



# 2015 Pierce County Smile Survey

An Oral Health Assessment of Children in Pierce County

**May 2017**

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## Executive Summary

Every five years the WA State Department of Health conducts oral health screenings which Pierce County has participated in since 2005. This report summarizes the analysis results associated with the 2014-2015 statewide oral health screening survey of Pierce County children. During the 2014-2015 school year, Pierce County screened 2,729 elementary children and 615 preschool children received a dental screening. The screening focused on three groups of children: (1) low-income preschoolers enrolled in Head Start/Early Childhood Education and Assessment Program (ECEAP), (2) public school kindergarteners, and (3) public school second and third graders. The screening reviewed multiple indicators, which convey information about children's oral health. They inform us how we as a community perform in caring for our children's teeth. This report focuses on the history of decay, untreated decay, and the presence of dental sealants (Table1). Researchers compared results with previous findings from oral health screenings done in 2009-10. You can find the Smile Survey from 2010 at <https://www.TPCHD.org/files/library/99b462d80ab0b4da.pdf>



Table 1: Key Indicators and their interpretation

Key Indicator	Interpretation
Untreated Decay	Access to restorative dental services
Dental Sealants	Access to preventive dental services
History of Decay (treated and untreated)	Prevention of decay

### Key Findings

1. Compared to 2010, substantially fewer children have untreated decay and substantially more children have protective dental sealants.
2. Over 80 percent of children in Pierce County had at least one dental sealant present in a permanent molar. The presence of dental sealants in third graders had more than doubled in the last 5 years.
3. Pierce County has met the Healthy People 2020 objectives for reducing the prevalence of tooth decay experience, untreated tooth decay and increasing the prevalence of dental sealants.
4. Oral health disparities exist for low-income children and children who are Hispanic or Asian.

## Background

Dental decay, or tooth decay, remains the single most common, yet preventable, chronic disease affecting children in the United States<sup>1</sup>. For children, untreated dental caries can lead to invasive, painful and costly dental treatments, school absences, difficulty concentrating and poor appearance. These problems affect a child's quality of life and ability to succeed<sup>2</sup>.

There are several nationally recognized best practice strategies that rely on strong collaboration between dental providers, public health programs, schools and others with a vested interest in the oral health of children. Researchers have proven the four key community based prevention measures effective in reducing tooth decay are:

- Community water fluoridation.
- Early-childhood caries prevention programs.
- School-based dental sealant programs.
- School-based fluoride supplement programs.

Every five years, since 1994, the State of WA has conducted a survey to assess the oral health of WA State children. This assessment primarily conveys information about children's oral health. It also indicates how we as a community perform in caring for our children's teeth.

## Survey Methodology

### Screening Methods

The most recent WA State Smile Survey was conducted during the 2014-2015 school year. Using National Basic Screening Survey (BSS) criteria recommended by the Centers for Disease Control and Prevention and the Association of State and Territorial Dental Directors, specially trained dental hygienists performed brief oral health screenings of each child's mouth using disposable dental mirrors and strong penlights to identify untreated decay, treated decay and sealants. Since screenings were brief and x-rays were not used, the survey may have underestimated the level of untreated decay.

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<sup>1</sup> The American Academy of Pediatric Dentistry - [www.aapd.org](http://www.aapd.org)

<sup>2</sup> Centers for Disease Control and Prevention – [www.cdc.gov](http://www.cdc.gov)

Table 2: Basic Screening survey measures and definitions for Smile Survey, 2015

Basic Screening Survey Measures	Definition
Untreated Decay	The presence of dental caries in which the screener can readily observe breakdown of the enamel surface. Only cavitated lesions were considered untreated decay.
Treated Decay	The presence of any type of filling, including a temporary filling. Teeth that were extracted as a result of decay were also included.
Caries Experience	Children with treated decay, untreated decay, or both.
Dental Sealants on Permanent Molars	The presence of at least one sealant on a permanent first molar. The sealant can cover all or part of the pits or fissures or it can be partially lost.
Urgency of need for dental care	Children with no observed problems were classified as having no treatment needs. Children with cavitated lesions without accompanying signs or symptoms were coded as having early dental care need. Children with signs or symptoms that included pain, infection or swelling were coded as having immediate treatment needs.
Rampant decay	Children with seven or more teeth with untreated and/or treated decay.

In addition to the clinical measures, researchers collected demographic information such as race (by observation only) and whether an elementary school student was receiving free or reduced price meals at school. Eligibility for the Free and Reduced Lunch Program is a household income at or below 130% (Free) and between 130-185% (reduced) of the federal poverty level. Among the Head Start/ECEAP children, low-income is an eligibility criterion for these programs. Researchers expected children in this sample to have a high risk of dental decay.

Researchers used third grade children as a benchmark. Most children get their first adult molars during the first and second grade. The third grade is a good time to check all children for sealants. National surveys use third-grade figures for reporting.

## **Sampling**

The 2015 Pierce County Smile Survey tracked the oral health of three groups: Head Start/ECEAP preschoolers (3-5 years old), public school Kindergarteners and public school third graders. The researchers conducted screenings in 20 randomly selected Healthy Start/ECEAP sites in 616 preschoolers, and in 23 randomly selected elementary schools (kindergarteners, second graders and third graders) for a total of 2,729 elementary school students.

To put current Pierce County performance into perspective, we have included several benchmarks to compare to local data. These are:

- 2015 WA State data.
- Healthy People 2020 objectives.
- 2010 Pierce County Smile Survey data.

Survey results by grade are available in Appendix A.

## **Data Management and Analysis**

We analyzed the data in this report using STATA, version 13. We conducted the data analysis by taking the clustering effect of the sampling methodology into account. We used the school or preschool program as the primary sampling unit. In addition, for elementary school data, observations were weighted for non-response within each school.

We present the data as percentages with 95% confidence intervals (95% CI). Confidence intervals indicate how well the sample results estimate the results for the whole county population. When displayed, confidence intervals are error bars in the figures.

Differences in groups based on free or reduced price lunch status, on race, and on changes in prevalence since 2010 were assessed using Pearson chi-square statistics. This method yields the likelihood (p-value) that differences among groups were because of chance and not because of differences inherent to the groups.

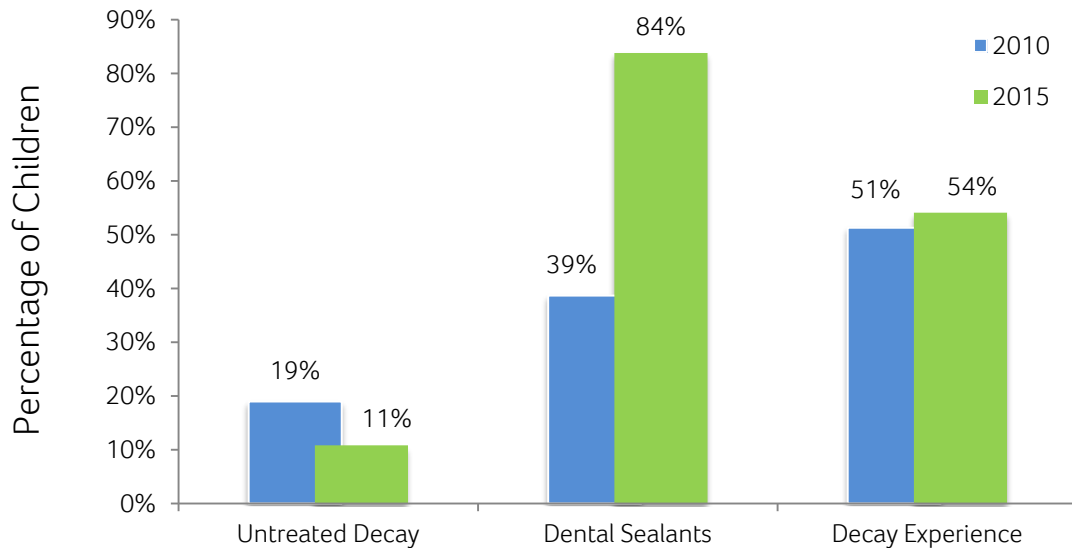
Because we had only aggregated state-level data, we considered state and county results to be different only if their confidence intervals did not overlap. This approach is conservative; with a bias toward missing true differences.



## Key Finding: Untreated Decay

### Compared to 2010, substantially fewer children have untreated decay and more children have protective dental sealants.

Figure 1: Percent of Pierce County's Third Graders with Untreated Decay, Dental Sealants, and Decay Experience: 2010 and 2015

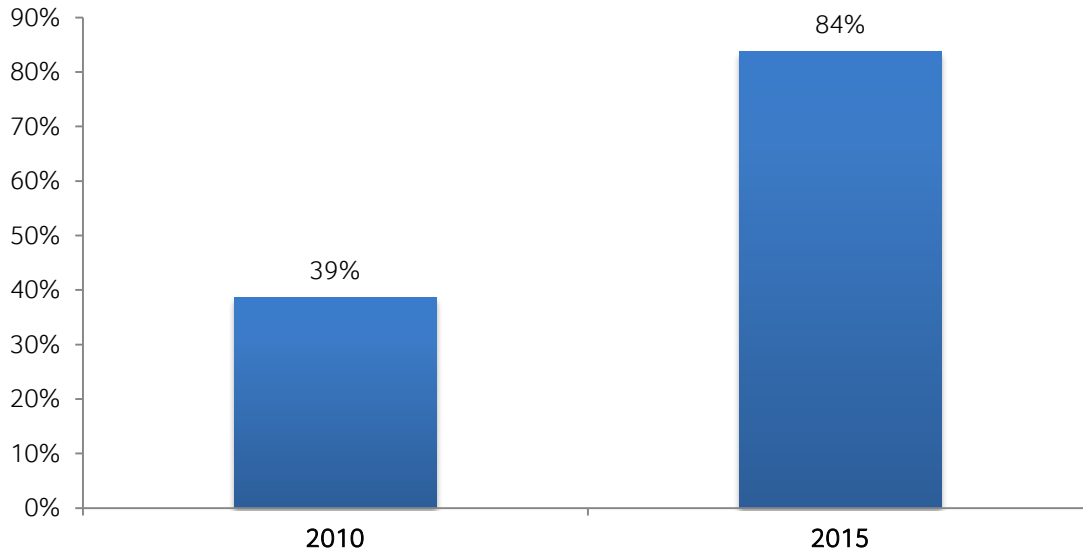


- Findings from the 2015 survey showed that fewer Pierce County children, aged 6-8 years have untreated decay compared to the 2010 survey. The untreated decay rate declined 41% since the 2010 survey. The rate dropped from 18.3% to 10.8%.
- In 2015, a larger percentage of Pierce County children have protective dental sealants compared to 2010. The sealant placement rate increased from 38.1% in 2010 to 84% in 2015 among children aged 6-8 years.
- While untreated decay declined and dental sealants increased significantly, the amount of decay experience by Pierce County's children remained the same. Almost half of all children (45.9%) aged 6-8 years have experienced caries (decayed, filled, or missing).
- The findings suggest that while decay experience has remained the same among third graders in Pierce County, the reduction in untreated decay may suggest that third-grade children in Pierce County with caries have more opportunity to access care.

## Key Finding: Dental Sealants

**Over 80% of children in Pierce County have dental sealants, a well-accepted clinical intervention to prevent tooth decay on molar teeth.**

Figure 2: Percentage of Pierce County's Third Graders with Dental Sealants present, 2010 vs. 2015



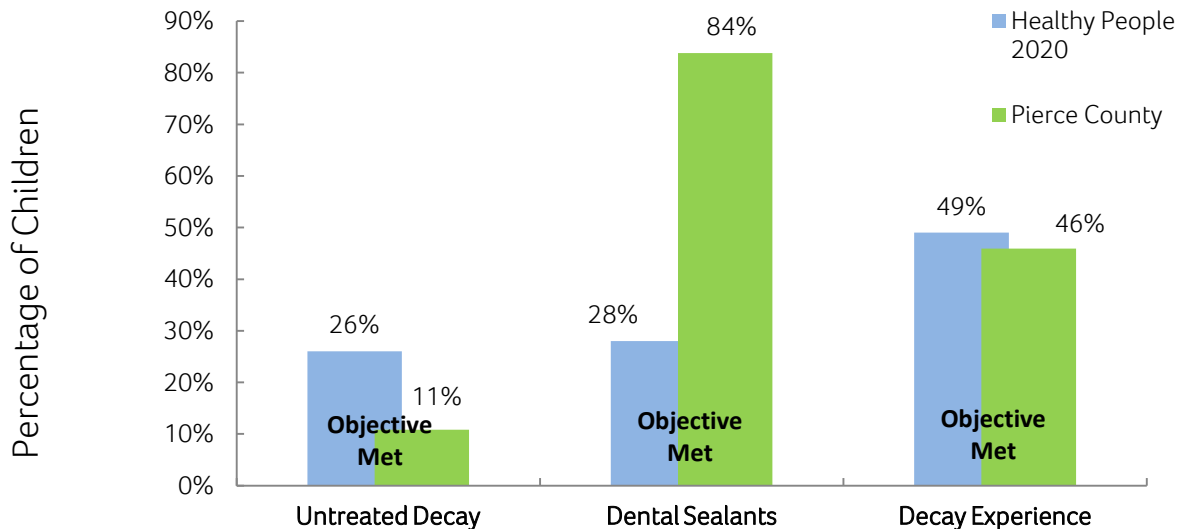
Dental sealants are thin plastic coatings applied to chewing surfaces of the back teeth as they erupt in the mouth. The coating flows into the deep pits and grooves to seal out decay-causing bacteria. School dental sealant programs are especially important for children from low-income families who are less likely to receive dental care otherwise.

- The percentage of Pierce County children with at least one dental sealant present on a first permanent molar has more than doubled in the last decade, going from 39% in 2010 to 84% in 2015. These results may be a good indication of the effectiveness of the Tacoma-Pierce County Health Department School-Based Dental Sealant program that has expanded dramatically in the last 10 years, increasing access to preventive dental services to children in the school setting.
- Pierce County exceeds the WA State rate of 54.1% of WA State third graders with dental sealants.

## Key Finding: Met 2020 Objectives for Untreated Decay

### Pierce County has met the 2020 Objectives for reducing the prevalence of tooth decay experience and untreated tooth decay and increasing the prevalence of dental sealants.

Figure 3: Pierce County Progress towards Healthy People 2020 Objectives for 6-9 year olds



Healthy People 2020 (HP 2020)<sup>3</sup> is a set of national health objectives with 10-year targets designed to guide national health promotion and disease prevention efforts to improve the health of all people in the United States. Data collected through the Smile Survey assessment are comparable with three HP 2020 oral health status objectives allowing us to monitor how Pierce County efforts align with national objectives.

Pierce County has met or exceeded each of these Healthy People 2020 Objectives. It should be noted that the Healthy people 2020 Objectives are for children six to nine years of age while most (99%) of the PC children screened were either eight or nine years of age.

These include:

- Decrease the proportion of 6-9 year-olds with decay experience to 49 percent. (Pierce County is already below the target at 46%).
- Decrease the proportion of 6-9 year-olds with untreated tooth decay to 26 percent. (Pierce County is already below the target at 11%).
- Increase the proportion of 6-9 year-olds with dental sealants to 28 percent. (Pierce County has far overtaken the target with 84% of children with sealants present).

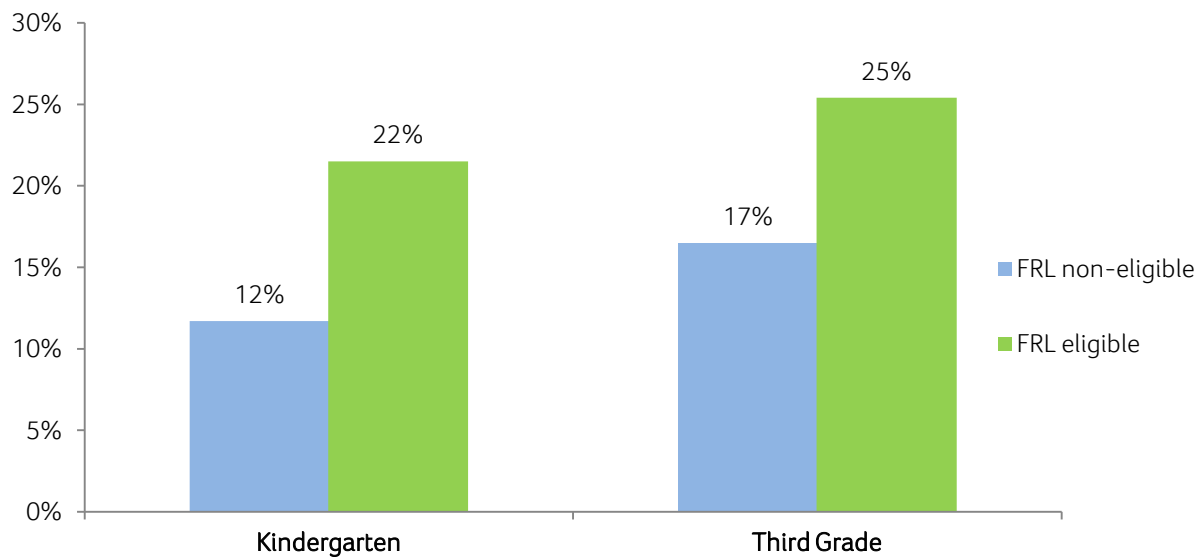
<sup>3</sup> <http://www.healthypeople.gov/hp2020>

## Key Finding: Health Disparities

### Oral health disparities exist for low-income children and children who are Hispanic or Asian.

Social determinants of health such as race/ethnicity and family income continue to affect children's vulnerability to diseases and limiting access to appropriate care. Eligibility for the free and/or reduced-price lunch (FRL) program is an indicator of overall socioeconomic status. To be eligible for the FRL program, children must live in low-income households below 110% of the federal poverty level. In Pierce County, third graders who were eligible for FRL were more likely to have a history of decay and rampant decay than their non FRL counterparts.

Figure 4: Percent of Children with Rampant Decay by Eligibly to Free/Reduced Lunch, Smile Survey 2015



Race/ethnicity (most commonly, Hispanic) was also associated with poorer oral health outcomes. A combined analysis of second and third graders showed that Hispanics and Asians were more likely to have a history of decay and rampant decay than their White Non-Hispanic counterparts (Figure 5 and Figure 6). Hispanics and Asians are over the Healthy People 2020 objective of 6-9 year olds with decay experience at 49 percent or lower.

Figure 5: Percent of Second and Third Graders with a History of Decay by Race/Ethnicity, 2015

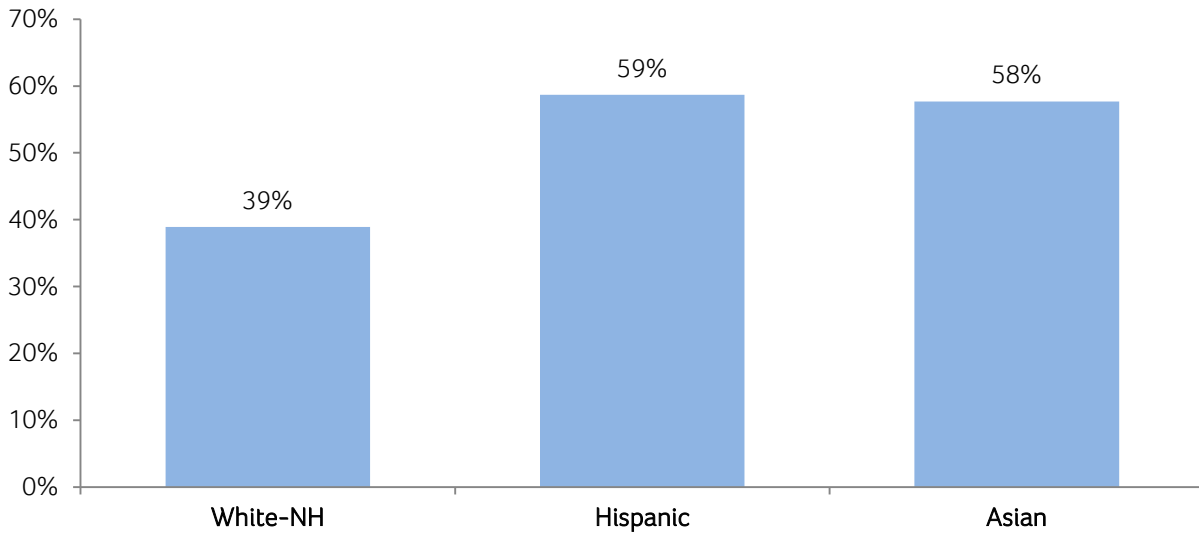
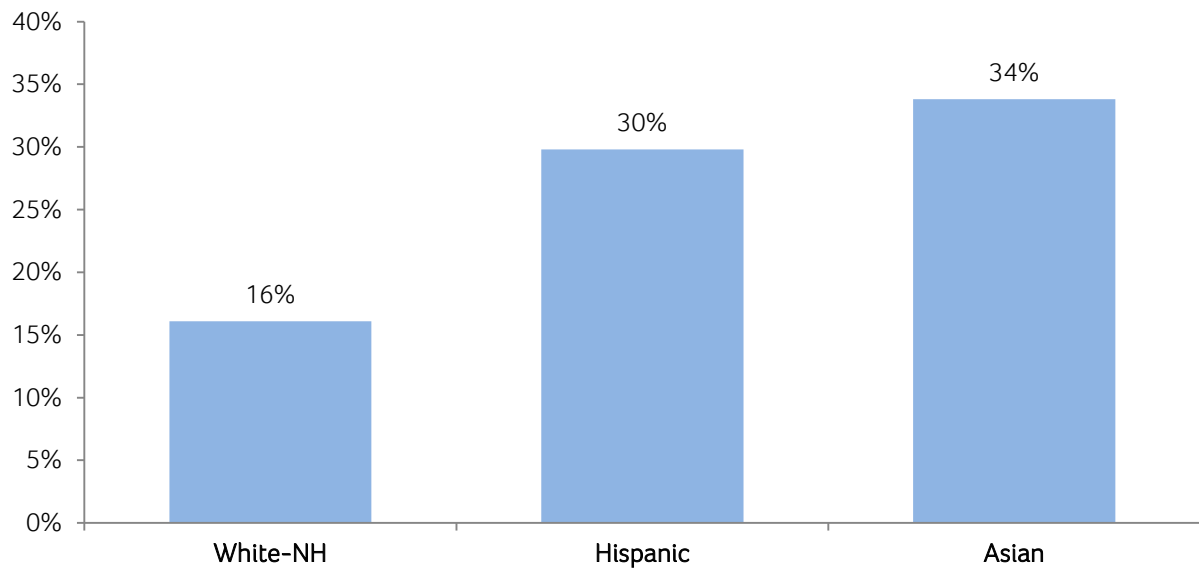


Figure 6: Percent of Second and Third Graders with Rampant Decay by Race/Ethnicity, Smile Survey 2015

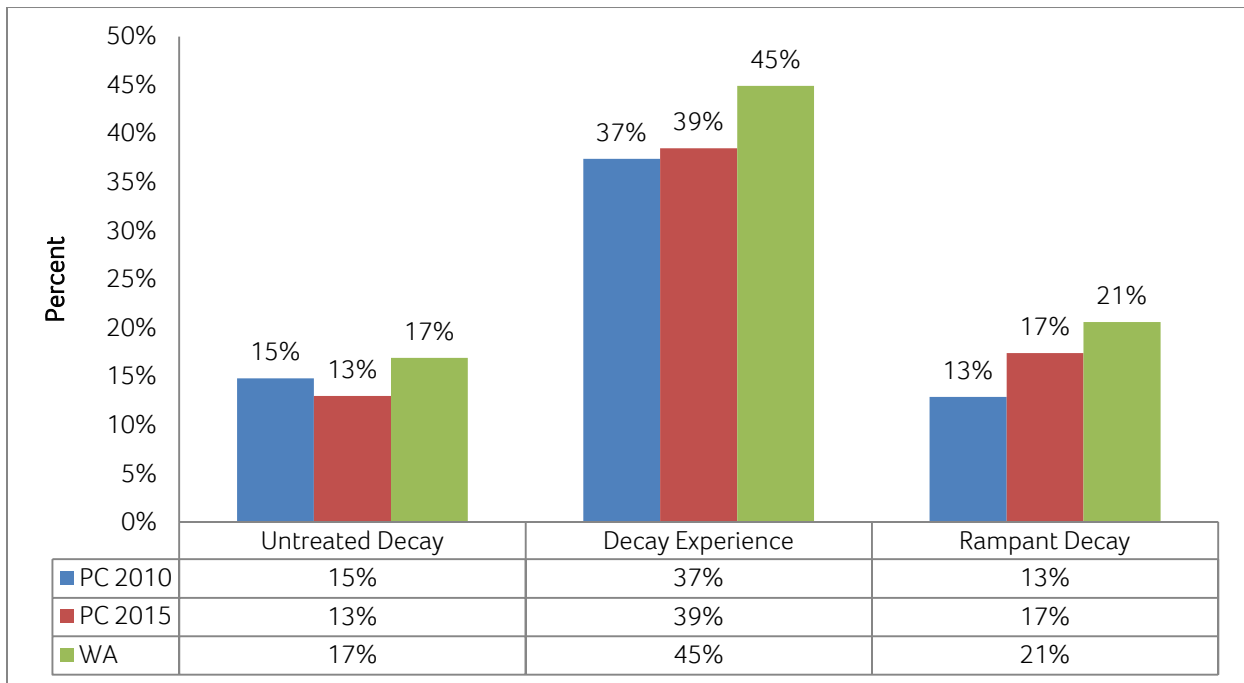


## Results - Head Start / ECEAP

There were 615 children from 22 Head Start or ECEAP preschools that were screened. To qualify for these programs, children must live in low-income households below 110% of the federal poverty level. Thus, these children represent 3-5 year-old children in the county who are living in poverty, not all Pierce County children.



Figure 7: Percent of Pierce County's Head Start/ECEAP Preschoolers with Untreated Decay, Dental Sealants, and Decay Experience: Pierce County, 2005-2010



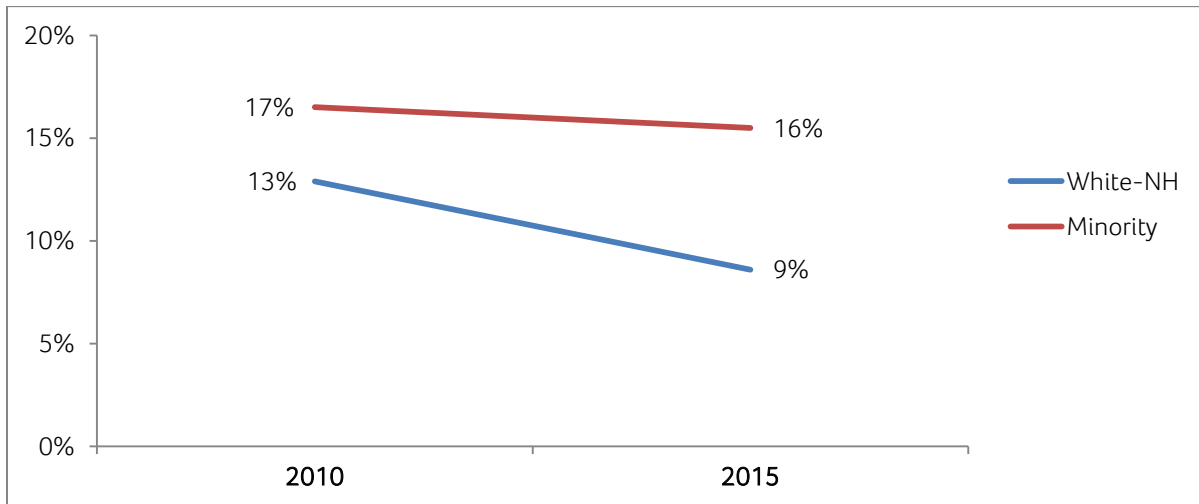
## Untreated Decay

- The rate of untreated decay in low-income children has not changed since 2010 (Figure 7). The same proportion of children in Pierce County had untreated decay as was found statewide. There were significant improvements for low-income white non-Hispanic children compared to low-income minority children (Figure 8). Pierce County has met the Healthy People 2020 target of reducing the prevalence of untreated tooth decay in preschool children to 21.4 percent.

## Decay Experience

- Decay experience in low-income children has remained the same since 2010 (Figure 7). In 2010, 39% of these children had experienced tooth decay. The Healthy People 2020 target for this age group is 30% or lower. The same proportion of children in Pierce County had decay experience as found statewide. Non-white and Hispanic children were more likely to have experienced decay than White non-Hispanic children.

Figure 8: Untreated Decay in low-income preschool children by race, Pierce County 2010-2015



The National Oral Health objectives for the year 2020 outlines several oral health status objectives for preschool children. For two-to-four-year-old children there are two primary oral health status objectives:

- To reduce the proportion of children aged 3 to 5 years with dental caries experience in their primary teeth to 30 percent.
- To reduce the proportion of children aged 3 to 5 years with untreated dental decay in their primary teeth to 21.4 percent.

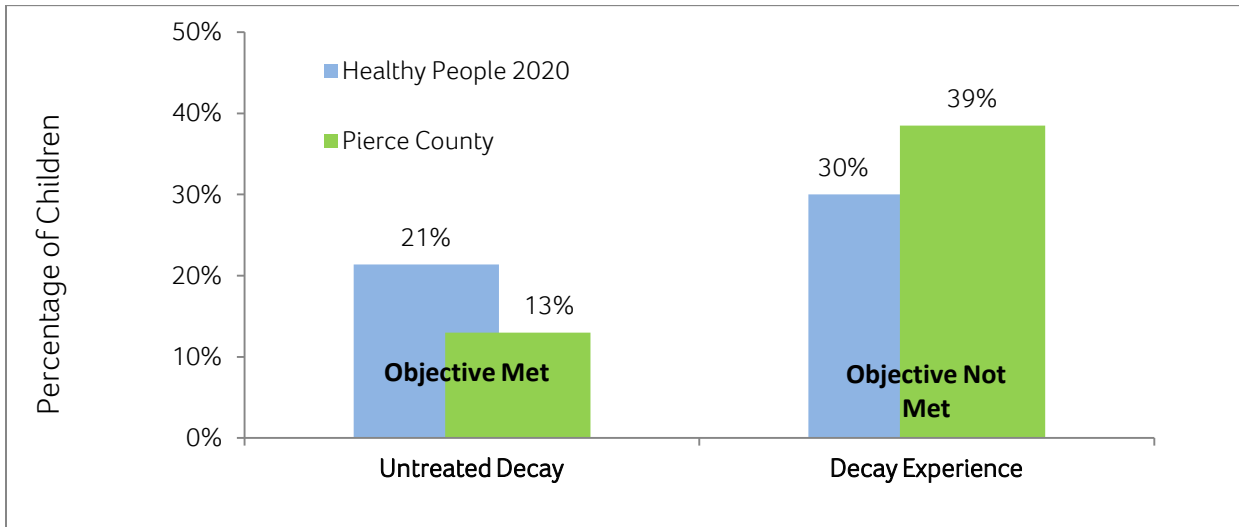
The Smile Survey was not designed to be representative of all two-to four-year-old children; with the majority of Pierce County’s low-income preschool children being three-to five years of age. Further, from 2010 to 2015, the population increases were as follows:

White-NH, increased by 0.7%

Minority: increased by 13%

This uneven distribution of population increase by race may account for some of the perceived disparity in Figure 8.

Figure 9: Pierce County Progress towards Healthy People 2020 Objectives for 3-5-Year Olds





## Oral Health Resources in Pierce County

Tacoma-Pierce County Health Department and community partners provide a family of oral health programs to address the needs of children and their families. These programs include:

Access to Baby and Child Dentistry (ABCD) Focuses on securing dental care for Medicaid-eligible children under age six, with emphasis on enrollment by ages one. The ABCD program also cross-trains staff to provide family oral health education by outreach workers and trained medical professional staff to increase prevention efforts.

School-Based Oral Health is a coordinated effort in which community dental providers deliver oral health services to students in participating public schools. These services include dental screening and referral, fluoride varnish (a preventive service for primary teeth), dental sealants, and oral health education.

The Maternal and Child Health Program conducted through the Health Department, education high-risk families about oral health practices as part of its home visiting programs. This included encouraging pregnant women to see a dentist in the prenatal period, recommending against sending babies to bed with bottles, avoiding/limiting juice consumption, wiping the gums of infant, as well as the recommendation that babies see the dentist following the eruption of their first tooth by their first birthday, whichever comes first. In future efforts, fluoride treatment will be included as well.

Pierce County Dentists Care sponsored by the Pierce County Dental Society and the Pierce County Dental Foundation, provides dental care to underserved adults and children.

In Give Kids a Smile, a program operated by the Pierce County Dental Society, volunteer dentist donate services for uninsured children. For more information, call Jennifer Bunch at (253) 272-1101.

Project Homeless Connect, an annual one day service fair for the homeless, offers free dental services and referral for both adults and children.

Mentorship through local colleges will increase the provider base to address the issues of access to care and encourage careers in dental public health that ultimately.

A list of low cost dental providers in Pierce County is at [www.tpchd.org](http://www.tpchd.org).

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## Appendix A: Data Tables

### Kindergarten (5-7 Years Old)

Table 3: Demographics of Kindergarteners Screened, Smile Survey 2015

Variable	Kindergarteners (n=1467)	
	Number	%
Gender		
Male	733	50.0%
Female	734	50.0%
Age		
5 years	594	40.5%
6 years	861	58.7%
7 years	12	0.8%
Race/Ethnicity		
White	812	55.4
Black	96	6.5
Hispanic	282	19.2
Asian	93	6.3
American Indian/Alaska Native	5	0.3
Pacific Islander	44	3.0
Multi-racial	135	9.2

Table 4: Oral Health Status of Kindergarteners Screened, Smile Survey, 2010 vs. 2015

Variable	2010 % (95% CI) N=1297	2015 % (95% CI) N=1467
Caries Experience	37.2% (30.8-44.1)	36.6% (32.2-41.2)
Untreated Decay*	16.8% (12.9-21.5)	14.6% (13.3-16.1)
Needing Urgent Treatment^	4.0% (2.9-5.5)	7.3% (6.0-8.9)
Rampant Decay	13.7% (10.0-18.5)	16.3% (13.6-19.4)

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Table 5: Oral Health Status of Kindergarteners screened, by race and ethnicity, Smile Survey 2015

Variable	White, non-Hispanic (n=812)	Minority (n=523)	P Value
% with a history of decay (95% CI)	31.0% (27.3-34.9)	45.1% (38.6-51.8)	P=.001
% with untreated decay (95% CI)	13.9% (11.8-16.2)	16.1% (13.4-19.3)	P=.272
% needing urgent treatment (95% CI)	7.3% (5.6-9.5)	7.5% (5.7-9.9)	P=.885
% with rampant decay (95% CI)	11.8% (9.6-14.3)	22.4% (18.7-26.6)	P=.000

Table 6: Oral Health Status of Kindergarteners Screened, by Student eligibility for Free/Reduced Lunch Program, Smile Survey 2015

Variable	Children not receiving Free or reduce price meals (n=332)	Children receiving Free or reduce price meals (n=414)	P Value
% with a history of decay (95% CI)	33.1% (23.9-43.8)	42.2% (36.0-48.6)	P=.100
% with untreated decay (95% CI)	12.5% (10.1-15.5)	16.3% (13.2-20.0)	P=.037
% needing urgent treatment (95% CI)	5.1% (3.2-8.0)	6.2% (4.7-8.2)	P=.355
% with rampant decay (95% CI)	11.7% (6.7-19.7)	21.5% (18.5-24.7)	P=.030

## Third Grade (8-10 year olds)

Table 7: Demographics of Third Graders Screened, Smile Survey 2015

Variable	Third Graders (n=1366)	
	Number	%
Gender		
Male	738	54.0%
Female	628	46.0%
Age		
8 years	544	39.8%
9 years	808	59.2%
10 years	14	1.0%
Race/Ethnicity		
White	794	58.1%
Black	104	7.6%
Hispanic	245	17.9%
Asian	70	5.1%
American Indian/Alaska Native	2	0.2%
Pacific Islander	42	3.1%
Multi-racial	108	7.9%
Unknown	1	0.1%

Table 8: Oral Health Status of Third Graders Screened, Smile Survey 2010 vs. 2015

Variable	2010 % (95% CI) N=	2015% (95% CI) N=1366
Caries Experience	50.3% (44.7-56.0)	45.1% (39.9-50.4)
Untreated Decay*	18.8% (15.5-22.5)	10.4% (8.2-13.0)
Dental Sealants Present*	38.9% (33.4-44.7)	83.6% (80.5-86.4)
Needing Urgent Treatment^	3.7 (2.4-5.5)	5.8% (4.1-8.1)
Rampant Decay	20.8% (17.0-25.2)	20.7% (17.2-24.6)

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Table 9: Oral Health Status of third-grader screened, by race and ethnicity, Smile Survey 2015

Variable	White, non-Hispanic (n=794)	Minority (n=476)	P Value
% with a history of decay (95% CI)	40.1% (34.3-46.1)	54.4% (48.1-59.4)	P=.001
% with untreated decay (95% CI)	10.4% (8.0-13.4)	10.7% (7.6-14.9)	P=.971
% with dental sealants (95% CI)	84.6% (80.0-88.3)	83.1% (79.4-86.3)	P=.583
% needing urgent treatment (95% CI)	5.7% (3.8-8.6)	6.0% (3.9-9.2)	P=.806
% with rampant decay (95% CI)	16.8% (12.7-21.7)	27.6% (23.4-32.3)	P=.003

Table 10: Oral Health Status of Third Graders Screened, by Student eligibility for Free/Reduced Lunch Program, Smile Survey 2015

Variable	Children not receiving Free or reduce price meals (n=313)	Children receiving Free or reduce price meals (n=293)	P Value
% with a history of decay (95% CI)	40.2 (31.7-49.3)	55.7 (46.8-64.2)	P=.020
% with untreated decay (95% CI)	7.2 (4.8-10.7)	12.5 (7.6-19.8)	P=.077
% with dental sealants (95% CI)	84.4 (78.8-88.9)	82.0 (73.9-88.0)	P=.473
% needing urgent treatment (95% CI)	3.9 (2.1-7.0)	7.8 (3.5-16.2)	P=.104
% with rampant decay (95% CI)	16.5 (11.8-22.7)	25.4 (18.6-33.6)	P=.037

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

Table 11: Demographics of Head Start/ECEAP Preschoolers Screened, Smile Survey 2015

Variable	3-5 Year Olds (n=615)	
	Number	%
Gender		
Male	309	50.2%
Female	306	49.8%
Age		
3 years	54	8.8%
4 years	315	51.2%
5 years	246	40.0%
Race/Ethnicity		
White	222	36.1%
Black	90	14.6%
Hispanic	198	32.2%
Asian	23	3.7%
American Indian/Alaska Native	30	4.9%
Pacific Islander	13	2.1%
Other	39	6.3%

Table 12: Oral Health Status of Head Start/ECEAP Preschoolers Screened

Variable	White, Non-Hispanic (n=222)	Minority (n=354)	P Value
% with a history of decay (95% CI)	32.0 (26.8-37.7)	43.5 (36.8-50.4)	.006
% with untreated decay (95% CI)	8.6 (5.9-12.2)	15.5 (12.5-19.2)	.021
% needing urgent treatment (95% CI)	**	**	**
% with rampant decay (95% CI)	12.6 (8.4-18.6)	20.6 (15.6-26.7)	.015

\*\*Data suppressed due to RSE>.30

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Table 13: Oral Health Status of Head Start/ECEAP Preschoolers Screened by race, Pierce County, 2015

Variable	White, Non-Hispanic (n=163)	Minority (n=164)	P Value
% with a history of decay (95% CI)	27.6 (21.1-35.2)	42.1 (31.8-53.1)	.043
% with untreated decay (95% CI)	12.9 (8.5-19.0)	16.5 (11.8-22.5)	.339
% needing urgent treatment (95% CI)	**	**	**
% with rampant decay (95% CI)	8.6 (5.6-13.1)	17.2 (10.7-26.4)	.048

\*\*Data suppressed due to RSE>.30

Table 14: Oral health status of combined second and third graders screened, by race and ethnicity, Smile Survey 2015

Variable	White, Non-Hispanic n=1659 Reference Group (95% CI)	Minority n=1007 (95% CI)	African-American n=219 (95% CI)	Hispanic n=537 (95% CI)	Asian n=143 (95% CI)
% with a history of decay (95% CI)	38.9% (34.4-43.5)	55.8% (51.1-60.4)	41.8% (35.0-49.0)	58.7% (53.1-64.1)	57.7% (45.9-68.7)
% with untreated decay (95% CI)	10.5% (8.4-13.1)	12.9% (10.6-15.7)	13.1% (9.1-18.6)	11.2% (8.4-14.7)	16.1% (11.2-22.7)
% with dental sealants (95% CI)	83.2% (78.3-87.1)	81.2% (78.5-83.8)	73.2% (65.6-79.6)	85.0% (81.1-88.1)	81.4% (74.6-86.6)
% needing urgent treatment (95% CI)	5.4% (3.9-7.6)	7.6% (5.7-10.0)	7.9% (5.4-11.5)	7.3% (4.8-11.1)	9.5% (5.4-16.2)
% with rampant decay (95% CI)	16.1% (13.0-19.7)	28.0% (24.8-31.4)	18.5% (14.5-23.3)	29.8% (25.6-34.4)	33.8% (25.7-43.1)



## Contact Information

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