South Dakota Oral Health Survey 2010

South Dakota Department of Health

South Dakota Oral Health Survey

2010

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Department of Health

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Office of Health Promotion

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HTTP://DOH.SD.GOV/ORALHEALTH

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This report, as well as supplemental oral health information is available on the Department of Health website:

http://doh.sd.gov/oralhealth

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INTRODUCTION

Dental disease is a serious public health issue and affects overall health and productivity. It can lead to pain and disfigurement, low self-esteem, lost school days, nutritional problems, and in the case of periodontal disease, possible cardiac complications.

Tooth decay is an infectious disease affecting children and adults. Although dental caries (tooth decay) is largely preventable, it remains the most common chronic childhood disease, five times more common than asthma and seven times more common than hay fever (US Department of Health and Human Services, 2000). This health problem begins early. National statistics show that 17 percent of children aged 2- 4 years have already had decay. By the age of 8, approximately 52 percent of children have experienced decay, and by the age of 17, dental decay affects 78 percent of children (CDC, 2005).

In order to conduct surveillance of oral health disease trends and treatments in South Dakota, the Department of Health in cooperation with the South Dakota Dental Association, conducted a statewide assessment of third grade students during the 2009-2010 academic year. The purpose of the survey was to obtain data regarding the oral health of children in South Dakota. The survey collected information on caries (cavities) experience, the prevalence of dental sealants, and the need for urgent treatment. The results of the survey will be used in a variety of ways including: monitoring trend data, assessing the extent of children's oral health needs, and providing direction for prevention programs. This report summarizes the major findings of that survey.

Summary

During the 2009-2010 school year, the South Dakota Department of Health conducted a statewide oral health survey of third grade children in public, private and Bureau of Indian Affairs (BIA) elementary schools. Thirty-two elementary schools were randomly selected and 30 agreed to take part in the survey. Volunteer dentists screened those children who returned a positive consent form. A total of 693 children returned the questionnaire/consent forms but for a variety of reasons, only 570 were screened (54 percent of all third grade children enrolled in the 30 participating schools).

Key Findings

- Sixty-two percent of the children had cavities and/or fillings (decay experience) and 29 percent of the children had untreated dental decay (cavities). Dental decay is a significant public health problem for South Dakota's children.
- Forty-five percent of the children did not have dental sealants. While dental sealants are a proven method for preventing decay, many of South Dakota's children have not received this preventive service.
- Twenty-nine percent of the children were in need of dental care including eight percent that needed urgent dental care because of pain or infection. A large proportion of South Dakota's children are in need of dental care.
- Compared to white non-Hispanic children, a significantly higher proportion of American Indian children have decay experience (58% vs. 84%) and untreated decay (22% vs. 48%).
- Thirty-eight percent of children that participate in the free/reduced price school lunch program had untreated decay compared to only 17% of children not eligible for the program.

Oral Health Trends — 2003, 2006 and 2010

- *Decay experience*: 62 percent of the third graders surveyed in 2010 had a history of decay compared to 66 percent in 2006 and 67 percent in 2003.

- *Untreated decay*: 29 percent of the third graders in the 2010 survey had untreated decay compared to 33 percent in 2006 and 30 percent in 2003.

- *Dental sealants*: 55 percent of the third graders in the 2010 survey had dental sealants compared to 61 percent in 2006 and 50 percent in 2003.

There was a significant increase in the prevalence of sealants between 2003 and 2006 but the prevalence decreased slightly in 2010, although the difference between 2006 and 2010 was not statistically significant. When comparing data from 2006 and 2010 it should be noted that in 2006 only 27 percent of the children screened were eligible for the free or reduced price school lunch program compared to 42 percent of the children screened in 2010. In the past three years the economy in South Dakota has reflected the national crisis. Job loss, lower wages, etc. have impacted the overall need for services by families that would not normally qualify for such programs.

Methods

An electronic list of all elementary schools in South Dakota was obtained from the Department of Education. The sampling frame was limited to public, private and Bureau of Indian Affairs schools with three or more students in third grade (313 schools and approximately 10,160 children).

Schools in the sampling frame were ordered by third grade enrollment (10 or fewer, 11-20, 21-50, and 51 or more) then by percent of students participating in the free or reduced price school lunch program. Using a systematic sampling strategy, 32 schools were selected to participate in the oral health survey. If a school refused, a replacement school was randomly selected from the same sampling strata. Two of the schools, along with their replacements, declined to participate; resulting in 30 schools with an enrollment of 1,058 children in third grade. Only those children that returned a positive consent form were screened.

Thirty-four volunteer dentists completed all of the screenings using head lamps, gloves, and disposable mirrors while following standard precautions for infection control. If necessary, a Q-tip was used to remove excess debris, as well as to check for the presence of dental sealants.

Epi Info, a public access software program developed and supported by the Centers for Disease Control and Prevention, was used to enter the data. The data analysis was completed using SAS (version 9.1). To account for differences in response rates between schools, the data were adjusted for non-response. The number of children enrolled in each school was divided by the number of children screened to obtain the non-response sampling weight for each school.

Results

The total third grade enrollment in the 30 participating schools was 1,058. Of these, 693 returned a questionnaire/consent form and 570 children were screened (54% response rate). The children screened ranged in age from 8-10 years with a mean of 8.8 years. About half of the children screened were female (48%) and the majority (76%) were white non-Hispanic. Refer to Tables 1A and 1B for further demographic information.[1] In terms of eligibility for the free and/or reduced price meal program, the schools participating in the oral health survey had a higher percentage of students eligible compared to the state as a whole (45% vs. 32%). Approximately 32 percent of all South Dakota's elementary school children receive free and/or reduced price meals compared to 45 percent of the children in the participating schools. Of the children with information on participation in the free/reduced school lunch program, 42% participate in the program. All data presented in the text of this report have been adjusted for non-response.

[1] Table 1A presents percentages with "unknown" included while Table 1B excludes "unknown" from the denominator.

Table 1A – Includes "Unknown"

Demographic Characteristics of Children Participating in South Dakota's Oral Health Survey

All Children who Returned a Questionnaire and Children Screened

Variable	Number with Data	Percent of all Children who Returned a Questionnaire (n=693)
Gender	693	
Male		47.0
Female		50.2
Missing/Unknown		2.7
Age	673	
Mean age (standard deviation)		8.8 (0.54)
Age range		8-10 years
Race and Ethnicity	693	
White		70.4
American Indian		13.3
Hispanic/Latino		2.2
Black/African American		1.9
Asian		1.0
Other & multi-racial		1.9
Unknown		9.4
Eligible for FRL	693	
No		51.7
Yes		37.1
Missing/Unknown		11.3
		Children who were Screened (n=570)
Gender	570	
Male		47.2
Female		51.4
Missing/Unknown		1.4
Age	563	
Mean age (standard deviation)		8.8 (0.54)
Age range		8-10 years
Race and Ethnicity	570	
White		72.5
American Indian		15.3
Hispanic/Latino		2.6
Black/African American		2.1
Asian		1.1
Other & multi-racial		1.9
Unknown		4.6
Eligible for FRL	570	
No		53.9
Yes		39.7
Missing/Unknown		6.5

Table 1B – Does Not Include "Unknown"

Demographic Characteristics of Children Participating in South Dakota's Oral Health Survey

All Children who Returned a Questionnaire and Children Screened

Variable	Number with Data	Percent of all Children who Returned a Questionnaire (n=693)
Gender	674	
Male		48.4
Female		51.6
Age	673	
Mean age (standard deviation)		8.8 (0.54)
Age range		8-10 years
Race and Ethnicity	628	
White		77.7
American Indian		14.6
Hispanic/Latino		2.4
Black/African American		2.1
Asian		1.1
Other & multi-racial		2.1
Eligible for FRL	615	
No		58.2
Yes		41.8
		Children who were Screened (n=570)
Gender	562	
Male		47.9
Female		52.1
Age	563	
Mean age (standard deviation)		8.8 (0.54)
Age range		8-10 years
Race and Ethnicity	544	
White		75.9
American Indian		16.0
Hispanic/Latino		2.8
Black/African American		2.2
Asian		1.1
Multi-Racial/Other		2.0
Eligible for FRL	533	
No		57.6
Yes		42.4

Oral Health Status Indicators (Table 2)

Sixty-two percent of the children screened had decay experience (untreated decay or fillings) in their primary and/or permanent teeth and approximately 29 percent of the children had untreated decay at the time of the screening.[2] Twenty-one percent were in need of early dental care while an additional eight percent of the children were in need of urgent dental care because of pain or infection.

Almost 55 percent of the children had a dental sealant on at least one permanent molar. Dental sealants provide an effective way to prevent decay on the chewing surfaces of molars (back teeth), which are most vulnerable to dental decay. A clear resin is used to cover the "pits and fissures" on the top of the teeth so that cavity causing bacteria cannot reach areas that are difficult to clean and for fluoride to penetrate.

Table 2

Oral Health Status of South Dakota's Third Grade Children

Variable	Number with Data	Percent of Children	95% CI	
Caries free	570	37.7	33.4	42.1
Caries history	570	62.3	57.9	66.6
Untreated decay	570	29.1	25.0	33.2
Dental sealants	570	54.8	50.3	59.2
Treatment urgency	570			
None		70.7	66.6	74.8
Early		21.0	17.4	24.5
Urgent		8.3	5.5	11.2

[2] The percent of children with untreated decay is assumed to be an under estimation because radiographs (x-rays) were not taken.

Access to Care Indicators (Tables 3-4)

Most of the parents (80%) reported having some type of dental insurance coverage for their child – 32 percent reported government insurance (Medicaid, IHS or both) and 46 percent reported private insurance.

Almost 79 percent of the parents reported that their child had visited the dentist in the last 12 months while almost five percent reported that their child had never been to the dentist. The primary reasons for not having been to the dentist in the last year were "cost" (n=49), "no reason to go" (n=45), and "difficulty in getting appointment" (n=20).

Table 3

Last Dental Visit and Payment for Dental Care for South Dakota's Third Grade Children

All Children Who Returned a Questionnaire – Not Adjusted for Non-Response

Variable	Number	Percent of Children
Last Dental Visit	625	
Within last 12 months		78.6%
1-2 years ago		15.2%
3 or more years ago		1.8%
Never been to dentist		4.5%
Payment for Dental Care	616	
Cash		19.8
Government insurance*		32.0
Private insurance		45.9
Other		2.3

* Includes Medicaid and Indian Health Service

Table 4

Reasons Why Child Had Not Been to Dentist in Last Year

All Children Who Returned a Questionnaire – Not Adjusted for Non-Response

Reason	Number of Responses
Cost	49
No reason to go	45
My child is too young	1
I do not have or know a dentist	7
Difficulty in getting appointment	20
Fear, apprehension, pain or dislike going	11
Cannot get to the dental office/clinic	8
Other	31

Note: Limited to those individuals who reported that they had not visited the dentist in the last year (n=134).

Impact of Dental Visit Frequency (Table 5)

While the majority of parents (79%) reported that their child saw a dentist within the last 12 months, almost 22 percent of parents reported that their child had either not seen a dentist in the last year (17%) or had never been to the dentist (5%). Compared to children who had not been to the dentist in the last year, children whose parents reported a dental visit in the last year were more likely to have dental sealants (63% vs. 35%) and less likely to have untreated decay (22% vs. 44%). In addition to differences in oral health status, a significantly higher proportion of children who had seen the dentist in the last year were white non- Hispanic and had private dental insurance; while a significantly lower proportion were eligible for the school lunch program.

Table 5

Oral Health of South Dakota's Third Grade Students

Stratified by Time Since Last Dental Visit

Adjusted for Non-Response

Variable	Within Last Year (n=414)			More than 1 Year Ago (n=102)			Never Been to Dentist (n=25)		
	Percent	95% CI		Percent	95% CI		Percent	95% CI	
White non-Hispanic	76.8	72.0	81.6	56.6	45.8	67.5	69.5	47.6	91.4
With Private Insurance	48.2	42.9	53.5	18.6	10.3	26.9	17.6	0.0	37.2
Eligible for FRL	40.6	35.3	45.9	68.6	58.9	78.4	63.8	41.0	86.5
Caries history	61.1	56.1	66.2	68.9	58.8	79.0	48.3	26.0	70.7
Untreated decay	22.2	17.7	26.7	44.0	33.1	54.9	48.3	26.0	70.7
Dental sealants	62.9	57.9	67.9	34.7	24.2	45.2	10.4	0.0	25.1
Treatment urgency									
None	77.1	72.6	81.6	56.5	45.6	67.4	53.3	32.9	73.6
Early	18.0	14.1	22.0	27.9	18.6	37.2	21.4	4.1	38.6
Urgent	4.8	2.1	7.5	15.6	6.5	24.7	25.3	3.9	46.8

Impact of Race and Ethnicity (Table 6)

Almost 76 percent of the children screened were white non-Hispanic while 16 percent were American Indian. When stratified by race, significant differences in oral health status appeared. Compared to white non-Hispanic children, American Indian children were significantly more likely to have a history of caries and untreated decay. In addition, a significantly lower proportion of American Indian children had private dental insurance or visited the dentist in the last year; while a significantly higher proportion were eligible for the school lunch program.

Note: The number of children in other minority groups was too small for stratification.

Table 6

Oral Health of South Dakota's Third Grade Students

Stratified by Race and Ethnicity

Adjusted for Non-Response

Variable	White non-Hispanic (n=413)			American Indian (n=87)			Other Minority Children (n=44)		
	Percent	95% CI		Percent	95% CI		Percent	95% CI	
With Private Insurance	65.7	59.6	71.8	13.3	4.5	22.0	32.2	14.4	50.0
Eligible for FRL	34.4	29.1	39.7	86.7	78.0	95.3	71.9	58.2	85.7
Dental Visit in Last Year	79.8	75.3	84.3	55.4	44.0	66.9	79.6	65.6	93.7
Caries history	57.5	52.4	62.7	83.7	75.0	92.4	53.6	36.0	71.1
Untreated decay	22.4	17.8	26.9	48.4	37.2	59.6	30.7	14.4	47.0
Dental sealants	58.0	52.8	63.2	46.0	34.5	57.6	47.5	30.8	64.3
Treatment urgency									
None	77.5	72.9	82.0	49.4	38.3	60.6	71.3	55.3	87.4
Early	16.0	12.4	19.6	39.6	28.4	50.7	13.6	1.6	25.6
Urgent	6.5	3.2	9.9	11.0	5.1	16.9	15.1	2.1	28.1

Impact of Insurance Type (Table 7)

When stratified by insurance type (private insurance, government insurance, cash only), significant differences in oral health status appeared. Compared to children with private insurance, children with government insurance were significantly more likely to have untreated decay and less likely to have visited the dentist in the last year.

Table 7

Oral Health of South Dakota's Third Grade Students

Stratified by Dental Insurance Status

Adjusted for Non-Response

	Private Dental Insurance[1] (n=236)			Government Dental Insurance[2] (n=178)			Cash Only (n=108)		
	Percent	95% CI		Percent	95% CI		Percent	95% CI	
White Non-Hispanic	87.4	82.0	92.8	44.4	36.3	52.5	94.5	89.9	99.0
Eligible for FRL	15.3	9.8	20.8	92.1	87.8	96.4	27.2	17.2	37.2
Dental Visit in Last Year	89.0	84.3	93.6	68.2	60.7	75.7	60.2	49.8	70.6
Caries history	53.9	47.0	60.9	73.1	66.0	80.2	55.5	45.3	65.6
Untreated decay	18.0	12.7	23.3	37.7	29.9	45.5	29.3	19.2	39.3
Dental sealants	60.3	53.5	67.1	56.9	49.0	64.9	43.5	33.3	53.6
Treatment urgency									
None	81.9	76.5	87.2	61.9	54.2	69.7	70.4	60.5	80.4
Early	14.5	9.8	19.2	28.6	21.5	35.8	18.4	11.2	25.6
Urgent	3.6	0.5	6.6	9.4	4.6	14.3	11.2	2.7	19.6

[1] Includes those who reported private dental insurance plus those who reported private insurance plus IHS or other. Also includes those that reported private insurance plus cash.

[2] Include those who reported Medicaid and/or IHS. Participants who reported both Medicaid and private insurance were classified as government.

Impact of Socioeconomic Status (Tables 8 & 9)

Eligibility for the free and/or reduced price school lunch (FRL) program is often used as a surrogate measure of socioeconomic status (SES). Table 8 presents demographic and oral health information stratified by a child's eligibility for the FRL program. Children eligible for FRL have poorer oral health compared to children not eligible. Table 9 presents information stratified by the proportion of children in each school eligible for the free and/or reduced price meal program (<20%, 20-49%, > 50%). Compared to children in higher income schools (<20% eligible for F/R meals), children in middle and lower income schools were significantly more likely to have untreated decay and significantly less likely to have dental sealants.

Table 8

Oral Health of South Dakota's Third Grade Students

Stratified by Child's Participation in the Free/Reduced Lunch Program

Adjusted for Non-Response

	Not Eligible for FRL (n=307)			Eligible for FRL (n=226)		
	Percent	95% CI		Percent	95% CI	
White Non-Hispanic	90.2	86.2	94.2	52.2	44.9	59.5
Private Insurance	64.8	59.1	70.5	13.4	8.4	18.4
Dental Visit in Last Year	85.1	80.7	89.4	65.0	57.9	72.1
Caries history	54.2	48.2	60.1	69.9	63.2	76.5
Untreated decay	17.3	12.9	21.6	38.1	31.0	45.3
Dental sealants	57.9	52.1	63.8	52.3	45.0	59.6
Treatment urgency						
None	82.2	77.8	86.5	61.8	54.7	68.9
Early	15.8	11.6	20.0	23.8	17.9	29.6
Urgent	2.0	0.5	3.6	14.4	8.6	20.2

Table 9

Oral Health of South Dakota's Third Grade Students

Stratified by Percent of Students Eligible for the Free and/or Reduced Price Meal Program

Adjusted for Non-Response

Variable	< 20% Students on FRL (n=110)			20-49.9% Students on FRL (n=253)			≥ 50% on FRL (n=202)		
	Percent	95% CI		Percent	95% CI		Percent	95% CI	
White Non-Hispanic	93.5	88.6	98.3	80.8	75.1	86.5	51.9	44.0	59.8
Private insurance	64.0	54.6	73.4	47.6	40.8	54.5	23.2	16.6	29.7
Dental Visit in Last Year	88.3	82.0	94.7	79.0	73.5	84.6	65.2	57.4	73.0
Eligible for FRL	17.7	10.4	25.0	35.1	28.3	41.9	74.4	67.7	81.2
Caries history	43.7	34.2	53.1	60.5	53.9	67.1	70.9	63.9	77.8
Untreated decay	9.2	3.7	14.8	26.4	20.6	32.3	39.6	32.1	47.1
Dental sealants	70.9	62.1	79.6	54.0	47.4	60.6	50.1	42.4	57.8
Treatment urgency									
None	89.1	83.2	95.0	72.8	67.0	78.7	61.4	53.9	68.8
Early	10.9	5.0	16.8	22.6	17.2	28.1	22.5	16.6	28.3
Urgent	0.0			4.5	1.7	7.4	16.2	9.8	22.5

Trends in Oral Health Status (Table 10)

Since the last statewide oral health survey in 2006, there has been a slight decrease in the proportion of children with a history of dental decay, with untreated decay and with dental sealants. These differences, however, were not statistically significant. When comparing 2010 with previous surveys it should be noted that the children screened in 2010, compared to 2006 and 2003, were more likely to be minority and lower income.

Healthy People 2010 Objectives (Table 10)

The National Oral Health Objectives for the Year 2010 (Healthy People 2010) outline several oral health status objectives for young children. For six- to eight-year-old children there are three primary oral health status objectives:

- To decrease the proportion of children who have experienced dental caries in permanent or primary teeth to 42 percent.
- To decrease the proportion of children with untreated dental caries in permanent or primary teeth to 21 percent.
- To increase the proportion of eight-year-olds receiving protective sealing of the occlusal surfaces of permanent molar teeth to 50 percent.

The State of South Dakota has exceeded the Healthy People 2010 objective for dental sealants. Unfortunately, significant progress must still be made in terms of caries history and untreated decay if South Dakota is to meet the other two objectives. About 62 percent of third grade children screened in South Dakota had experienced dental caries – much higher than the HP2010 objective of 42 percent. About 29 percent of the South Dakota children had untreated caries compared to the HP2010 objective of 21 percent. Almost 55 percent of the third grade students screened had dental sealants compared to the HP2010 objective of 50 percent.

Table 10

Oral Health of South Dakota's Third Grade Children in 2003, 2006 and 2010

Compared to Healthy People 2010

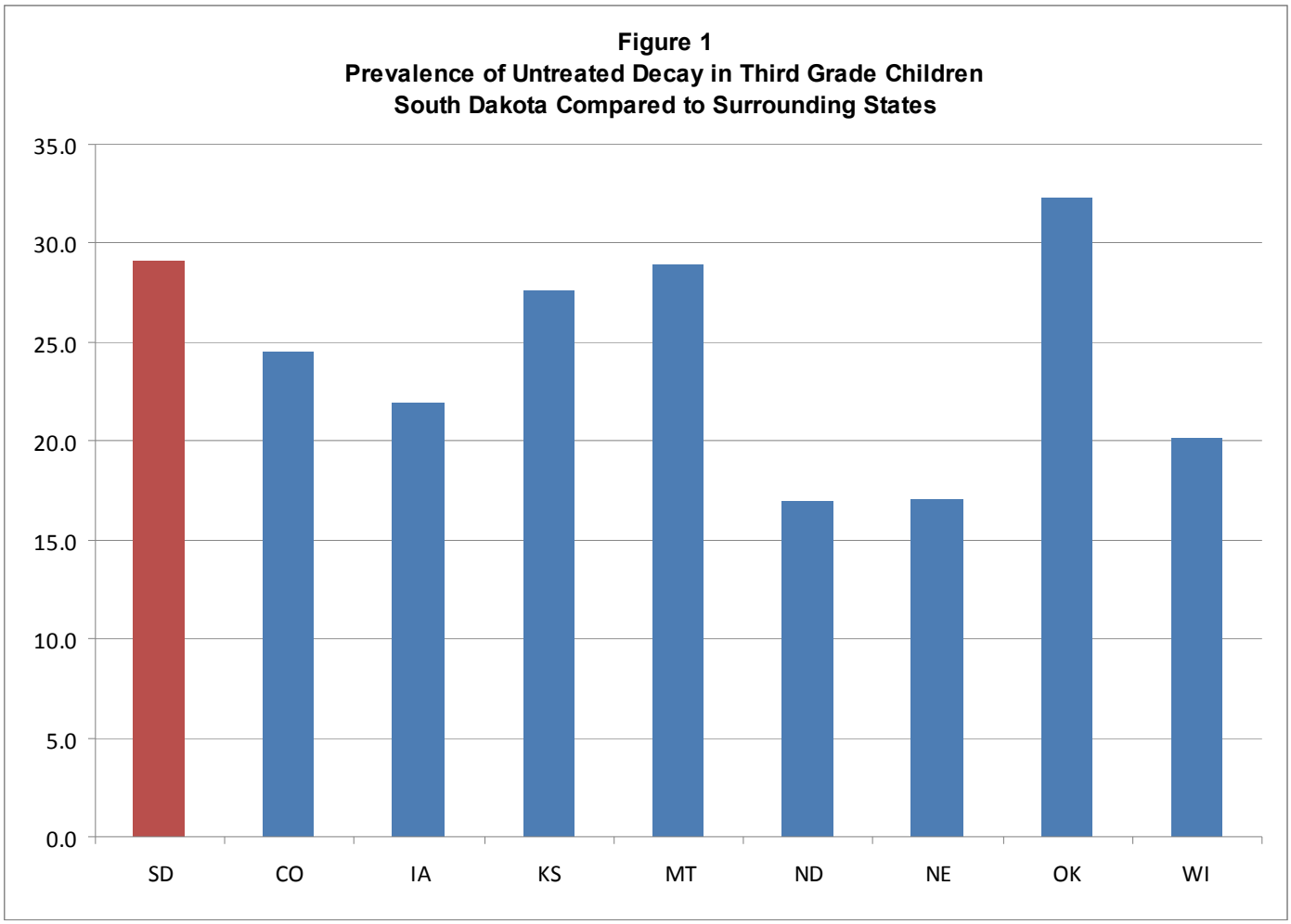
Adjusted for Non-Response

Variable	South Dakota 2003			South Dakota 2006			South Dakota 2010			HP 2010 Objective
	Percent	95% CI		Percent	95% CI		Percent	95% CI		6-8 Year Olds
White Non-Hispanic	83.8			85.3			75.9			
Private insurance	51.8			53.6			45.9			
Eligible for FRL	NA			27.4			42.4			
Caries history	66.9	60.8	73.0	65.6	62.5	68.6	62.3	57.9	66.6	42
Untreated decay	30.2	22.8	37.5	32.9	29.9	35.9	29.1	25.0	33.2	21
Dental sealants	49.6	44.2	55.0	61.1	57.2	64.8	54.8	50.3	59.2	50
8 Year Olds Only										
Dental sealants	52.7	43.8	61.7	57.6	50.1	64.8	54.7*	46.3	63.0	50

* 169 of the children screened in 2010 were 8 years of age

Comparison to Other States (Figures 1-3)

Figures 1-3 compare the oral health of South Dakota's third grade children with the oral health of third grade children from several other states. Each of the states on the graphs collected data in a manner similar to South Dakota.



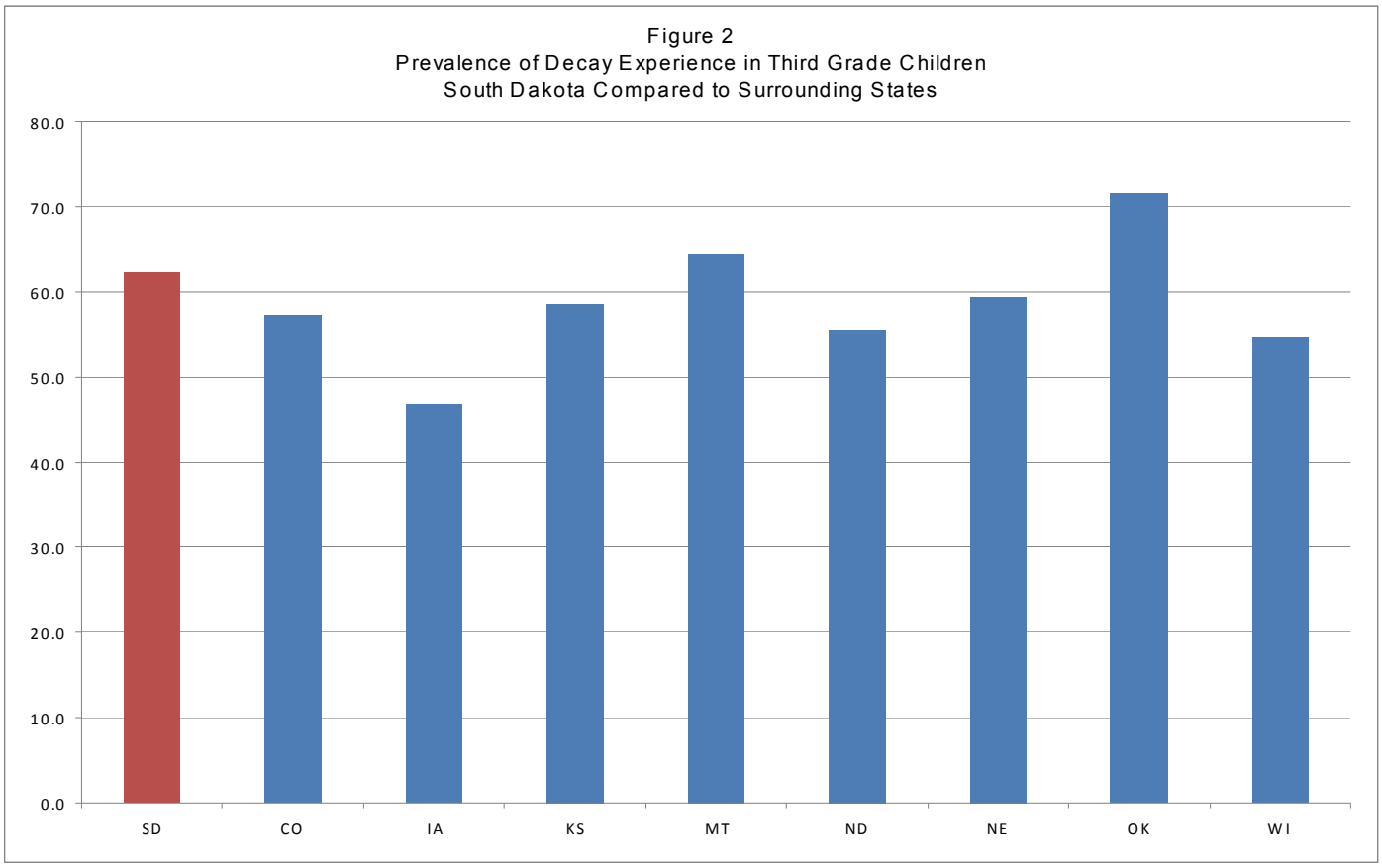


Figure 2
Prevalence of Decay Experience in Third Grade Children
South Dakota Compared to Surrounding States
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
SD
CO
IA
KS
MT
ND
NE
OK
WI

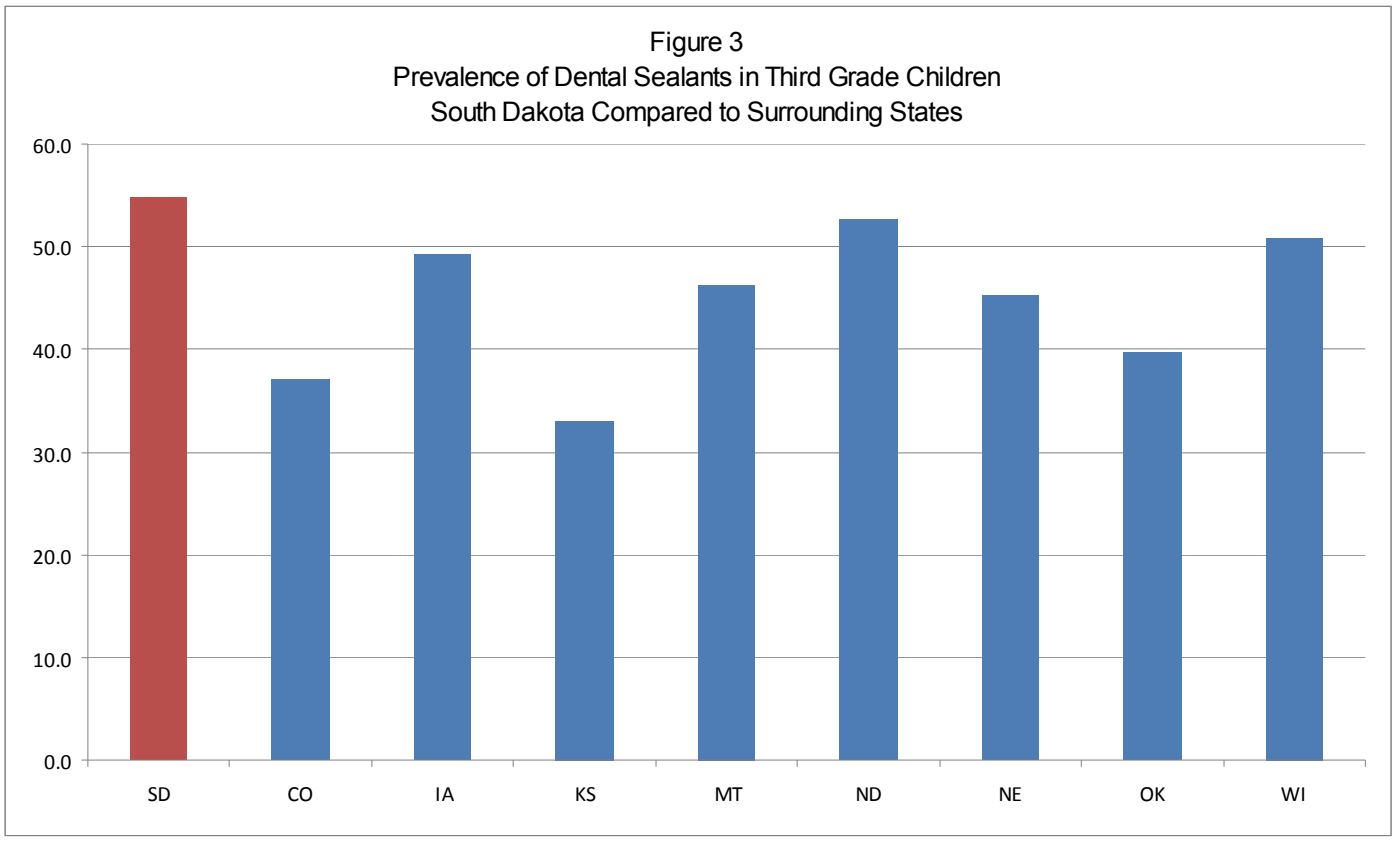


Figure 3
Prevalence of Dental Sealants in Third Grade Children
South Dakota Compared to Surrounding States
60.0
50.0
40.0
30.0
20.0
10.0
0.0
SD
CO
IA
KS
MT
ND
NE
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Reference

U.S. Department of Health and Human Services. Oral Health in America: a report of the Surgeon General.

Resource List

South Dakota Department of Health
http://doh.sd.gov/oralhealth

South Dakota State Dental Association
www.sddental.org

South Dakota Dental Hygiene Association
www.sddha.org

University of South Dakota Dental Hygiene Program
http://www.usd.edu/health-sciences/dental-hygiene/index.cfm

Delta Dental Plan of SD — Dakota Smiles Program
http://www.deltadentalsd.com/webpage/caremobile.jsp?DView=CareMobile

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