

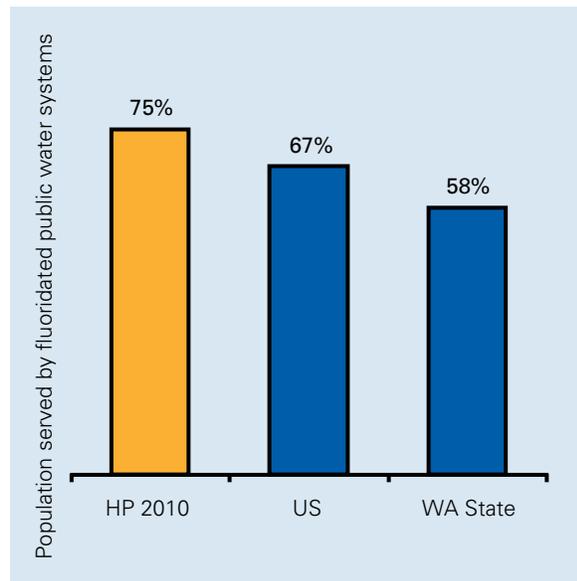
# Oral Disease Prevention

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]

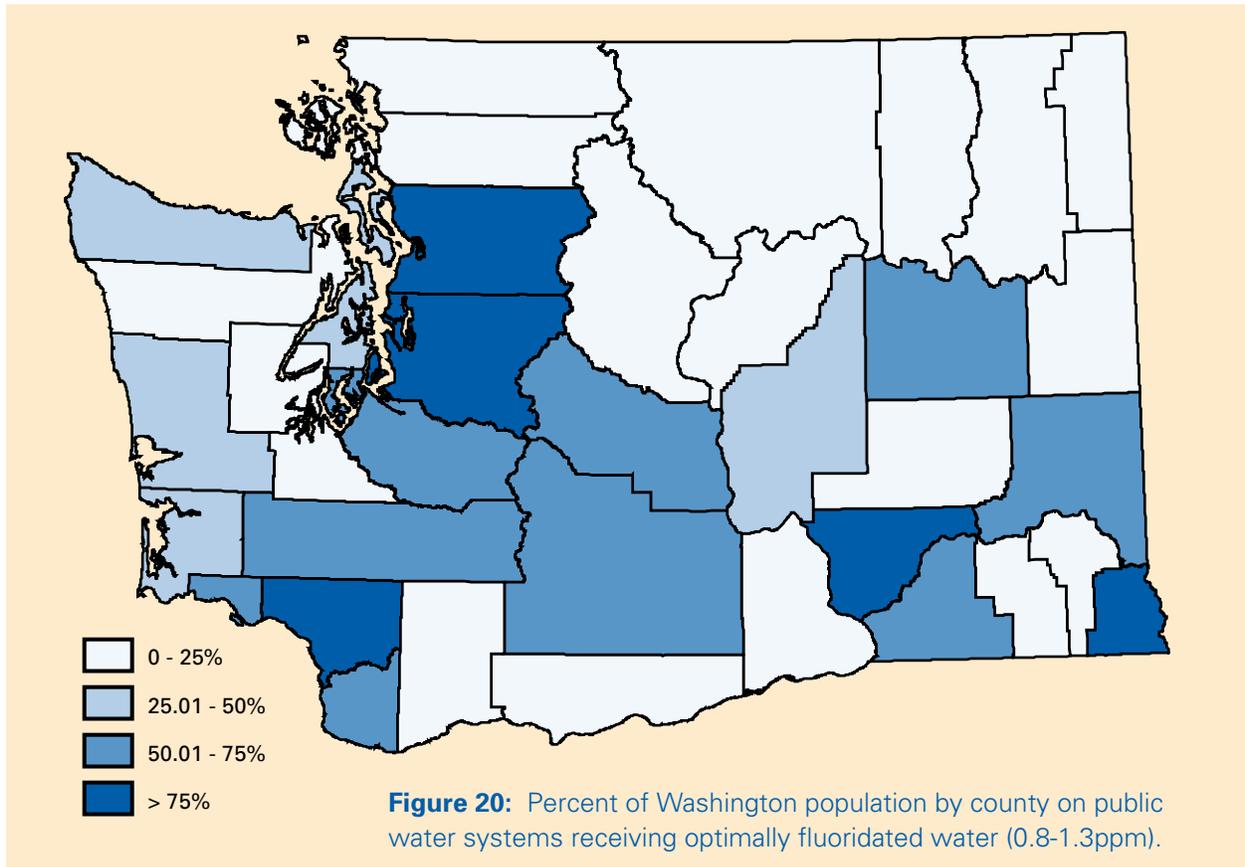
**Figure 19:** Population served by fluoridated public water systems, 2006 DOH Office of Drinking Water data.



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](http://www.doh.wa.gov/ehp/dw/our_main_pages/data.htm).



## 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

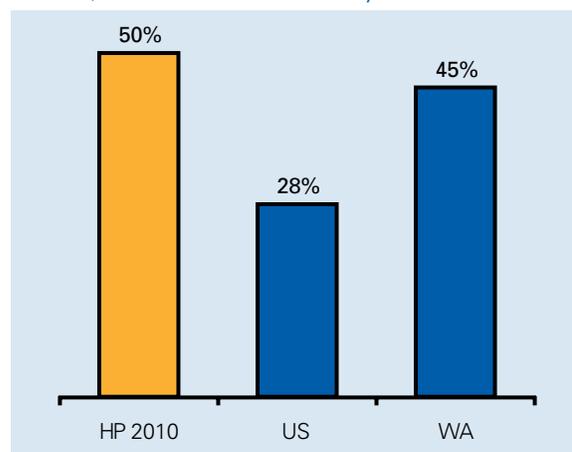
The HP2010 target for sealants is 50 percent for eight year-olds and 14 year-olds. The national average is 23 percent and 15 percent, respectively. In Washington State as in most states, there are no data for the 14 year-olds.

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.



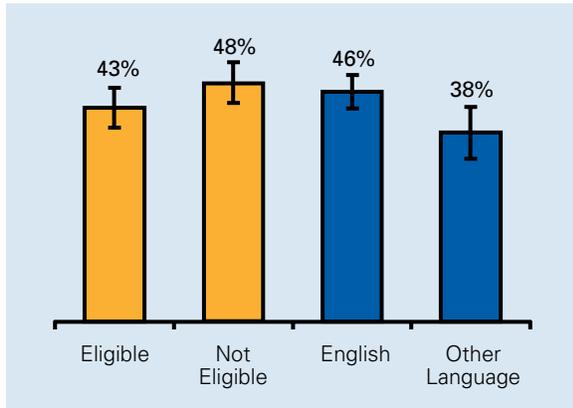
**Table 7:** Trends in the prevalence of dental sealants among elementary school-age children in Washington (unadjusted for non-response), 2000 & 2005 WA Smile Survey.

*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.

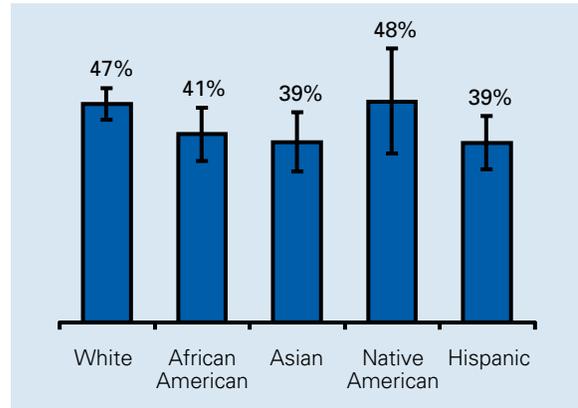
Race or ethnicity	Smile Survey year	Percent with sealants	
		Second grade	Second and third grade
All	2000	40.7 (38.0-43.2)	47.2 (45.3-49.1)
	2005	38.9 (37.3-40.5)	44.6 (43.4-45.7)
White Non-Hispanic	2000	42.1 (39.0-45.2)	49.4 (47.2-51.7)
	2005	41.2 (39.3-43.1)	47.1* (43.6-50.5)
Racial and ethnic minorities	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.

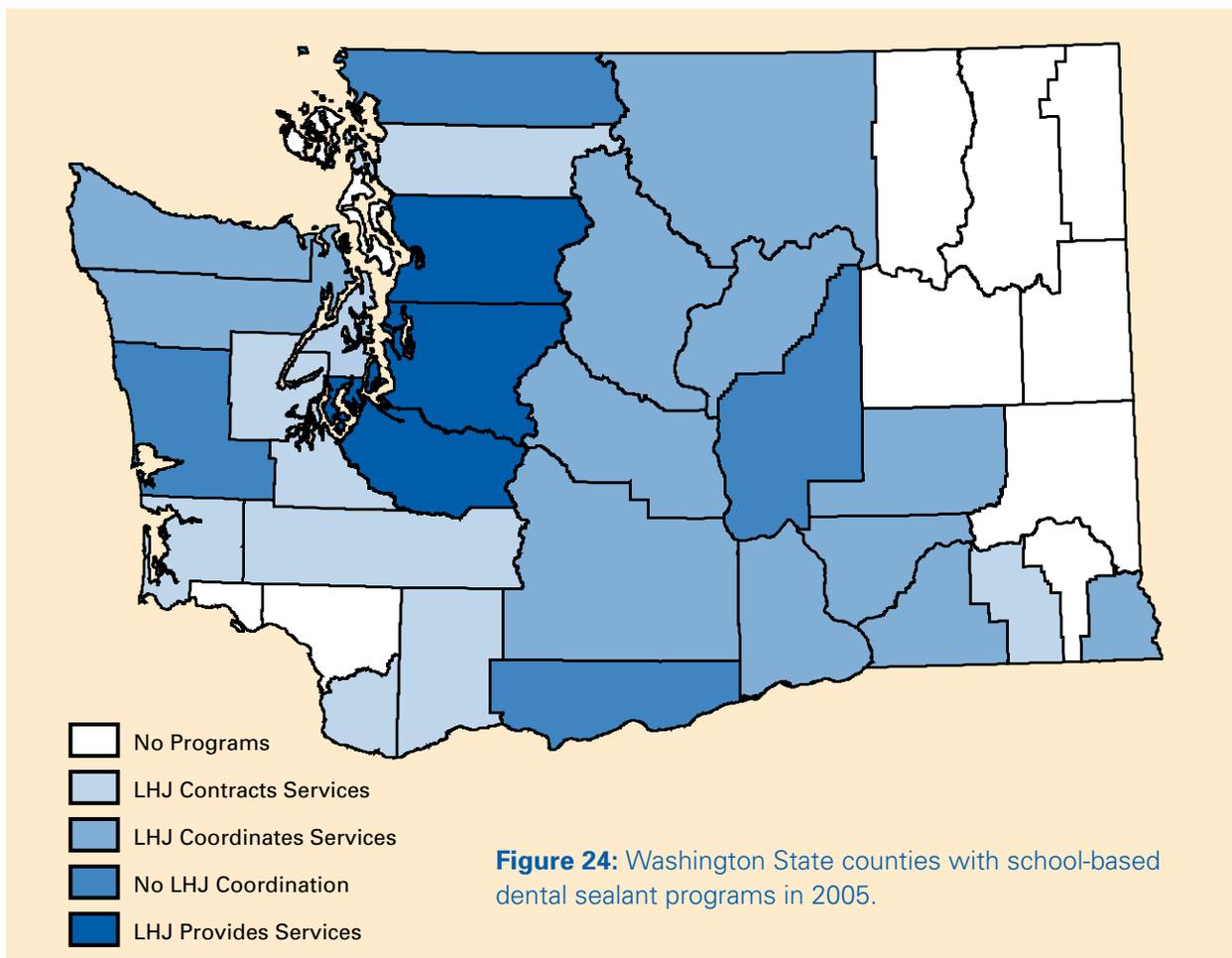


**Figure 23:** Dental sealants among elementary school-age children (second and third graders) by race and ethnicity (adjusted for non-response), 2005 WA Smile Survey.



## 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



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 school-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.

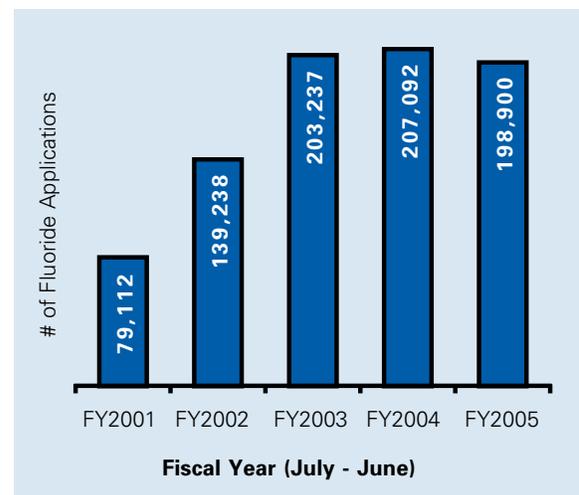
## Topical fluorides and fluoride supplements

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.

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.

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



## 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:

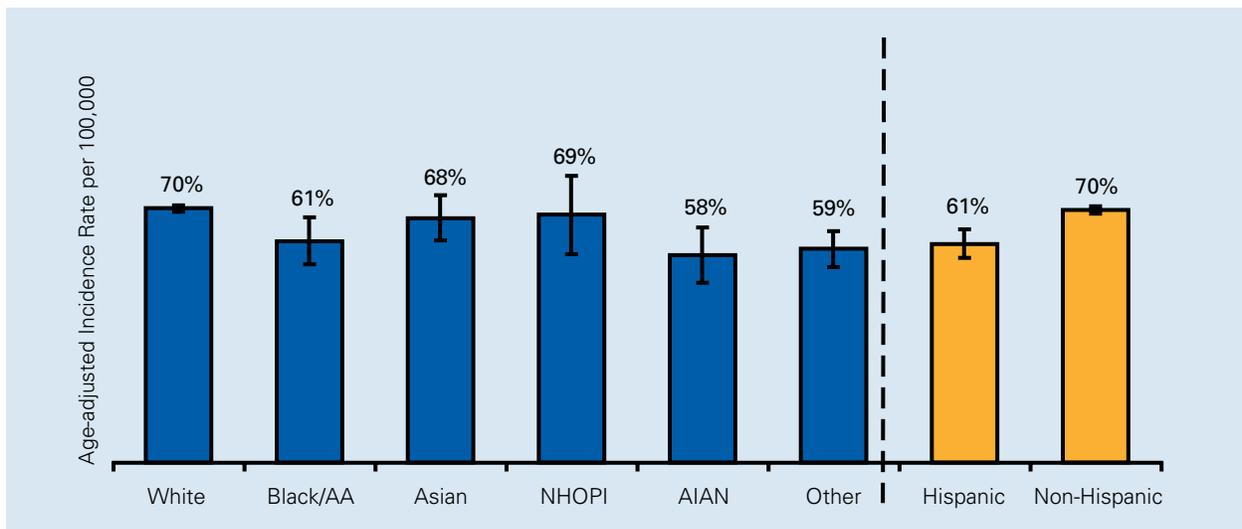
- Between 1999 and 2004, the state experienced an overall decrease in the percent of adults who had a preventive dental visit.
- Even lower rates of preventive visits were observed in individuals who were Hispanic, from low-income families, or who had attained less than a high school education.

**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%

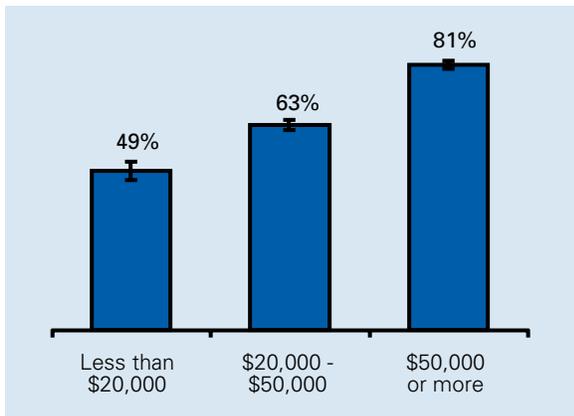
*Source:* National data from BRFSS 2004 (2002=69%, 1999=70%); state data from BRFSS 1999 and 2004 (2002 = 68.8%).

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

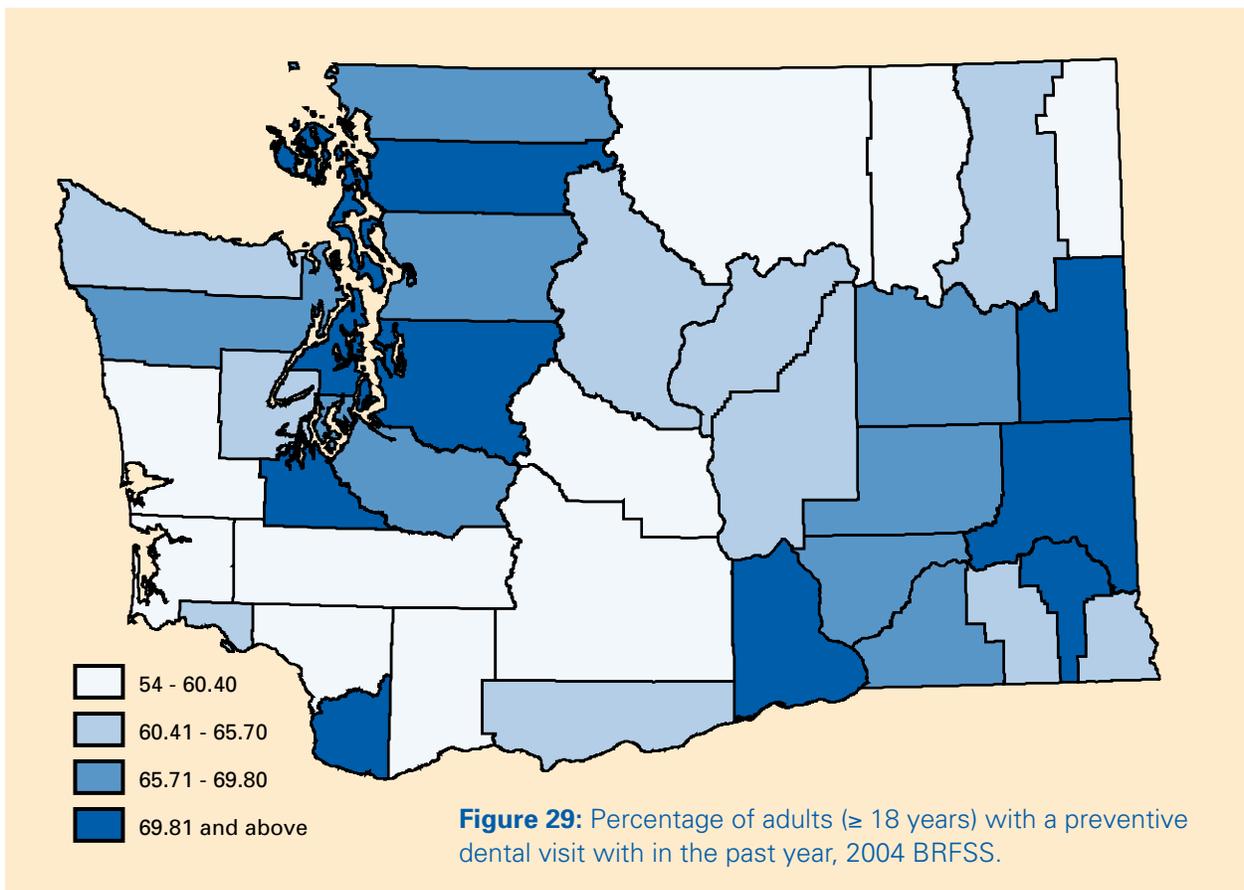
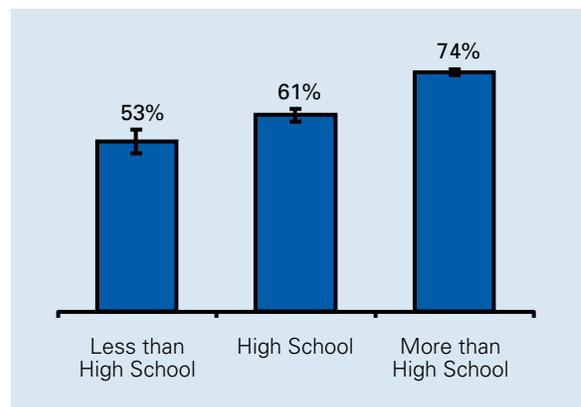


†Race and ethnicity in this chart are mutually exclusive.

**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
<b>Race</b>	
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)
<b>Maternal education</b>	
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)
<b>Poverty level</b>	
<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
<b>Race and ethnicity</b>		
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)
<b>Age</b>		
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)
<b>Education</b>		
<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 ( $\geq 18$  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
<b>Race and ethnicity</b>	
White	93.9 (87.5-97.1)
Black	§
Multiracial	95.5 (73.0-99.4)
Other	§
Hispanic	95.9 (84.1-99.1)
<b>Gender</b>	
Male	91.9 (82.3-96.6)
Female	97.5 (90.5-99.4)
<b>Maternal education</b>	
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)
<b>Poverty Level</b>	
<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)
<b>Age</b>	
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.

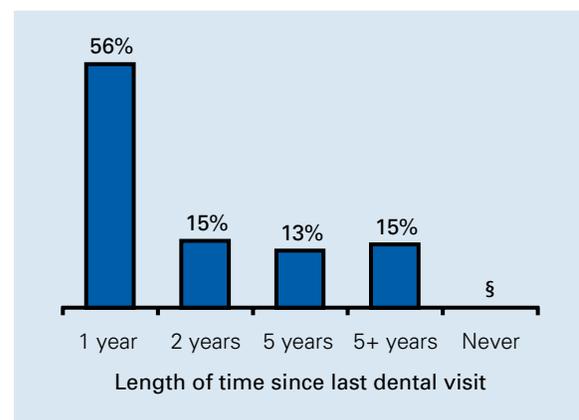
In Washington State:

- 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) (%)
<b>Grade 8</b>				
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)
<b>Grade 10</b>				
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)
<b>Grade 12</b>				
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](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.