Snohomish County SMILE Survey, 2000

September 2002

SNOHOMISH HEALTH DISTRICT

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Acknowledgements

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Participating School District and Schools

Participating Schools

Everett School District
Madison Elementary School

Marysville School District
Pinewood Elementary School
Allen Creek Elementary School
Liberty Elementary School

Mukilteo School District
Columbia Elementary School

Edmonds School District
Hazelwood Elementary School
Brier Elementary School
Martha Lake Elementary School

Sultan School District
Gold Bar Elementary School

Monroe School District
Sky Valley Educational Center

Stanwood School District
Cedarhome Elementary School
Stanwood Elementary School

For more information, contact Snohomish Health District Oral Health Program at 425.339.5230.

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INTRODUCTION

The SMILE Survey, 2000 is a dental health and screening survey conducted statewide of a random sample of Washington State schools. Snohomish Health District conducted a dental survey in 2000 of an additional random selection of school children in 2nd and 3rd grade in Snohomish County that would be comparable to the Washington State SMILE survey. * The Washington State SMILE survey assessed oral health from several age cohorts, including 2-4 year olds, children 3-5 years old, children enrolled in the Indian Health Services programs, and 2nd and 3rd grade elementary school children. This report contains only the results for Snohomish County 2nd and 3rd grade students selected in both the state sample and the county oversample.

Both the Snohomish County and Washington State SMILE surveys indicate that, like national data, dental decay is a common infectious childhood disease among surveyed children. According to the Office of the US Surgeon General "Oral Health in America: A Report of the Surgeon General", dental caries has seven times the prevalence of hay fever and five times the prevalence of pediatric asthma. In addition, it is a preventable disease for children who receive oral health care.

Key findings of the Snohomish County SMILE Survey, 2000 are discussed in this report. Other relevant data is also presented when applicable. These findings provide a better understanding of how Snohomish County is doing in helping children receive dental services that are necessary to protect their oral health.

*Washington State SMILE Survey, 2000 (http://www.doh.wa.gov/cfh/OralHealth/links/smile.html)

*The Health of Washington State, A statewide assessment of health status, health risks, and health care services, Infectious Disease, Dental Caries, July 2002. http://www.doh.wa.gov/HWS/default.htm) See Appendix

OTHER SNOHOMISH COUNTY ORAL HEALTH SURVEYS

Other local surveys have been used to quantify oral health in Snohomish County.

1993 - Snohomish Health District in collaboration with the Community Health Center of Snohomish County, Snohomish County Human Services Department, General Hospital Medical Center, Providence Hospital of Everett and Stevens Memorial Hospital contracted with the Gilmore Research Group to survey local dentists and physicians. The results indicated a substantial lack of dental providers for low-income families.

1994 - The University of Washington conducted a stratified random sample survey of third graders in 39 Washington State counties and found that Snohomish County children ranked in the bottom quartile for tooth decay. (Leroux, Maynard, Domoto Zhu and Milgrom, "The Estimation of Caries Prevalence in Small Areas", J Dent Res 75(12); 1947-11956, December, 1996)

1994 -The Snohomish Health District and University of Washington conducted a survey in the East Snohomish County Health Planning Area of 2nd and 3rd grade children utilizing SMILE survey methodology. The results indicated that less than 20% had dental sealants, one measure used to prevent tooth decay. Overall caries experience was 47.7%. (Participation rates ranged from 50.1-67.6%)

2000 - A Snohomish Health District SMILE survey of Darrington Elementary School 2nd and 3rd grade children found dental caries experience of 59.2%. (78% participation rate)

2002 - Snohomish County Counts 2001 Community Assessment (www.uwsc.org/assessment) of a random sample of Snohomish County households found that cost and perceived need lead the list of reasons for not visiting a dentist in the last year.

KEY FINDINGS

- Dental caries rates among 2nd and 3rd grade children were similar in Snohomish County and Washington State despite different response rates for minority and low-income students.

- Snohomish County 3rd graders are no longer in the bottom quartile for dental decay as indicated by the University of Washington third grade survey conducted in 1994.

- By the age of eight years, 57.6% of third grade participants and 52.5% of second graders in Snohomish County had experienced tooth decay, mostly in their primary teeth.

- In Snohomish County, low-income students have poorer oral health compared to students who were high income.

- Low-income students in Snohomish County were similar to low income students in Washington State for decay, rampant decay, untreated decay, and needing treatment.

- Higher income participants in Snohomish County had poorer oral health than higher income participants in Washington State.

- Children that do not speak English at home had poorer oral health and more trouble obtaining dental care than any other group evaluated by SMILE survey 2000.

- Children in Snohomish County were more likely to have dental sealants than Washington State children, 58.1% versus 47.2%, respectively, regardless of income or minority status.

- Snohomish County 3rd grade children attending schools with a Snohomish Health District School-based Dental Sealant program were three times more likely to receive dental sealants than those attending schools without a dental sealant program.

- From 1990 to 2000, the number of Snohomish County children with DSHS medical coupons who visited a dentist in the last year tripled while the proportion of children with DSHS medical coupons increased by 12.2%.

Methods

An electronic list of all public elementary schools was obtained from the Washington State Office of Superintendent of Public Instruction. All Washington State schools with at least 25 children in second and/or third grade were included in both the Washington State and Snohomish County sampling frame. All schools larger than 25 students in 2nd and/or 3rd grade were ordered by percent of minority enrollment and randomly selected. Five Snohomish County schools were selected as part of the Washington State SMILE survey sample.

Using the same methodology, an additional eight schools were randomly selected for participation in a Snohomish County oversample. Twelve of the 13 schools selected in Snohomish County agreed to participate. A total of 2007 2nd and 3rd grade children were enrolled in participating schools (Oct. 1999 enrollment data, OSPI). The one school that did not participate was one of the smaller schools and was not different from other Snohomish County schools in terms of socio-economic factors or minority populations.

Only those children whose families returned a positive consent form were screened for both the Washington State and Snohomish County SMILE surveys. In Snohomish County, 858 completed the questionnaire but did not participate in the screening (questionnaire response rate of 42.7%). A total of 751 second and third grade Snohomish County students were screened for the survey. Because three students had missing grade information, analysis was conducted on 748 (37.2% screening response rate). While the response rates were low, they were not significantly different from the response rates for the Washington State sample (45.2% and 39.6%, respectively).

Table 1. Survey Response Rates for Snohomish County and Washington State, SMILE Survey, 2000

	Snohomish County N=2007	Washington State N=6814	p-value
Questionnaire response rate	42.7% (N=858)	45.2 (N=3081)	>0.10
Screening response rate	37.2% (N=748)	39.6% (N=2699)	>0.10

Due to the lower than expected response rate, any generalization to all Snohomish County children should be interpreted cautiously. Of those responders that did not choose to participate in the dental screening, more, but not all, had recent dental visits. Therefore, non-responders to the survey may be more likely to have better oral health and regular dental care. Results from the Snohomish Health District School-Based Dental Sealant Program (2nd and 3rd grade children) found a larger proportion of low income children were identified when all consent forms were returned. Therefore, non-responders may be more likely to be low income, have poorer oral health and lack regular dental care.

All data for Snohomish County students in the Washington State sample and the Snohomish County oversample surveys were collected by one screener. Diagnostic criteria for the survey criteria are outlined in the Association of State and Territorial Dental Directors 1999 “Basic Screening Surveys: An Approach to Monitoring Community Oral Health”. In addition the Snohomish County screener (dental hygienist) attended a one-day training session for calibration with the Washington State SMILE Survey data collectors. All of the SMILE Survey screenings were conducted using gloves, penlight and mouth mirror. If necessary, a toothbrush or gauze swab was used to remove excess debris from the teeth.

PARTICIPANTS

Children participating in the Snohomish County SMILE Survey, 2000 ranged in age from 6-11 years old with a mean of 8.1 years, just over half were female, 80.7% were White and non-Hispanic, and 20.8% were eligible for R/F%.

The proportion of White/non-Hispanic children taking part in the Snohomish County SMILE survey, 2000 was lower than the sample of schools participating in the Snohomish County SMILE survey, 2000 or from all 2nd and 3rd grade children in Snohomish County. However, this difference was not statistically significant. When compared to the Washington participants, children in 2nd and 3rd grade who participated in the Snohomish County SMILE survey, 2000 were more likely to be White/non-Hispanic. The participants in the Washington sample had a lower proportion of White non-Hispanics compared to school enrollment data and are, therefore, not representative of the student population. This was not surprising as the sample methodology was designed to oversample minorities.

Also, a significantly lower proportion of Snohomish County SMILE Survey, 2000 participants were eligible for a reduced fee or free lunch (R/F%) program compared to students in the Washington State survey. Eligibility for R/F% program was used to define low-income children. The proportion of Snohomish County children eligible for the R/F% program was, however, similar to the sample and to those taking part in the Snohomish County SMILE survey, 2000. Participants in the Washington State SMILE Survey, 2000, however, had a higher percentage of R/F% program students compared to statewide school enrollment data.

Based on these indicators, the data suggested that the Snohomish sample participants were statistically similar to that of all 2nd and 3rd graders, but the Washington participants were not representative of the population of 2nd and 3rd graders. However, even though the Snohomish participants did not seem statistically different from enrollment data, caution should still be taken in interpreting the results. Respondents or participants can be different than non-respondents with respect to other information that is not available in the database. Because of the differences in the Washington and Snohomish participants, comparisons of Snohomish County data to Washington data should be done within minority and R/F% categories. Comparisons of overall county to statewide data need to be interpreted with caution.

Table 2. Percent of Minority and Reduced Fee and Free Lunch (R/F%) in Second and Third Graders in Snohomish County Compared with Washington State, SMILE Survey, 2000

	Snohomish County			**Washington State**		
2nd & 3rd Grade Students	Number	White Non-Hispanic	%R/F%	Number	White Non-Hispanic	R/F%
Screened Participants	748	80.7% (N=747*)	20.8% (N=578*)	2,699	72.4%	36.6%
Sample	2,007	82.8%	20.9%	6,814	74.4%	36.8%
School Enrollment	16,361	83.3%	20.0%	156,369	75.3%	31.0%

*Because some students had missing information, the numbers do not add up to the total number of screened participants.

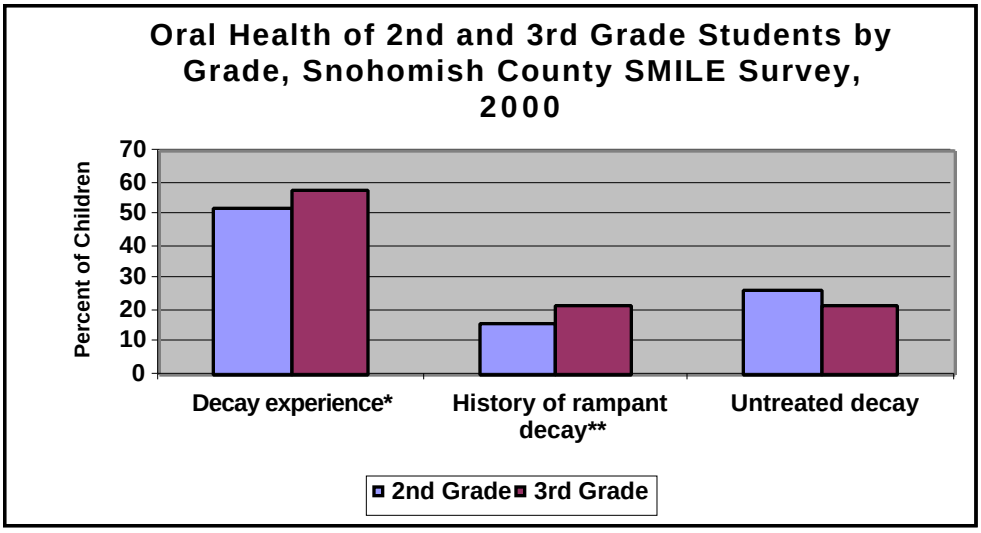
DATA ANALYSIS

Because of the non-representative nature of the participants, data were first analyzed by weighting the data using grade and minority information. However, it was decided not to weight the data because the weighted results were similar to unweighted data. In addition, the results would be more comparable to the unweighted results in the Washington State report. Data were analyzed in both Epi Info 6 and STATA to account for clustering effects by school and county.

Confidence intervals (CI) are the range of numbers that indicate the accuracy of the percents reported. A 95% CI tells the probability that the "true" estimate will be within the CI 95% of the time. When comparing two proportions for Snohomish County data, the confidence interval of the smaller sample, or category was used, as it will have greater variability. When Snohomish County is compared to Washington State, the Snohomish County 95% CI is used. If the compared percent falls inside of the 95%, it is not statistically different. If it falls outside the 95% range, the two percents are statistically different. For example, 28.2% (95% CI 19.4%, 39.0%) of non-White and/or Hispanic Snohomish County children have rampant decay percent compared to 16.6% of White/non-Hispanics. Because 16.6% falls outside of the 95% CI of non-Whites (range = 19.4% to 39.0%), Snohomish County non-White/Hispanics are statistically different (have more rampant decay) than White/non-Hispanics.

ORAL HEALTH BY STUDENT GRADE

Dental caries experience is cumulative; therefore it would be expected that there would be more caries experience in third grade as opposed to second grade. While there was not significant difference between caries experience between 2nd and 3rd grade in Snohomish County participants, grade 3 children had more rampant tooth decay.



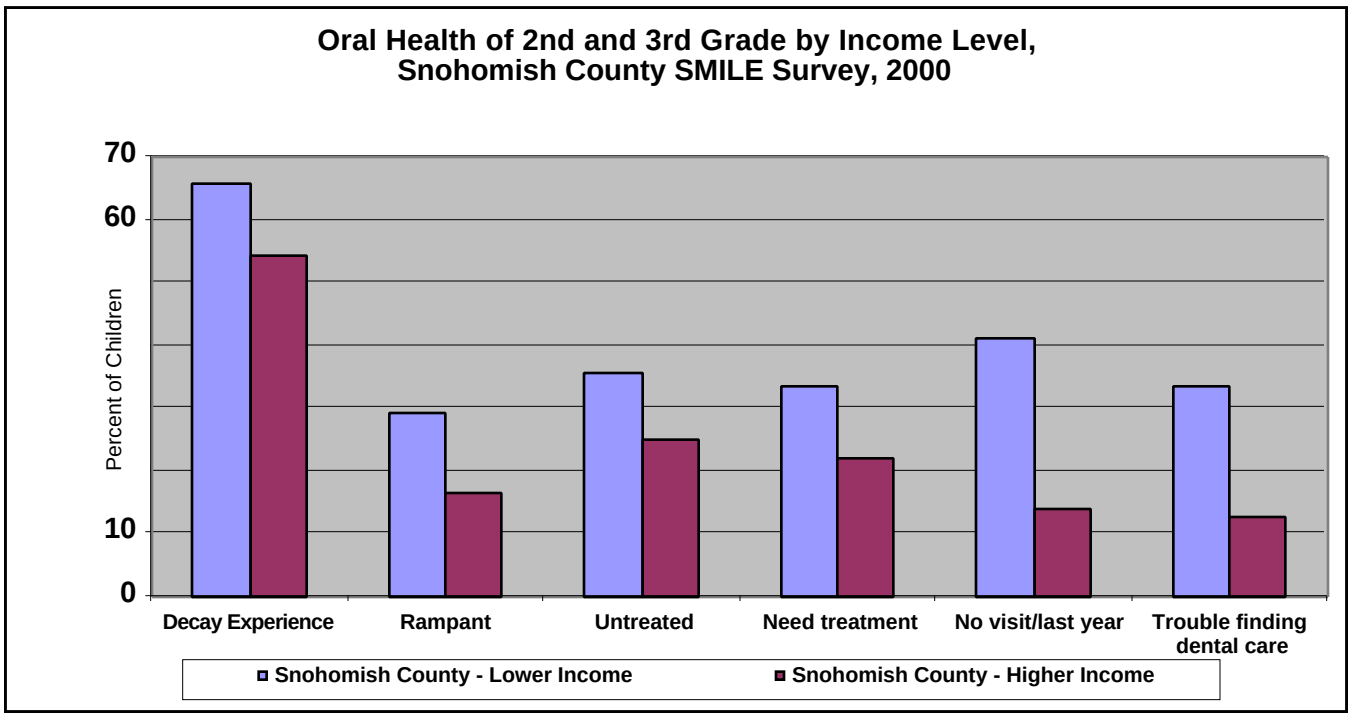
*History of decay and/or fillings in primary and/or permanent teeth.
**Decay in seven or more teeth.

See Table A in appendix.

ORAL HEALTH BY INCOME

Lower Incomes

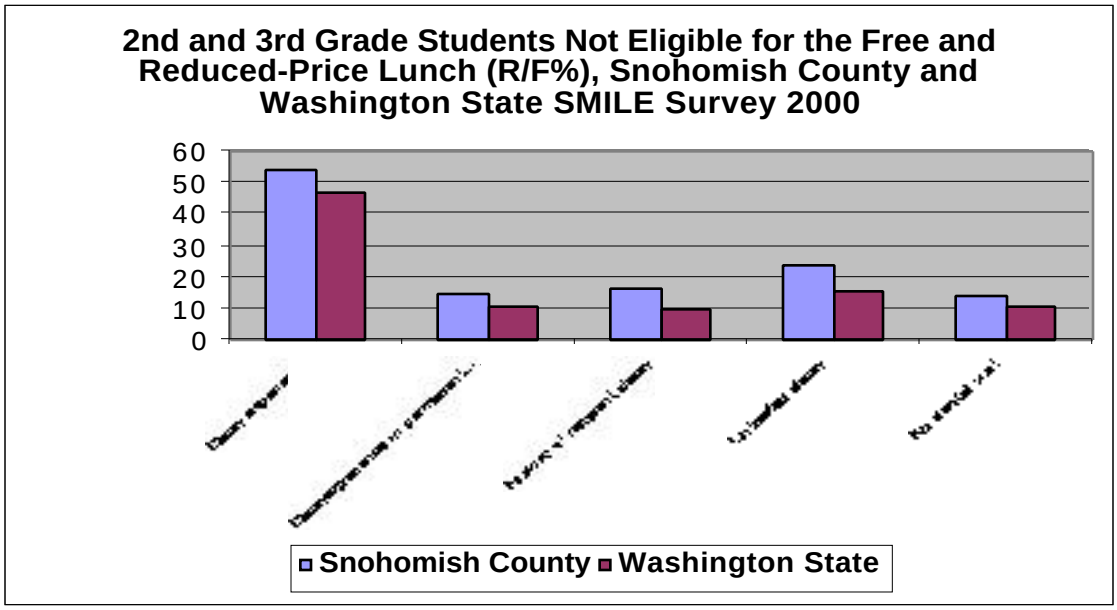
Compared to children that were higher income (not eligible for the R/F%- Reduced Fee and Free Lunch program), children with lower family income (R/F%) in both Snohomish County and Washington State were more likely to have decay experience in permanent or primary teeth (65.8% vs. 54.1%), have rampant tooth decay, have untreated decay, need treatment, have less insurance, not have seen a dentist in the last year, and have trouble finding dental care. In Snohomish County participants the only areas where low-income was not different from higher income were for decay experience in permanent teeth only and sealants. A significantly higher proportion of low-income children in Snohomish County had dental sealants and had not seen a dentist in the last year compared to low-income children in Washington State. There was no difference between low-income children in Snohomish County and low-income children in Washington State for decay in permanent teeth and primary teeth, decay in permanent teeth only, rampant decay, untreated decay, needing treatment, having trouble finding dental care, or having insurance.



See Table B in Appendix.

Higher Incomes

Even though for both Snohomish County and Washington State many of the oral health measures were similar for low versus not low-income students, the Snohomish County sample included a much larger proportion of children that were high income. Other surveys indicate that lower incomes are associated with a higher prevalence of dental caries experience. Snohomish County is consistent with this fact; indicating caries is greater in low income (65.8%). However, among higher income children tooth decay was also higher in Snohomish County (54.1%) when compared to Washington State higher income (47.7%). The proportion of higher income children was also significantly higher for rampant decay in Snohomish County (16.5%) than Washington State (10.1%).



See Table B in Appendix

It may be that higher income children in Snohomish County have more access to dental care. Children that visit the dentist receive more comprehensive evaluation and diagnosis that identify tooth decay earlier than is possible with dental screening surveys. Today, most dentists treat early tooth decay with dental restorations. Dental restorations represent a history of tooth decay experience that is more easily counted in dental screening surveys (although newer tooth colored fillings can also be difficult to see). In populations with greater access to care, dental restoration as a treatment decision would be greater. In other words, one reason that Snohomish County higher income children indicate higher rates of tooth decay than the Washington State sample may be that the higher income children have had more access to dental treatment.

It is, however, also possible that Snohomish County children who consented to participate were more likely to have dental caries experience than children that did not consent to participate. Families that chose not to participate in the dental screening often indicate that they have had recent dental visits.

DENTAL SEALANTS and SCHOOL-BASED DENTAL SEALANT PROGRAMS

Overall, in Snohomish County, 2nd and 3rd graders were significantly more likely to have had dental sealants to protect their newly erupted teeth, both by income or minority status, when compared to the Washington State SMILE survey. Snohomish County third graders had more sealants - 55.5% (95% CI 52.7, 58.3) than second graders - 48.6%.

After the implementation of water fluoridation in 1992, the Snohomish Health District piloted the provision of dental sealants in school-based programs with parent permission. (Dental sealants are a plastic coating that protects the chewing surface of teeth.) Nationally, 87% of tooth decay in permanent teeth of children now occurs on these surfaces.

In a 1994 survey, approximately 19% of Snohomish County 2nd and 3rd grade children had had dental sealants. In this 1994 survey, low sealant utilization was identified in schools and particularly in children on the R/F%, Hispanic, Native American and/or non-English speaking students.

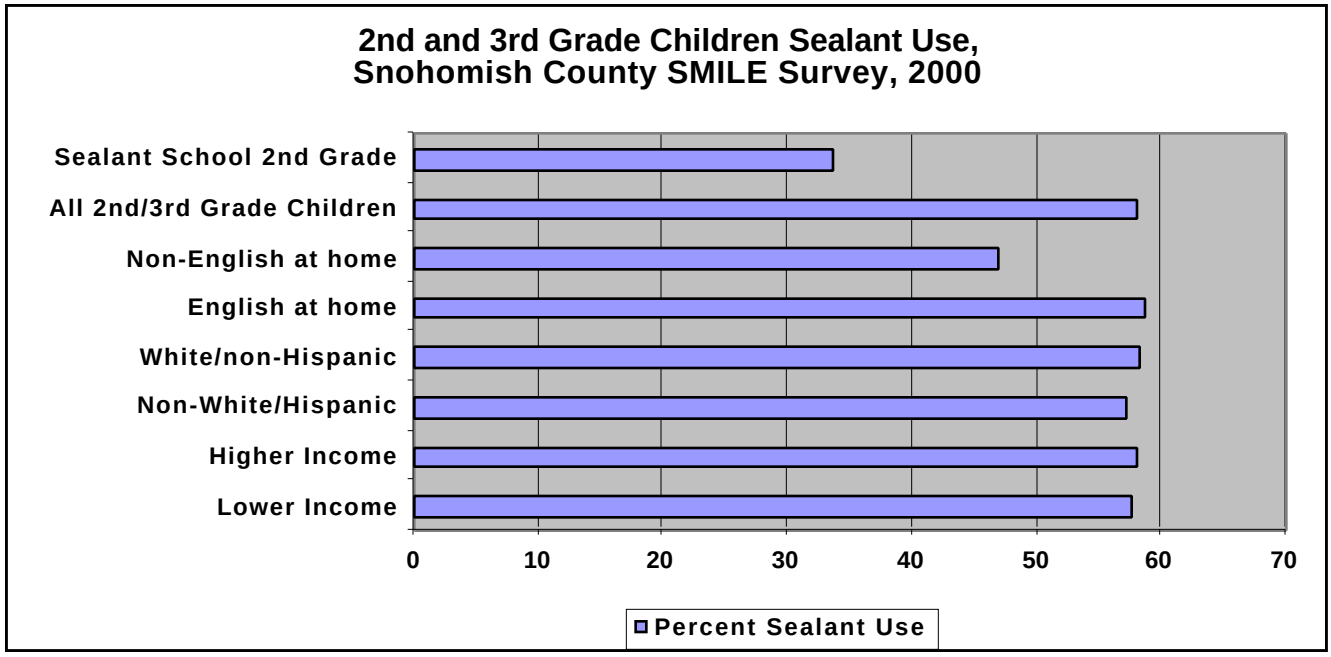
Water fluoridation protects the smooth sides of the teeth more than the chewing surface. Snohomish Health District selected second grade schools in Snohomish County that have had low sealant usage and other high risk indicators for tooth decay (high numbers of 2nd grade students with low family incomes, minority, and no-English spoken at home) for participation the School-based Dental Sealant Programs.

The Snohomish County and Washington State SMILE Survey 2000 contained two schools participating in the Snohomish Health District school-based dental sealant programs. Third graders in the 2000 survey would have had one-year post experience in the sealant program. To evaluate the effectiveness of this program, sealant schools were compared to non-sealant schools. Since children in the third grade may begin to show the effect of interventions begun in the second grade, an analysis was done of third graders to determine if there was a change in sealant use or dental decay and to determine if they varied by a child receiving free school lunch. Odds ratios (OR) were used to compare sealant and non-sealant schools.

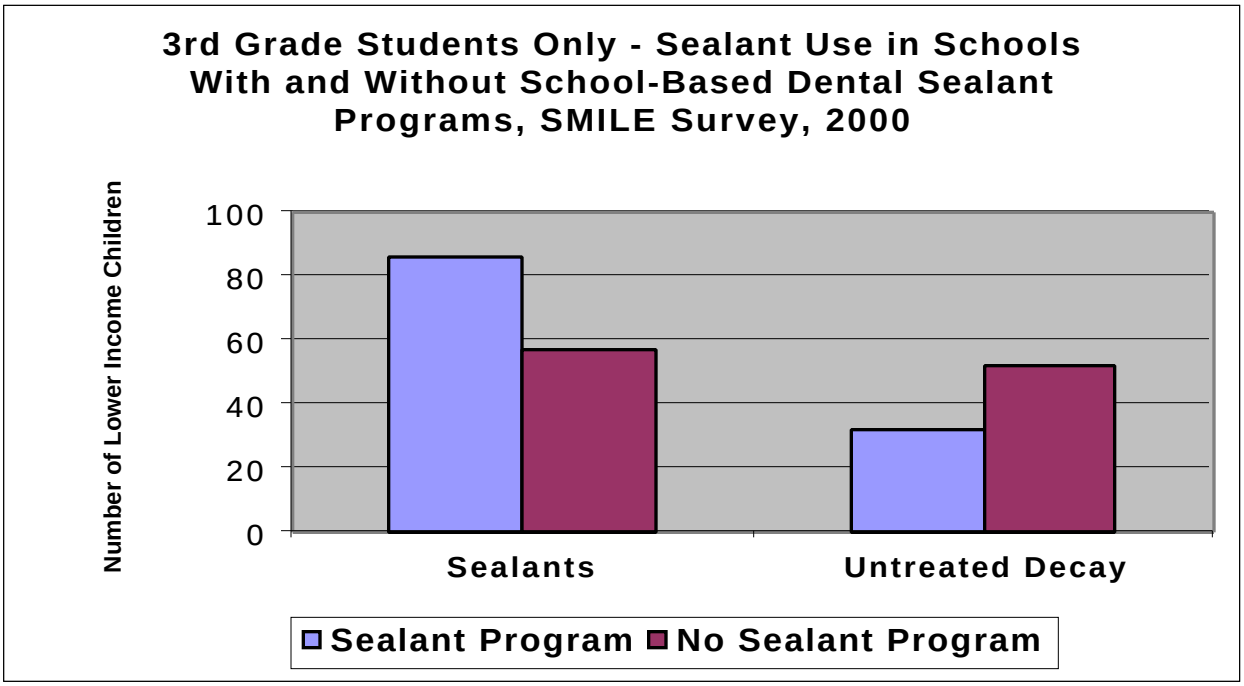
For 3rd grade students who participated in the survey for which there was no missing information, 85.1% of students in sealant schools had received sealants compared to 52.0% of third graders in non-sealant schools. Thus, third grade students attending sealant schools were 3.2 times more likely statistically (95% CI= 1.8, 5.6) to have sealants than those not attending a sealant school. To determine if there were any differences in the effect in lower income children, the results were stratified by whether a child received a reduced fee or free school lunch (R/F%). While third graders on the R/F% and attending a sealant school were 4.8 times more likely (95% CI= 0.8, 29.4) to have sealants than R/F% children attending a non-sealant school, it was not significant probably due to small numbers. Children not on R/F% and attending sealant schools were 2.8 times more likely to have sealants compared to children in non-sealant schools. This was statistically significant (95% CI= 1.3,6.1). The data suggested the effect of the sealant program was greater in those children on R/F% than those that were not.

There was no difference in untreated dental decay among third grade children between those attending a sealant school and those who did not attend a sealant school (Odds Ratio (OR) 95% CI=0.5, 2.0). Those children who received R/F% were a little less likely (OR=0.8) to have untreated dental decay if they attended a sealant school than those who did not have free school lunch (OR=1.1). Even though

the results were in the direction expected, these differences were not statistically significant. Since it was only one year from the time the sealant program began, it may be that not enough time had elapsed to see a difference in dental decay.



See Tables A-F in Appendix



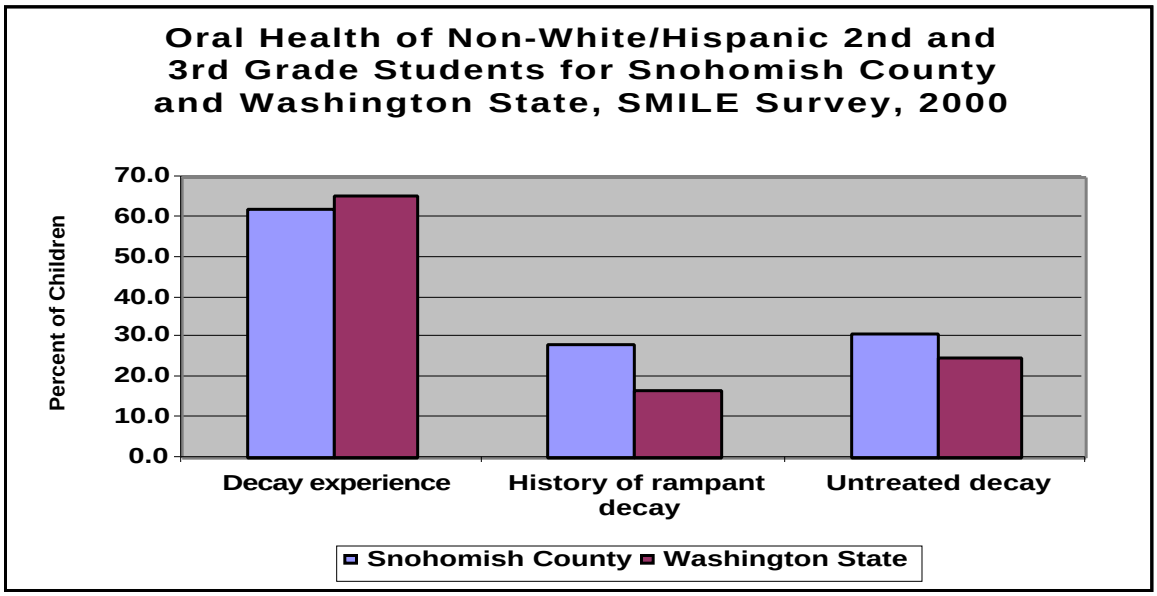
See Table C in Appendix

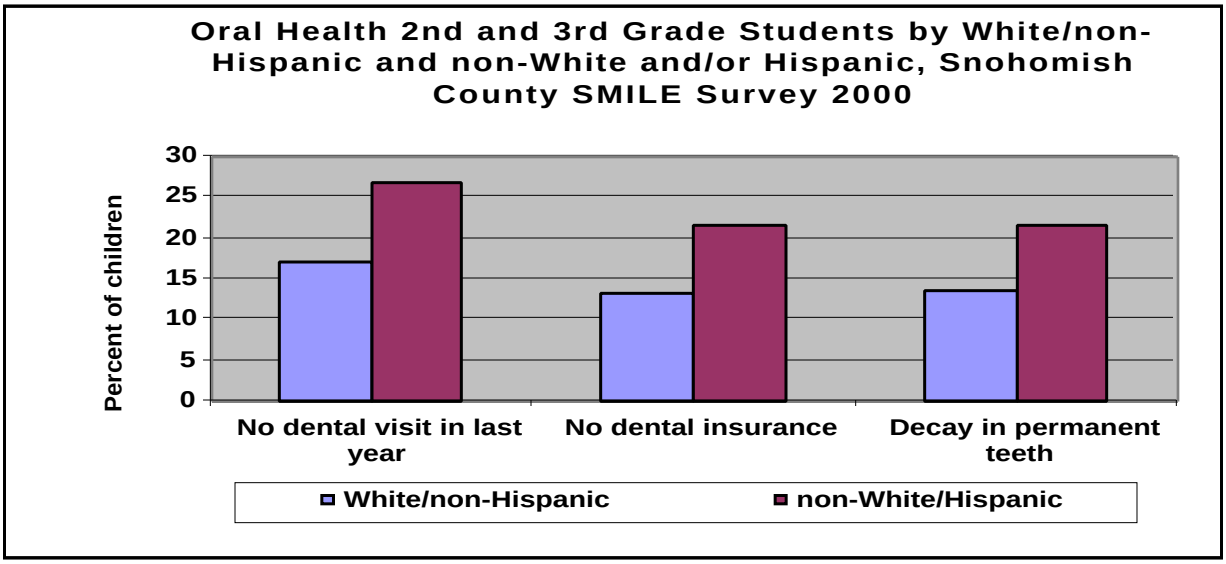
ORAL HEALTH BY RACE AND ETHNICITY

The proportion of minority children in the Snohomish County sample and participants was similar to the county's enrollment and was only 19.3% (N=142) of the participants. Even though the numbers were small, there were some statistical differences. Non-white and Hispanic children in Snohomish County were less likely to visit the dentist and to have dental insurance than white and non-Hispanic populations in Snohomish County. Non-whites were also more likely to have more decay experience in permanent teeth and have more rampant decay than Whites/non-Hispanics.

For Washington children, non-White/Hispanics had more overall oral health problems and access for all measures compared to White/non-Hispanics.

For Snohomish County, non-White/Hispanic children had a significantly greater history of rampant decay compared to Washington State. For White/non-Hispanic children, Snohomish also had more untreated decay and sealants than for Washington State.

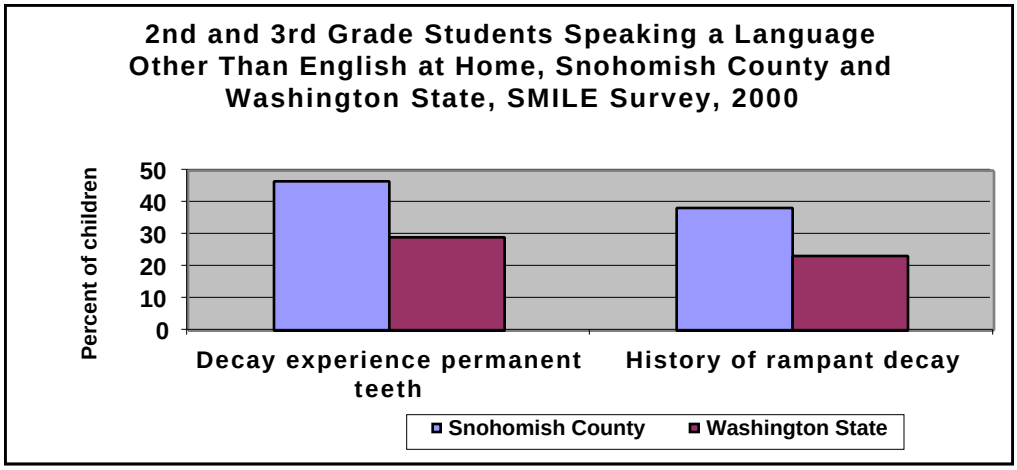


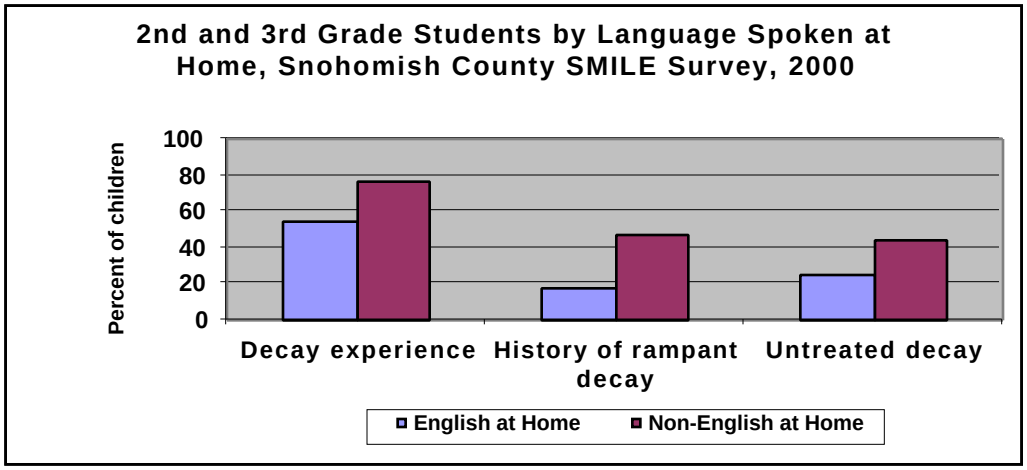


See Table D in Appendix

ORAL HEALTH BY LANGUAGE SPOKEN AT HOME

Overall, children that speak a language other than English at home in Snohomish County have more dental caries experience in permanent teeth and more rampant decay compared to non-English speaking children in Washington State SMILE Survey, 2000. Non-English speaking children in Snohomish County were generally less well off than English speaking children in the county. There were no differences for decay in permanent or primary teeth, needing treatment, trouble accessing care in the last two years, and visiting a dentist in the last year.





See Table E in Appendix.

DISCUSSION

Access to Dental Care

Insurance

Health insurance coverage is a contributing factor in the decision to seek dental services. Health insurance relates positively with the use of dental services. Dental insurance includes those with private dental insurance and/or coverage provided with Medical Assistance Administration (MAA) Medical Coupons.

Snohomish County participants have more dental insurance than national averages (86% vs. 52%). For Snohomish County children, 16.6% wanted dental care but could not get it. The main reason that was cited for not receiving care in Snohomish County SMILE Survey, 2000 was cost (61.9%). Private dental insurance rarely covers the total cost of services with the insured paying out-of-pocket 20-50% or more of the costs of routine restorative dental treatment. The Snohomish County Counts (April 2002) survey also reported the main reason households did not seek dental care was cost. Overall Snohomish County SMILE Survey, 2000 reported visits to the dentist were quite high, however a significant number still have untreated dental caries.

In 1999 the Snohomish County Behavioral Risk Factor Surveillance Report identified a similar trend with health care utilization in those over age 18 years. " It is difficult to explain the increase in the number of persons with adequate incomes who could not afford a usual provider of health care. Rising health care costs may be to blame, although the rate of increase in such costs has slowed in recent years (Health, United States, 1998). It may also reflect imprecision in the classification system used to determine 'Low…… High' income groups. Another possible explanation is that respondents in the middle and upper income brackets who could not afford a regular place were demonstrating an unwillingness to afford a regular source, rather than an inability to afford one. That is they could afford a regular provider if they desired, but do not believe that it would be worth the cost."

Access to Dental Care for Snohomish County's Second and Third Grade Children Proportion (95% Confidence Interval)*		
	Snohomish County SMILE Survey, 2000 2nd and 3rd grade children	National Averages 1996** Children 0-18
Percent with dental insurance	86.0% (N=834)	52%
Percent that visited the dentist in the last year	82.1% (N=825)	56%

* All surveyed children were included (both screened and not screened)

**Manski, Richard J., Edelstein, Burton L, Moeller, John F. The Impact of Insurance Coverage on Children's Dental visits and Expenditures, 1996 JADA, Aug 2000.

Providers of low income dental care

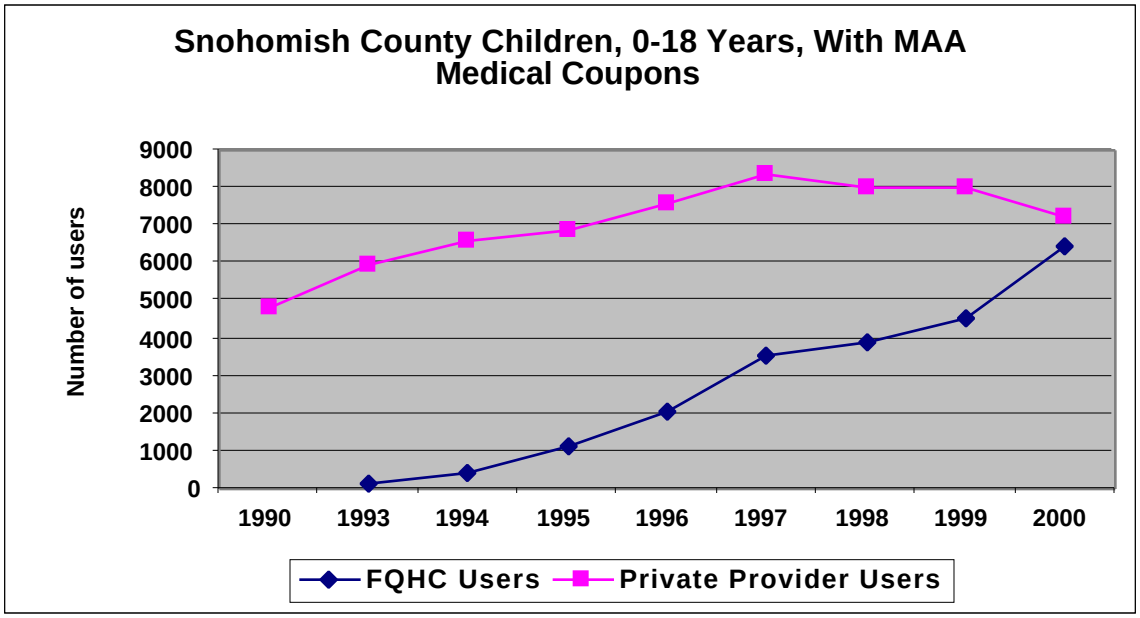
MAA Dental utilization data indicates that more children in Snohomish County with MAA Medical Coupons (low income) have visited the dentist at least once in the last year than in previous years (19%, 1990 vs. 32.3%, 2001).

The proportion of Snohomish County children 0-18 years with DSHS Medical Coupons has increased 12.3% since 1990 while the total number of children seen has tripled (4800-15,000).

In 1995 reimbursements to dental providers for Medical Assistance Administration (MAA) dental benefits for low-income children were increased but have not kept up with cost-of-living. The number of private providers serving low-income children is declining. In1996, there were162 MAA dentists and in 2000 there were only136 dentists accepting MAA Medical Coupons.

The Community Health Center of Snohomish County (Federally Qualified Health Center-FQHC) has expanded since 1993 to include two dental facilities targeting low-income children in Snohomish County. SeaMar Community Health Center opened a new dental facility in September 2001. 42.9% of children 0-18 years of age with DSHS Medical Coupons that visited a dentist were seen at the Community Health Center of Snohomish County Dental Clinics in 2000.

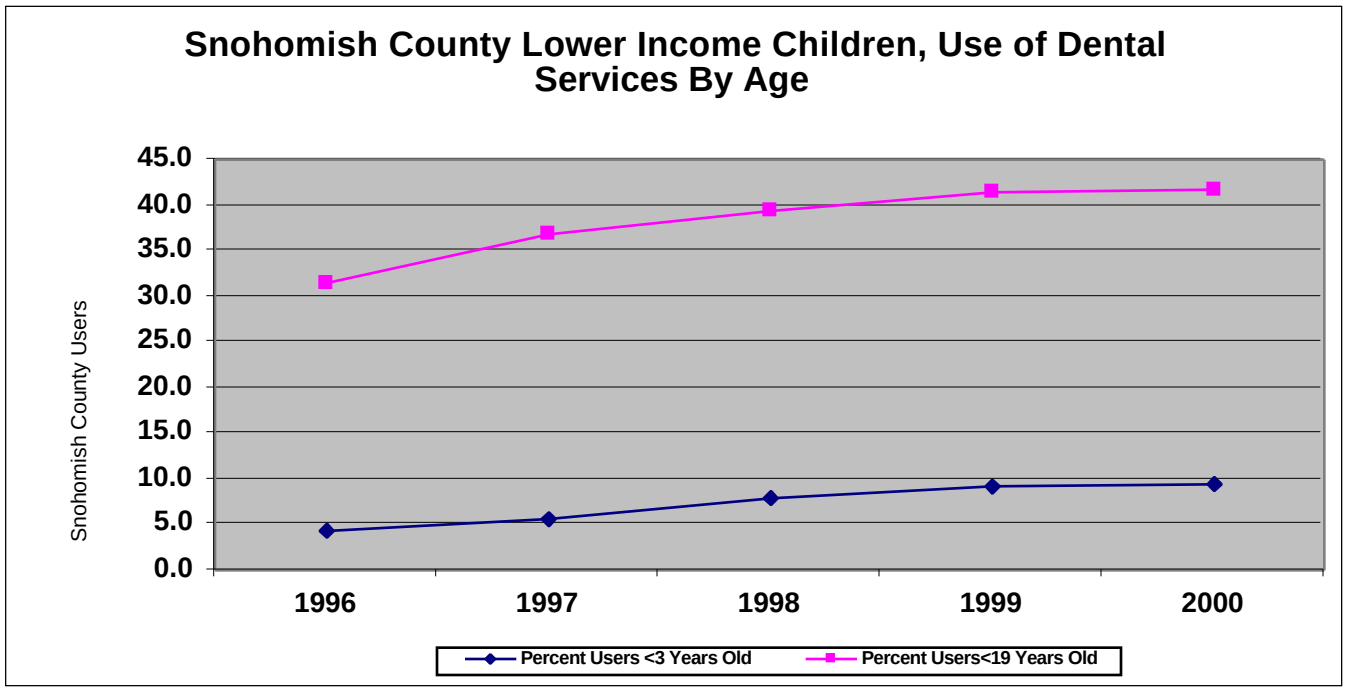
In addition, the Snohomish Health District has supported the No Cavity Club, a referral resource to private dentists for families seeking dental care for children with Medical Coupons since 1993. A new program, Access to Baby and Child Dentistry, targeting earlier intervention and prevention was initiated in the fall of 2001.



Annual Reports Medical Assistance Administration-Dental Clients by Client County- 0-18 years.

See Table F in Appendix.

Children categorized by the Medical Assistance Administration data by age less than 3 years old and compared to all MAA children, demonstrate that younger children in Snohomish County were less likely to have visited the dentist than older children.



Annual Reports Medical Assistance Administration Clients by Client Age (CY) and County

See Table G in Appendix.

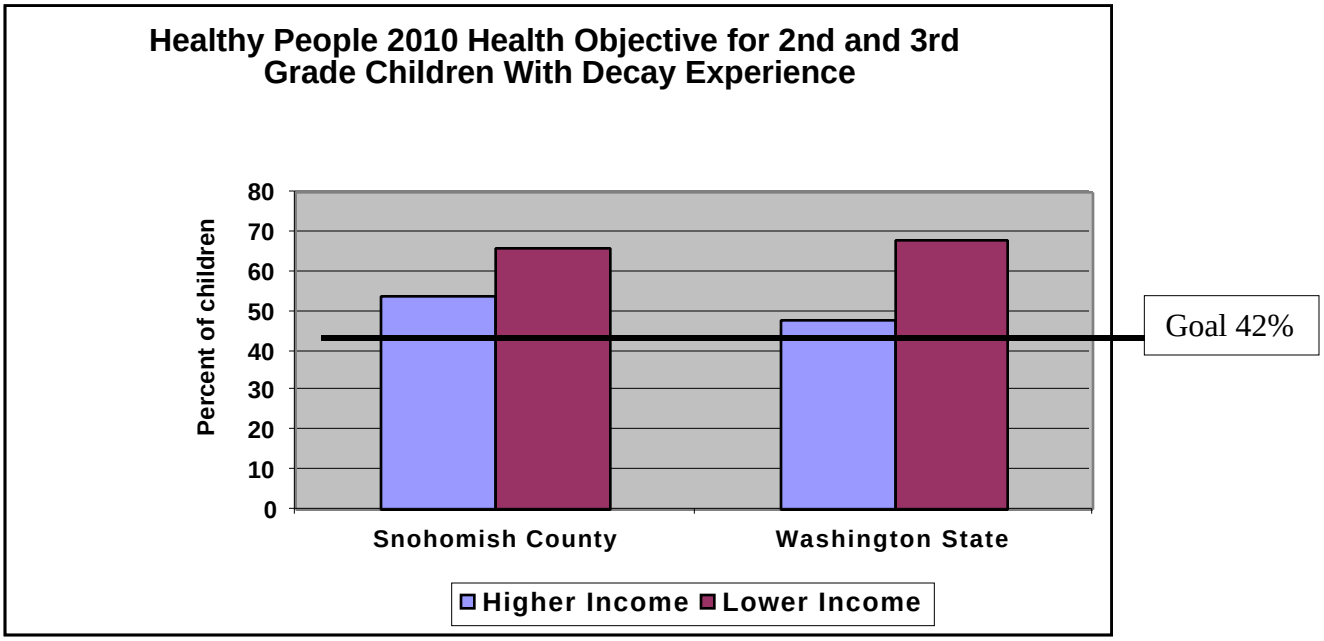
Healthy People 2010 Objectives

Healthy People 2010 is 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 develop programs to improve health.

Healthy People 2010 builds on initiatives pursued over the past two decades. The 1979 Surgeon General's Report, Healthy People, and Healthy People 2000: National Health Promotion and Disease Prevention Objectives both established national health objectives and served as the basis for the development of State and community plans. Like its predecessors, Healthy People 2010 was developed through a broad consultation process built on the best scientific knowledge and was designed to measure programs over time.

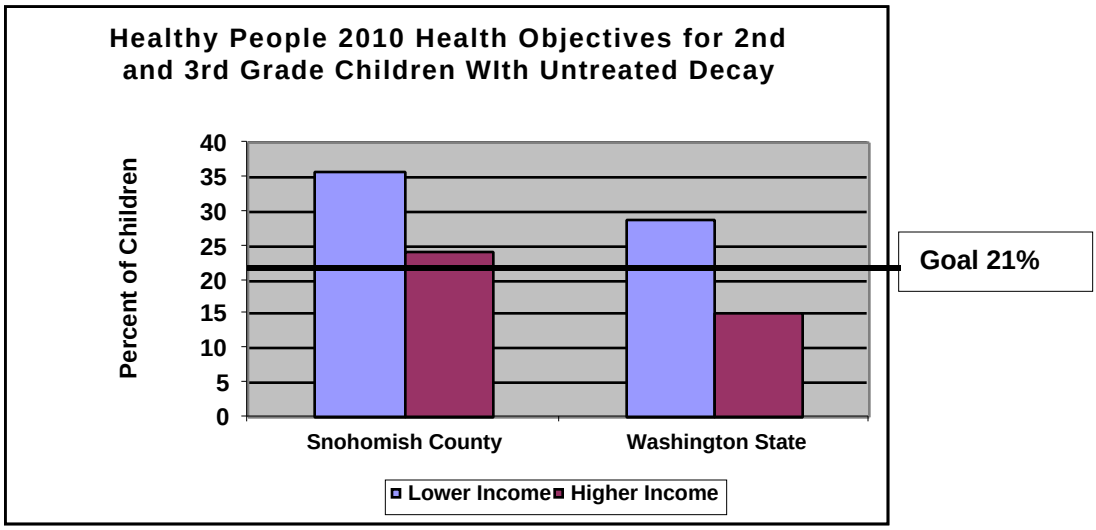
Healthy People objectives have been specified by Congress as the measure for assessing the progress of the Indian Health Care Improvement Act, the Maternal and Child Health Block Grant, and the Preventive Health and Health Services Block Grant. Healthy People objectives also have been used in performance measurement activities. For example, the National Committee on Quality Assurance incorporated many Healthy People targets into the Health Plan Employer Data and Information Set (HEDIS®) 3.0, a set of standardized measures for health care purchasers and consumers to use in assessing performance of managed care organizations in the areas of immunizations, mammography screening, and other clinical preventive services.

- The Snohomish County SMILE survey, 2000 indicates that Snohomish County is not meeting the Healthy People 2010 targets for decay experience for all 2nd and 3rd grade Snohomish County children. Children from lower income families, minorities, or no English spoken at home are even further from these goals.

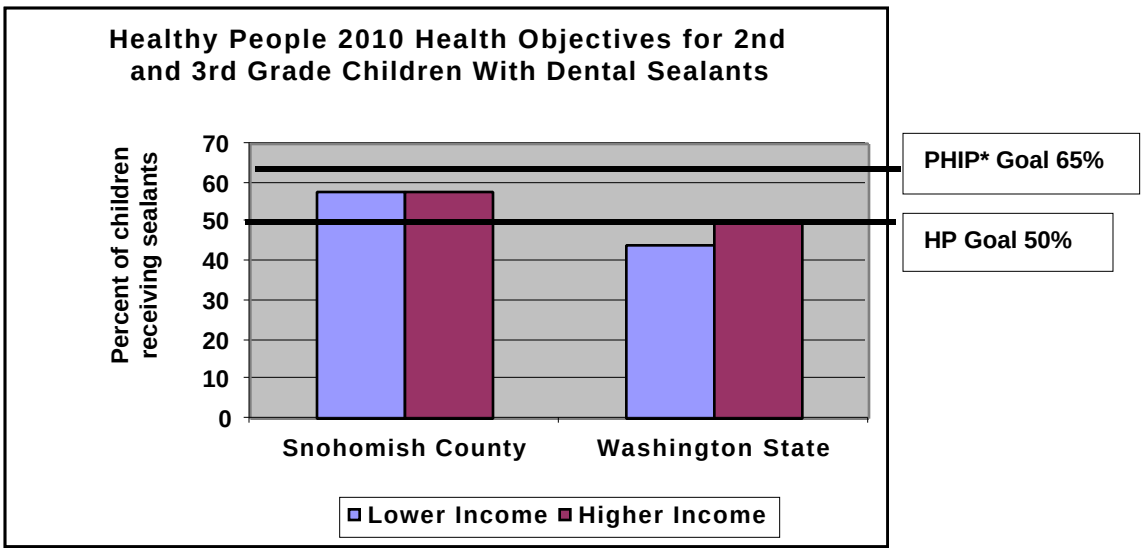


See Table H in Appendix.

· The Snohomish County SMILE Survey, 2000 indicates that Snohomish County is not meeting the Healthy People 2010 targets for untreated decay for all 2nd and 3rd grade Snohomish County children. Children from lower income families, minorities, or no English spoken at home are even further from these goals.



· Snohomish County children are meeting or exceeding the Year 2010 Health Objectives for the Nation by third grade for using dental sealants. The Washington State Public Health Improvement Plan (PHIP) has set a higher goal for sealant utilization



*PHIP – Washington State Public Health Improvement Plan

See Table H in Appendix

ORAL HEALTH AND WATER FLUORIDATION IN SNOHOMISH COUNTY

Neither the Washington State SMILE Survey, 2000 nor the Snohomish County SMILE Survey, 2000 collected data on residence and exposure to water fluoridation so no comparisons can be made with non-fluoridated communities.

Research consistently supports reductions in dental caries as a result of community water fluoridation at a level of one part per million. (The Guide to Community Preventive Services: Recommendations on Selected Interventions to Prevent Dental Caries, Oral and Pharyngeal Cancers, and Sports-Related Craniofacial Injuries, American Journal of Preventive Medicine 2002; 23(1S)

In March 1992, water fluoridation was implemented by the City of Everett impacting over 85% of Snohomish County residents. In 1994, a survey of 3rd grade students by the University of Washington found that Snohomish County ranked in the worst quartile for tooth decay when compared to all 39 Washington State counties. The Snohomish County SMILE Survey, 2000 looked at children that may have benefited from water fluoridation for their entire lives (1992-2000). Overall decay experience for third graders in Snohomish County is not different from the overall decay experience for 3rd graders in the Washington State SMILE Survey, 2000. (Leroux, BG, Maynard, RJ, Domoto, P, Shu,C, Milgrom, P, "The Estimation of Caries Prevalence in Small Areas", J Dent Res 75(12):1947-1956, Dec. 1996)

Fluoridated communities (>. 7ppm)

These communities have large public water systems with the fluoride level adjusted to be optimal for oral health. Independent systems or individual homes may have different fluoride levels. Please call the community water district for specific boundaries of their service area. If you are unsure, it is recommended to have the drinking water tested for fluoride.

Arlington - variable (2001)	Machias
Bothell-Alderwood Water District	Mill Creek
Brier	Marysville - South
Edmonds	Monroe
Everett	Mountlake Terrace
Granite Falls	Mukilteo
Lake Stevens	Silver Lake
Lynnwood	Snohomish – partial

Non-fluoridated communities (<. 2ppm)

Fluoride supplements may be prescribed for children whose primary drinking water has a low fluoride concentration and who are at high risk for tooth decay, dependent upon an evaluation of all other available fluoride use. (Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States, CDC, MMWR Recommendations and Reports, August 17, 2001/50 (RR14); 1-42)

Arlington - part	Marysville
Bothell - Cross Valley Water Association	Oso
Darrington	Stanwood
Gold Bar	Sultan
Index	Tulalip, Stilliguamish and Sauk-Suiattle tribal reservations
Lakewood	
Maltby	

For more information, contact Snohomish Health District Oral Health Program at 425.339.5230.

APPENDIX

Table A.

Oral Health of 2nd and 3rd Grade Snohomish County Students by Grade, SMILE Survey, 2000						
	Grade 2			Grade 3		
	Sno. Co. % (95% CI)	Sno. Co. n/Total	WA State % (95% CI)	Sno. Co.* (95% CI)	Sno. Co. % n/Total	WA State % (95% CI)
Decay experience in permanent or primary teeth	52.5 (46.4,58.5)	220/419	54.7 (52.1,57.3)	57.6 (50.2, 64.6)	183/318	57.5 (54.7-60.3)
Decay experience in permanent teeth	14.56 (11.5, 18.2)	31/419	13.3 (11.5-15.1)	15.7 (11.4,21.3)	50/318	17.8 (15.7-20.0)
Rampant Decay	16.2 (11.7, 21.9)	68/420	15.7 (13.8-17.6)	22.0 (16.3, 29.0)	70/318	14.9 (12.9-16.9)
Untreated Decay	26.1 (20.1, 33.0)	110/422	21.7 (19.5-23.9)	25.7 (20.0, 32.4)	82/319	20.5 (18.3-22.8)
Needing treatment	24.2 (16.7, 33.7)	102/421	22.7 (20.5-24.9)	23.3 (17.8, 30.0)	74/317	20.6 (18.4-22.9)
With Sealants	48.7 (38.9, 58.3)	205/422	40.5 38.0-43.1)	70.2 (63.2, 76.4)	224/319	55.5 (52.7-58.3)
Needing urgent treatment	2.4 (1.0, 5.7)	10/421	4.0 (3.0-5.0)	1.6 (0.4, 5.7)	5/317	3.0 (2.1-4.0)

* 95% CI for Snohomish County Grade 3 was used for comparison to Snohomish County Grade 2 to determine statistical significance.

Table B.

Oral Health of 2nd and 3rd grade by Eligibility of Free or Reduced-Price(F/R%) Meals Proportion , Snohomish County and Washington State, Smile Survey, 2000						
	Eligible for R/F% (Low Income)			Not Eligible for R/F% (Not Low Income)		
	Snohomish County		WA State	Snohomish County		WA State
	% (95% CI)	n/total	% (95% CI)	% (95% CI)	n/total	% (95% CI)
Decay experience in permanent or primary teeth	65.8 (55.9, 74.6)	79/120	67.9 (64.6-71.2)	54.1 (49.1, 58.9)	247/457	47.7 (45.0-50.4)
Decay experience in permanent teeth	20.8 (13.8, 30.3)	25/120	22.1 (19.2-25.1)	14.7 (12.1, 17.7)	67/457	10.4 (8.8-12.1)
Rampant	29.2 (20.7, 9.4)	35/120	22.5 (19.5-25.5)	16. 5 (12.3, 21.6)	75/456	10.1 (8.5-11.8)
Untreated	35.8 (28.7, 43.7)	43/120	28.7 (25.5-31.9)	24.0 (18.7, 30.3)	110/458	15.3 (14.4-16.2)
Needing treatment	33.6 (28.0, 39.7)	40/119	29.4 (26.2-32.7)	21.9 (15.8, 29.6)	100/456	15.1 (13.2-17.1)
Has sealants	57.5 (51.5, 63.3)	69/120	44.3 (40.8-47.8)	58.1 (51.5, 64.4)	266/458	50.1 (47.0-52.8)
Has insurance	81.0 (74.0, 86.5)	94/116	84.4 (81.8-86.9)	86.6 (84.3, 88.7)	389/449	87.6 (85.9-89.2)
Not visiting dentist in last year	41.1 (30.7, 52.3)	46/112	30.4 (27.1-33.7)	14.0 (11.7, 16.8)	63/449	10.9 (9.3-12.5)
Trouble accessing care in last two years	33.7 (24.3, 44.5)	35/104	31.5 (28.1-34.9)	12.8 (11.4, 14.4)	55/429	8.2 (6.8-9.6)
Mean cavities per child (among those with decay experience)	Mean = 1.67	n=79	2.70 (SD=2.24 SE=0.15)	Mean = 0.88	n= 247	2.05 (SD=1.60 SE=0.12)

Table C

Dental Decay and Sealant Use in Sealant Schools Compared to Non-Sealant School Third Graders Snohomish County, SMILE Survey, 2000 *						
	Sealant School # with/Total	**%**	**Non-Sealant School # with/Total**	**%**	**Odds Ratio (OR)**	**95% CI**
Sealants						
All 3rd graders unadjusted (N=250)	40 / 47	85.6	130 / 203	52.0	3.21	1.84, 5.61
On R/F%	19 / 22	86.4	20 / 35	57.1	4.75	0.77, 29.36
Not on R/F%	21 / 25	84.0	110 / 168	65.5	2.77	1.25, 6.14
Dental Decay						
All 3rd graders unadjusted (N=248)	13 / 47	27.7	51 / 201	25.4	1.02	0.52, 2.02
On R/F%	7 / 22	31.8	13 / 35	52.0	0.79	0.23, 2.73
Not on R/F%	6 / 25	84.0	38 / 166	22.9	1.06	0.22, 5.11

*Participating schools not representative of all schools

Table D.

2nd and 3rd Grade Students by White/Non-Hispanic and non-White and/or Hispanics, Snohomish County and Washington State, SMILE Survey, 2000						
	Non-White and/or Hispanic			White non-Hispanic		
	Sno. Co. % (95% CI)	n/Total	WA State % (95% CI)	Sno. Co. % (95% CI)	n/Total	WA State % (95% CI)
Decay exp. Permanent or Primary teeth	62.0 (50.8,72.0)	22/142	65.4 (61.9-68.8)	53.0 (47.0,58.8)	313/591	51.6 (49.4-53.9)
Decay exp. Permanent Teeth	21.8 (15.0,30.0)	31/142	18.6 (15.8-21.5)	13.5 (11.3,6.17)	80/591	13.9 (12.4-15.5)
Rampant Decay	28.2 (19.4,39.0)	40/142	17.9 (15.1-20.7)	16.6 (12.6, 21.4)	98/592	13.7 (12.2-15.3)
Untreated	31.0 (21.7,42.2)	44/142	29.1 (25.7-32.3)	25.2 (19.6, 31.8)	150/595	17.6 (15.9-19.3)
Needing Treatment	28.9 (19.0,41.2)	41/142	29.2 (25.9-32.5)	23.0 (15.8, 32.2)	136/592	18.4 (16.7-20.2)
Has Sealants	57.0 (45.5,67.8)	81/142	42.0 (38.4-45.6)	58.3 (52.3, 64.1)	347/595	49.4 (47.2-51.7)
Has Insurance	78.3 (69.9, 84.8)	108/138	82. (79.7-85.2)	86.6 (84.0, 88.9)	504/582	86.1 (84.6-87.6)
Not visiting dentist in last year	26.9 (20.5,34.4)	36/134	23.3 (20.2-26.4)	17.1 (12.9, 22.2)	99/580	15.7 (14.1-17.2)
Trouble accessing care in last two years	19.0 (13.2,26.6)	22/116	24.0 (20.7-27.3)	17.0 (13.2, 21.7)	96/564	15.6 (14.1-17.2)
Mean cavities per child (those with decay experience)	Mean= 1.6	n=88	N=544 2.7	Mean= 0.9808	n=313	N=544 2.3

Table E.

Language spoken at home in Snohomish County and Washington State, SMILE Survey, 2000						
	English Spoken at Home			Non-English Spoken at Home		
	Sno. Co. % (95% CI)	n/Total	WA State % (95% CI)	Sno. Co. % (95% CI)	n/Total	WA State % (95% CI)
Decay experience in perm or primary teeth	53.7 (48.4, 58.9)	371/691	52.9 (50.9-54.9)	76.6 (53.6, 90.3)	36/47	75.4 (70.6-80.2)
Decay experience in perm teeth	13.6 (11.7,15.8)	94/691	14.2 (12.7-15.6)	38.3 (26.6,51.5)	18/47	23.6 (18.9-28.3)
Rampant	17.1 (12.8,22.4)	118/692	13.1 (11.7-14.5)	46.8 (31.2,63.0)	22/47	29.4 (24.3-34.4)
Untreated	25.0 (20.5,30.2)	174/695	19.0 (17.5-20.6)	44.7 (26.9,63.9)	21/47	33.5 (28.3-38.8)
Needing treatment	23.3 (17.2,30.7)	161/692	19.8 (18.2-21.4)	38.3 (23.0,56.4)	18/47	33.2 (28.0-38.4)
Has sealants	58.6 (52.6,64.3)	407/695	48.3 (46.3-50.3)	46.8 (35.9,58.0)	22/47	40.3 (34.8-45.7)
Has insurance	86.2 (83.8,88.2)	592/687	85.9 (84.5-87.2)	72.7 (59.2,83.1)	32/44	81.4 (77.0-85.7)
Not visiting dentist in last yr.	18.0 (14.3,22.4)	561/684	16.9 (15.5-18.4)	34.2 (15.2,60.1)	14/41	23.5 (18.7-28.4)
Trouble accessing care in last two years	17.4 (14.1,21.3)	115/662	17.1 (15.6-18.6)	17.9 (11.7,26.2)	5/28	22.5 (17.1-27.9)
Mean cavities per child (among those with decay experience)	Mean= 1.0	n=371	N=552 2.28	Mean= 1.7	n=36	N=522 2.96
White non-Hispanic	85.4 (80.0,89.5)	583/683	80.7 (79.2-82.3)	10.9 (1.8,44.5)	5/46	15.2 (11.4-18.9)

Table F.

Snohomish County Children 0 –18 years using MAA Medical Coupons									
Snohomish County	1990	1993	1994	1995	1996	1997	1998	1999	2000
Percent Users <19	20.1								32.3
Number Users	4,803								15,069
FQHC Users	N/A	153	438	1,119	2,059	3,562	3,932	4,533	6,459
Private Provider Users	4,803	5,945	6,599	6,886	7,598	8,369	8,020	7,981	7,199

Annual Reports: Medical Assistance Administration - Dental Clients by Client County - 0-18 yrs. (CY)

Table G.

Comparison of younger and older Snohomish County children using MAA Medical Coupons					
Snohomish Co.	1996	1997	1998	1999	2000
Percent Users <3	04.4	5.6	7.9	9.2	9.5
Percent Users <19	27.0	31.3	31.4	32.2	32.3

Annual Report: Medical Assistance Administration Dental Clients by Client County and Age (CY)

Table H.
Objectives Healthy People 2010 for children 6-8 years old

	Healthy People 2010 Goal/Target Children 6-8 years old	**Snohomish County N=748**	**Washington State N=2699**
With a history of decay experience	42.0%	54.9%	55.6%
With untreated tooth decay	21.0%	26.2%	22.0%
With dental sealants	50.0%	58.1%	47.2%