPD can also be caused by exposure to other airway irritants such as coal dust or solvents. In some cases, there are no known causes (idiopathic COPD) or the disease may arise due to congenital defects. Conditions included in this umbrella term are chronic bronchitis, emphysema, and bronchiectasis.
- **Cleft lip:** formed in the upper lip as either a small gap or dent in the lip (partial or incomplete cleft) or continues into the nose (complete cleft). Lip cleft can occur as one-sided (unilateral) or two-sided (bilateral).
- **Cleft palate:** a condition in which the two plates of the skull that form the hard palate (roof of the mouth) are not completely joined. The soft palate is in these cases cleft as well. In most cases, cleft lip

is also present. Palate cleft can occur as complete (soft and hard palate, possibly including a gap in the jaw) or incomplete (a hole in the roof of the mouth, usually as a cleft soft palate). When cleft palate occurs, the uvula is usually split.

- **Community water fluoridation:** the adjustment of the level of fluoride in the water to the optimal level for preventing tooth decay. Water fluoridation (fluoride in water) prevents tooth decay in two ways: primarily through direct contact with teeth throughout life, and when consumed by children during the tooth forming years.
- **Co-morbidity:** the presence of one or more disorders (or diseases) in addition to a primary disease or disorder and the effect of such additional disorders or diseases on the individual.
- **Composite:** a tooth-colored filling made of plastic resin or porcelain.
- **Cortisol:** a corticosteroid hormone produced by the adrenal cortex that is involved in the response to stress; it increases blood pressure, blood sugar levels, may cause infertility in women, and suppresses the immune system.
- **Children with Special Health Care Needs:** those children who have a chronic physical, developmental, behavioral, or emotional condition that lasts more than a year and who also require health and related services of a type or amount beyond that required by children generally.
- **Dental encounter:** a dental encounter consists of all dental treatment other than a dental screening.
- **Dental sealant:** a thin plastic coating that is applied to the chewing surfaces of the molars (back teeth).
- **Dental implant:** an artificial device usually made of metal alloy or ceramic material that is implanted within the jawbone as a means to attach an artificial crown, denture, or bridge.
- **Denture:** a removable appliance used to replace teeth.
- **Destructive periodontitis:** the presence of one or more sites with four mm or greater loss of tooth attachment compared to surrounding periodontal tissues.
- **Distant metastasis:** cancer that has spread from the original (primary) tumor to distant organs or distant lymph nodes. Also known as distant cancer.
- **Early childhood caries (ECC):** decay of primary (baby) teeth that develop between the ages of six months and six years.
- **Edentulism:** complete loss of all natural teeth.
- **Endocarditis, Endocartitis or Bacterial endocarditis:** an infection of the heart's inner lining (endocardium) or the heart valves.
- **Etiology:** the study of causation. In medicine, the term refers to the causes of diseases or pathologies.
- **Federally Qualified Health Centers (FQHCs):** also known as Community and Migrant Health Centers, are federally funded organizations required to take all patients regardless of ability to pay and to provide a comprehensive array of primary health care services, including oral health. They receive Medicaid and Medicare reimbursement enhancements, grants to serve the uninsured (Section 330 Grants) and some federal and state support for development. The Migrant Health Program (MHP) supports the delivery of migrant health services.
- **FQHC look-alikes:** are similar to a FQHC but do not receive Section 330 grants to serve the uninsured.
- **Full dentition:** the presence of all natural teeth, not including the third molars.
- **Free or charity care clinics:** clinics typically operated by churches or other community services

organizations using donated materials and labor. Some receive federal grants. Most charity care clinics limit care to a few hours or a few days a week.

- **Gingivitis:** an inflammation of the gingiva (gum tissue).
- **Healthy People 2010:** a set of health objectives for the nation to achieve over the first decade of the new century. It can be used by many different people, states, communities, professional organizations, and others to help them develop programs to improve health.
- **Health Professional Shortage Areas (HPSAs):** Health Professional Shortage Areas (HPSAs) designations are used to establish initial eligibility for certain types of federal and state programs. The DOH Office of Community and Rural Health collaborates with local partners to prepare designation requests for federal review and to designate counties or specific census tracts as HPSAs. This voluntary designation is periodically reevaluated. HPSAs may be established for primary medical care, primary dental care, and mental health care. The three major types of HPSA designations are:
  i. Geographic HPSAs, which have a shortage of health professionals for the total population.
  ii. Population HPSAs, which have particular underserved population in a geographic area (such as the low-income people or migrant farm workers).
  iii. Facility designations, which refer to specific types of facilities, including community health clinics, rural health clinics, and federal and state correctional facilities.

  HPSAs are not the same as other commonly used federal designations such as Medically Underserved Areas (MUAs) or Medically Underserved Populations (MUPs). These designations refer only to the distribution of primary care physicians and generally do not expire, and the criteria and data requirements differ from those used for HPSAs. But a given area may qualify for all three designations.
- **Hypopharynx:** the bottom part of the pharynx and is the part of the throat that connects to the esophagus.
- **Incidence:** the number of new cases of disease occurring in a population during a defined time interval.
- **Incipient dental decay:** a small white spot on the teeth that indicates the first signs of demineralization (starting of caries process). The caries process can be halted here and even reversed.
- **Individuals with disabilities:** represent a specific group of individuals older than five years of age who, according to the US Census, have a lasting condition producing any one of the following: blindness, deafness or a severe hearing or vision impairment; difficulty in physical activities such as walking, carrying, lifting or climbing stairs; difficulty in self care such as bathing or dressing; difficulty learning or remembering; difficulty in going outside the home alone to shop or visit a doctor's office; difficulty working at a job or business.
- **In situ (cancer):** when malignant cells are present in the epithelium but have not invaded beyond the basal lamina into deeper tissues.
- **Kaposi's sarcoma:** a cancer that develops in connective tissues such as cartilage, bone, fat, muscle, blood vessels, or fibrous tissues (related to tendons or ligaments).
- **Localized (cancer):** cancer that is restricted to the site of origin, without evidence of spread.
- **Methamphetamine:** a psychostimulant drug used primarily for recreational purposes, but it is sometimes prescribed for ADHD and narcolepsy. Methamphetamine is highly psychologically addictive.
- **Meth mouth:** an informal name for the tooth decay and poor oral health seen in many cases of methamphetamine abuse.

- **Mortality:** the number of deaths (from a disease or in general) per 1,000 people and typically reported on an annual basis.
- **Mucosal infections/mucositis:** the painful inflammation and ulceration of the mucous membranes lining the digestive tract. In the mouth and esophagus, mucositis is characterized by painful ulceration.
- **Nasopharynx:** lies behind the nose and above the level of the soft palate.
- **Oral congenital anomaly/disorder:** a medical condition that is present at birth. Congenital disorders can be a result of genetic abnormalities, the intrauterine environment, or unknown factors.
- **Oral ulcers:** an open sore inside the mouth caused by a break in the mucous membrane or the epithelium on the lips or surrounding the mouth.
- **Oropharyngeal cancer:** cancer of the mouth and throat.
- **Oropharynx:** the oral part of the pharynx and reaches from the soft palate to the level of the hyoid bone.
- **Osteoporosis:** a disease of bone in which the bone mineral density (BMD) is reduced, bone microarchitecture is disrupted, and the amount and variety of non-collagenous proteins in bone is changed.
- **Pathogens:** a biological agent that causes disease or illness to its host.
- **Perimolysis:** decalcification of the teeth from exposure to gastric acid in people with chronic vomiting.
- **Periodontitis:** a disease involving inflammation of the supporting structures of tooth, including the gum, the periodontal ligament, and the jawbone.
- **Predisposing factors:** genetic, attitudinal, personality, and environmental factors that are associated with health, or lack of it, in a person.
- **Preterm births:** delivery of an infant before 37 completed weeks of gestation.
- **Prevalence:** the total number of cases of a given disease in a specified population at a specified time.
- **Prosthodontics:** the dental specialty dealing with the replacement of missing teeth and other oral structures.
- **Public health clinics:** the six clinics operated by Public Health-Seattle & King County that provide primary medical and dental care services.
- **Rampant caries:** advanced and severe caries that affects numerous teeth in the dentition. In the Smile Survey, it refers of seven or more teeth with caries in a child.
- **Regional lymph nodes:** lymph nodes located in a specific anatomic region or compartment.
- **Relative Value Units (RVU):** a numerical system for describing the value of a medical procedure for the purpose of assigning a price or charge.
- **Salivary glands:** glands which produce saliva, which keeps the mouth and other parts of the digestive system moist.
- **Singleton:** a fetus that develops alone.
- **Smoker (BRFSS):** respondents who reported having smoked at least 100 cigarettes in their lifetime and currently smoke.
- **Stomatitis:** an inflammation of the mucous lining of any of the structures in the mouth that may involve the cheeks, gums, tongue, lips, and roof or floor of the mouth.
- **Streptococcus mutans:** a gram-positive, facultatively anaerobic bacterium commonly found in the human oral cavity and is a significant contributor to tooth decay.

- **Temporomandibular disorders (TMD):** disorders of the jaw muscles, temporomandibular joints, or the nerves associated with chronic facial pain.
- **Teratogens:** substances that cross the placental barrier and harm the developing baby.
- **Trigeminal neuralgia:** a disorder of the fifth cranial (trigeminal) nerve that causes episodes of intense, stabbing, electric shock-like pain in the areas of the face where the branches of the nerve are distributed (lips, eyes, nose, scalp, forehead, upper jaw, and lower jaw).
- **Varnishes:** a thin resin protective coating that is painted on a child's teeth to prevent cavities.
- **White spot lesions:** incipient dental decay.
- **Xerostomia (dry mouth):** the condition of not having enough saliva to keep the mouth wet due to inadequate function of the salivary glands.

Data tables

1. Proportion of adults (≥ 18 years) who visited a dentist in the previous 12 months, 2004 BRFSS.

Demographics	Dental visit in previous year	
	United States (%)	Washington (%)d
TOTAL	70.3	70.0 (69.1-70.9)
Race and ethnicity		
White	72.2	71.1 (70.2-72.0)
Black or African American	63.8	66.5 (60.3-72.8)
Asian or Pacific Islander	63.5	69.2 (63.2-75.3)
American Indian or Alaska Native	NA	61.4 (54.3-68.7)
Hispanic or Latino	63.5	60.0 (56.2-63.8)
Not Hispanic or Latino	NA	70.9 (70.0-71.8)
Gender		
Female	72.8	71.8 (70.8-72.9)
Male	67.7	68.2 (66.7-69.6)
Education level (persons aged 25 years and over)		
Less than high school	51.0	51.5 (48.1-54.9)
High school graduate	65.7	62.0 (60.1-63.9)
At least some college	73.0	75.5 (74.5-76.5)

2. Length of time since last dental visit, 2004 BRFSS.

Demographics	Time since last dental visit				
	Past year (95% CI)	Past 2 years (95% CI)	Past 5 years (95% CI)	5+ years (95% CI)	Never (95% CI)
Gender					
Male	68.2 (66.7-69.6)	12.9 (11.9-14.0)	9.2 (8.3-10.1)	9 (8.1-9.8)	0.7 (0.4-1.0)
Female	71.8 (70.8-72.9)	11.6 (10.8-12.3)	8.3 (7.6-8.9)	7.8 (7.2-8.4)	0.6 (0.4-0.8)
Race and ethnicity					
White	71.1 (70.2-72.0)	11.8 (11.1-12.4)	8.6 (8.0-9.1)	8.3 (7.8-8.8)	0.2 (0.1-0.3)
Black/AA	66.5 (60.2-72.8)	12.8 (8.3-17.4)	8 (4.6-11.4)	11.3 (7.3-15.3)	§
Asian	69.2 (63.2-75.3)	12.8 (8.4-17.2)	10.7 (6.1-15.4)	6.1 (3.3-8.8)	§
Native Hawaiian/Other Pacific Islander	69 (58.3-79.7)	13 (6.1-19.8)	§	§	§
American Indian	61.5 (54.3-68.7)	15.3 (10.4-20.2)	13.4 (8.1-18.7)	9.4 (5.5-13.3)	§
Other	56.7 (51.9-61.6)	17.1 (13.5-20.7)	9.7 (6.7-12.7)	9.7 (6.7-12.7)	6.7 (4.0-9.5)
Hispanic	60 (56.2-63.8)	15.8 (13.1-18.5)	9.6 (7.4-11.9)	9.8 (7.3-12.2)	4.9 (3.0-6.8)
Non-Hispanic	70.9 (70.0-71.8)	12 (11.3-12.6)	8.7 (8.1-9.2	8.2 (7.7-8.7)	0.3 (0.2-0.4)
Age					
18-24	67.7 (64.6-70.8)	16 (13.6-18.4)	10 (7.9-12.0)	4.3 (3.1-5.6)	2 (1.0-3.1)
25-34	64.5 (62.2-66.9)	15 (13.3-16.8)	10.8 (9.2-12.4)	8.8 (7.4-10.1)	0.9 (0.4-1.3)
35-44	69.5 (67.5-71.4)	13.2 (11.8-14.6)	9.7 (8.4-10.9)	7.4 (6.3-8.6)	§
45-54	75.3 (73.6-77.0)	10.9 (9.6-12.1)	7.3 (6.3-8.3)	6.2 (5.2-7.2)	§
55-64	74 (72.0-76.0)	9.2 (8.0-10.4)	7.5 (6.3-8.6)	9 (7.5-10.4)	§
65-74	71.5 (69.2-73.9)	8.1 (6.7-9.5)	6.8 (5.6-8.1)	13.2 (11.4-15.0)	§
75+	66.3 (63.7-68.9)	9.6 (7.9-11.3)	7 (5.7-8.3)	16.6 (14.5-18.6)	§
Smoking status					
Not at risk	73.3 (72.3-74.2)	11.5 (10.8-12.2)	7.8 (7.2-8.3)	6.8 (6.3-7.3)	0.6 (0.5-0.8)
At risk	56.3 (54.1-58.6)	15.4 (13.8-17.0)	13.1 (11.4-14.7)	14.6 (13.1-16.2)	§
Income					
Less than $20K	49.6 (46.8-52.3)	16.3 (14.3-18.4)	14.4 (12.5-16.2)	17.1 (15.1-19.1)	2.6 (1.5-3.8)
$20K-50K	63.5 (62.0-64.9)	14.5 (13.4-15.6)	10.6 (9.6-11.6)	11 (10.1-12.0)	0.4 (0.3-0.6)
$50K+	82.5 (81.2-83.7)	9.1 (8.1-10.1)	5.2 (4.5-6.0)	3.1 (2.6-3.7)	§
Education					
Less than high school	51.5 (48.1-54.9)	14.1 (11.9-16.3)	14.7 (12.2-17.1)	15.7 (13.3-18.0)	4.1 (2.4-5.7)
High school	62 (60.1-63.9)	14.1 (12.7-15.4)	10.9 (9.6-12.1)	12.5 (11.3-13.8)	0.5 (0.3-0.8)
More than high school					

§ Relative standard error (RSE) >30%, therefore data too unreliable to report.

3. Length of time since last teeth cleaning among adults, 2004 BRFSS.

Demographics	Time since last teeth cleaning				
	Past Year (95% CI)	Past 2 years (95% CI)	Past 5 years (95% CI)	5+ years (95% CI)	Never (95% CI)
Gender					
Male	67.3 (65.9-68.8)	13.1 (12.0-14.2)	10.0 (9.1-11.0)	8.8 (7.9-9.6)	0.8 (0.5-1.1)
Female	71.2 (70.1-72.3)	12.7 (11.9-13.5)	8.3 (7.7-9.0)	7.1 (6.5-7.7)	0.7 (0.5-0.9)
Race and ethnicity					
White	70.4 (69.4-71.3)	12.2 (11.5-12.9)	8.9 (8.3-9.5)	8.0 (7.4-8.5)	0.5 (0.4-0.6)
Black/AA	61.4 (54.9-68.0)	17 (12.1-21.9)	7.9 (4.1-11.7)	12.9 (8.5-17.3)	§
Asian	67.8 (61.6-74.0)	13.5 (9.0-18.1)	13.3 (8.3-18.2)	4.5 (2.3-6.7)	§
Native Hawaiian/ Other Pacific Islander	68.6 (57.7-79.5)	12.1 (5.3-19.0)	§	§	§
American Indian	57.5 (49.8-65.2)	14.1 (9.4-18.8)	13.4 (7.7-19.1)	12.7 (7.6-17.8)	§
Other	59.2 (54.2-64.2)	21.0 (16.7-25.3)	9.6 (6.7-12.6)	6.7 (4.5-9.0)	3.5 (1.7-5.3)
Hispanic	60.6 (56.7-64.5)	17.9 (14.8-21.0)	11.0 (8.5-13.4)	7.4 (5.4-9.4)	3.1 (1.6-4.6)
Non-Hispanic	70.0 (69.1-70.9)	12.5 (11.8-13.2)	9.0 (8.4-9.6)	8.0 (7.4-8.5)	0.5 (0.4-0.7)
Age					
18-24	66.0 (62.9-69.2)	17.6.0 (15.0-20.1)	10.6 (8.5-12.8)	5.3 (3.9-6.7)	§
25-34	62.5 (60.2-64.9)	14.9 (13.1-16.7)	11.6 (10.0-13.2)	10.1 (8.7-11.5)	0.9 (0.4-1.4)
35-44	67.1 (65.1-69.1)	13.7 (12.3-15.2)	10.2 (8.9-11.5)	8.3 (7.2-9.5)	§
45-54	73.0 (71.2-74.8)	11.5 (10.2-12.8)	7.9 (6.8-8.9)	7.1 (6.1-8.2)	0.5 (0.3-0.7)
55-64	75.2 (73.1-77.3)	10.4 (8.9-11.8)	6.7 (5.6-7.8)	7.3 (5.9-8.7)	0.5 (0.2-0.7)
65-74	75.7 (73.2-78.1)	8.1 (6.6-9.6)	7.2 (5.6-8.7)	7.8 (6.3-9.4)	1.2 (0.6-1.9)
75+	72.9 (70.2-75.6)	9.0 (7.3-10.7)	6.7 (5.2-8.2)	9.3 (7.6-11.2)	2.0 (1.2-2.8)
Smoking status					
Not at risk	73.1 (72.1-74.0)	12.2 (11.5-13.0)	8.1 (7.5-8.7)	6.0 (5.5-6.5)	0.6 (0.4-0.8)
At risk	52.7 (50.3-55.0)	15.8 (14.2-17.5)	14.1 (12.3-15.9)	16.1 (14.4-17.9)	1.3 (0.9-1.8)
Income					
Less than $20K	48.5 (45.6-51.4)	18.3 (16.0-20.7)	14.9 (12.8-17.0)	16.4 (14.3-18.4)	1.9 (1.2-2.6)
$20K-50K	62.5 (60.9-64.0)	14.5 (13.3-15.6)	11.3 (10.2-12.3)	10.8 (9.8-11.8)	1.0 (0.8-1.3)
$50K+	81.0 (79.7-82.3)	10.1 (9.0-11.1)	5.6 (4.9-6.4)	3.2 (2.7-3.8)	§
Education					
Less than HS	52.5 (48.8-56.2)	16.3 (13.5-19.1)	14.3 (11.6-17.0)	13.1 (10.7-15.5)	3.7 (2.5-5.0)
HS	60.9 (58.9-62.9)	14.3 (12.9-15.7)	11.8 (10.4-13.2)	11.9 (10.6-13.3)	1.0 (0.6-1.4)
More than HS	74.2 (73.2-75.2)	12.0 (11.2-12.8)	7.6 (7.0-8.3)	5.9 (5.4-6.4)	0.3 (0.2-0.4)

§ Relative standard error (RSE) >30%, therefore data too unreliable to report.

4. Proportion of adults (≥18 years) with tooth loss by selected demographic and risk factor variables, 2004 BRFSS.

Demographics / risk factors	Number of teeth lost §			
	None (95% CI)	5 or less (95% CI)	6+ (95% CI)	All (95% CI)
Male	63.5 (62.1-64.9)	25.2 (23.9-26.4)	8.0 (7.3-8.7)	3.3 (2.9-3.8)
Female	62.2 (61.1-63.3)	24.4 (23.3-25.4)	8.6 (8.0-9.1)	4.9 (4.4-5.3)
Race and ethnicity				
White	62.6 (61.6-63.5)	24.4 (23.5-25.2)	8.7 (8.2-9.2)	4.4 (4.0-4.7)
Black/AA	57.8 (51.2-64.4)	28.9 (22.7-35.1)	9.8 (6.4-13.3)	§
Asian	67.9 (61.9-73.8)	27.3 (21.6-33.1)	§	§
Native Hawaiian/Other Pacific Islander	60.7 (48.8-72.6)	32.5 (21.1-43.9)	§	§
American Indian	54.7 (47.1-62.2)	29.3 (22.3-36.4)	11.8 (7.7-16.0)	4.2 (2.1-6.3)
Other	66.6 (62.1-71.0)	27.4 (23.3-31.6)	4.2 (2.3-6.0)	§
Hispanic	67.8 (64.2-71.3)	25.1 (21.8-28.4)	4.7 (3.3-6.1)	2.4 (1.2-3.6)
Non-Hispanic	62.4 (61.5-63.3)	24.8 (23.9-25.6)	8.6 (8.1-9.1)	4.2 (3.9-4.5)
Age				
18-24	88.3 (86.1-90.6)	11.1 (8.9-13.3)	§	§
25-34	79.9 (78.0-81.8)	17.7 (15.9-19.6)	2.0 (1.4-2.7)	§
35-44	70.8 (68.9-72.6)	24.3 (22.6-26.1)	3.9 (3.1-4.7)	1.0 (0.5-1.4)
45-54	59.3 (57.4-61.3)	30.1 (28.2-31.9)	8.4 (7.3-9.4)	2.2 (1.7-2.8)
55-64	43.8 (41.5-46.0)	32.6 (30.4-34.7)	15.6 (14.0-17.3)	8.0 (6.8-9.3)
65-74	32.4 (29.9-34.9)	31.5 (29.0-34.0)	21.9 (19.6-24.1)	14.2 (12.4-16.0)
75+	24.7 (22.2-27.2)	33.1 (30.4-35.8)	24.2 (21.7-26.6)	18.0 (15.9-20.2)
Smoking Status				
Not at risk	65.4 (64.5-66.4)	23.7 (22.9-24.6)	7.3 (6.8-7.8)	3.6 (3.2-3.9)
At risk (Current smokers)	52.4 (50.1-54.6)	28.9 (36.9-31.0)	12.3 (11.0-13.6)	6.4 (5.5-7.3)
Income				
Less than $20K	51.2 (48.5-54.0)	26.0 (23.6-28.3)	13.9 (12.4-15.5)	8.9 (7.6-10.1)
$20K-50K	56.6 (55.1-58.0)	27.7 (26.3-29.0)	10.5 (9.7-11.4)	5.3 (4.7-5.9)
$50K+	72.8 (71.4-74.1)	21.7 (20.4-23.0)	4.6 (4.0-5.2)	0.9 (0.7-1.1)
Maternal education				
Less than HS	51.4 (48.0-54.8)	28.2 (25.2-31.2)	10.8 (9.1-12.5)	9.6 (8.0-11.2)
HS	53.6 (51.6-55.5)	28.9 (27.1-30.7)	10.8 (9.7-11.8)	6.8 (6.0-7.5)
More than HS	67.8 (66.8-68.9)	22.8 (21.8-23.7)	7.0 (6.5-7.5)	2.4 (2.1-2.7)

§ Relative Standard Error (RSE) >30%, therefore data too unreliable to report.

5. Treatment need and dental visit among pregnant women, 2001-03 PRAMS.

Problem: "I needed to see a dentist for a problem."

Went: "I went to a dentist or dental clinic."

Demographics	No problem / Didn't go (95% CI)	No problem / Went (95% CI)	Problem / Didn't go (95% CI)	Problem / Went (95% CI)
Race and ethnicity				
Hispanic	42.7 (39.5-46.1)	20.1 (17.6-22.8)	8.0 (6.3-10.0)	29.2 (26.3-32.4)
African American	46.2 (42.5-49.8)	22.9 (20.0-26.0)	10.7 (8.7-13.2)	20.3 (17.5-23.3)
Native American	44.0 (40.2-47.8)	16.0 (13.4-18.9)	16.5 (13.8-19.6)	23.6 (20.6-26.8)
Asian /Pacific Islander	46.2 (43-49.4)	26.6 (24.0-29.4)	7.0 (5.5-8.8)	20.3 (17.8-23.0)
White	42.8 (40.0-45.7)	33.0 (30.4-35.8)	8.1 (6.6-9.8)	16.0 (14-18.3)
Age				
15-17	43.7 (31.9-56.3)	24.0 (14.6-36.9)	§	20.3 (11.5-33.4)
18-19	50.7 (42.1-59.3)	15.6 (10.2-23.1)	14.0 (8.8-21.4)	19.8 (13.7-27.6)
<20	48.8 (41.8-55.9)	18.2 (13.2-24.5)	13.2 (9.0-19.0)	19.8 (14.6-26.3)
20-24	47.5 (43.2-51.8)	19.1 (16.0-22.6)	11.8 (9.3-15.0)	21.7 (18.4-25.3)
25-29	43.7 (39.7-47.8)	28.2 (24.6-32.0)	9.1 (7.0-11.8)	19.0 (16.1-22.2)
Age				
30-34	39.5 (35.5-43.7)	38.3 (34.3-42.5)	5.6 (4.0-7.7)	16.6 (13.9-19.7)
35+	38.8 (33.8-44.1)	41.2 (36.1-46.5)	2.8 (1.7-4.7)	17.1 (13.6-21.3)
Medicaid status				
TANF	51.1 (44.9-57.2)	9.9 (6.9-14.1)	16.5 (12.4-21.5)	22.6 (17.8-28.2)
S-Women	47.1 (42.2-52.1)	16.6 (13.4-20.5)	14.9 (11.6-18.9)	21.4 (17.6-25.7)
Non-Citizens	35.9 (31.6-40.5)	16.2 (13.2-19.6)	7.6 (5.1-11.2)	40.4 (36.0-44.9)
Non-Medicaid	41.1 (38.3-43.9)	40.4 (37.7-43.2)	4.5 (3.5-5.8)	14.0 (12.2-16.0)
RUCA				
Rural	45.4 (41.8-49.0)	26.3 (23.2-29.7)	9.1 (7.2-11.4)	19.1 (16.6-21.9)
Urban	42.0 (39.5-44.6)	31.6 (29.2-34.0)	7.8 (6.5-9.3)	18.6 (16.8-20.7)

§ Relative Standard Error (RSE) >30%, therefore data too unreliable to report.

6. Proportion of adolescents who had a dental visit within the past year, 2004 HYS.

Grade / demographics	Dental visit in previous year (95% CI)
Grades 8, 10 and 12	
Grade 8	72.2 (69.4-74.8)
Grade 10	74.1 (71.3-76.7)
Grade 12	73.3 (70.6-75.9)
Gender (grade 10)	
Male	72.1 (68.5-75.3)
Female	75.9 (73.3-78.3)
Race and ethnicity (grade 10)	
White	77.9 (75.5-80.1)
Black	56.9 (50.3-63.3)
American Indian /Alaska Natives	65.2 (54.5-74.5)
Asian	73.4 (64.8-80.6)
Hispanic	59.4 (54.4-64.2)
Hawaiian/ Pacific Islander	60.7 (48.2-71.9)
Other	67.4 (59.4-74.5)
More than one race	76.2 (69.9-81.6)

7. Length of time since last dental visit and smoking status among adolescents, 2004 HYS.

Grade/ length of time since last dental visit	Smoking status	
	Non-smoker (%)	Smoker (%)
Grade 8		
During past year	72.7 (69.8-75.4)	66.0 (60.1-71.4)
1-2 years	10.3 (9.1-11.6)	9.9 (7.0-13.9)
2+ years	4.9 (4.0-6.0)	7.3 (4.7-11.0)
Never	2.2 (1.7-2.8)	5.3 (3.4-8.2)
Unsure	10.0 (8.7-11.5)	11.6 (8.2-16.0)
Grade 10		
During past year	75.8 (73.0-78.3)	63.1 (58.7-67.3)
1-2 years	10.6 (9.4-12.0)	15.9 (13.3-19.0)
2+ years	5.7 (4.8-6.7)	10.3 (7.5-13.9)
Never	2.0 (1.5-2.6)	2.5 (1.5-4.2)
Unsure	6.0 (5.0-7.2)	8.2 (5.6-11.8)
Grade 12		
During past year	75.1 (72.0-77.9)	65.9 (61.6-70.0)
1-2 years	12.2 (10.5-14.1)	16.9 (14.0-20.1)
2+ years	7.2 (5.7-9.0)	9.2 (6.8-12.3)
Never	2.1 (1.5-2.7)	3.4 (2.1-5.4)
Unsure	3.5 (2.7-4.6)	4.7 (3.1-6.9)

8. Length of time since last dental visit and smokeless tobacco use among adolescents, 2004 HYS.

Grade/ length of time since last dental visit	Smokeless tobacco	
	Do not use (%)	Use (%)
Grade 8		
During past year	72.4 (69.5-75.1)	64.5 (54.4-73.5)
1-2 years	10.1 (9.0-11.4)	14.0 (7.6-24.3)
2+ years	5.0 (4.2-6.0)	§
Never	2.3 (1.9-2.9)	§
Unsure	10.1 (8.8-11.6)	§
Grade 10		
During past year	74.2 (71.5-76.8)	71.7 (62.3-79.6)
1-2 years	11.4 (10.2-12.7)	8.3 (4.9-13.6)
2+ years	6.3 (5.3-7.3)	6.9 (3.8-12.1)
Never	1.9 (1.5-2.5)	§
Unsure	6.2 (5.1-7.5)	9.0 (5.0-15.5)
Grade 12		
During past year	73.6 (70.7-76.3)	70.2 (63.5-76.1)
1-2 years	13.0 (11.4-14.7)	14.4 (10.2-19.8)
2+ years	7.5 (6.1-9.1)	8.3 (5.3-12.8)
Never	2.1 (1.6-2.8)	5.0 (2.9-8.5)
Unsure	3.9 (3.1-4.8)	§

§ Relative standard error (RSE) >30%, therefore data too unreliable to report.

9. Overview of oral health indicators among children (0-17years), 2003 NSCH.

Indicator	Percent (95% CI)
Condition of child's teeth	
Excellent	44.2 (41.5-47.0)
Very good	27.1 (24.7-29.6)
Good	19.1 (17.0-21.4)
Fair	7.2 (5.8-9.0)
Poor	2.2 (1.5-3.4)
Time since dentist was last seen	
Never	11.3 (9.7-13.0)
Less than 1 year	81.8 (79.6-83.9)
> 1 year & < 2 years	5.0 (3.9-6.4)
> 2 years & < 5 years	1.8 (1.1-2.9)
> 5 years	§
If in last year's visit, child was seen for routine prevention	
Yes	94.0 (92.2-95.3)
No	5.8 (4.4-7.5)
In the last year, child needed routine prevention	
Yes	22.0 (12.4-36.1)
No	78.0 (64.0-87.6)

Note: *The options of Refused, Don't Know, etc have not been shown in these tables.*
§ Relative standard error (RSE) >30%, therefore data too unreliable to report.

10. Parents' perception of the condition of their child's teeth, 2003 NSCH.

Demographics	Condition of child's teeth				
	Excellent (95% CI)	Very good (95% CI)	Good (95% CI)	Fair (95% CI)	Poor (95% CI)
Age					
Less than 5 years	54.0 (48.2-59.8)	25.9 (21.1-31.4)	13.6 (10.0-18.3)	§	§
5-9 Years	43.2 (37.8-48.7)	24.7 (20.4-29.6)	21.4 (17.4-26.1)	8.0 (5.4-11.8)	§
10-14 Years	35.8 (30.9-41.0)	33.0 (28.4-38.0)	20.5 (16.7-25.0)	7.5 (5.2-10.8)	§
15-17 Years	48.5 (42.4-54.7)	22.1 (17.3-27.8)	19.7 (15.2-25.2)	7.9 (5.0-12.2)	§
Race					
White	46.2 (43.1-49.4)	27.2 (24.4-30.0)	17.8 (15.5-20.3)	6.6 (5.0-8.6)	2.2 (1.3-3.7)
African American	39.6 (24.8-56.6)	31.8 (19.4-47.5)	§	§	§
Multi-racial	39.8 (29.9-50.7)	26.9 (18.5-37.3)	28.1 (19.1-39.3)	§	§
Other	43.5 (31.5-56.2)	28.2 (18.7-40.3)	18.7 (10.6-30.8)	§	§
Maternal education					
Less than 12 years	21.4 (12.6-33.9)	25.7 (16.3-38.0)	25.3 (16.7-36.7)	19.5 (11.1-31.9)	§
12 years	34.3 (27.6-41.8)	25.4 (19.5-32.3)	27.9 (21.7-35.1)	8.7 (5.7-13.1)	§
More than 12 years	48.4 (45.3-51.5)	27.6 (24.9-30.5)	16.5 (14.3-18.9)	6.0 (4.5-7.9)	1.5 (0.9-2.5)
Hispanic					
Yes	31.0 (24.2-38.6)	20.4 (14.6-27.8)	24.1 (18.1-31.3)	20.9 (14.9-28.6)	§
No	46.0 (43-49)	27.9 (25.3-30.7)	18.4 (16.2-20.9)	5.6 (4.2-7.3)	2.0 (1.2-3.4)
Poverty level					
<100% FPL	26.1 (19.5-33.8)	24.9 (18.3-32.9)	25.5 (19.0-33.3)	16.1 (10.9-23.0)	§
100-185% FPL	41.3 (34.2-48.7)	21.4 (16.1-27.7)	24.2 (18.6-30.8)	10.9 (6.9-16.7)	§
185-200% FPL	33.4 (21.7-47.6)	26.8 (16.4-40.6)	21.8 (12.6-35.0)	§	§
200-400% FPL	45.6 (40.9-50.4)	30.4 (26.2-35.0)	17.2 (13.9-21.1)	5.4 (3.6-8.1)	§
400+% FPL	54.1 (49.6-58.6)	28.0 (24.1-32.3)	14.8 (11.9-18.3)	2.2 (1.4-3.6)	§

§ Relative standard error (RSE) >30%, therefore data too unreliable to report.

11. Length of time since last dental visit among children (0-17 years), 2003 NSCH.

Demographics	Time since last dental visit				
	Never (95% CI)	<1 year (95% CI)	1 - 2 years (95% CI)	2 - 5 years (95% CI)	>5 years (95% CI)
Age					
Less than 5 years	44.4 (38.8-50.2)	52.7 (47.0-58.5)	§	§	§
5-9 Years	4.7 (2.9-7.5)	90.5 (87.1-93.1)	4.0 (2.5-6.4)	§	§
10-14 Years	§	89.4 (85.4-92.4)	7.0 (4.7-10.2)	§	§
15-17 Years	§	90.1 (84.9-93.6)	6.2 (3.4-10.9)	§	§
Race					
White	11.0 (9.3-13.0)	82.5 (80.0-84.7)	4.9 (3.6-6.5)	1.6 (0.9-2.7)	§
Black	9.1 (3.6-21.2)	83.0 (69.9-91.1)	§	§	§
Multiracial	16.1 (9.5-26.0)	79.8 (69.4-87.3)	§	§	§
Other	§	78.5 (66.0-87.3)	§	§	§
Maternal education					
Less than 12 years	§	84.1 (73.6-90.9)	§	§	§
12 years	13.9 (9.7-19.5)	75.3 (68.2-81.3)	7.5 (4.3-12.9)	§	§
More than 12 years	10.9 (9.3-12.9)	83.3 (80.9-85.4)	4.3 (3.2-5.7)	1.4 (0.8-2.4)	§
Hispanic					
Yes	15.7 (10.6-22.7)	78.0 (70.5-84.0)	§	§	§
No	10.7 (9.1-12.6)	82.4 (80.0-84.5)	4.9 (3.7-6.4)	1.9 (1.2-3.2)	0.1 (0.01-0.7)
Poverty level					
<100% FPL	15.9 (10.9-22.5)	72.0 (64.2-78.7)	8.1 (4.6-13.8)	§	§
100-185% FPL	11.7 (8.2-16.5)	77.6 (71.1-83)	6.8 (4.0-11.3)	§	§
185-200% FPL	§	83.7 (71.5-91.3)	§	§	§
200-400% FPL	10.1 (7.6-13.2)	84.0 (80.2-87.3)	4.7 (2.9-7.5)	§	§
400+% FPL	11.5 (9.0-14.6)	86.1 (82.8-88.8)	2.2 (1.3-3.7)	§	§

§ Relative standard error (RSE) >30%, therefore data too unreliable to report.

12. Proportion of children (0-17years) receiving routine preventive care within the past year, 2003 NSCH.

Demographics	Received routine preventive care	
	Yes (95% CI)	No (95% CI)
Age		
Less than 5 years	93.8 (89.0-96.6)	§
5-9 Years	95.4 (92.5-97.2)	4.5 (2.8-7.4)
10-14 Years	93.5 (90.0-95.9)	5.8 (3.6-9.3)
15-17 Years	92.6 (87.6-95.7)	7.4 (4.3-12.4)
Race		
White	94.3 (92.2-95.8)	5.5 (4.0-7.5)
Black	95.4 (82.6-98.9)	§
Multiracial	95.3 (88.7-98.1)	§
Other	96.1 (85.7-99.0)	§
Maternal education		
Less than 12 years	81.7 (69.1-89.9)	§
12 years	84.6 (77.5-89.8)	14.7 (9.6-21.7)
More than 12 years	96.9 (95.5-97.9)	3.1 (2.1-4.5)
Hispanic		
Yes	85.1 (77.5-90.5)	13.6 (8.5-21.0)
No	95.0 (93.2-96.3)	4.9 (3.6-6.7)
Poverty level		
<100% FPL	84.5 (74.8-90.9)	14.3 (8.1-23.9)
100-185% FPL	90.3 (84.8-94.0)	9.0 (5.5-14.4)
185-200% FPL	93.1 (80.0-97.8)	§
200-400% FPL	95.9 (93.5-97.4)	4.1 (2.6-6.6)
400+% FPL	97.5 (95.3-98.7)	§

§ Relative standard error (RSE) >30%, therefore data too unreliable to report.

13. Proportion of adults (≥ 18 years) with a dental visit and teeth cleaning with the past year by county, 2004 BRFSS.

Counties	Teeth cleaning visit (<1 year)	Dental visit (<1 year)
Adams	69.4 (60.2-77.3)	70.2 (61.6-77.6)
Asotin	61.3 (53.1-68.8)	56.6 (49.2-63.8)
Benton	71.4 (64.9-77.1)	74.2 (68.1-79.4)
Chelan	65.5 (58.4-71.9)	63.2 (56.3-69.6)
Clallam	62.6 (55.5-69.2)	64.5 (57.7-70.7)
Clark	70.6 (67.2-73.9)	72.4 (69.1-75.5)
Columbia	60.4 (46.6-72.7)	69.4 (57.8-79.0)
Cowlitz	54.5 (47.1-61.7)	57.3 (50.4-63.9)
Douglas	64.2 (56.7-71.1)	66.2 (59.0-72.8)
Ferry	56.2 (48.0-64.1)	57.7 (49.8-65.2)
Franklin	65.7 (56.5-73.9)	68.0 (60.1-75.0)
Garfield	73.4 (63.5-81.4)	73.1 (63.9-80.7)
Grant	64.6 (56.7-71.8)	62.1 (54.8-68.9)
Grays Harbor	56.1 (48.7-63.2)	57.3 (50.4-64.0)
Island	73.4 (67.1-78.8)	72.8 (66.5-78.3)
Jefferson	66.4 (58.3-73.6)	66.9 (59.1-73.9)
King	73.8 (71.8-75.7)	74.1 (72.1-75.9)
Kitsap	69.8 (65.9-73.3)	70.3 (66.6-73.7)
Kittitas	54.1 (45.7-62.2)	59.0 (50.9-66.7)
Klickitat	63.4 (55.3-70.9)	65.4 (58.0-72.1)
Lewis	58.3 (51.2-65.1)	57.1 (50.5-63.5)
Lincoln	66.3 (57.6-74.0)	63.1 (53.6-71.7)
Mason	60.9 (52.9-68.3)	60.6 (52.9-67.7)
Okanogan	55.6 (47.3-63.5)	57.4 (49.7-64.6)
Pacific	59.6 (51.7-67.0)	58.2 (50.7-65.3)
Pend Oreille	54.0 (43.2-64.5)	60.7 (51.3-69.4)
Pierce	68.9 (66.0-71.6)	70.5 (67.7-73.1)
San Juan	69.8 (61.7-76.9)	72.0 (64.0-78.7)
Skagit	70.9 (64.4-76.6)	72.6 (66.3-78.0)
Skamania	60.0 (48.6-70.4)	66.9 (58.2-74.6)
Snohomish	67.5 (64.6-70.4)	69.1 (66.2-71.8)
Spokane	71.3 (67.9-74.5)	70.7 (67.4-73.8)
Stevens	61.9 (52.7-70.3)	59.6 (50.5-68.1)
Thurston	72.2 (68.9-75.3)	73.5 (70.4-76.4)
Wahkiakum	61.0 (43.0-76.4)	62.8 (45.7-77.3)
Walla Walla	67.5 (60.4-73.8)	71.3 (64.6-77.1)
Whatcom	66.8 (60.3-72.6)	66.9 (60.7-72.6)
Whitman	74.3 (67.1-80.3)	74.9 (68.0-80.7)
Yakima	59.1 (54.5-63.6)	60.1 (55.7-64.4)
Washington	69.3 (68.3-70.2)	70.0 (69.1-70.9)

County Oral Health Profiles

(Note: The county profiles presented here are for the twenty two counties which conducted a county wide smile survey in 2005.)

Adams County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
17,300

Population by age (2006)[1]:	
Age	**%**
0-4	9.1%
5-19	26.5%
20-64	53.7%
65+	10.6%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	46.0%
Non-Hispanic Others	1.7%
Hispanic	52.3%

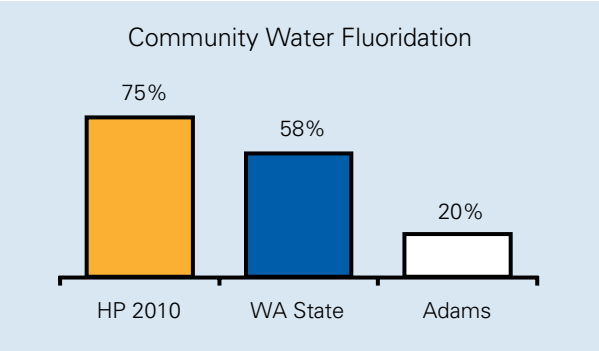
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	12.6	2180	41.4	902
6-20	16.7	2893	49.2	1422
>21	9.8	1697	35.4	601
All ages	39.1	6770	28.7	2925

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	8
Number of dental hygienists	6
Dentist-population ratio[1]	1:2163
Number of Medicaid dental providers[2]	3

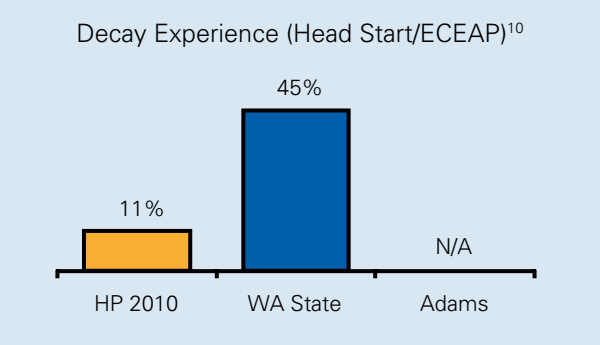
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	1
School-based dental sealant program:	No
Percentage of people on public water systems receiving fluoridated water:[8]	20%



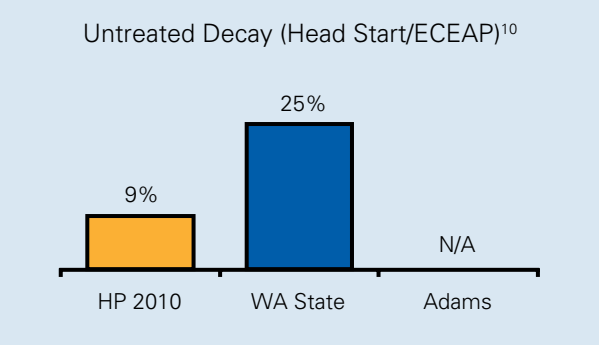
[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

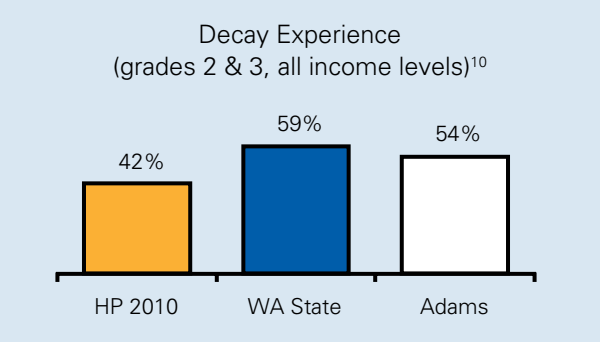
Children's Oral Health Indicators

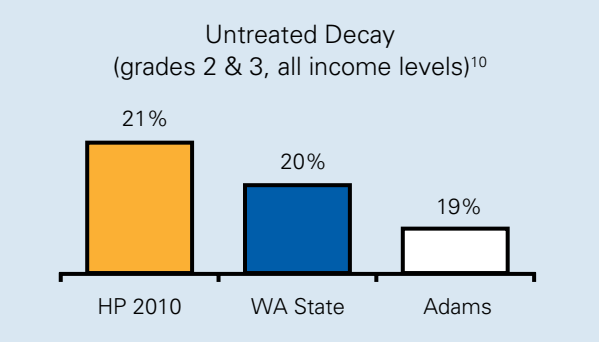
Decay experience[9]



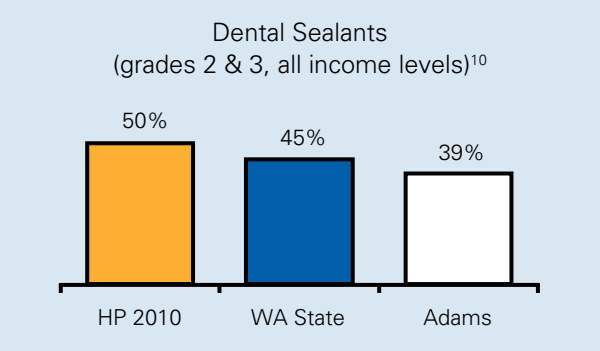
Untreated decay[11]







Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Asotin County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
21,100

Population by age (2006)[1]:	
Age	**%**
0-4	6.5%
5-19	20%
20-64	56.9%
65+	16.5%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	94.2%
Non-Hispanic Others	3.6%
Hispanic	2.2%

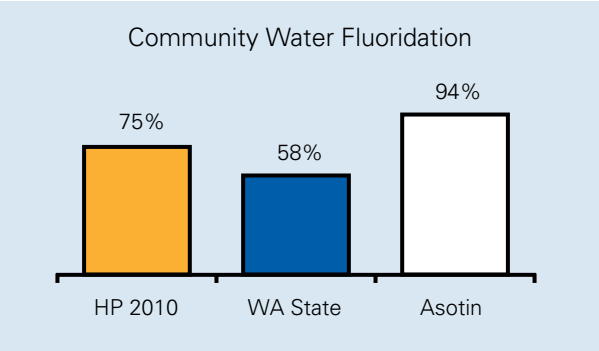
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	5.6	1182	29.4	348
6-20	9.2	1934	38.1	737
>21	11.3	2385	20.6	492
All ages	26.1	5501	28.7	1577

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	8
Number of dental hygienists	7
Dentist-population ratio[1]	1:2638
Number of Medicaid dental providers[2]	5

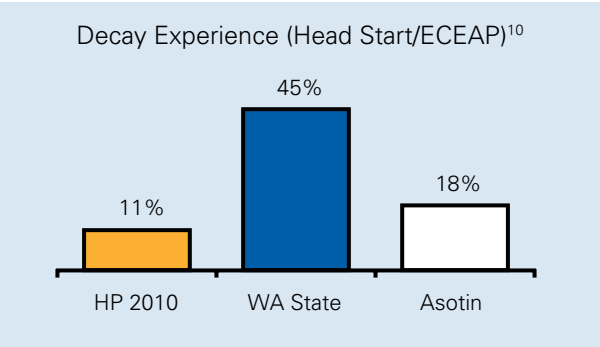
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	0
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	94%

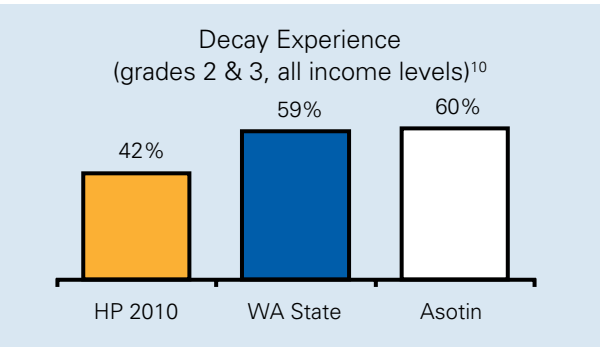


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

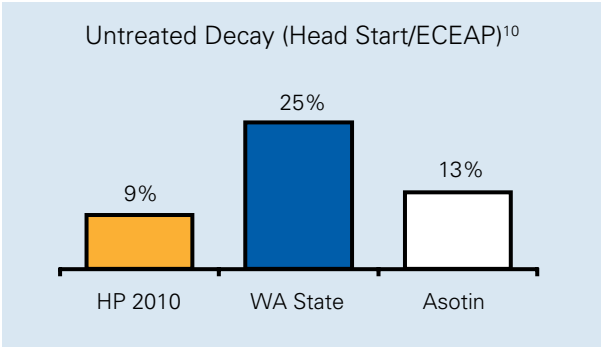
Children's Oral Health Indicators

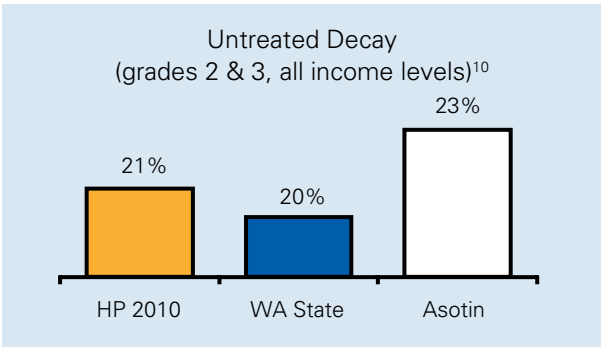
Decay experience[9]



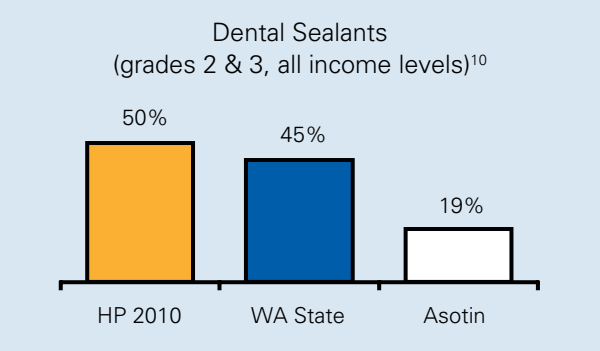


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Benton-Franklin Counties

Oral Health Profile 2006

Demographics

County population (2006)[1]:
224,800

Population by age (2006)[1]:	
Age	**%**
0-4	8%
5-19	24.5%
20-64	57.5%
65+	10%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	67.5%
Non-Hispanic Others	5.2%
Hispanic	27.3%

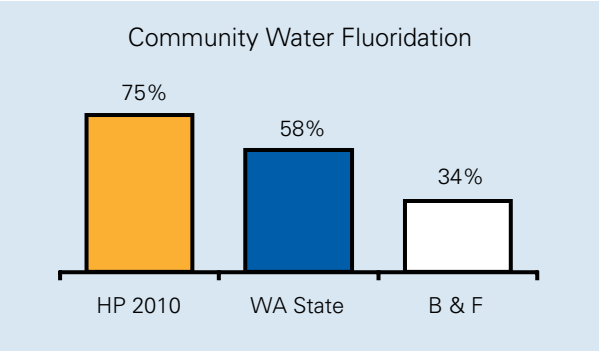
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	6.9	15543	35.6	5540
6-20	9.8	22096	48.7	10762
>21	7.4	16537	29.4	4870
All ages	24.1	54176	39.1	1272

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	108
Number of dental hygienists	141
Dentist-population ratio[1]	1:2081
Number of Medicaid dental providers[2]	54

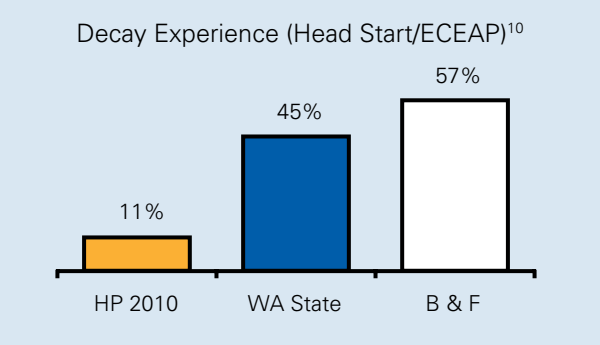
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	3
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	34%

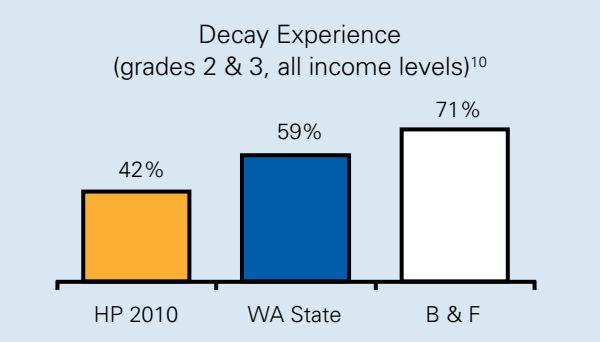


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

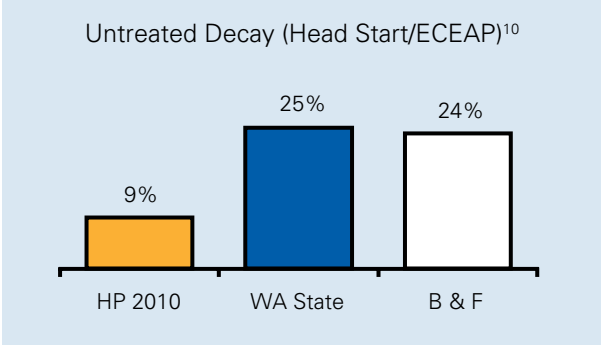
Children's Oral Health Indicators

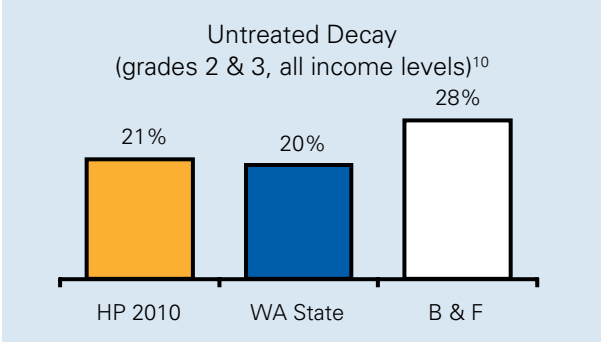
Decay experience[9]



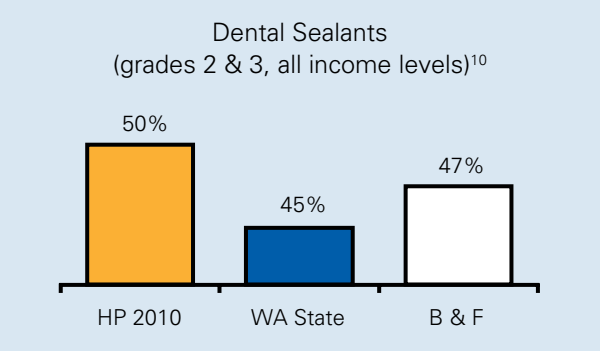


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Chelan-Douglas Counties

Oral Health Profile 2006

Demographics

County population (2006)[1]:
105,800

Population by age (2006)[1]:	
Age	**%**
0-4	7%
5-19	22.7%
20-64	56.6%
65+	13.7%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	73.6%
Non-Hispanic Others	2.9%
Hispanic	23.5%

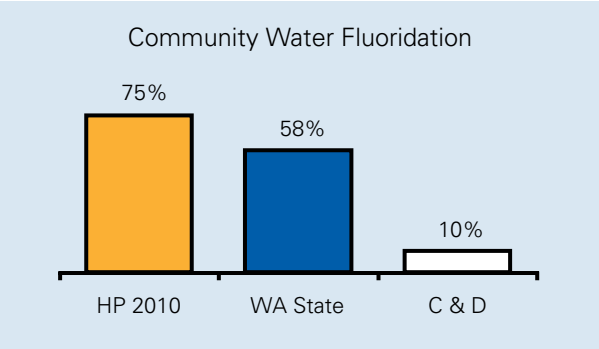
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	6.5	6831	50.3	3439
6-20	10.1	10729	63.1	6775
>21	7.8	8300	23.3	1931
All ages	24.4	25860	47	12145

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	65
Number of dental hygienists	73
Dentist-population ratio[1]	1:1628
Number of Medicaid dental providers[2]	37

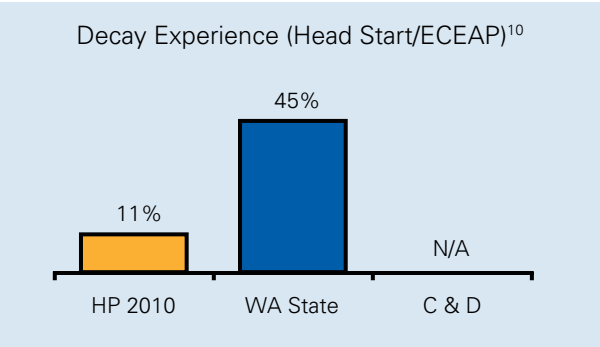
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	2
School-based dental sealant program:	No
Percentage of people on public water systems receiving fluoridated water:[8]	10%

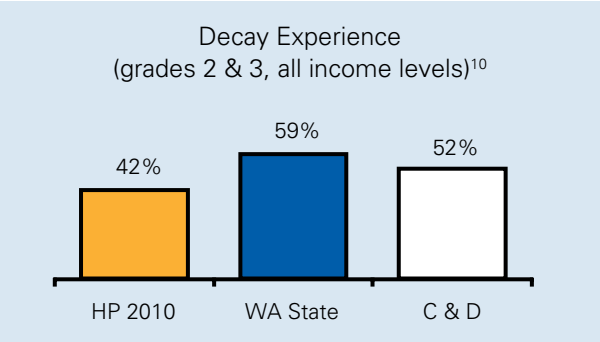


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

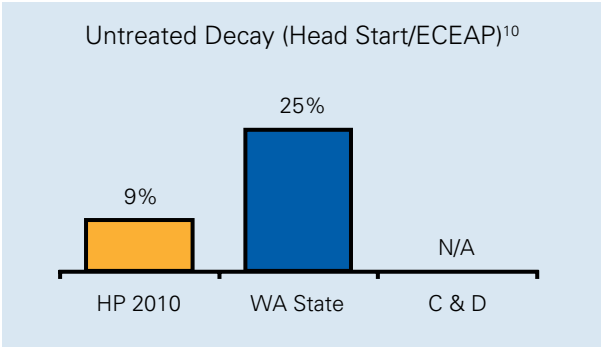
Children's Oral Health Indicators

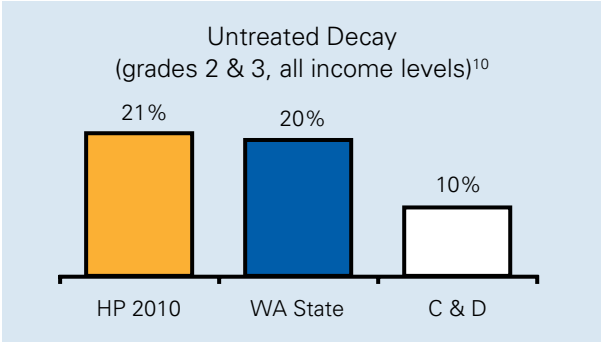
Decay experience[9]



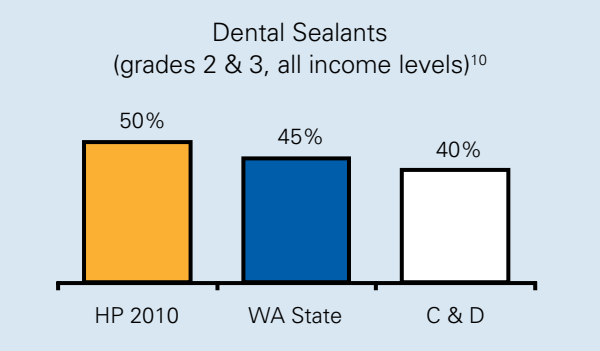


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Clallam County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
67,800

Population by age (2006)[1]:	
Age	**%**
0-4	4.9%
5-19	18.1%
20-64	55.7%
65+	21.3%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	86.4%
Non-Hispanic Others	9.2%
Hispanic	4.3%

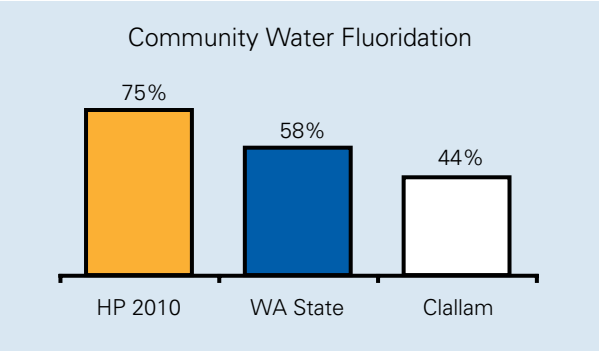
Medicaid (FY 2006)[2]:				
	Eligibles[3]		**Users[4]**	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	4	2701	29.8	804
6-20	7.5	5065	41.7	2114
>21	8.8	5973	20.8	1242
All ages	20.3	13739	30.3	4160

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	47
Number of dental hygienists	37
Dentist-population ratio[1]	1:1443
Number of Medicaid dental providers[2]	23

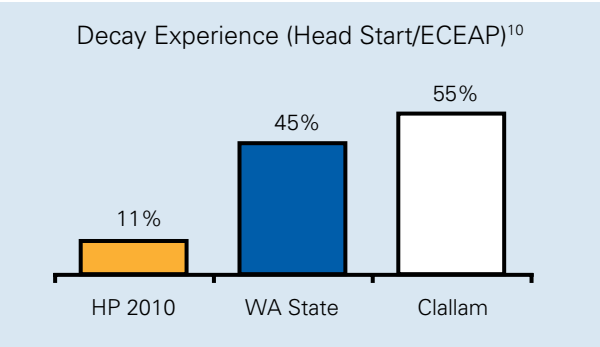
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	2
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	44%



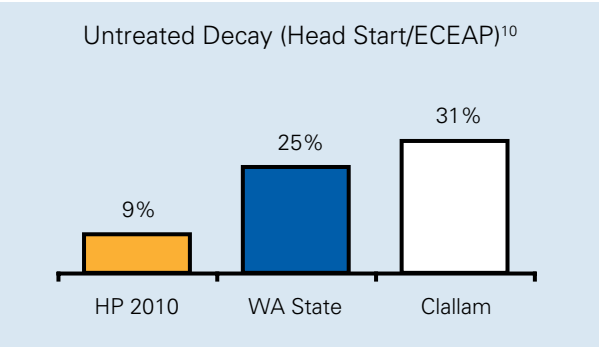
[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

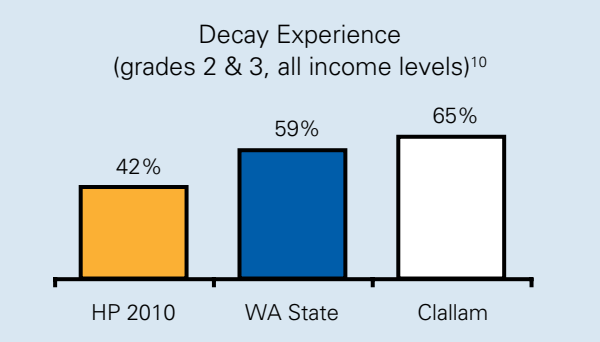
Children's Oral Health Indicators

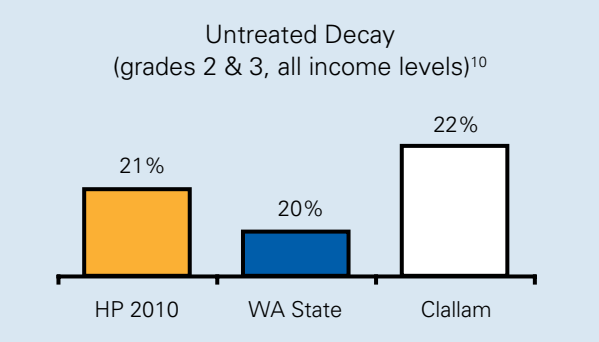
Decay experience[9]



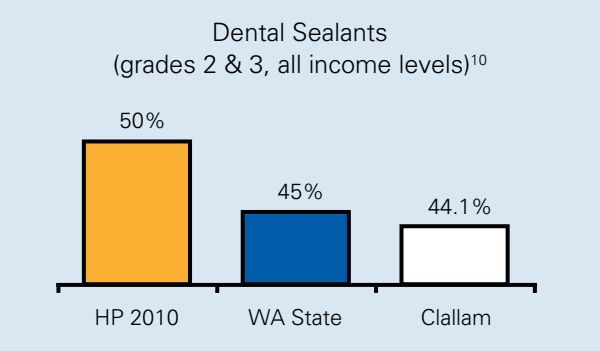
Untreated decay[11]







Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Clark County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
403,500

Population by age (2006)[1]:	
Age	**%**
0-4	7.5%
5-19	22.2%
20-64	60.5%
65+	9.7%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	85.2%
Non-Hispanic Others	9.2%
Hispanic	5.6%

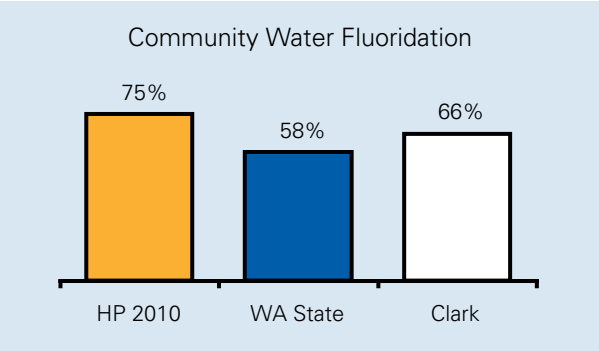
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	4.1	16366	29.4	4809
6-20	6.6	26623	47.4	12626
>21	6.3	25411	30.5	7750
All ages	17	68400	36.8	25185

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	246
Number of dental hygienists	332
Dentist-population ratio[1]	1:1640
Number of Medicaid dental providers[2]	81

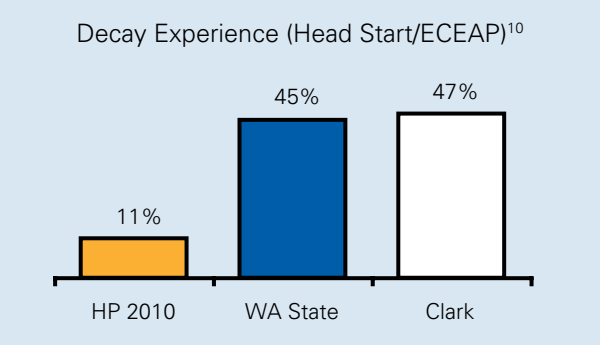
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	1
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	66%

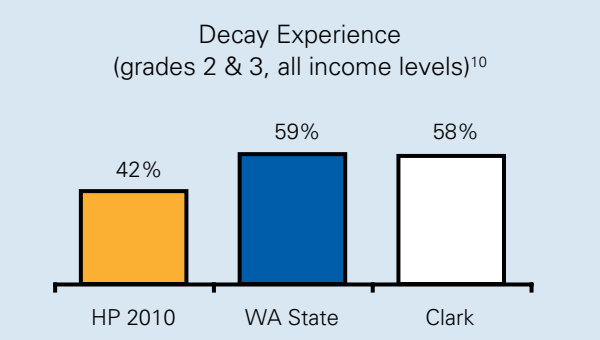


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

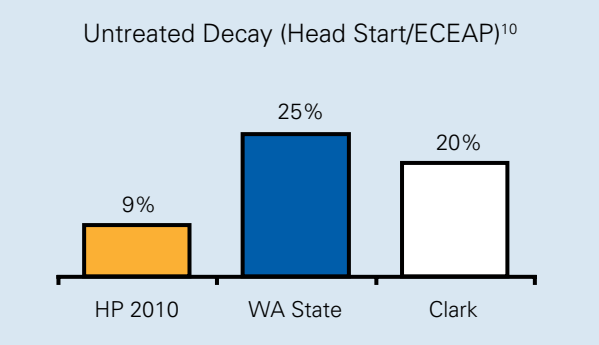
Children's Oral Health Indicators

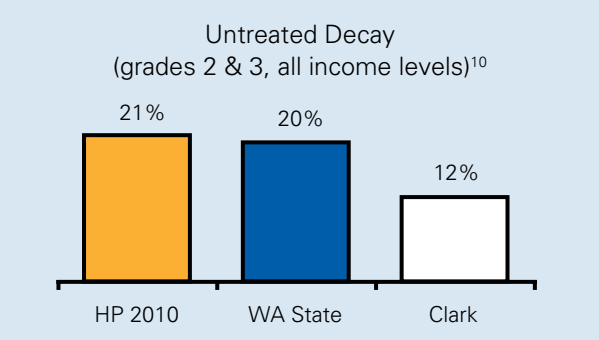
Decay experience[9]



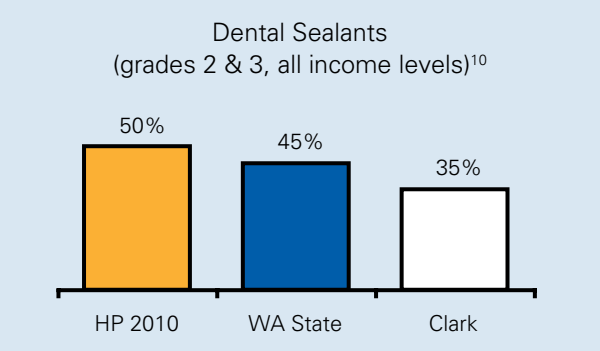


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Columbia County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
4,100

Population by age (2006)[1]:	
Age	**%**
0-4	5%
5-19	19.5%
20-64	57%
65+	18.4%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	89.7%
Non-Hispanic Others	3%
Hispanic	7.3%

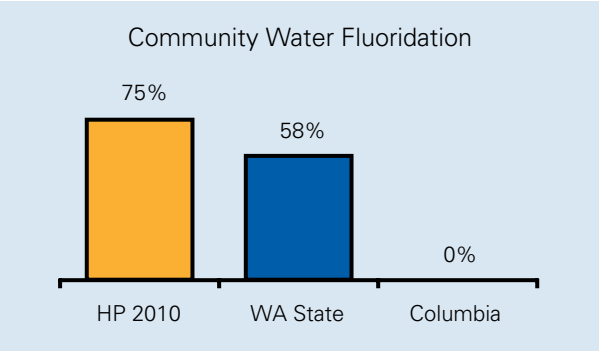
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	3.9	159	39.6	63
6-20	8.9	365	55.6	203
>21	10.7	440	30.0	132
All ages	23.5	964	41.3	398

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	8
Number of dental hygienists	7
Dentist-population ratio[1]	1:2638
Number of Medicaid dental providers[2]	5

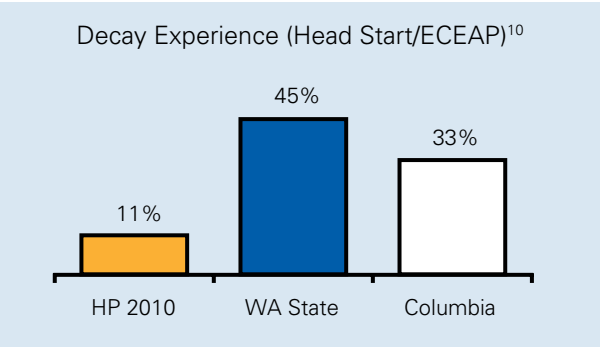
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	0
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	0%

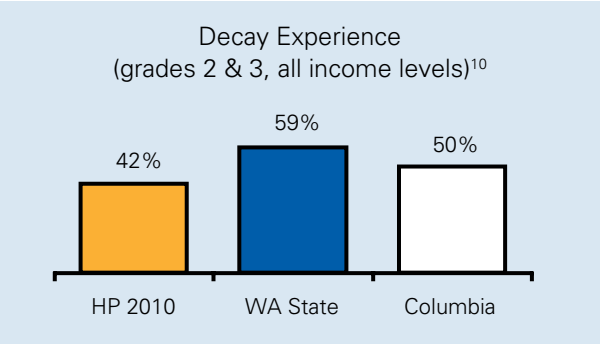


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

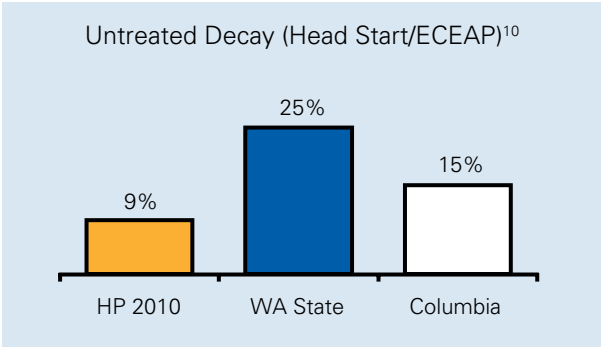
Children's Oral Health Indicators

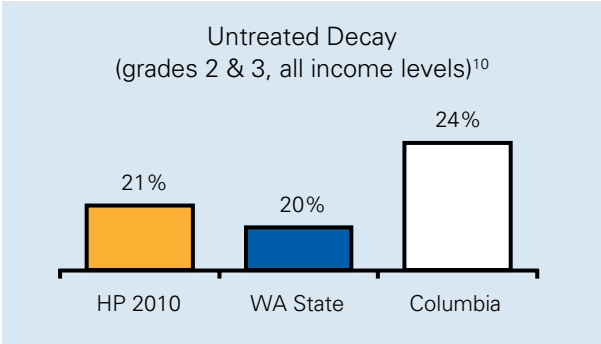
Decay experience[9]



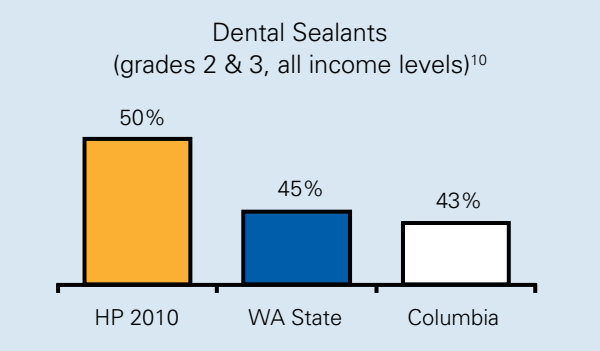


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Island County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
77,200

Population by age (2006)[1]:	
Age	**%**
0-4	6.4%
5-19	19.9%
20-64	59.4%
65+	14.3%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	83.4%
Non-Hispanic Others	11.9%
Hispanic	4.6%

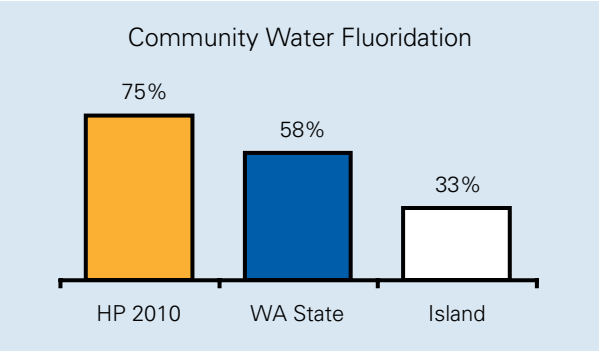
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	2.5	1961	34.7	680
6-20	4.1	3169	47.6	1507
>21	4.0	3118	19.9	619
All ages	10.7	8248	34.0	2806

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	39
Number of dental hygienists	35
Dentist-population ratio[1]	1:1979
Number of Medicaid dental providers[2]	7

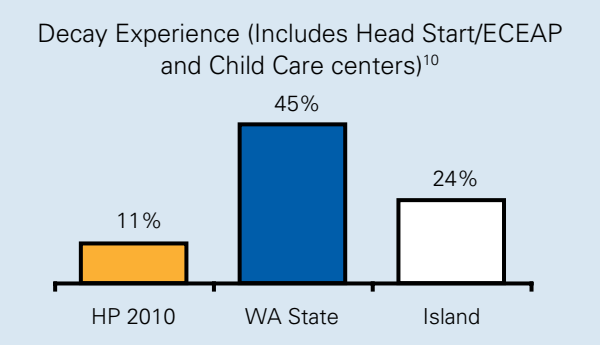
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	1
School-based dental sealant program:	No
Percentage of people on public water systems receiving fluoridated water:[8]	33%

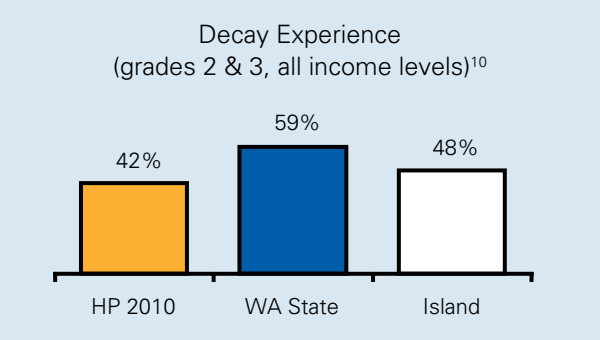


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

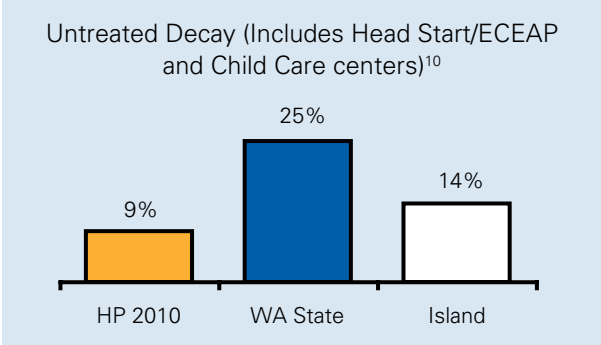
Children's Oral Health Indicators

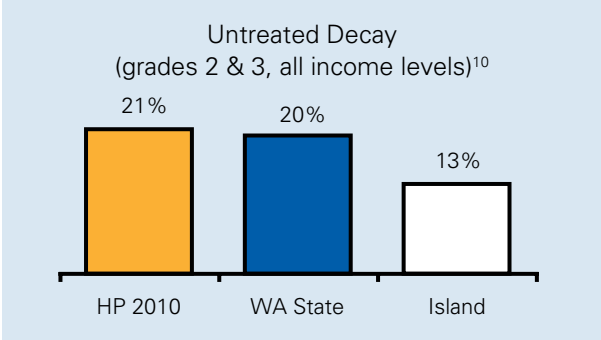
Decay experience[9]



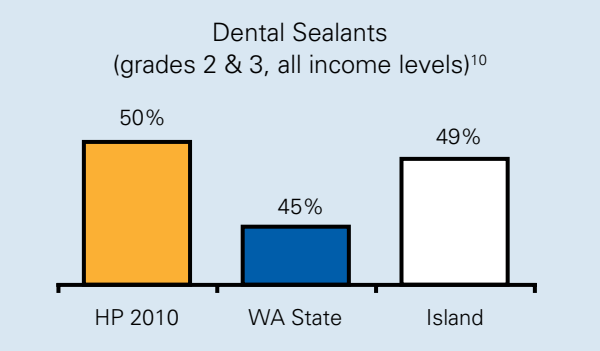


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Jefferson County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
28,200

Population by age (2006)[1]:	
Age	**%**
0-4	3.8%
5-19	16.1%
20-64	59.6%
65+	20.6%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	90.5%
Non-Hispanic Others	6.8%
Hispanic	2.7%

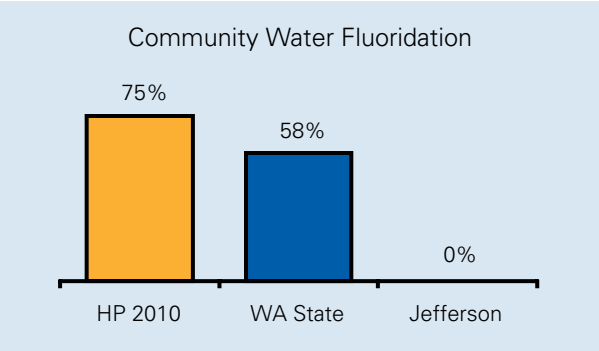
Medicaid (FY 2006)[2]:				
	Eligibles[3]		**Users[4]**	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	4.1	1155	22.6	261
6-20	7.5	2128	29.7	633
>21	4.0	3118	19.9	619
All ages	20.4	5750	20.9	1200

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	18
Number of dental hygienists	24
Dentist-population ratio[1]	1:1567
Number of Medicaid dental providers[2]	9

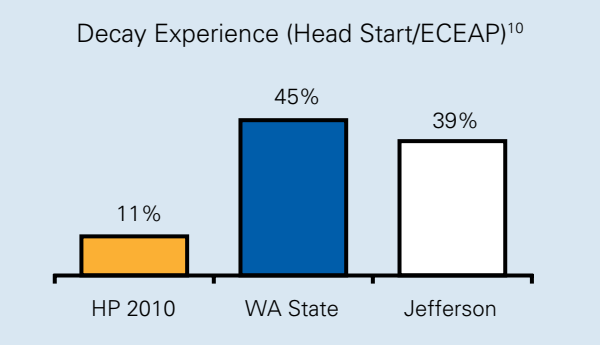
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	2
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	0%

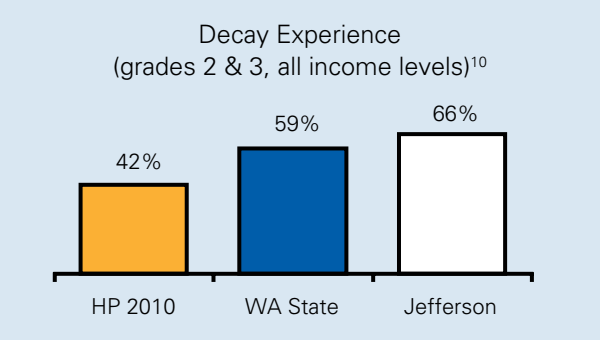


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

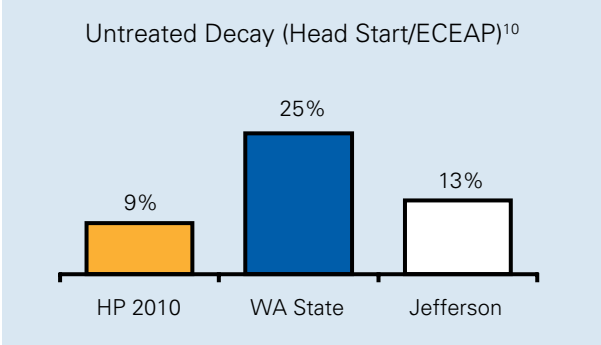
Children's Oral Health Indicators

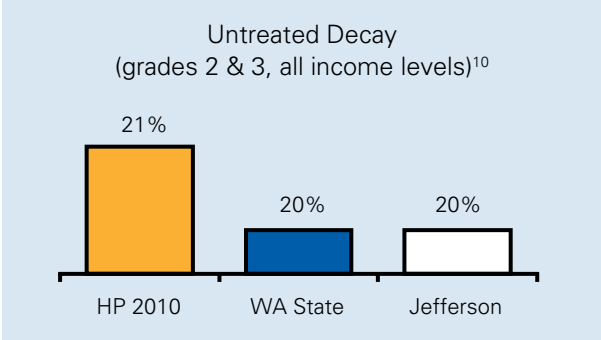
Decay experience[9]



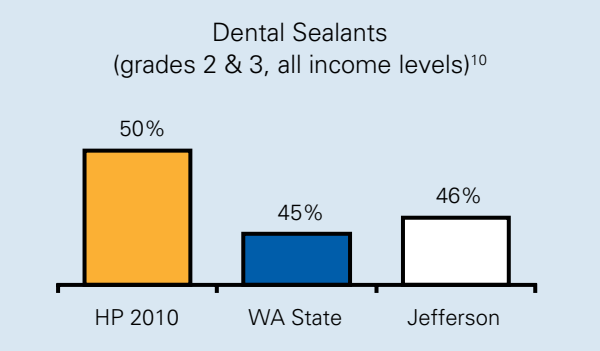


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

King County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
1,835,300

Population by age (2006)[1]:	
Age	**%**
0-4	5.9%
5-19	17.9%
20-64	65.5%
65+	10.7%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	70.7%
Non-Hispanic Others	22.8%
Hispanic	6.4%

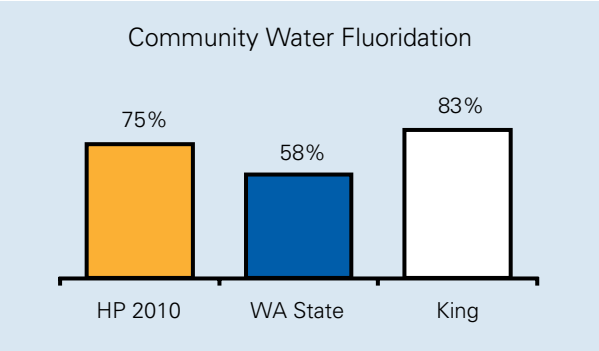
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	3.0	54691	31.9	17466
6-20	4.4	81432	46.7	38014
>21	5.9	107696	27.6	29754
All ages	13.3	243819	35.0	85233

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	1936
Number of dental hygienists	1346
Dentist-population ratio[1]	1:948
Number of Medicaid dental providers[2]	503

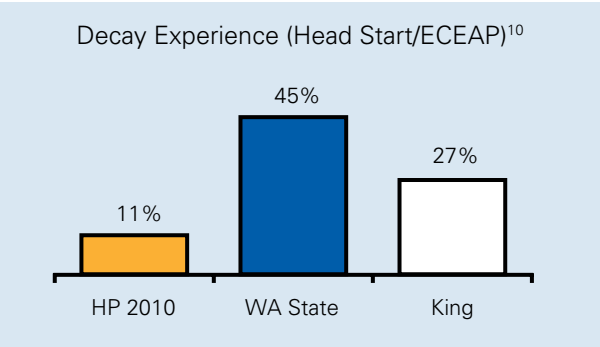
Prevention and Access	
Local oral health coalition:	No
Number of safety net/community health center dental clinics:	25
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	83%

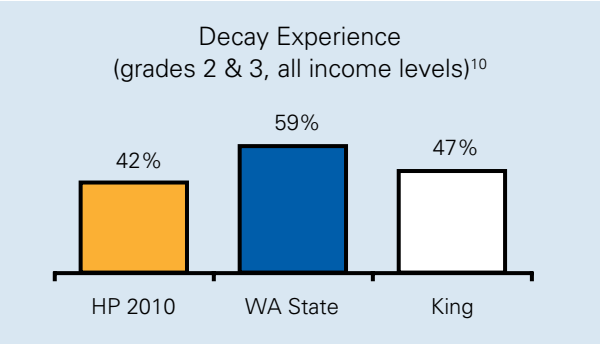


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

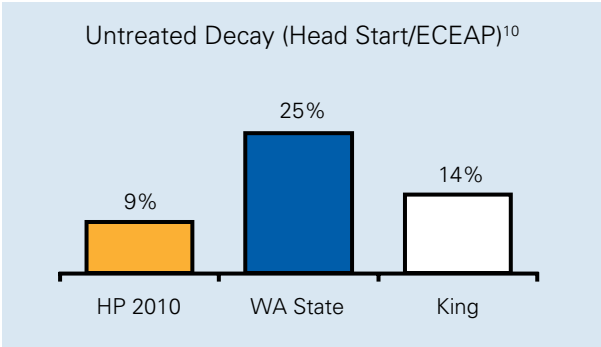
Children's Oral Health Indicators

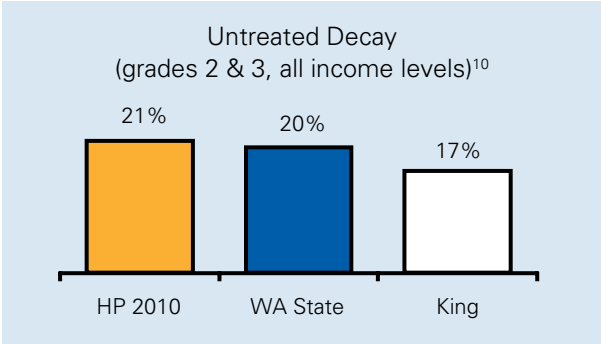
Decay experience[9]



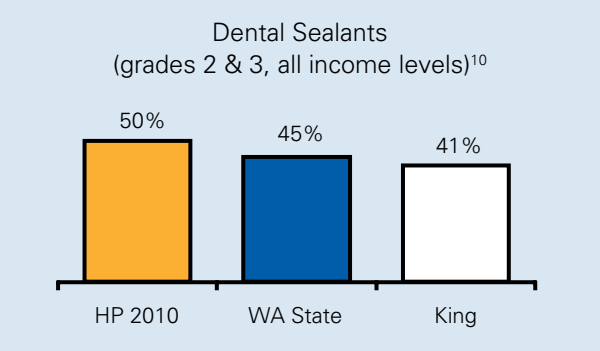


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Kitsap County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
243,400

Population by age (2006)[1]:	
Age	**%**
0-4	6.4%
5-19	21.5%
20-64	61.3%
65+	10.8%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	80.8%
Non-Hispanic Others	14.4%
Hispanic	4.7%

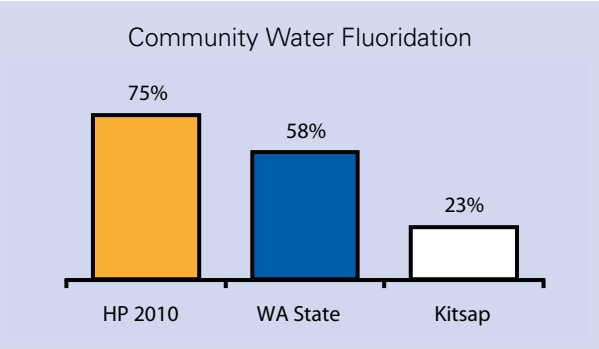
Medicaid (FY 2006)[2]:				
	Eligibles[3]		**Users[4]**	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	2.9	7099	27.8	1975
6-20	5.0	12192	44.6	5437
>21	6.0	14714	25.6	3771
All ages	14.0	34005	32.9	11183

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	135
Number of dental hygienists	131
Dentist-population ratio[1]	1:1803
Number of Medicaid dental providers[2]	57

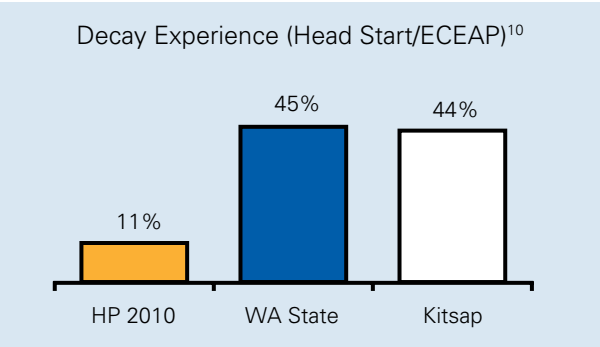
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	2
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	63%

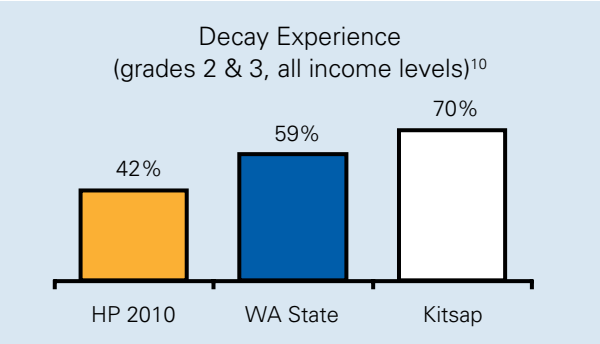


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

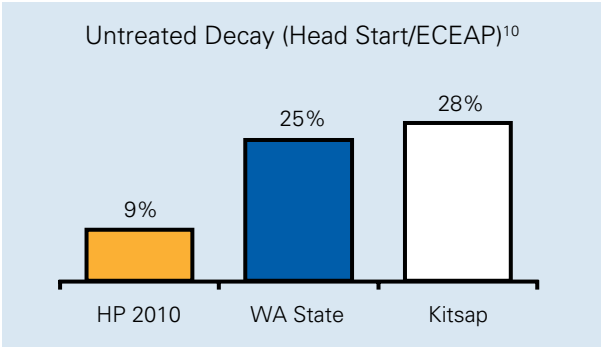
Children's Oral Health Indicators

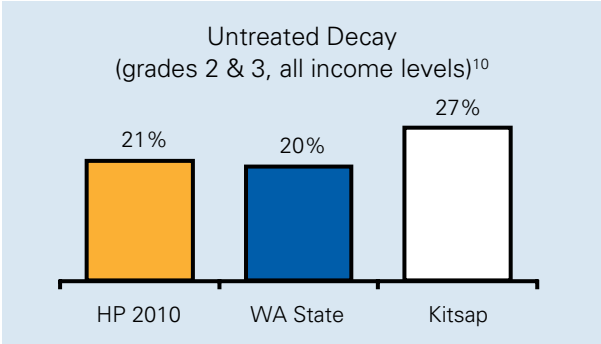
Decay experience[9]



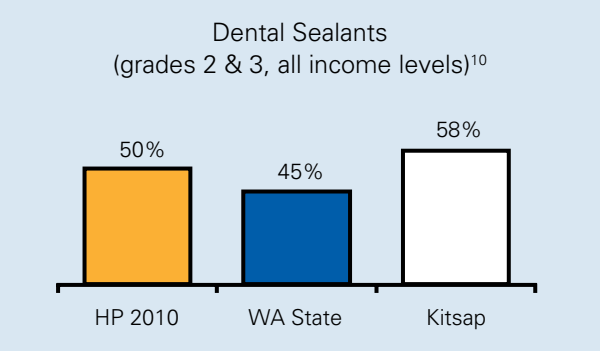


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Kittitas County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
37,400

Population by age (2006)[1]:	
Age	**%**
0-4	4.8%
5-19	20%
20-64	63.5%
65+	11.7%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	87.9%
Non-Hispanic Others	6%
Hispanic	6.2%

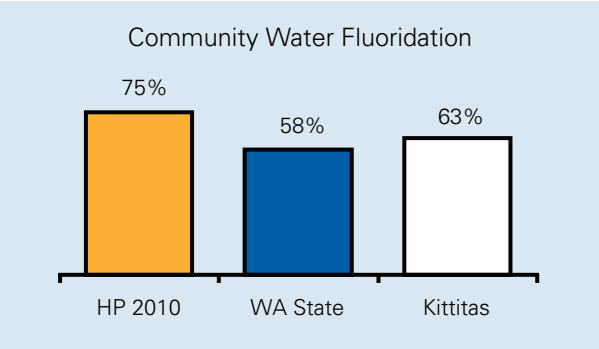
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	3.5	1297	28.1	365
6-20	5.6	2080	37.9	788
>21	5.7	2139	22.3	478
All ages	14.7	5516	29.6	1631

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	17
Number of dental hygienists	20
Dentist-population ratio[1]	1:2200
Number of Medicaid dental providers[2]	7

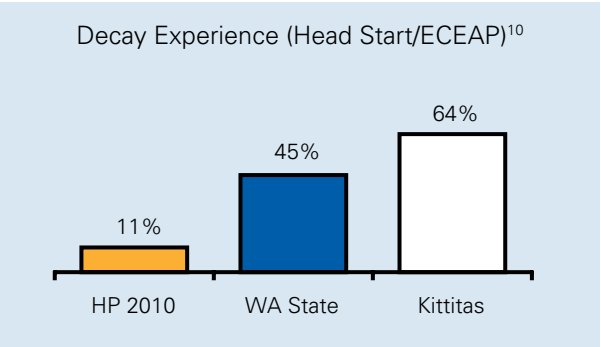
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	1
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	63%

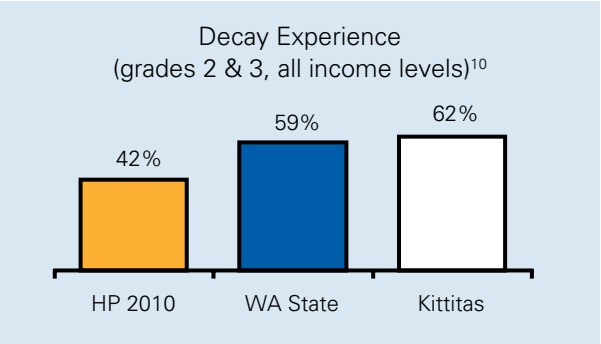


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

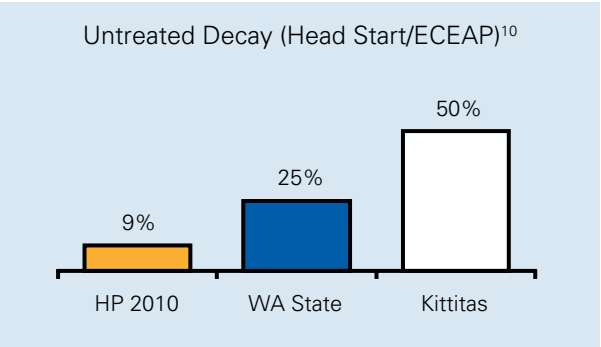
Children's Oral Health Indicators

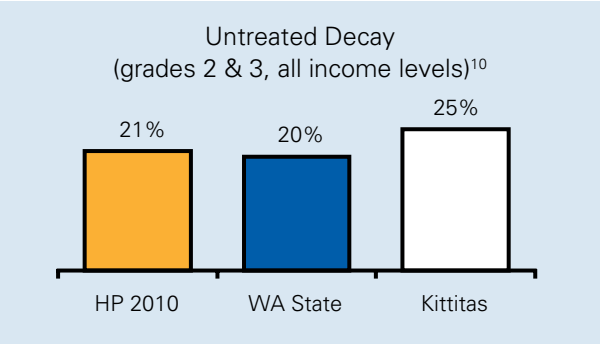
Decay experience[9]



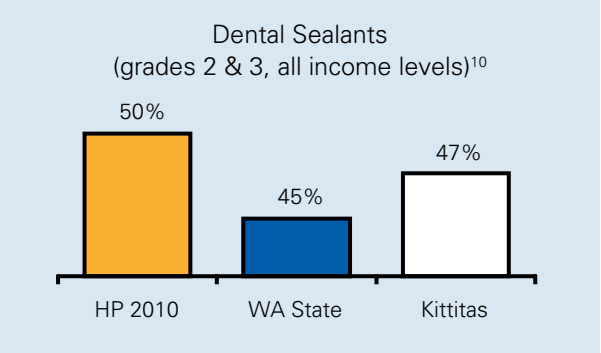


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Klickitat County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
19,800

Population by age (2006)[1]:	
Age	**%**
0-4	6.1%
5-19	21.5%
20-64	58.4%
65+	14%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	83.8%
Non-Hispanic Others	6.8%
Hispanic	9.4%

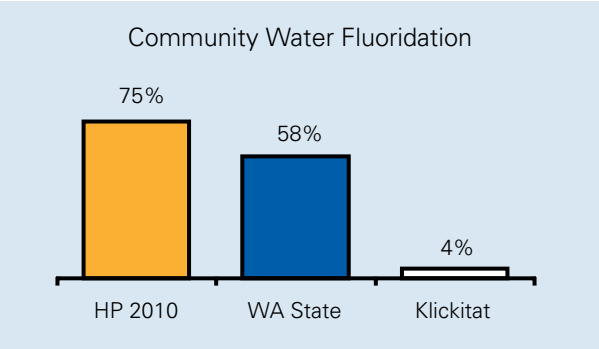
Medicaid (FY 2006)[2]:				
	Eligibles[3]		**Users[4]**	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	4.7	929	34.4	320
6-20	9.5	1887	47.6	899
>21	9.4	1869	22.5	421
All ages	23.7	4685	35.0	1640

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	7
Number of dental hygienists	6
Dentist-population ratio[1]	1:2829
Number of Medicaid dental providers[2]	6

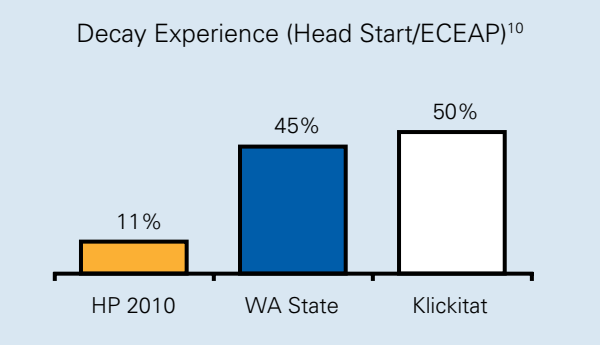
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	1
School-based dental sealant program:	No
Percentage of people on public water systems receiving fluoridated water:[8]	4%



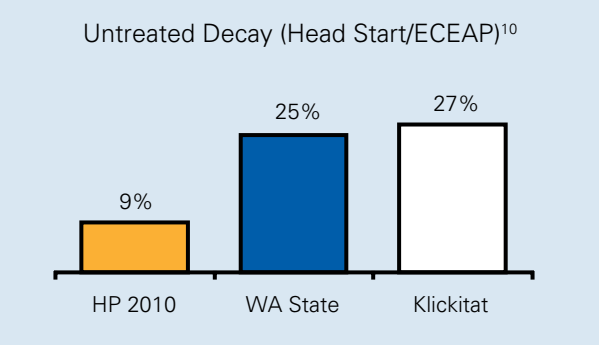
[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

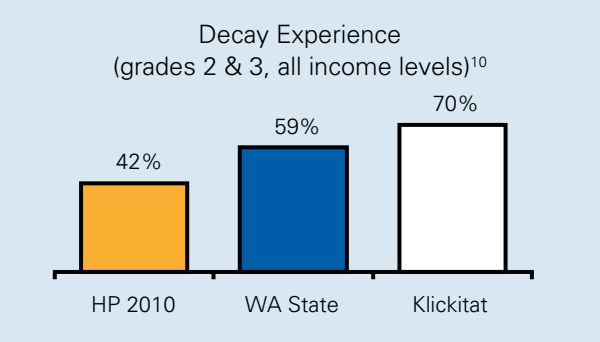
Children's Oral Health Indicators

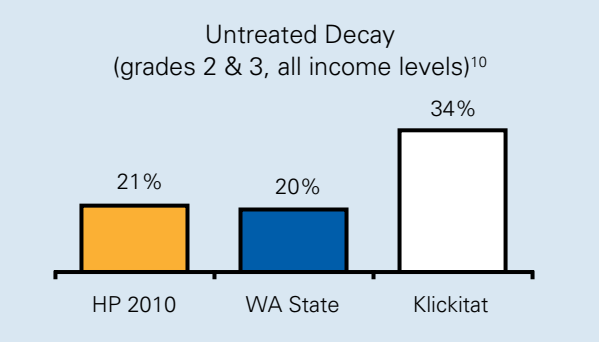
Decay experience[9]



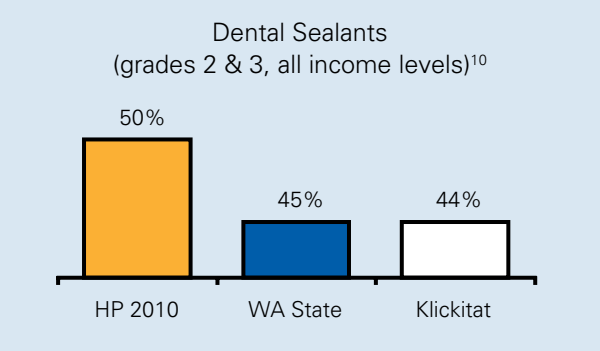
Untreated decay[11]







Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Lewis County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
72,900

Population by age (2006)[1]:	
Age	**%**
0-4	6.1%
5-19	21.5%
20-64	56.7%
65+	15.7%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	89%
Non-Hispanic Others	4.2%
Hispanic	6.8%

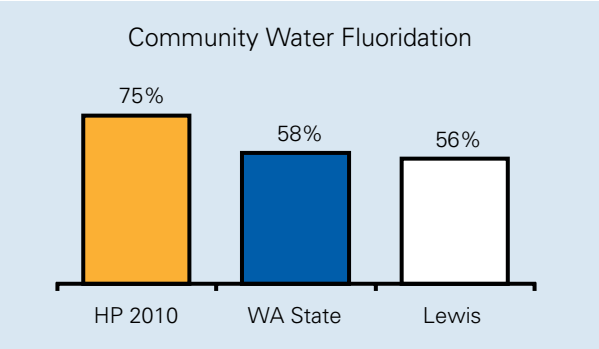
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	5.6	4104	38.9	1597
6-20	10.0	7258	44.7	3245
>21	10.9	7946	24.8	1967
All ages	26.5	19308	35.3	6809

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	32
Number of dental hygienists	41
Dentist-population ratio[1]	1:2278
Number of Medicaid dental providers[2]	23

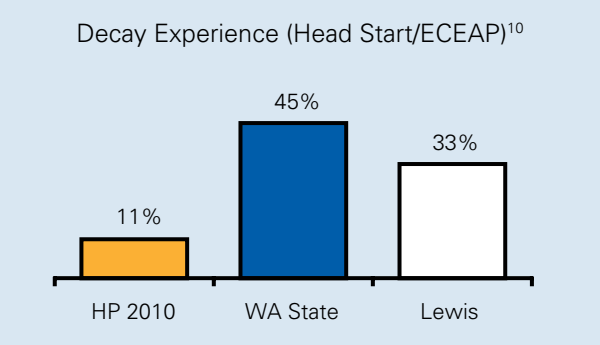
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	1
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	56%

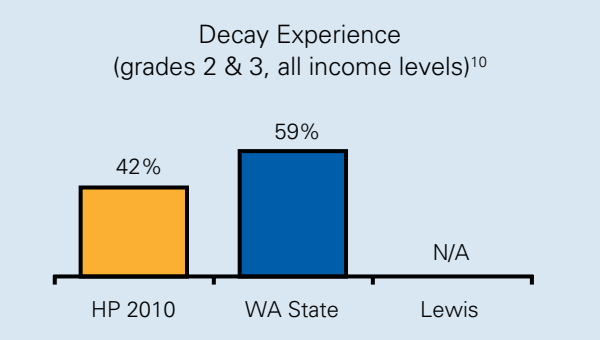


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

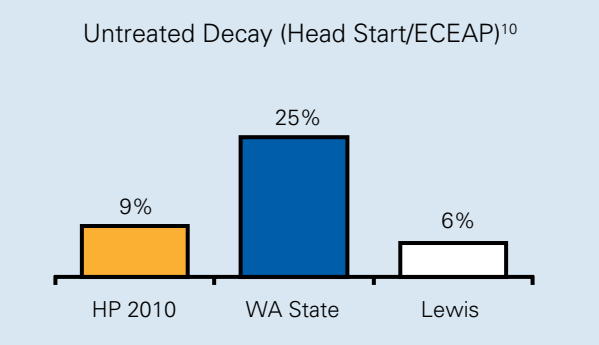
Children's Oral Health Indicators

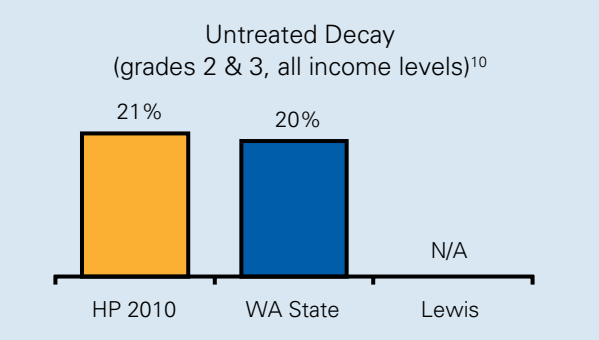
Decay experience[9]



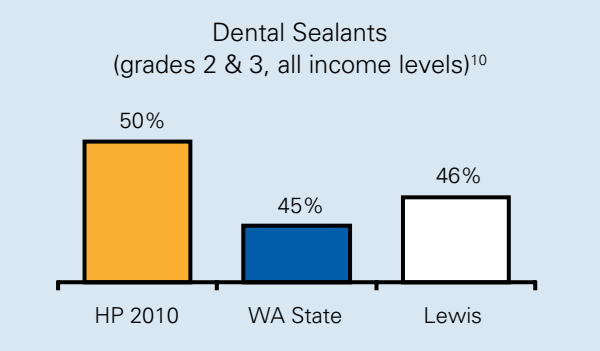


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Mason County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
53,100

Population by age (2006)[1]:	
Age	**%**
0-4	5.1%
5-19	19.4%
20-64	59%
65+	16.5%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	85.8%
Non-Hispanic Others	8.4%
Hispanic	5.8%

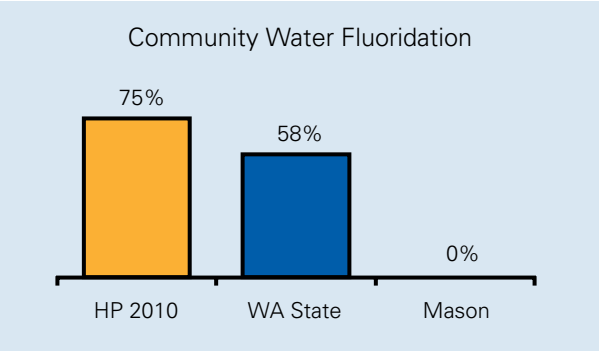
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	4.9	2590	33.7	873
6-20	8.3	4433	43.4	1923
>21	9.4	5005	26.2	1309
All ages	22.7	12028	34.1	4104

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	19
Number of dental hygienists	25
Dentist-population ratio[1]	1:2795
Number of Medicaid dental providers[2]	8

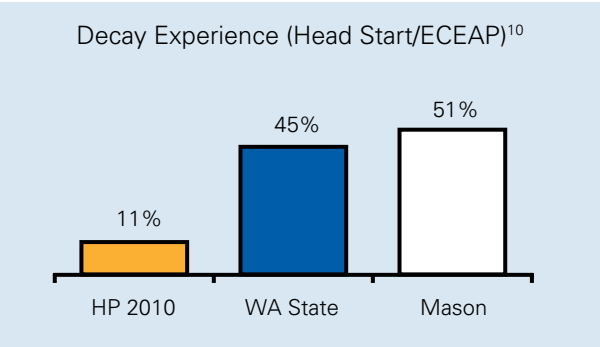
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	0
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	0%

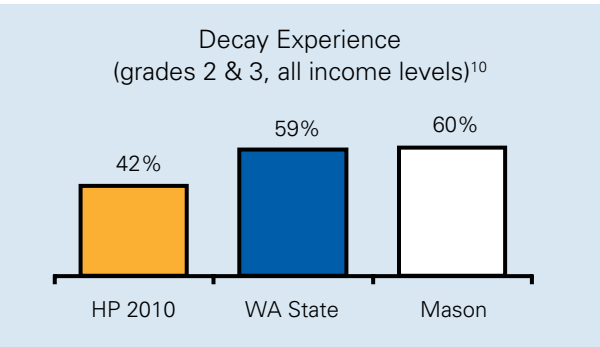


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

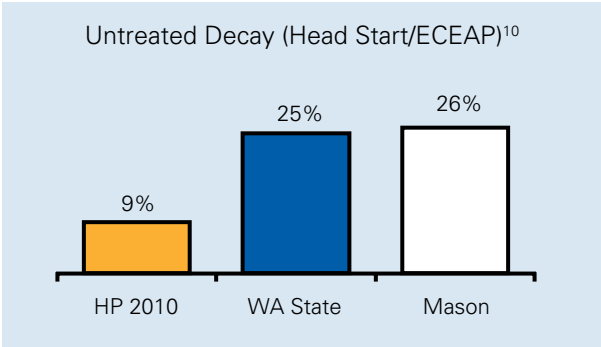
Children's Oral Health Indicators

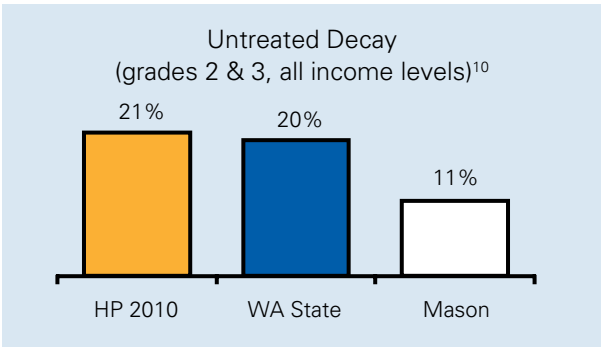
Decay experience[9]



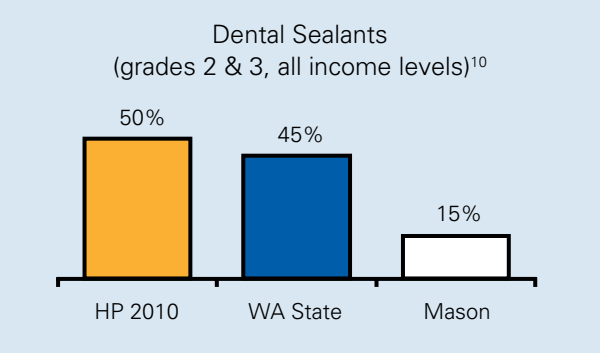


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Pierce County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
773,500

Population by age (2006)[1]:	
Age	**%**
0-4	6.9%
5-19	21.8%
20-64	60.9%
65+	10.4%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	74%
Non-Hispanic Others	19.5%
Hispanic	6.5%

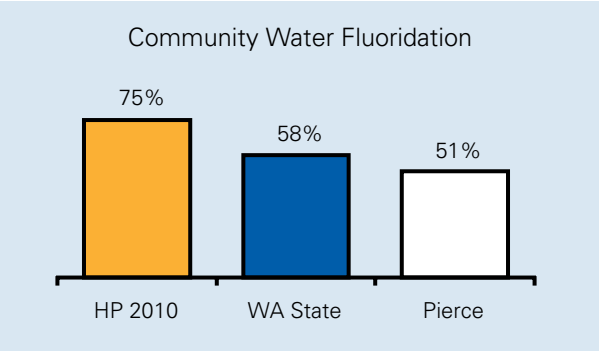
Medicaid (FY 2006)[2]:				
	Eligibles[3]		**Users[4]**	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	4.0	31141	33.9	10545
6-20	6.5	50655	44.5	22536
>21	7.1	54542	26.1	14209
All ages	17.6	136338	34.7	47290

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	423
Number of dental hygienists	497
Dentist-population ratio[1]	1:1829
Number of Medicaid dental providers[2]	177

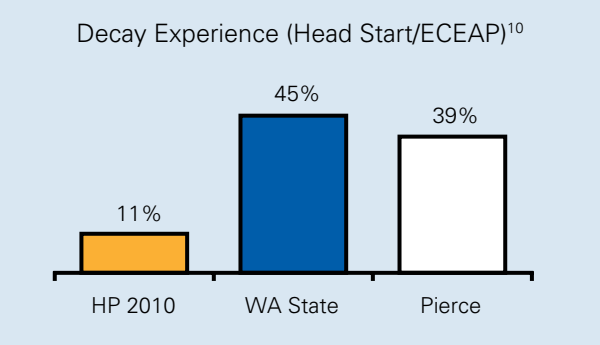
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	6
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	51%

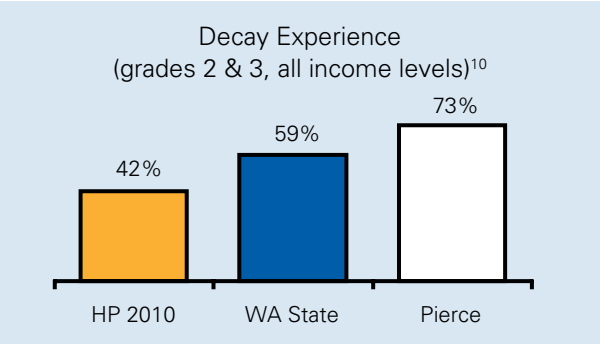


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

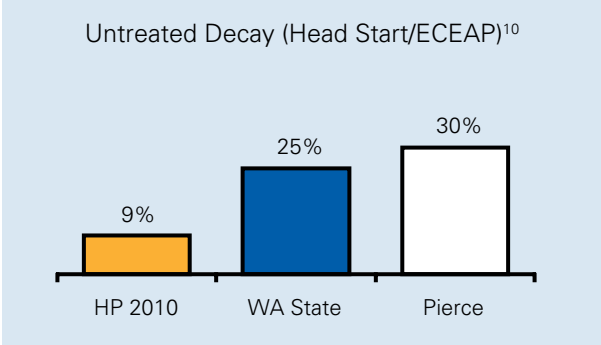
Children's Oral Health Indicators

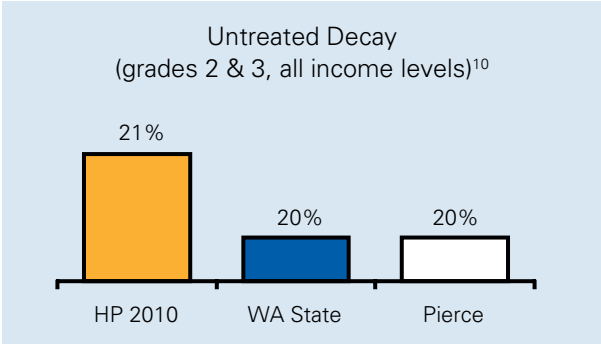
Decay experience[9]



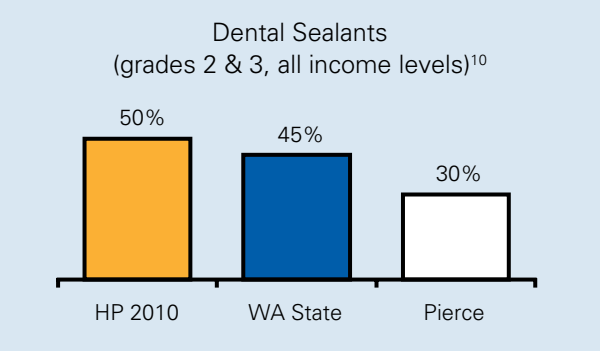


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Skamania County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
10,600

Population by age (2006)[1]:	
Age	**%**
0-4	6.1%
5-19	21.4%
20-64	61.3%
65+	11.2%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	90.5%
Non-Hispanic Others	5%
Hispanic	4.5%

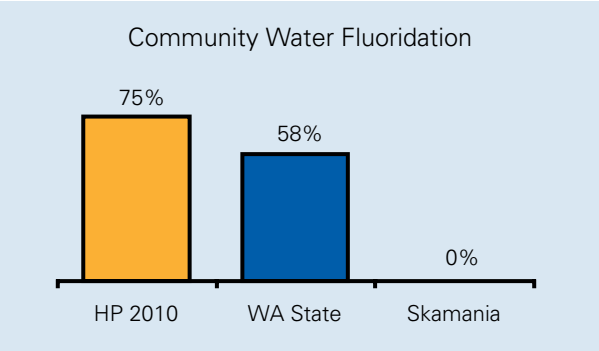
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	9.9	1050	7.0	73
6-20	18.3	1943	9.8	191
>21	17.4	1842	7.6	140
All ages	45.6	4835	8.4	404

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	2
Number of dental hygienists	3
Dentist-population ratio[1]	1:5300
Number of Medicaid dental providers[2]	0

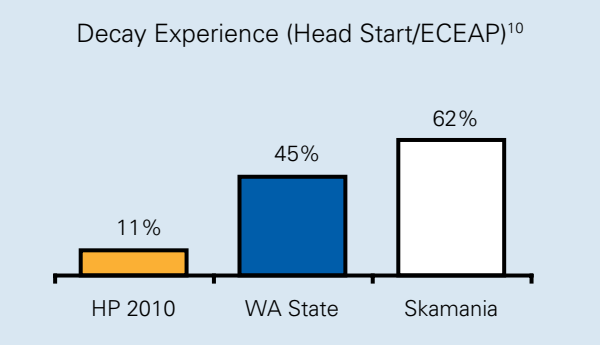
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	0
School-based dental sealant program:	No
Percentage of people on public water systems receiving fluoridated water:[8]	0%

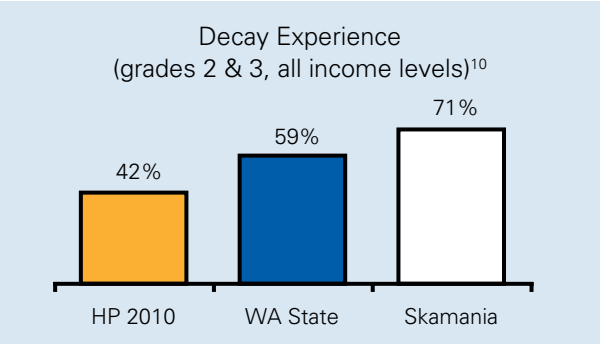


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

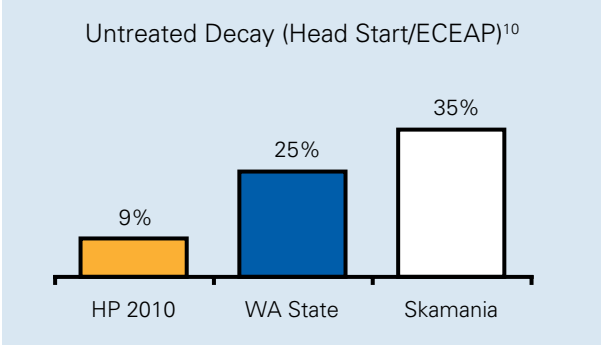
Children's Oral Health Indicators

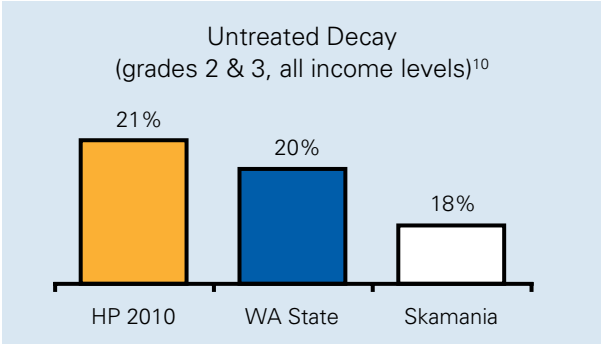
Decay experience[9]



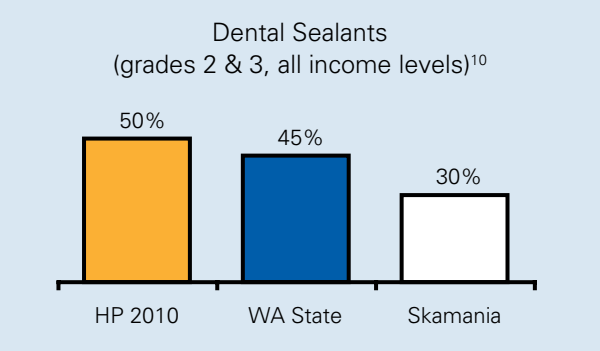


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Snohomish County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
671,800

Population by age (2006)[1]:	
Age	**%**
0-4	7%
5-19	21.7%
20-64	62%
65+	9.4%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	81.5%
Non-Hispanic Others	12.9%
Hispanic	5.6%

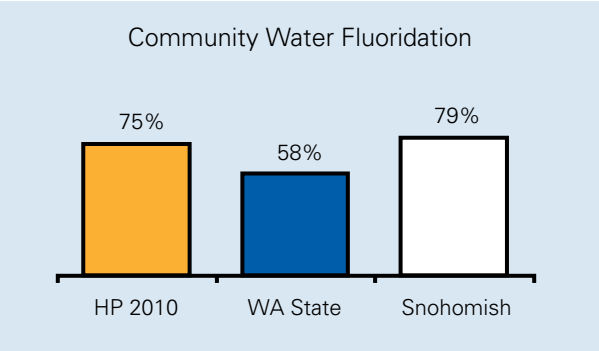
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	3.5	23609	28.5	6724
6-20	5.3	35735	43.3	15487
>21	5.9	39592	24.1	3540
All ages	14.7	98936	32.1	31751

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	378
Number of dental hygienists	453
Dentist-population ratio[1]	1:1177
Number of Medicaid dental providers[2]	132

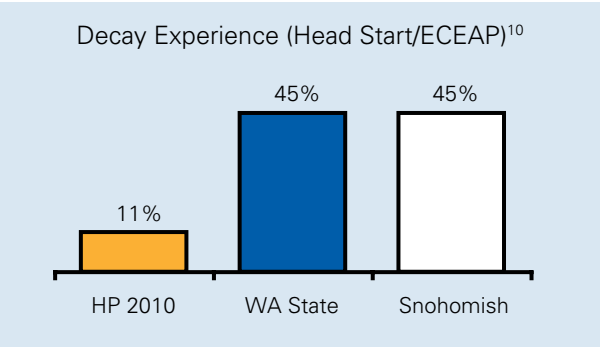
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	3
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	79%

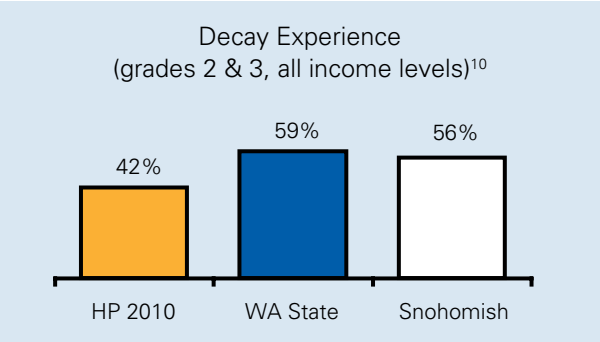


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

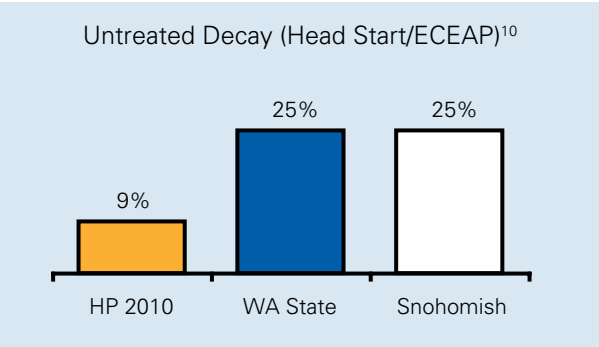
Children's Oral Health Indicators

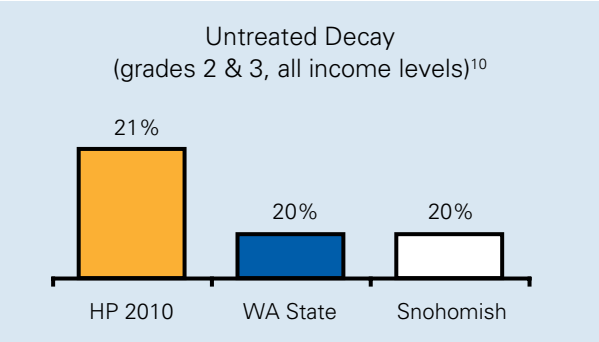
Decay experience[9]



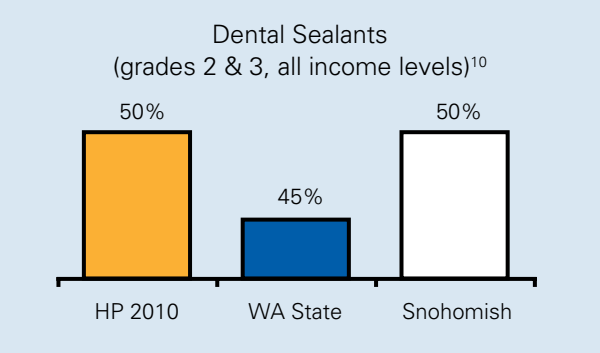


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Spokane County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
443,800

Population by age (2006)[1]:	
Age	**%**
0-4	6.3%
5-19	21.2%
20-64	59.8%
65+	12.7%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	89%
Non-Hispanic Others	7.8%
Hispanic	3.2%

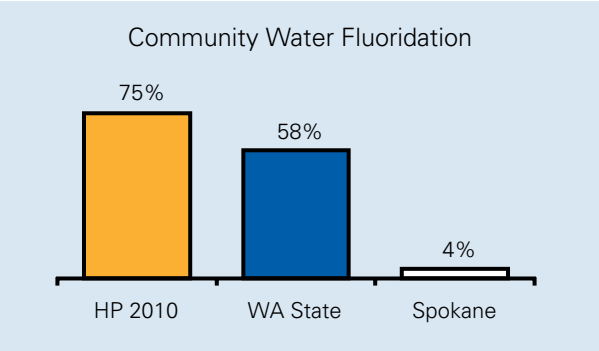
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	4.9	21595	40.5	8745
6-20	8.3	36687	49.9	18294
>21	9.2	40857	27.1	11085
All ages	22.3	99139	38.5	38124

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	325
Number of dental hygienists	378
Dentist-population ratio[1]	1:1366
Number of Medicaid dental providers[2]	190

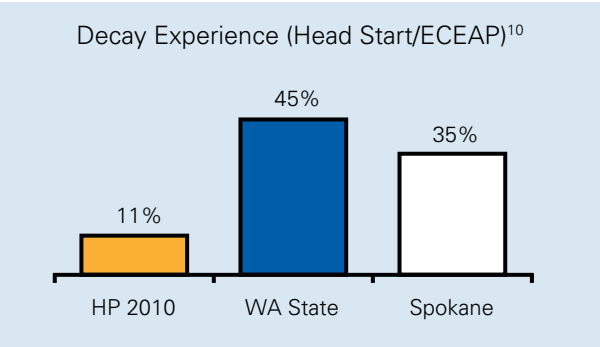
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	5
School-based dental sealant program:	No
Percentage of people on public water systems receiving fluoridated water:[8]	4%

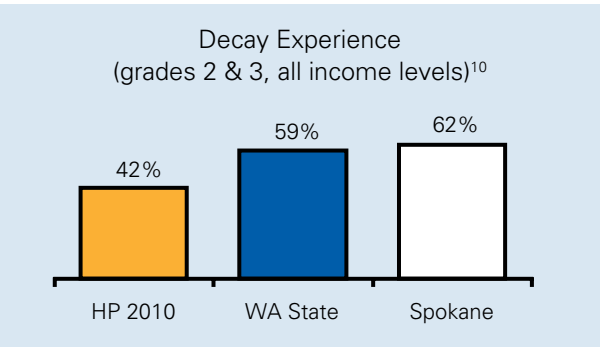


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

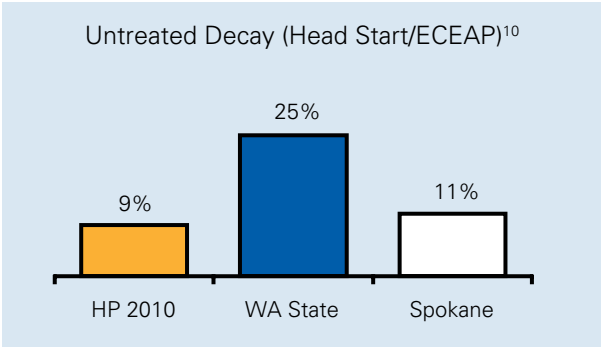
Children's Oral Health Indicators

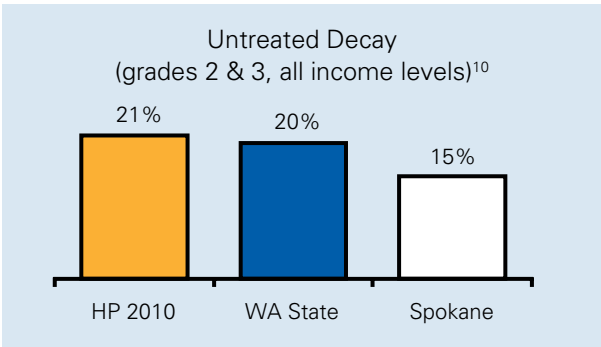
Decay experience[9]



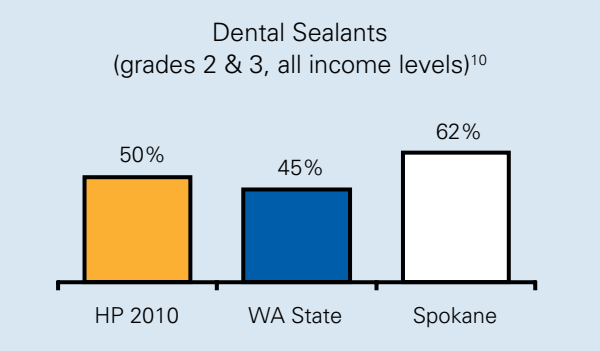


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Walla Walla County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
57,900

Population by age (2006)[1]:	
Age	**%**
0-4	6%
5-19	21.4%
20-64	57.5%
65+	15.1%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	75.8%
Non-Hispanic Others	5.4%
Hispanic	18.8%

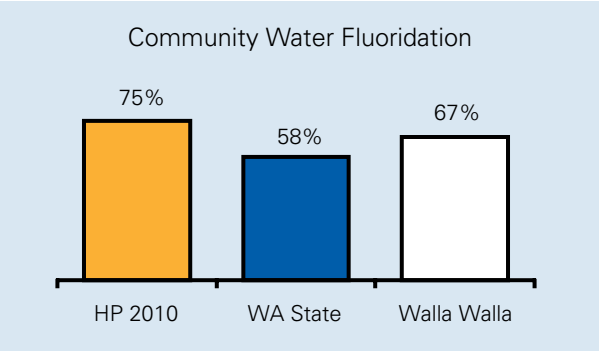
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	5.2	3024	31.3	947
6-20	8.2	4728	47.4	2239
>21	7.7	4479	22.7	1017
All ages	21.1	12231	34.4	4203

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	37
Number of dental hygienists	43
Dentist-population ratio[1]	1:1565
Number of Medicaid dental providers[2]	16

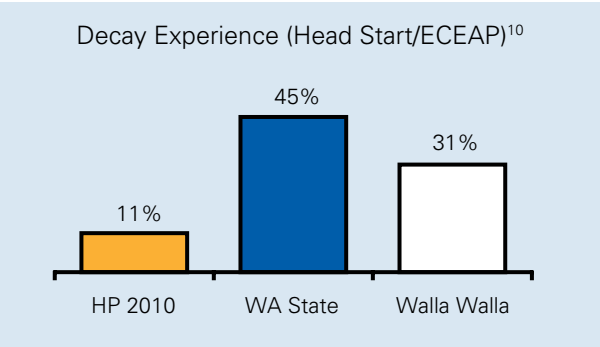
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	1
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	67%

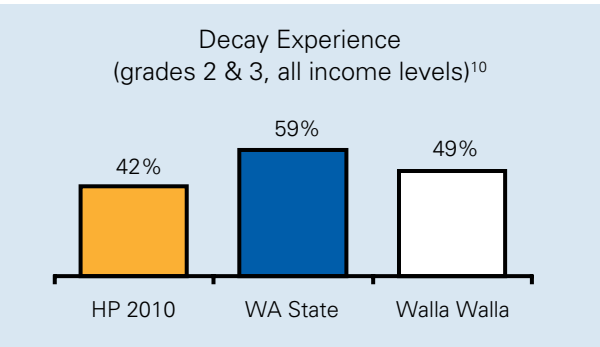


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

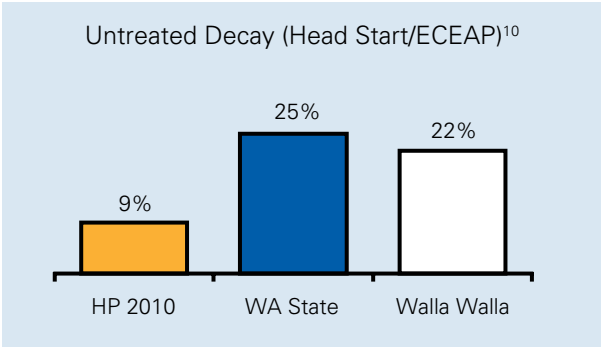
Children's Oral Health Indicators

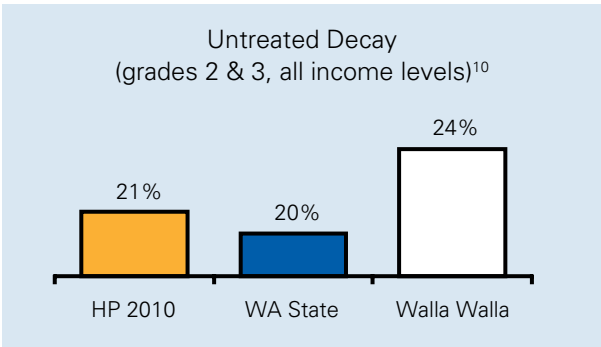
Decay experience[9]



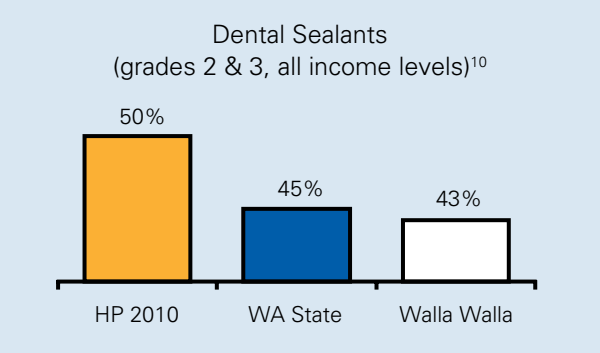


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Whitman County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
42,800

Population by age (2006)[1]:	
Age	**%**
0-4	4.6%
5-19	21.1%
20-64	65.1%
65+	9.3%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	85.3%
Non-Hispanic Others	11.4%
Hispanic	3.3%

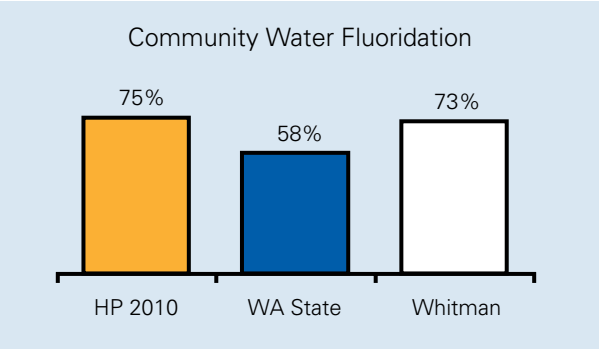
Medicaid (FY 2006)[2]:				
	Eligibles[3]		Users[4]	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	2.8	1214	37.7	458
6-20	3.8	1619	43.6	706
>21	4.5	1920	28.0	537
All ages	11.1	4753	35.8	1701

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	18
Number of dental hygienists	14
Dentist-population ratio[1]	1:2378
Number of Medicaid dental providers[2]	12

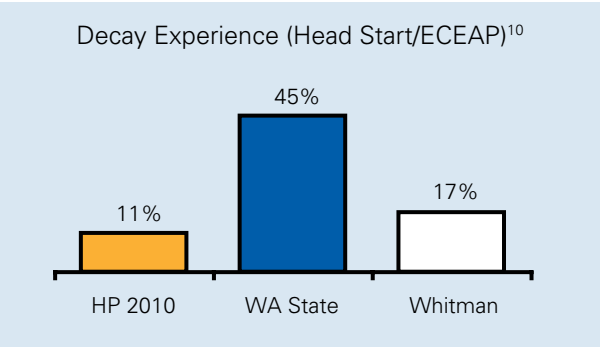
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	0
School-based dental sealant program:	No
Percentage of people on public water systems receiving fluoridated water:[8]	73%

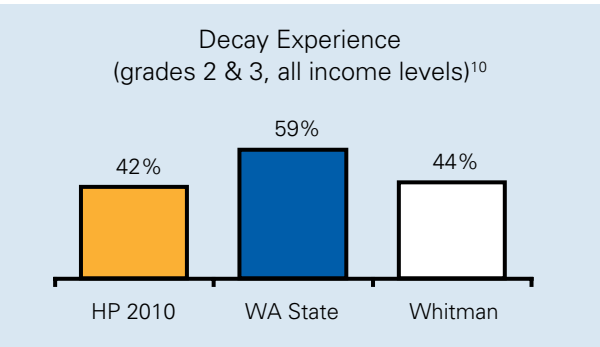


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

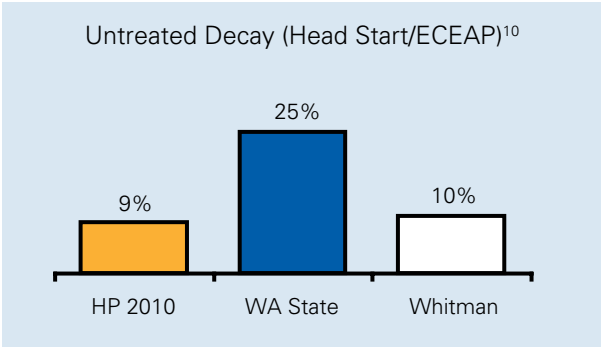
Children's Oral Health Indicators

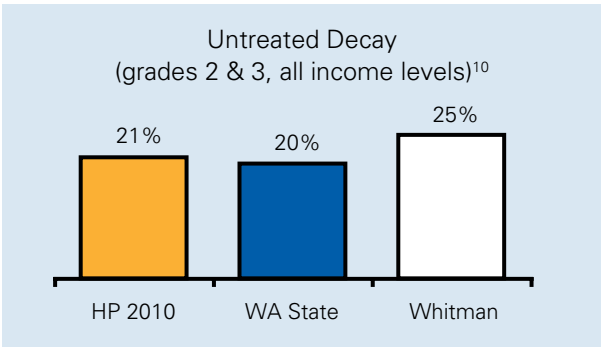
Decay experience[9]



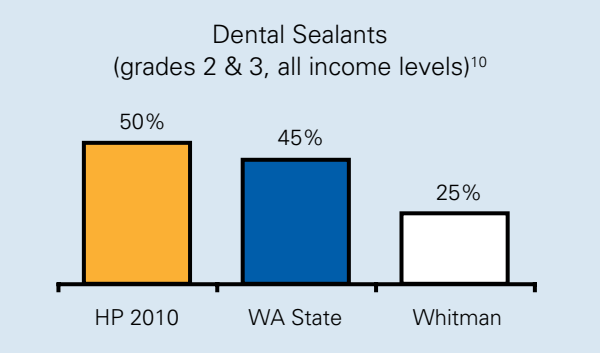


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

Yakima County

Oral Health Profile 2006

Demographics

County population (2006)[1]:
231,800

Population by age (2006)[1]:	
Age	**%**
0-4	8.4%
5-19	24.8%
20-64	55.3%
65+	11.5%

Population by race/ethnicity (2006)[1]:	
Race/ethnicity	**%**
Non-Hispanic White	51.9%
Non-Hispanic Others	6.9%
Hispanic	41.1%

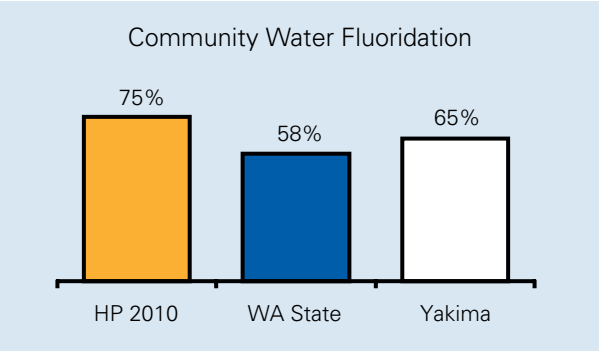
Medicaid (FY 2006)[2]:				
	Eligibles[3]		**Users[4]**	
Age	**%[5]**	**Number**	**%[6]**	**Number**
0-5	9.3	21446	48.1	10306
6-20	14.6	33936	57.3	19440
>21	11.0	25393	25.5	6469
All ages	34.8	80775	44.8	36215

[1] *Population of Cities, Towns, and Counties used for the allocation of Selected State Revenues, WA State Office of Financial Management, April 1, 2006.*
[2] *Washington State Department of Social and Health Services, Health and Recovery Services Administration, December 20, 2006.*
[3] *Individuals eligible for Medicaid coverage in Washington State.*
[4] *Individuals enrolled in Medicaid who received Medicaid services.*
[5] *Percent of county population eligible for Medicaid services.*
[6] *Percent of Medicaid eligibles who received services.*

Oral Health Information

Workforce[7]	
Number of dentists	114
Number of dental hygienists	131
Dentist-population ratio[1]	1:2033
Number of Medicaid dental providers[2]	62

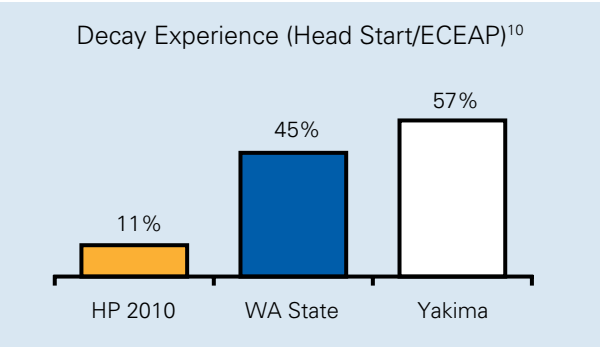
Prevention and Access	
Local oral health coalition:	Yes
Number of safety net/community health center dental clinics:	6
School-based dental sealant program:	Yes
Percentage of people on public water systems receiving fluoridated water:[8]	65%

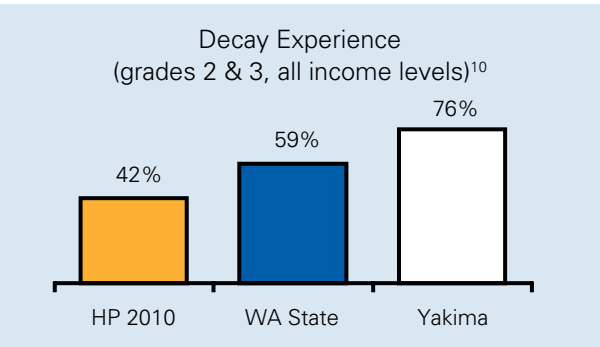


[7] *Washington State Department of Health Office of Health Professions Quality Assurance, November 2006.*
[8] *Washington State Department of Health Office of Drinking Water, October 2006.*

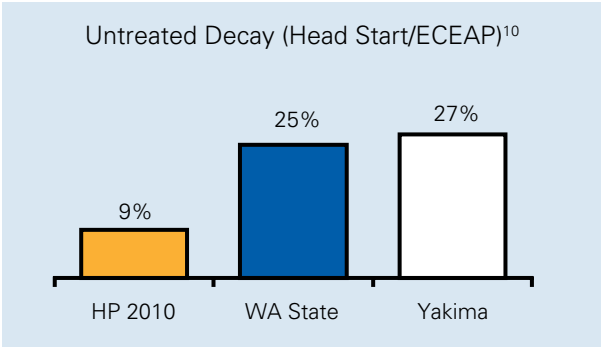
Children's Oral Health Indicators

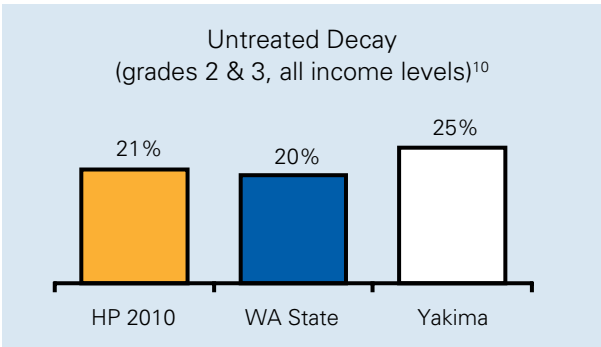
Decay experience[9]



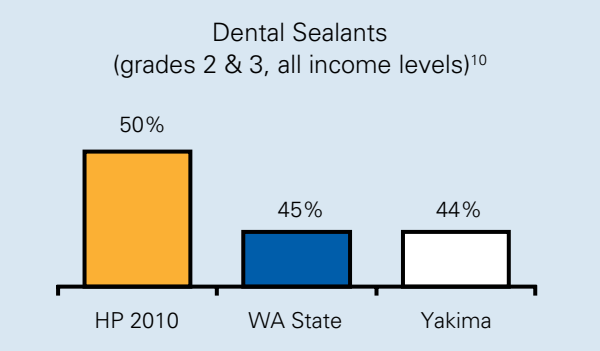


Untreated decay[11]





Dental sealants[12]



[9] *Represents the presence of a cavity or a filling or a missing tooth lost due to a cavity. It is a proxy for the burden of disease in the population.*

[10] *Contains references to Healthy People 2010 Oral Health Objectives and Washington State and County-level Smile Survey Results 2005*

[11] *Represents the presence of an unfilled cavity. It is a proxy for access to dental care.*

[12] *A thin plastic coating applied to the chewing surfaces of the molars (back teeth) to prevent decay.*

This County Oral Health Profile is part of the 2007 Department of Health Oral Disease Burden Document – The Impact of Oral Disease on the Lives of Washingtonians, which is available at http://www.doh.wa.gov/cfh/oral_health/burden.htm. For more information or feedback, please contact the DOH MCH Oral Health Program at oralhealth@doh.wa.gov.

PUBLIC HEALTH
ALWAYS WORKING FOR A SAFER AND
HEALTHIER WASHINGTON