WISCONSIN — DEPARTMENT OF HEALTH SERVICES

2008 — Make Your Smile Count
The Oral Health of Wisconsin's Children

Current Status, Trends and Disparities

Department of Health Services
State of Wisconsin

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For additional information on the Wisconsin Oral Health Program please contact Marianna Smith at (608) 267-9008 or visit our website at http://dhs.wisconsin.gov/health/Oral_Health/

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EXECUTIVE SUMMARY

The Problem

Tooth decay (dental caries) is an infectious disease process affecting both children and adults. Even though the prevalence of tooth decay has declined in the U.S. over the past 30 years, it remains the most prevalent and yet the most preventable disease known to man. Certain groups suffer disproportionately; including both low-income and minority children.

Oral disease is progressive and cumulative and becomes more complex over time. Unfortunately, those individuals at highest risk of tooth decay are also the least likely to have access to routine professional dental care. The public perception among many is that tooth decay is a natural and minor occurrence that deserves little attention or dollars. If left untreated, however, tooth decay can lead to needless pain and suffering; difficulty in speaking, chewing, and swallowing; lost school days; increased cost of care; the risk of other systemic health problems due to poor nutrition; and loss of self-esteem. Additionally, emerging connections have been identified between bacteria and the condition of the mouth with diabetes, heart disease, and adverse pregnancy outcomes.[1]

The good news is that tooth decay is largely preventable through early risk assessment and comprehensive prevention strategies at the community and practice level.

During the 2007-08 school year, the Wisconsin Department of Health Services completed "Make Your Smile Count," a statewide oral health survey of Wisconsin's third grade children. More than 4,300 children in third grade received a dental screening. Results were compared to a similar dental survey conducted in the 2001-02 school year; overall, it was found that in 2008, tooth decay continues to be a major problem for Wisconsin's children. Six key findings were identified.

Key Findings

1. Dental decay is a significant public health problem for Wisconsin's children.
2. Many children in Wisconsin do not get the dental care they need.
3. About half of the children in Wisconsin do not have dental sealants, a well accepted clinical intervention to prevent tooth decay on molar teeth.
4. There are significant oral health disparities in Wisconsin with minority and low-income children having the highest level of dental disease and the lowest level of dental sealants.
5. Wisconsin has met the Healthy People 2010 objectives for reducing the prevalence of untreated tooth decay and increasing the prevalence of dental sealants among elementary school children, but has not met the Healthy People 2010 objective for decay experience.
6. Our prevention programs are working. Compared to the 2001-02 survey, fewer children today have dental decay and more have dental sealants.

Response

The 2001-02 *Make Your Smile Count* survey was the stimulus behind the creation and implementation of numerous effective community-based preventive efforts.

- Since 2000-01 the Wisconsin Department of Health Services (DHS) Seal-A-Smile program has provided funding to assist community based projects implement school-based dental sealant programs.
- Seal-A-Smile has experienced continual growth, with increased State and Health Resources and Services Administration Federal funding.
- State funding supports the efforts of 17 local health departments to provide school-based fluoride mouthrinse programs, as well as fluoride supplement programs at 15 local health departments.
- The Oral Health Program works closely with local communities on fluoride initiatives and successful implementation of community water fluoridation projects.
- DHS has trained and assisted primary care providers in the detection of early childhood caries, identifying at risk children providing anticipatory guidance and implementing fluoride varnish application programs.
- Although the Seal-A-Smile and fluoride programs have been effective prevention based efforts, more needs to be accomplished at an earlier age to reduce the percentage of Wisconsin children who have experienced dental decay.
- In 2006-07, DHS awarded $4,000,000 in grant funding to 16 grantees to increase oral health access, services and infrastructure across the state.
- In 2008-09 DHS awarded an additional $3,200,000 to 12 new projects targeting the same objectives.

Historically, oral health program creation in Wisconsin has been a public and private collaborative effort. DHS is committed to continuing these valuable partnerships and to establishing new partnerships and programs that will ensure and promote the best possible oral health for all Wisconsin residents.

THE IMPORTANCE OF ORAL HEALTH

"The mouth reflects general health and well-being."

Former Surgeon General David Satcher, 2000

Tooth decay (dental caries) is an infectious disease process affecting both children and adults.[2] During childhood, tooth decay is the single most common chronic disease, five times more common than asthma.[3] Tooth decay still affects more than half of all children by the third grade and by the time children finish high school, about 80% have decay.[4] If left untreated tooth decay can lead to difficulty speaking, chewing, and swallowing, increased cost of care, loss of self-esteem, needless pain and lost school days. Nationwide in 1996, children between 5 to 17 years of age missed 1,611,000 school days due to acute dental problems – an average of 3.1 days per 100 students.

The mouth reflects general health and well-being.[1] Recent studies point to associations between oral infections and diabetes; heart disease; stroke; and pre-term, low-weight births.[1]

While the prevalence and severity of tooth decay has declined among U.S. school-aged children, it remains a significant problem in some populations – particularly certain racial and ethnic groups and low-income children.[6] National data indicate that 80% of tooth decay in children is concentrated in 25% of the child population. Low-income children and racial/ethnic minority groups have more untreated decay than the U.S. population as a whole.[7]

Recognizing and understanding the oral health needs of Wisconsin's children through surveillance will help to ensure that all children receive the oral health care they need. As a result of policy development, the answers to effective policies to protect children's oral health lie in recommendations outlined in the 2000 *Oral Health in America: A Report of the Surgeon General*. Some of the approaches to promote oral health include:

- Change perceptions regarding oral health and disease so that oral health becomes an accepted component of general health.
- Build an effective oral health infrastructure that meets the oral health needs of all Americans and integrates oral health effectively into overall health.
- Remove known barriers between people and oral health services.
- Engage in public-private partnerships to improve the oral health of those who still suffer disproportionately from oral diseases.
- Include oral health services in health promotion and disease prevention programs, care delivery systems, and reimbursement schedules.
- Replicate effective programs and proven efforts in improving oral health care access, addressing needs and reducing disease.

This needs assessment demonstrates that many barriers exist to improving the oral health of Wisconsin's children; especially, low-income and minority children. In order to reverse these trends, there is a need to mobilize resources and increase access to preventive services through both public and private oral health care providers.

INTRODUCTION

In 2001-02, the Department of Health Services (DHS) conducted the first *Make Your Smile Count* survey. The results of the survey reported that Wisconsin's third grade children had more tooth decay experience than the national average along with high levels of untreated decay.

Based on the results of this survey, the DHS defined program goals and targeted dental activities designed to prevent tooth decay in Wisconsin's children. Some of the activities implemented since 2002 include expansion of school-based oral health programs including Seal-A-Smile, the state funded school-based sealant program. DHS has been successful in initiating, training and providing technical support for fluoride varnish program implementation within Head Start agencies, local health departments, WIC programs and primary care settings. Additionally, in 2006, and again in 2009 the state of Wisconsin released one-time dental access grant funds totaling over seven million dollars to 28 separate projects around the state to increase capacity and to establish infrastructure.

DHS completed this second *Make Your Smile Count* survey during the 2007-08 school year. More than 4,300 third grade children received dental screenings; approximately seven percent of all children enrolled in third grade. Detailed information on the design of the 2007-08 survey can be found in the Survey Methods section of this report.

Results from the 2007-08 *Make Your Smile Count* survey have been organized into six key findings. These findings highlight the current oral health status of Wisconsin's children, change in oral health from 2001-02 to 2007-08, and disparities in oral health within Wisconsin. Findings are also compared to objectives from *Healthy People 2010*.

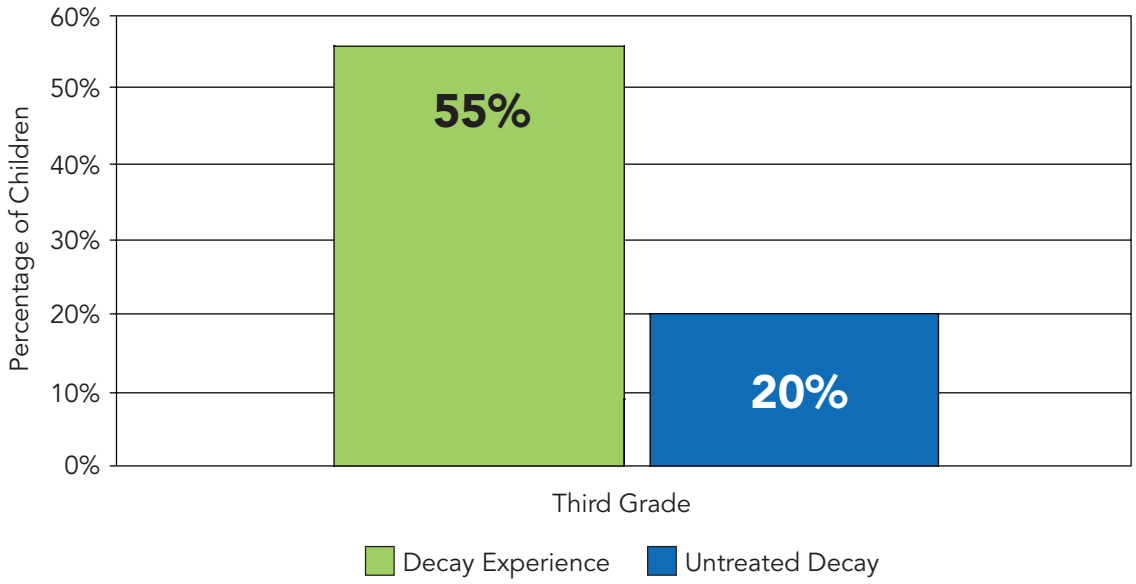
SIX KEY FINDINGS

- Dental decay is a significant public health problem for Wisconsin's children.
- Many children in Wisconsin do not get the dental care they need.
- About half of the children in Wisconsin do not have dental sealants, a well accepted clinical intervention to prevent tooth decay on molar teeth.
- There are significant oral health disparities in Wisconsin with minority and low-income children having the highest level of dental disease and the lowest level of dental sealants.
- Wisconsin has met the *Healthy People 2010* objectives for reducing the prevalence of untreated tooth decay and increasing the prevalence of dental sealants among elementary school children, *but has not met the Healthy People 2010* objective for decay experience.
- Our prevention programs are working. Compared to 2001-02, fewer children today have dental decay and more have dental sealants.

KEY FINDING #1

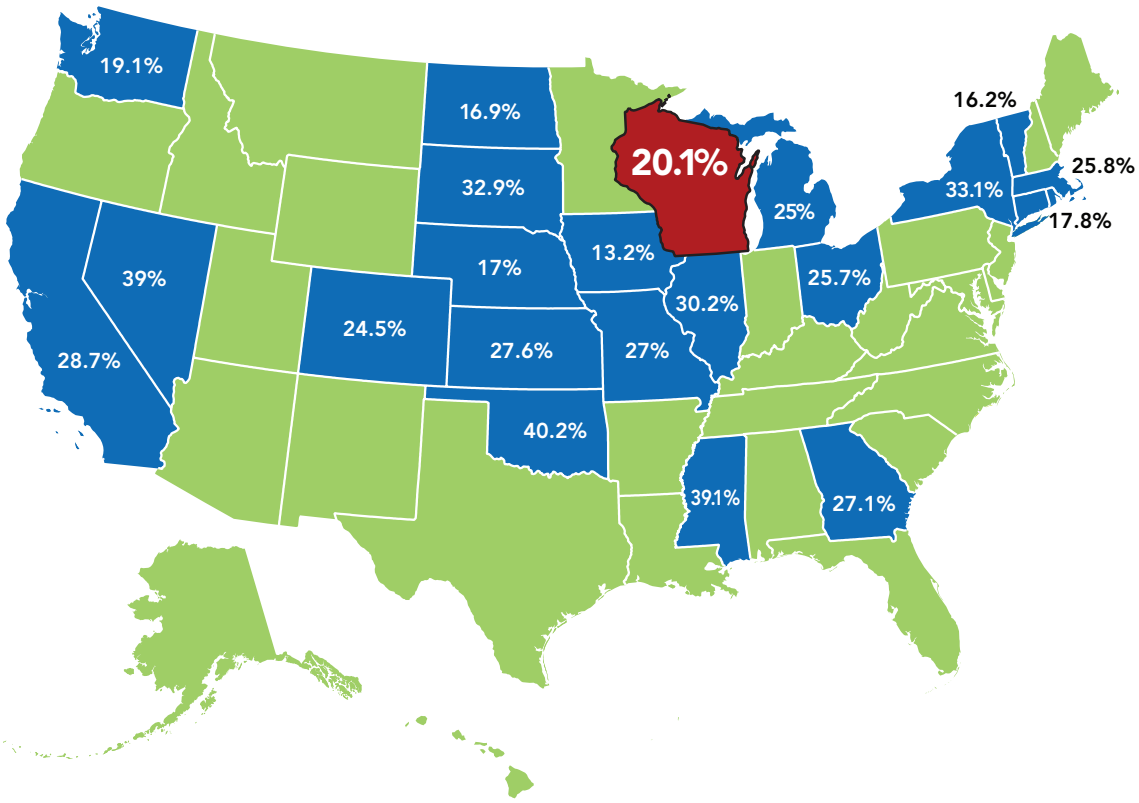
Dental decay is a significant public health problem for Wisconsin's children.

Percentage of Wisconsin's Third Grade Children with Decay Experience and Untreated Tooth Decay 2007-2008



Decay experience means that a child has had tooth decay in the primary (baby) and/or permanent (adult) teeth in his or her lifetime. Decay experience can be past (fillings, crowns, or teeth that have been extracted because of decay) or present (untreated tooth decay or cavities). In Wisconsin, at the time of the survey 55% of third graders had experienced tooth decay and 1 out of 5 had untreated tooth decay.

Refer to Table 3.

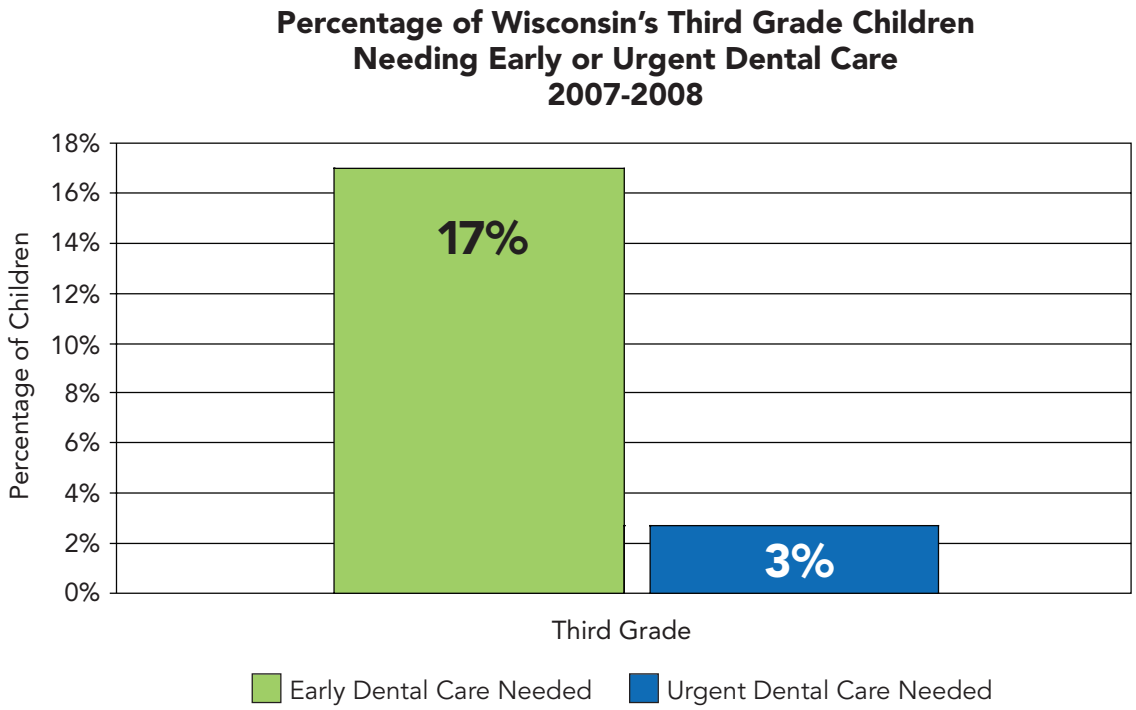


Of the 20 states with oral health data reported since 2002, Wisconsin ranks seventh for the percentage of children presenting with untreated tooth decay. Our prevention programs are working, however, it is clear we are still faced with disparities that we must continue to aggressively address.

Additional information is available through the National Oral Health Surveillance System (NOHSS), www.cdc.gov/nohss

KEY FINDING #2

Many children in Wisconsin do not get the dental care they need.



Seventeen percent of the third grade children screened had a need for early dental care, which means that the child exhibited dental decay without accompanying signs or symptoms. ***Nearly three percent of screened children needed urgent dental care*** because of pain or infection. In 2007-08 there were about 59,000 third grade children in Wisconsin. If three percent are in urgent need of dental care, this means that approximately 1,770 third grade children are in the classroom in pain or with an oral infection. If this percentage is extrapolated to all kindergarten to sixth grade school children in Wisconsin, ***about 12,500 children may need urgent dental care because of pain or infection***.

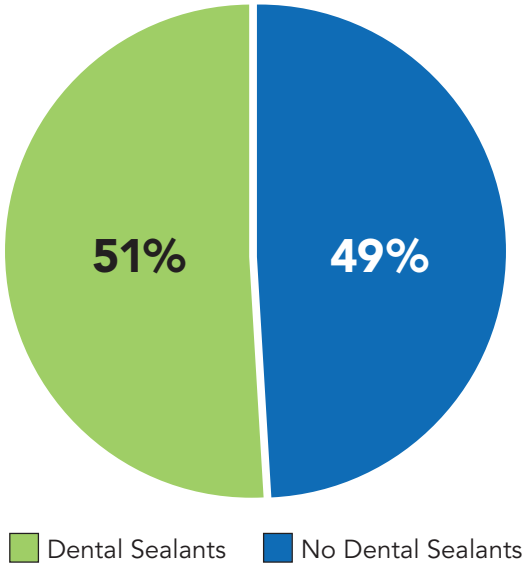
For *Make Your Smile Count* complete diagnostic dental examinations were not provided. Dental screenings were conducted. Therefore, it is reasonable to assume that these numbers actually ***underestimate the proportion of children needing dental care***.

Refer to Table 4.

KEY FINDING #3

About half of the children in Wisconsin do not have dental sealants, a well-accepted clinical intervention to prevent tooth decay on molar teeth.

Percentage of Wisconsin's Third Grade Children with Dental Sealants 2007-2008



Dental sealants are a plastic coating applied to the chewing surfaces of the back teeth. They are a safe, effective way to prevent tooth decay among schoolchildren. Sealants have been shown to significantly reduce a child's risk for having untreated decay. In some cases, sealants can stop the progression of tooth decay.[9] In Wisconsin, 51% of the third grade children screened had dental sealants.

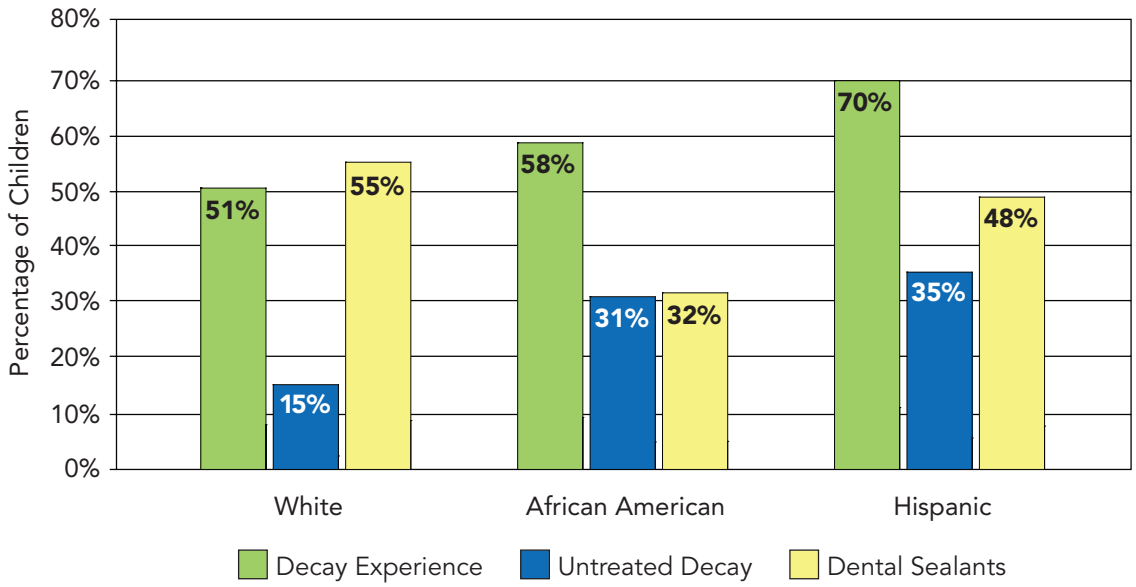
In 2007, through the Seal-A-Smile program 9,860 children received dental screenings and 6,254 received dental sealants. The Seal-A-Smile program, along with the support of private sector clinical providers, helped to meet the *Healthy People 2010* objective.

Refer to Table 3.

KEY FINDING #4

There are significant oral health disparities in Wisconsin with minority and low-income children having the highest level of dental disease and the lowest level of dental sealants.

Percentage of Wisconsin's Third Grade Children with Decay Experience, Untreated Decay and Sealants by Race 2007-2008

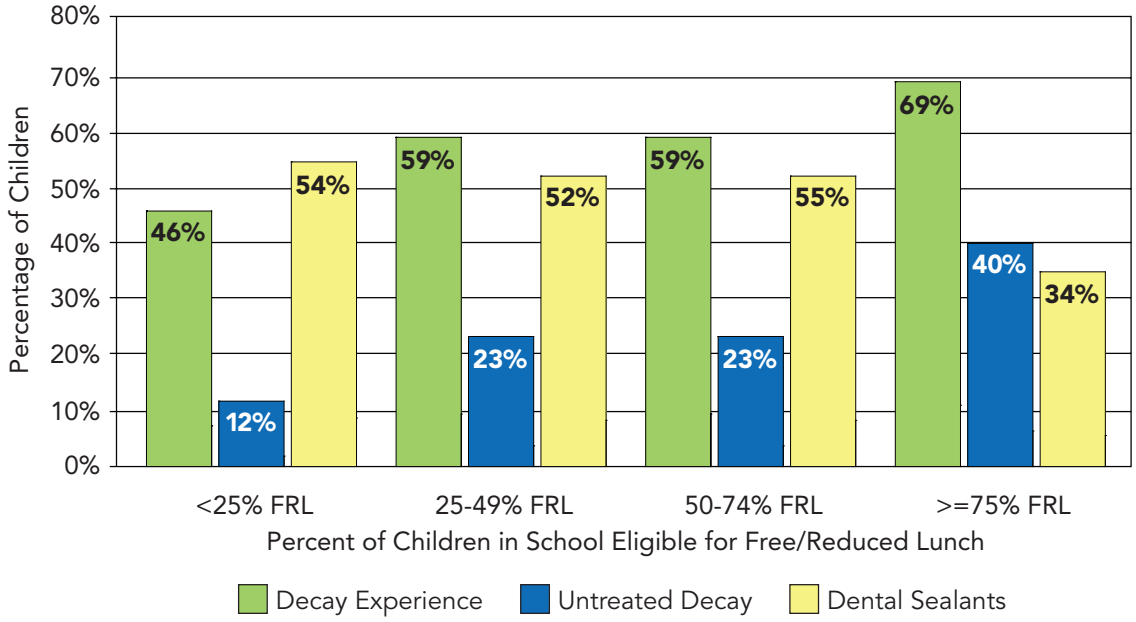


In Wisconsin, African American and Hispanic children are more likely to have decay experience and untreated decay when compared to non-Hispanic white children. The prevalence of untreated decay among those screened was twice as high among minority children. Minority children, especially African American children, were less likely to have the benefit of dental sealants.

Oral health disparities between racial/ethnic groups in Wisconsin are further affected by socioeconomic status. Eighty-seven percent of the children in the higher income schools were white non-Hispanic while only sixteen percent of the children in the lower income schools were white non-Hispanic.

Refer to Table 5.

Percentage of Wisconsin's Third Grade Children with Decay Experience, Untreated Decay and Sealants by Free/Reduced Lunch (FRL) Status 2007-2008



Eligibility for the free and/or reduced price lunch (FRL) program is often used as an indicator of overall socioeconomic status. To be eligible for the FRL program during the 2007-08 school year, annual household income for a family of four could not exceed $38,203.[1] Information on an individual child's participation in the FRL program was not available; however, the percentage of children participating in the FRL program in each school was known. Compared to children from "higher income" schools, children in schools where ≥ 25% of children participate in the FRL program had a significantly higher prevalence of decay experience and untreated decay. Children in schools where ≥ 75% of children participate in the FRL program had a significantly lower prevalence of dental sealants.

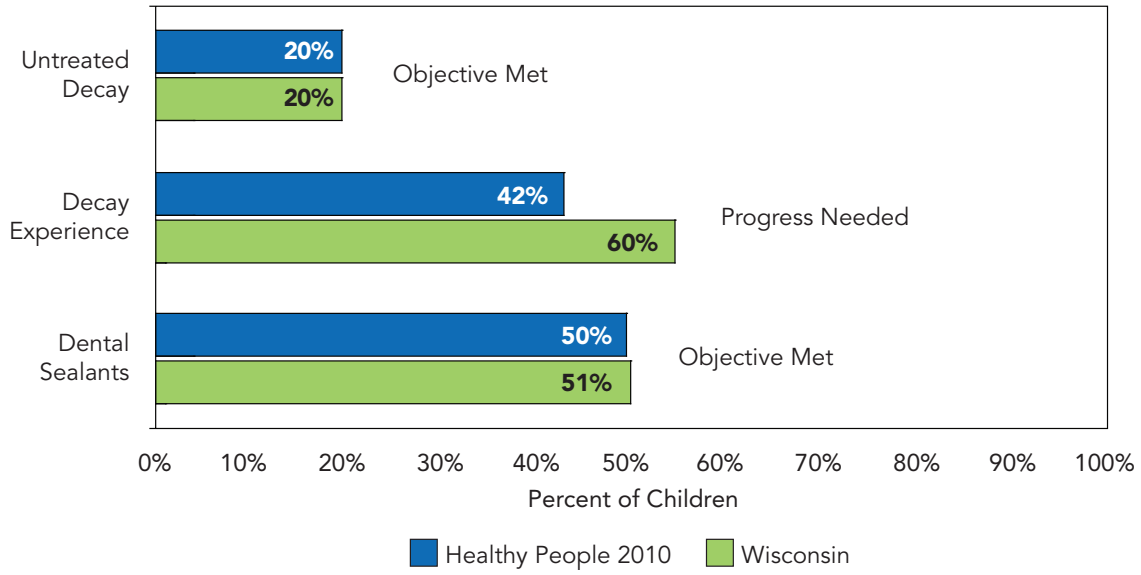
Refer to Table 5.

[1] U.S. Department of Agriculture, Child Nutrition Programs, School Lunch Program, Income Eligibility Guidelines SY 2007-2008, http://www.fns.usda.gov/cnd/governance/notices/iegs/IEGs07-08.pdf.

KEY FINDING #5

Wisconsin has met the Healthy People 2010 objectives for reducing the prevalence of untreated tooth decay and increasing the prevalence of dental sealants among elementary school children, but has not met the Healthy People 2010 objective for decay experience.

Oral Health of Wisconsin's Third Grade Children Compared to Healthy People 2010 Objectives



Healthy People 2010 outlines several oral health status objectives for elementary school children. These include:

- Decrease the proportion of 6-8 year olds with untreated tooth decay to 21%.
- Decrease the proportion of 6-8 year olds with decay experience to 42%.
- Increase the proportion of 8 year olds with dental sealants to 50%.

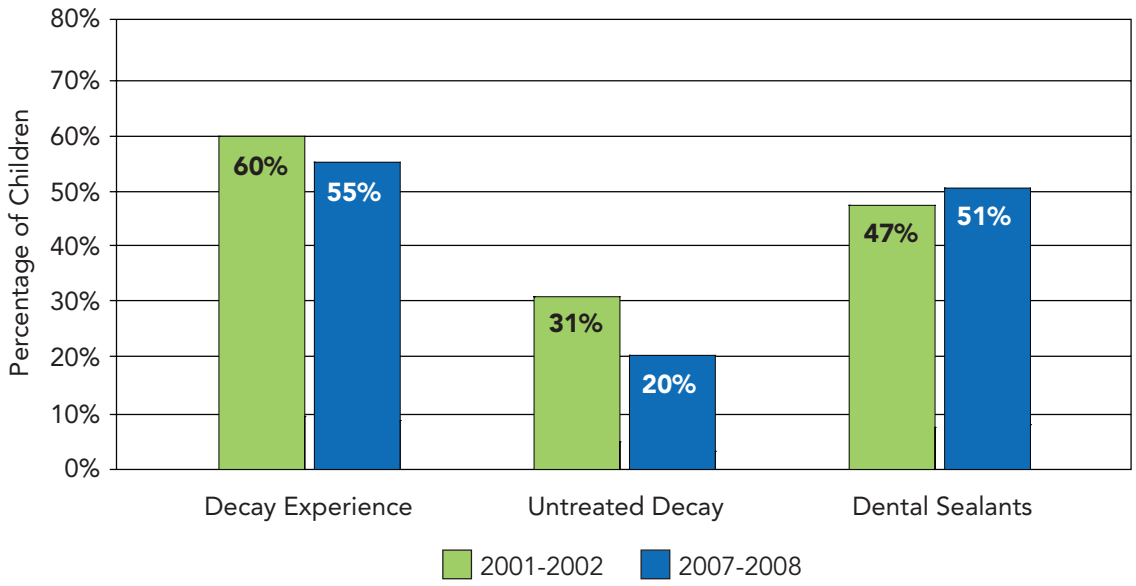
Wisconsin has met the *Healthy People 2010* objectives for both untreated decay and dental sealants, but must make substantial progress to meet the objective for reducing decay experience.

Refer to Table 3.

KEY FINDING #6

Compared to 2001-2002, fewer children today have dental decay and more have dental sealants.

Percentage of Wisconsin's Third Grade Children with Decay Experience, Untreated Decay and Dental Sealants 2001-2002 and 2007-2008



Since the 2001-02 survey, there has been an improvement in the oral health of Wisconsin's children. The greatest amount of change has occurred in untreated decay with a reduction of eleven percentage points between the 2001-02 and 2007-08 surveys. In addition fewer children had decay experience and a slightly higher percent of children had protective dental sealants.

The compelling data gathered in the 2001-02 was the stimulus for a more aggressive approach to creating and implementing preventive based projects that would impact those most in need in Wisconsin. By establishing strong partnerships with primary care providers and advocating for changes to eligible services billed to Medicaid, this partnership has flourished with local health departments, large clinics, and private practices now actively implementing and sustaining fluoride varnish programs.

Refer to Table 3

SURVEY METHODS

Make Your Smile Count is a representative sample of third grade children in Wisconsin's public schools. All public elementary schools with at least 10 children in third grade, in the 2006-07 school year were included in the sampling frame (1,105 schools with 59,403 third grade children). The sampling frame was stratified by region then ordered within each region by percent of children that participate in the free/reduced school lunch (FRL) program. In all regions except the Northern region, 10% of the schools were selected. In the Northern region, 12.5% of schools were selected. The Northern region was oversampled to assure an adequate sample size for the region level estimate.

If a school refused to participate, a replacement school within the same sampling strata was randomly selected. If the sample school plus the replacement school refused to participate, no data were collected in that sampling stratum. Of the 114 elementary school strata, data are available for 93.

Dental hygienists and dentists completed the screenings using gloves, penlights, and disposable mouth mirrors. The diagnostic criteria outlined in the Association of State and Territorial Dental Director's publication *Basic Screening Surveys: An Approach to Monitoring Community Oral Health* were used. Screeners either attended a full-day training session, which included a didactic review of the diagnostic criteria along with a hands-on calibration session, or were independently trained.

Information on age was obtained from the child or the child's teacher while gender and race were determined by the screener.

The data were adjusted to account for the complex sampling scheme and non-response. Data analysis was completed using SAS version 9.1.

DATA TABLES

Table 1 – Participating Children and Schools Compared to Original Sample and Schools in Sampling Frame

Variable	# Schools	# 3rd Graders	FRL%	% White	% African American	% Hispanic
Sampling Frame*	1,105	59,403	37.1	73.7	12.4	8.9
Original Sample*	114	6,168	36.0	73.7	13.4	8.0
Participating Schools*	93	4,941	36.1	77.1	9.1	8.0
Participating Children**	93	4,413	NA	71.5	13.2	9.3

NOTE 1: The sampling frame for this survey included public elementary schools with 10+ students enrolled in 3rd grade in the 2006-07 school year.

*Source: Wisconsin Department of Public Instruction, race/ethnicity as reported by parents

**Source: Race/ethnicity was determined by the screeners.

Table 2 – Race, Gender and Age of Participating 3rd Grade Children

Variable	Percent or Mean
Race/Ethnicity (n=4,370)	
White	71.5
African American / Black	13.2
Hispanic / Latino	9.3
Asian	4.0
American Indian	0.7
Multi-racial	0.6
Other/Unknown	0.7
Gender (n=4,375)	
Male	51.5
Female	48.5
Age (n=4,397)	
7 years	< 0.1
8 years	33.1
9 years	63.4
10 years	3.4
11 years	< 0.1
Age (n=4,397)	
Mean (standard error)	8.7 (0.008)

Table 3 – Oral Health of Wisconsin's Third Grade Children

	Number of Children with Data	Percent of Children	95% Confidence Interval
Decay experience	4,354	54.7	53.2 – 56.2
Untreated decay	4,358	20.1	18.9 – 21.3
Need treatment (early & urgent)	4,359	19.7	18.5 – 20.9
Need urgent treatment	4,359	2.7	2.2 – 3.2
Dental sealants	4,354	50.8	49.3 – 52.3

Table 4 – Need for Dental Treatment (n=4,359)

	Percent of Children	95% Confidence Interval
No treatment need	80.3	79.1 – 81.5
Early treatment	17.0	15.9 – 18.2
Urgent treatment	2.7	2.2 – 3.2

Table 5 – Oral Health of Wisconsin's 3rd Grade Children Stratified by Race

	White (n=3,264)	African American (n=479)	Hispanic (n=372)	Asian (n=171)
Decay experience (%) (95% CI)	50.8 (49.1-52.6)	**58.1 (53.6-62.7)**	**70.2 (65.5-74.9)**	**74.6 (68.6-80.6)**
Untreated decay (%) (95% CI)	15.3 (14.0-16.5)	**30.9 (26.8-35.1)**	**34.9 (29.8-39.9)**	**34.9 (28.6-41.3)**
Need early treatment (%) (95% CI)	15.2 (13.9-16.4)	**29.8 (25.7-33.9)**	**34.8 (29.9-39.8)**	**30.9 (24.5-37.2)**
Need urgent treatment (%) 95% CI)	2.1 (1.6-2.6)	3.2 (1.8-4.6)	**5.9 (3.7-8.1)**	4.8 (2.1-7.4)
Dental sealants (%) (95% CI)	55.4 (53.6-57.1)	**31.6 (27.7-35.5)**	**48.0 (43.0-53.0)**	**44.1 (37.4-50.8)**

Note 1: The number of children listed for each race category is the number of children within that category who participated. Because of missing data, the number for each cell differs slightly.

Note 2: Numbers **in bold** indicate a significant difference ($p<0.05$) from white children screened.

Table 6 – Oral Health of Wisconsin's 3rd Grade Children Stratified by Free and Reduced Lunch (FRL) Status of School

	Higher Income < 25% FRL (n=3,264)	25-49% FRL (n=479)	50-75% FRL (n=372)	Lower Income ≥ 75% FRL (n=171)
Decay experience (%) (95% CI)	46.3 (43.9-48.6)	**58.9 (56.5-61.3)**	**59.2 (55.1-63.3)**	**68.9 (63.8-73.9)**
Untreated decay (%) (95% CI)	12.1 (10.5-13.7)	**22.6 (20.4-24.7)**	**22.8 (19.4-26.3)**	**40.2 (34.9-45.5)**
Need early treatment (%) (95% CI)	11.9 (10.3-13.5)	**22.3 (20.2-24.4)**	**22.1 (18.7-25.5)**	**39.4 (34.2-44.7)**
Need urgent treatment (%) 95% CI)	1.5 (0.9-2.1)	**4.1 (3.1-5.0)**	3.1 (1.6-4.5)	2.5 (0.8-4.2)
Dental sealants (%) (95% CI)	53.6 (51.2-56.0)	52.2 (49.8-54.6)	51.5 (47.5-55.4)	**33.8 (29.4-38.3)**

Note 1: The number of children listed for each region is the number of children within that region who participated. Because of missing data, the number for each cell differs slightly.

Note 2: Numbers **in bold** indicate a significant difference ($p<0.05$) from the children in the schools with < 25% eligible for FRL.

Table 7 – Oral Health Wisconsin's 3rd Grade Children Stratified by Region

	Northeast (n=942)	North (n=538)	Southeast (n=1,368)	South (n=776)	West (n=789)
Decay experience (%) (95% CI)	54.9 (51.8-58.0)	67.7 (63.8-71.7)	53.0 (50.4-55.7)	52.7 (49.2-56.2)	53.8 (50.3-57.3)
Untreated 2.1 (95% CI)	17.9 (15.3-20.6)	16.9 (13.8-20.0)	24.3 (22.1-26.5)	13.4 (11.0-15.7)	20.7 (17.9-23.5)
Need early treatment (%) (95% CI)	17.9 (15.3-20.5)	17.1 (13.9-20.2)	23.3 (21.2-25.5)	13.4 (11.0-15.8)	20.9 (18.1-23.7)
Need urgent treatment (%) 95% CI)	2.4 (1.5-3.3)	3.7 (2.1-5.3)	2.2 (1.4-2.9)	2.6 (1.4-3.7)	4.7 (3.2-6.2)
Dental sealants (%) (95% CI)	46.6 (43.3-49.8)	77.4 (74.0-80.8)	43.1 (40.5-45.7)	54.3 (50.9-57.6)	61.0 (57.7-64.4)

Note: The number of children listed for each region is the number of children within that region who participated. Because of missing data, the number for each cell differs slightly.

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