

# 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

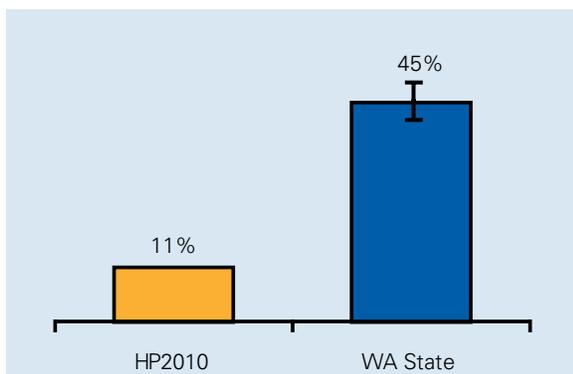
Dental caries is the most common chronic disease across all age groups. Children and adults can develop caries in the crowns of their teeth, but adults may also present it on the root surfaces after gingival recession. Fortunately, dental caries is completely preventable by measures that are widely available.

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](http://www.doh.wa.gov/cfh/Oral_Health/Data_and_pubs.htm).

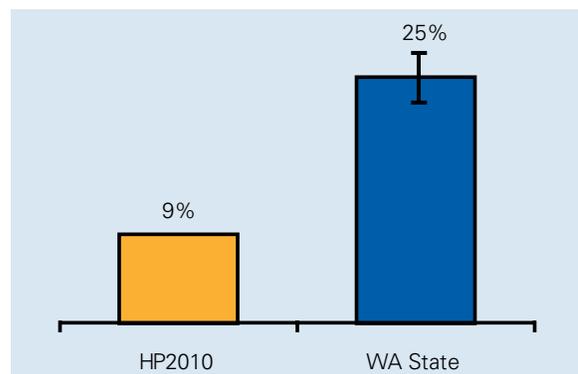
### Low-income preschool children (Head Start and ECEAP)

- **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.

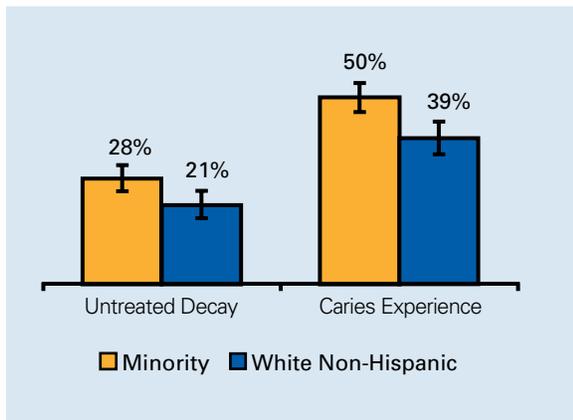


**Table 2:** Trends in the prevalence of caries experience, untreated dental caries, rampant caries, and treatment needs among Head Start and ECEAP children.

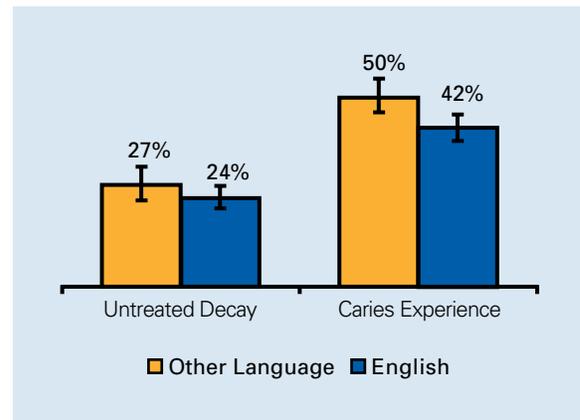
*Important note:* The data presented in this table are unadjusted for non-response. Further, caution should be taken when comparing trends over time between the three Smile Surveys. The same diagnostic criteria were used among all three surveys, but the sampling methods and type of consent varied. (See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

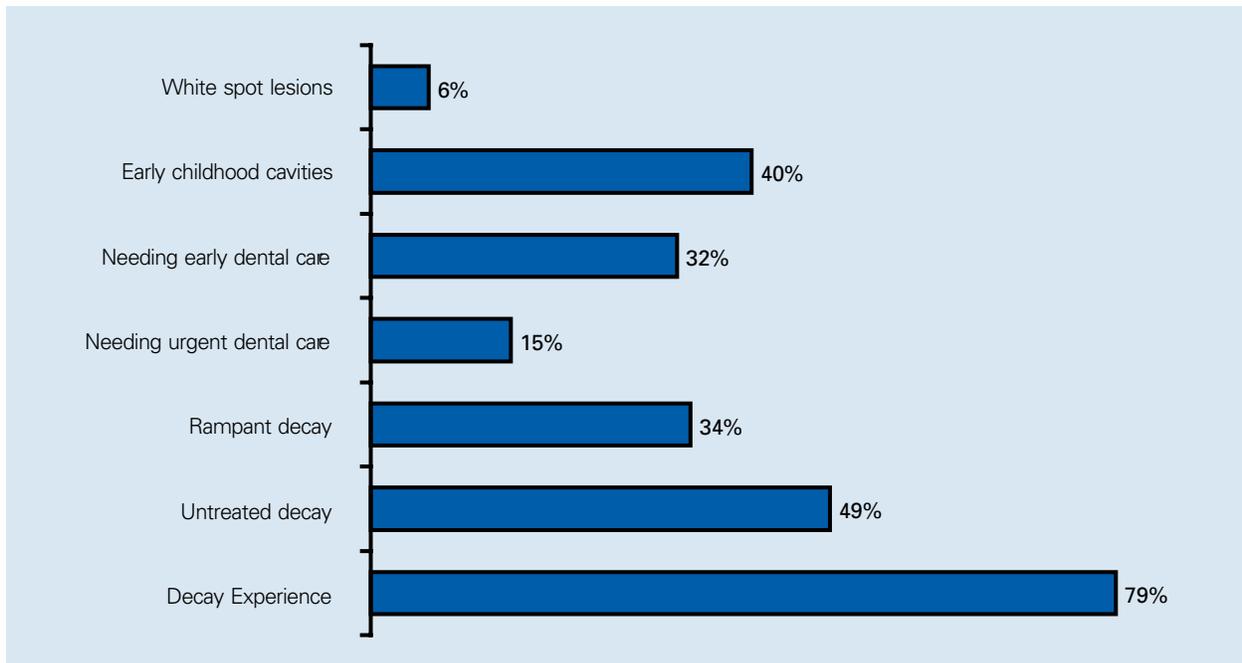
**Figure 3:** Oral health status of Head Start and ECEAP children by race and ethnicity (unadjusted), 2005 WA Smile Survey.



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



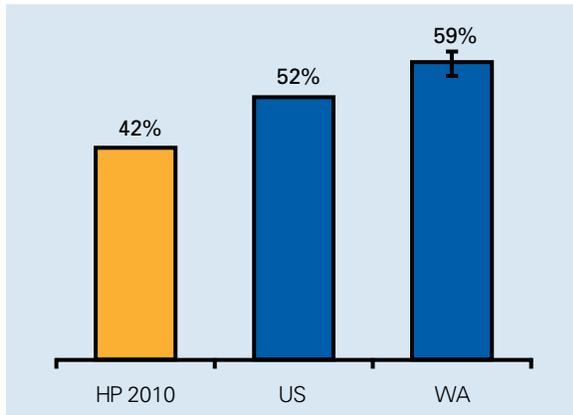
**Figure 5 :** Oral health status of Native American children in tribal Head Start, 2005 WA Smile Survey



### 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.

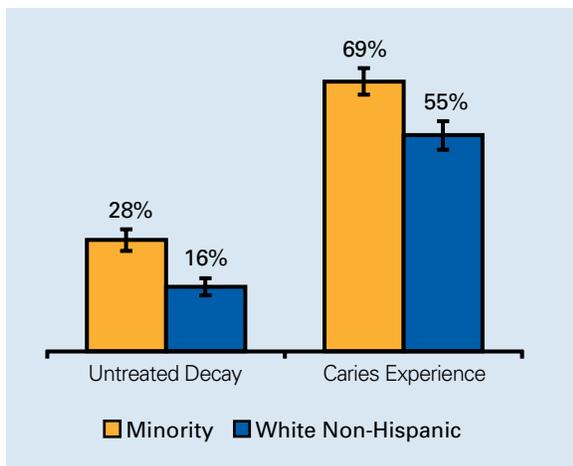
**Figure 7:** Untreated caries among elementary school-age children (second and third graders) in Washington (2005 WA Smile Survey adjusted), compared to 6-8 year-olds in the United States and the HP2010 objectives.



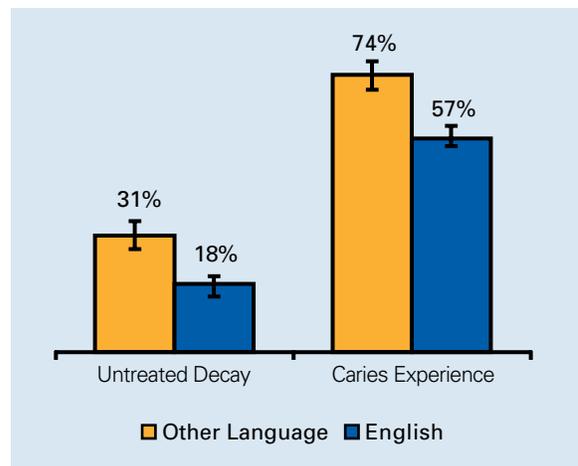
*Note:* It should be noted that the 2005 Smile Survey was not designed to be representative of all 2-4 year-old and 6-8 year-old children; with the majority of Washington’s preschool and elementary school-age children screened being 3-5 years and 7-9 years of age, respectively.

*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.

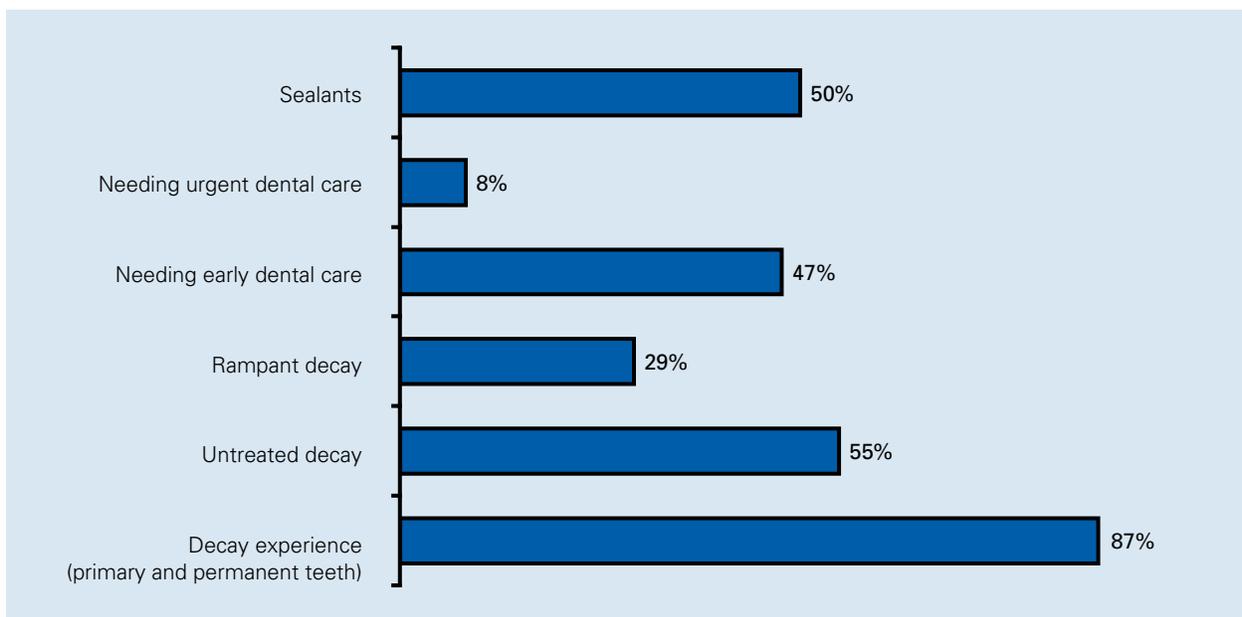


**Table 3:** Trends in the prevalence of caries experience, untreated dental caries, rampant caries, and treatment needs among elementary school-age children.

*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)
<b>Type of treatment needed</b>		
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  $\geq 20$  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

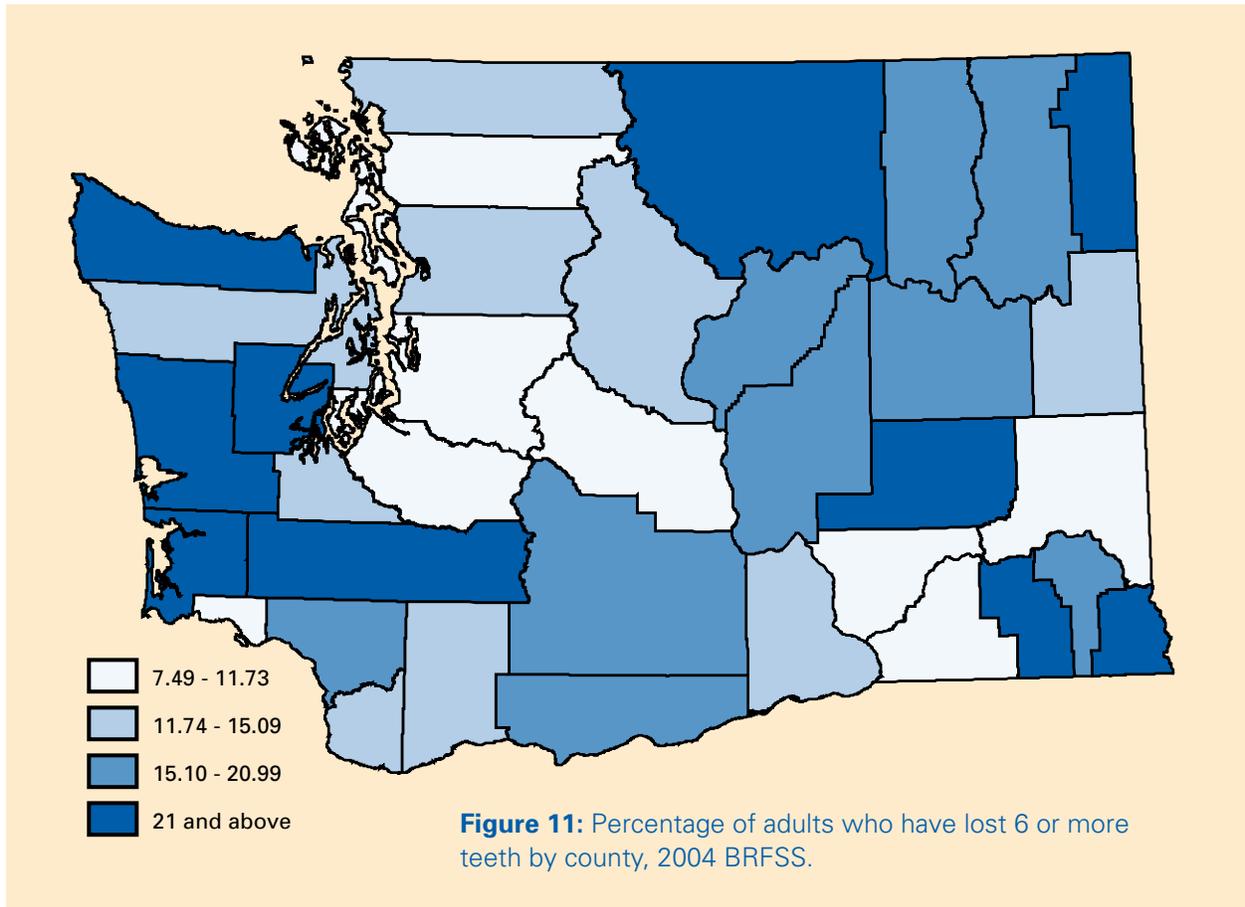
In Washington State:

- 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 <sup>1</sup> HP2010 = 42%		Ages 65-74 years Lost all natural teeth <sup>2</sup> HP2010 = 20%	
	Washington (%)	United States (%)	Washington (%)	United States (%)
<b>Race and ethnicity</b>				
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
<b>Gender</b>				
Female	68.9	60.5	17.3	18.8
Male	72.6	61.0	10.7	17.1
<b>Education level</b>				
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.*



## 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]

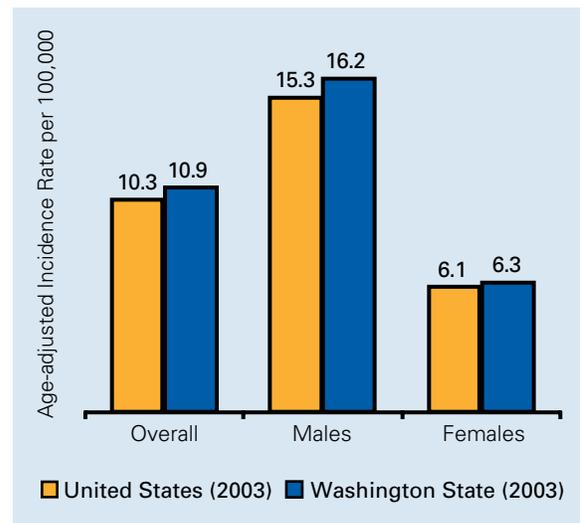
Cigarette smoking and alcohol use are the major known risk factors for oral cancer in the United States, accounting for more than 75 percent of oral cancers. [19]Using other forms of tobacco, including smokeless tobacco [20] and cigars [21], also increases the risk for oral cancer. Dietary factors, particularly 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).



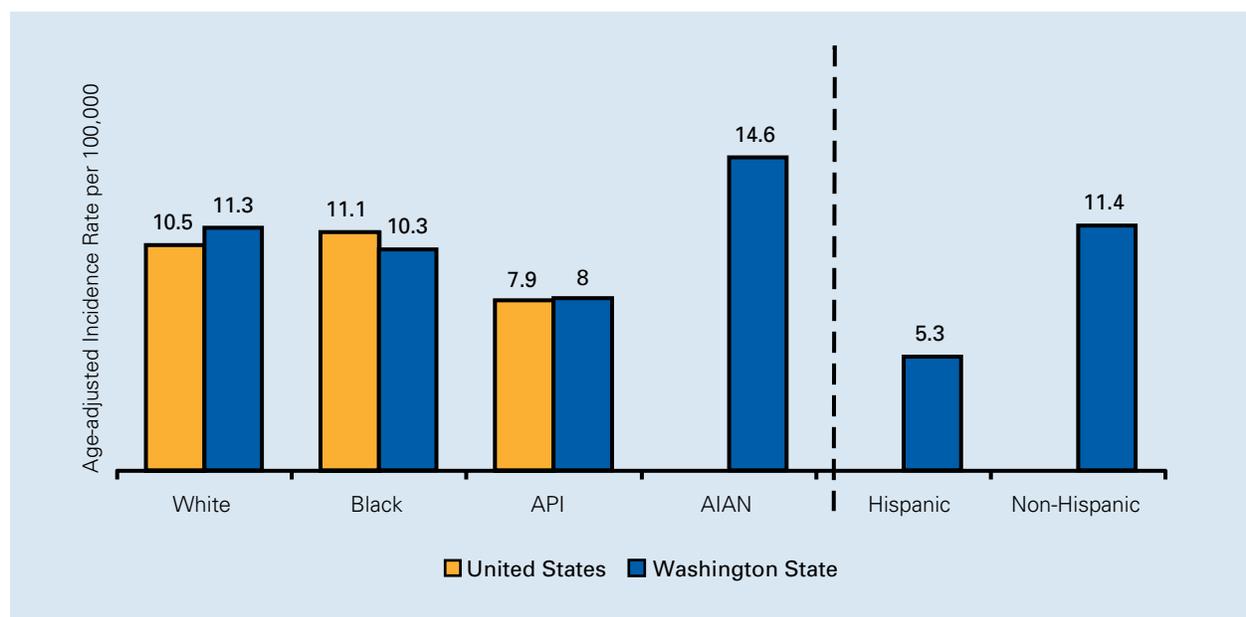
*Note:* Rates per 100,000 have been adjusted to the 2000 U.S. standard population.

*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.

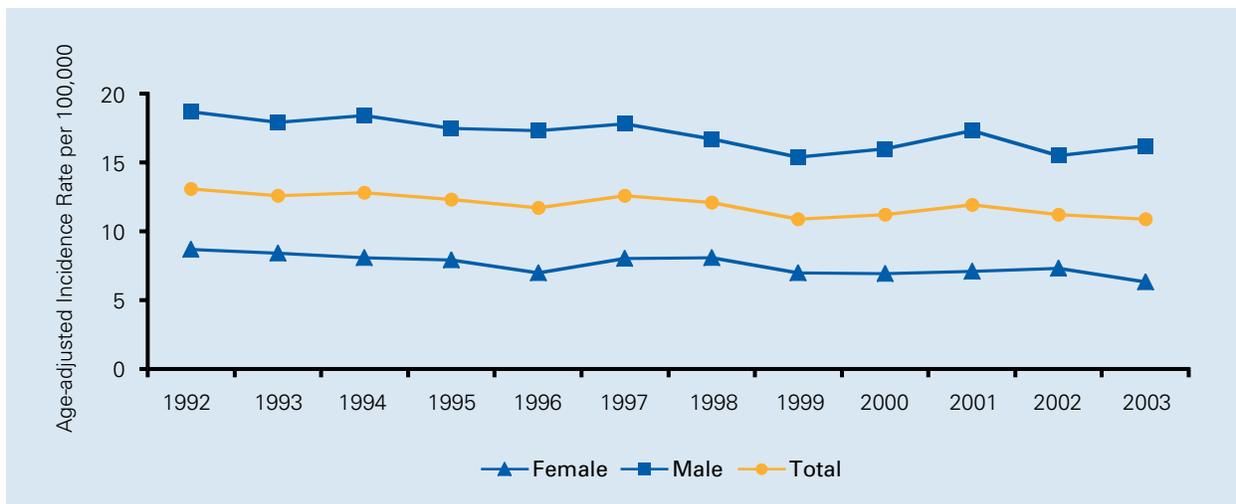
*Note:* National incidence rates for American Indian/Alaska Natives and Hispanics are not comparable to Washington data.

*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).

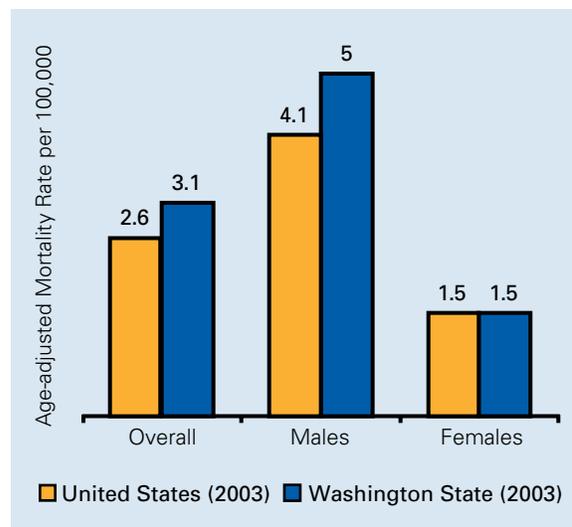


**Mortality of oral and pharyngeal cancers**

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).

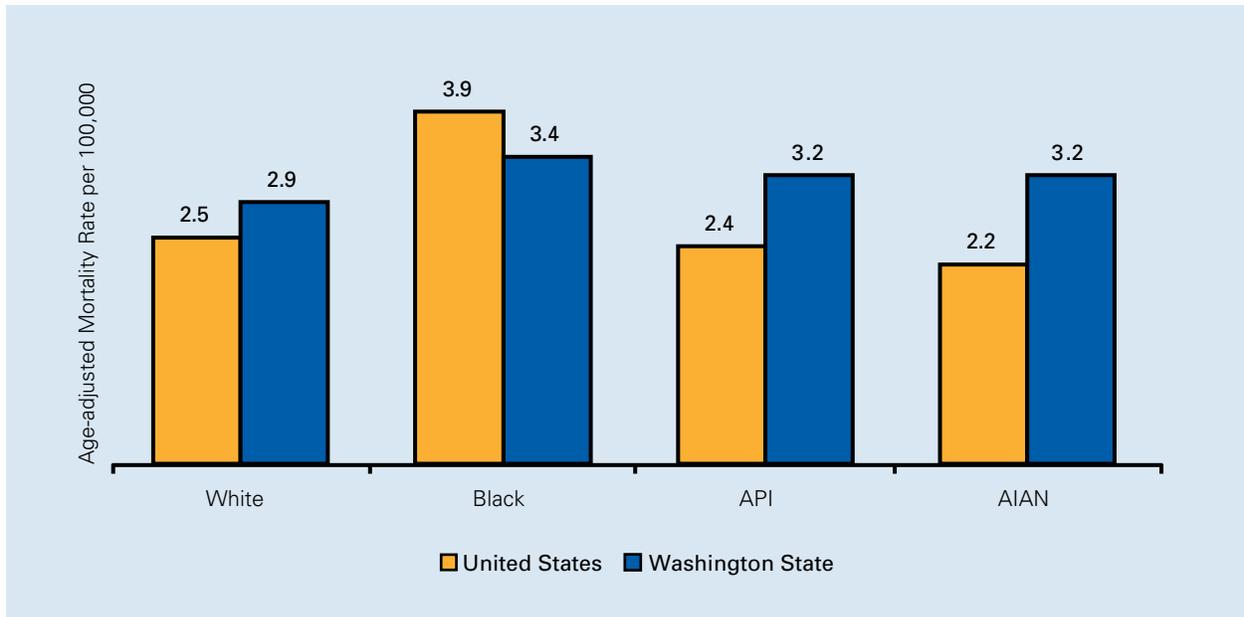


**Table 5:** Age-adjusted oral cancer incidence rates per 100,000, 2001- 03 WA Cancer Registry.

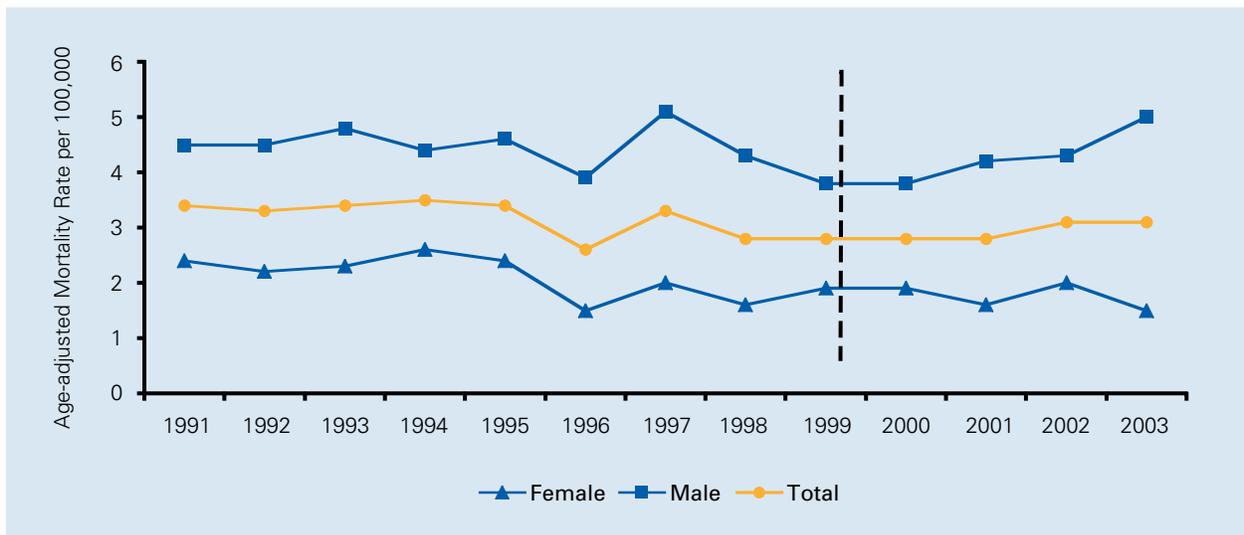
Type of cancer	Age-adjusted incidence rate per 100,000 (2001-03)
Tongue	3.2
Gum/other mouth	1.9
Tonsil	1.5
Salivary gland	1.0
Lip	1.1
Mouth floor	0.9
Nasopharynx	0.5
Oropharynx	0.4
Hypopharynx	0.3
Other cavity	0.3

*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.

**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

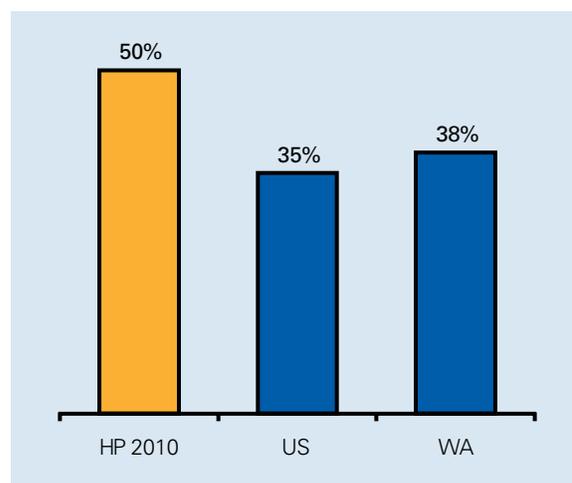
In Washington State:

- 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
<b>Cleft lip and palate</b>	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.*