

# NORTH DAKOTA ORAL HEALTH SURVEY 2004-2005 SCHOOL YEAR



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Prepared by:  
Kathy Phipps, DrPH  
ASTDD Data Coordinator  
PO Box 1006  
Morro Bay, CA 93443  
Tel: 805-771-9788, Fax: 805-771-9843  
Email: krp123@charter.net

## SUMMARY

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During the 2004-2005 school year, the North Dakota Department of Health conducted a statewide oral health survey of third grade children enrolled in public, state or Bureau of Indian Affairs elementary schools in North Dakota. Fifty-three schools were included in the probability sample and 50 agreed to participate. Dental hygienists screened 1,015 children using a disposable dental mirror and penlight. Within the 50 participating schools, 73 percent of the enrolled children were screened.

### Key Findings

- ⇒ Dental decay remains a significant public health problem for North Dakota's third grade children.
  - 56 percent have cavities and/or fillings (decay experience).
  - 17 percent have untreated dental decay (cavities).
- ⇒ Many of North Dakota's third grade children have behaviors that increase their risk of tooth decay.
  - 27 percent reported that they had not brushed their teeth that day and 3 percent reported they did not have their own toothbrush.
  - 80 percent reported that they drank soda or sugared beverages during the last week.
- ⇒ Dental sealants are a proven method for preventing tooth decay and more than half of North Dakota's children (53%) have had this valuable preventive treatment.
- ⇒ Minority children have poorer oral health.
  - Compared to white non-Hispanic children, a significantly higher proportion of minority children have decay experience, untreated decay, and urgent dental needs.
  - At the time of the screening, 5 percent of minority children had decay so advanced that they had pain or an infection.
  - 36 percent of minority children had not brushed their teeth on the day of the screening and 12 percent reported that they did not have their own toothbrush.
- ⇒ Children in North Dakota have less untreated decay and more dental sealants than children in other states.
  - North Dakota ranks 2<sup>nd</sup> behind Vermont in the percentage of children without untreated decay.
  - North Dakota ranks 4<sup>th</sup> behind Vermont, Massachusetts and Idaho in the percentage of children with dental sealants.
- ⇒ North Dakota has met, and exceeded, the Healthy People 2010 objectives of reducing the prevalence of untreated decay and increasing the prevalence of dental sealants.

## Methods

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### Sampling

An electronic data file of all elementary schools in North Dakota was obtained from the North Dakota Department of Public Instruction. The data file, which was for the 2003-2004 school year, contained the following information for each school – district, type of school, enrollment by grade, and number of children participating in the free or reduced price lunch program. During the 2003-2004 school year, there were 364 schools in North Dakota with children in kindergarten, 1<sup>st</sup>, 2<sup>nd</sup>, and/or 3<sup>rd</sup> grade. Of these 364 schools, 317 were public, state or BIA and 47 were private. All public, state and BIA schools with 20 or more children in grades K-3 were included in the sampling frame (264 schools with a 3<sup>rd</sup> grade enrollment of 7,785). Implicit stratification by percent of children eligible for the free or reduced price lunch (FRL) program was used to select a probability sample of 53 schools. The sampling frame was ordered by percent of students eligible for the FRL program. A random number between 1 and 5 was selected (n=3); the 3<sup>rd</sup> school was selected with every 5<sup>th</sup> school thereafter. Selecting a sample using implicit stratification assures that the sample is representative of the state's schools in terms of free/reduced lunch participation. If a school refused to participate, a replacement school within the same sampling strata was selected. If the sample school plus one replacement school refused to participate, no data were collected in that sampling stratum. Of the 53 strata, data is available for 50.

*Data Management and Analysis:* Data entry and analysis was completed using Epi Info Version 3.2.2. Epi Info is a public access software program developed and supported by the Centers for Disease Control and Prevention. The data were not adjusted for non-response.

*Screening Methods:* All children in third grade were screened; unless they returned a consent form specifically requesting that they not take part in the survey (passive consent). The state's Oral Health Regional Dental Hygienist Consultants completed the screenings using gloves, penlights, and disposable mouth mirrors. The diagnostic criteria outlined in ***Basic Screening Surveys: An Approach to Monitoring Community Oral Health*** were used.

Information on age was obtained from the child while gender and race were determined by the screener. Each child was asked a series of questions regarding dental visits, oral hygiene, plus soda and milk consumption.

# Results

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## Overall Results

Of the 53 selected schools, 50 agreed to participate in the oral health survey. There were 1,393 children enrolled in the participating schools with 1,015 children screened; a 73 percent response rate. In terms of eligibility for the free and/or reduced price meal program, the participating schools did not differ substantially from either the 53 schools in the original sample or the 264 schools in the sampling frame. Refer to Tables 1 and 2.

The children screened ranged in age from 8-11 years with the majority being either 8 or 9 years of age. Slightly more than half of the children (54%) were male, 89 percent were white non-Hispanic, 7 percent were American Indian, and 2 percent were African-American. Refer to Table 3.

Fifty-six percent of the children screened had decay experience (untreated decay or fillings) in their primary and/or permanent teeth while 17 percent had untreated decay at the time of the screening.<sup>1</sup> About 18 percent of the children needed dental treatment including 1 percent in need of urgent dental care because of pain or infection. Refer to Table 4.

Fifty-three 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 caries. A clear or opaque 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. Refer to Table 4.

The vast majority of the children screened (95%) reported that they had been to a dentist at least once. About 73 percent reported that they had brushed their teeth on the day of the screening while 97 reported that they had their own toothbrush. In terms of dietary habits, 80 percent of the children reported drinking sodas or other sugared beverages in the last 7 days while 93 percent reported that they drank milk on a daily basis. Refer to Table 5.

## Impact of Race and Ethnicity

Table 6 compares the oral health of white non-Hispanic children with American Indian and all minority children. Please note that the sample sizes for American Indian and all minority children are small and the following results should be viewed with caution. Minority children, compared to white non-Hispanic children, have a substantially higher prevalence of caries experience, untreated decay, and urgent treatment needs. It is interesting to note that a significantly lower percentage of minority children reported having a toothbrush and having brushed their teeth on the day of the screening.

## Impact of Daily Tooth Brushing

Each child screened was asked if they had brushed their teeth on the day of the screening. While this is not true indicator of daily tooth brushing, and the reliability of a child’s response has not been evaluated, it can be used as a surrogate measure of regular tooth brushing. A significantly higher proportion of children who reported not brushing their teeth had untreated decay, compared to those

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<sup>1</sup> The percent of children with untreated decay is assumed to be an under estimation because radiographs (x-rays) were not taken.

who said they had brushed their teeth. These children were also less likely to report having their own tooth brush. Refer to Table 7.

### Impact of Daily Milk Consumption

There was no significant difference in any of the oral health indicators between children who reported drinking milk on a daily basis and those that did not drink daily. Refer to Table 8.

### Impact of Soda Consumption

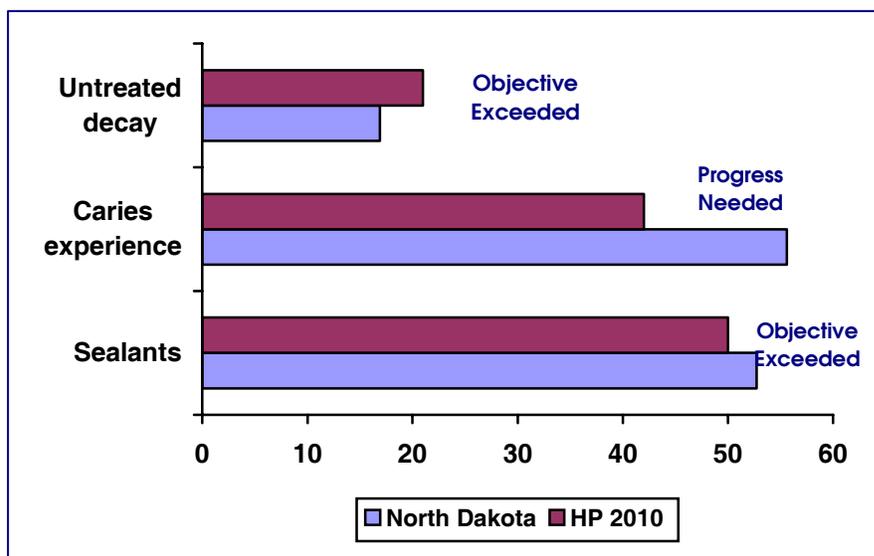
There was a trend toward a higher prevalence of untreated decay in children that drank four or more sodas in the last week, compared to those that did not drink soda, but the difference was not statistically significant. Refer to Table 9.

### Comparison to Healthy People 2010 Objectives

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 21percent.
- To increase the proportion of eight-year-olds receiving protective sealing of the occlusal surfaces of permanent molar teeth to 50 percent.

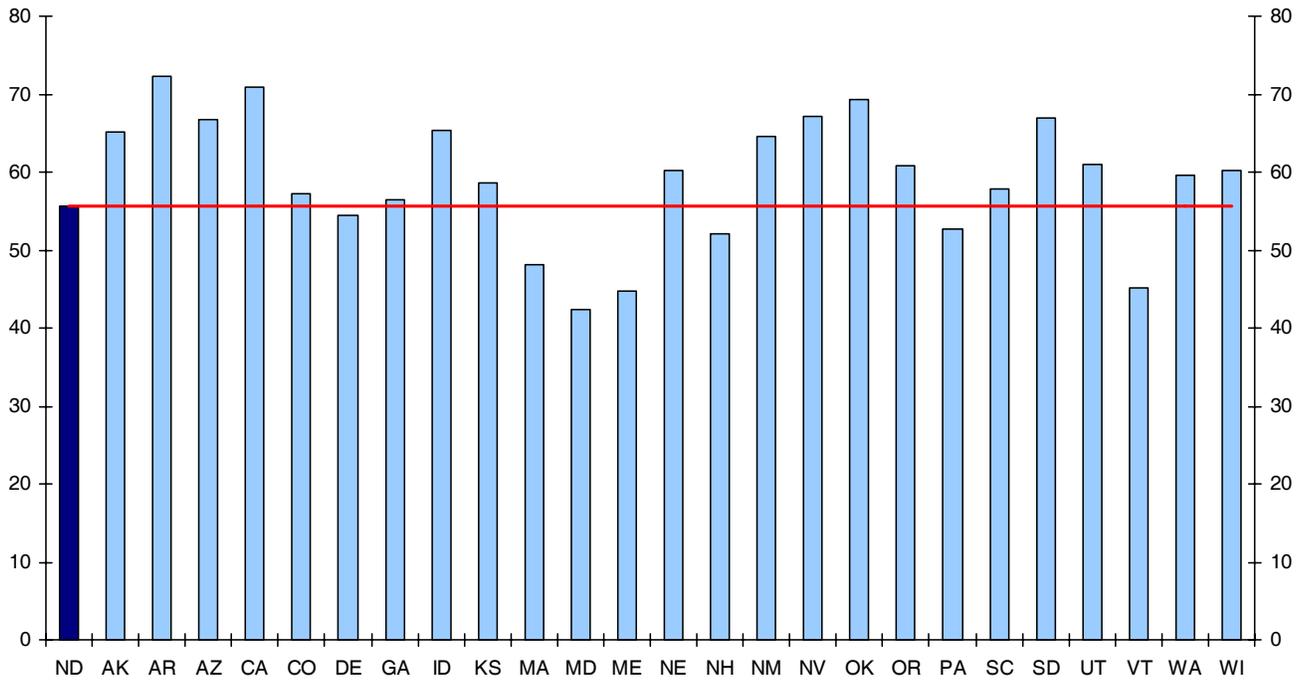
It should be noted that the North Dakota Oral Health Survey was not designed to be representative of 6-8 year old children; with the majority of children screened being 8-9 years of age. Fifty-six percent of the 3<sup>rd</sup> graders screened in North Dakota had experienced dental caries – substantially higher than the HP2010 objective of 42 percent. Seventeen percent of North Dakota’s 3<sup>rd</sup> graders had untreated caries compared to the HP2010 objective of 21 percent and 53 percent of North Dakota’s 3<sup>rd</sup> graders had dental sealants compared to the HP2010 objective of 50 percent.



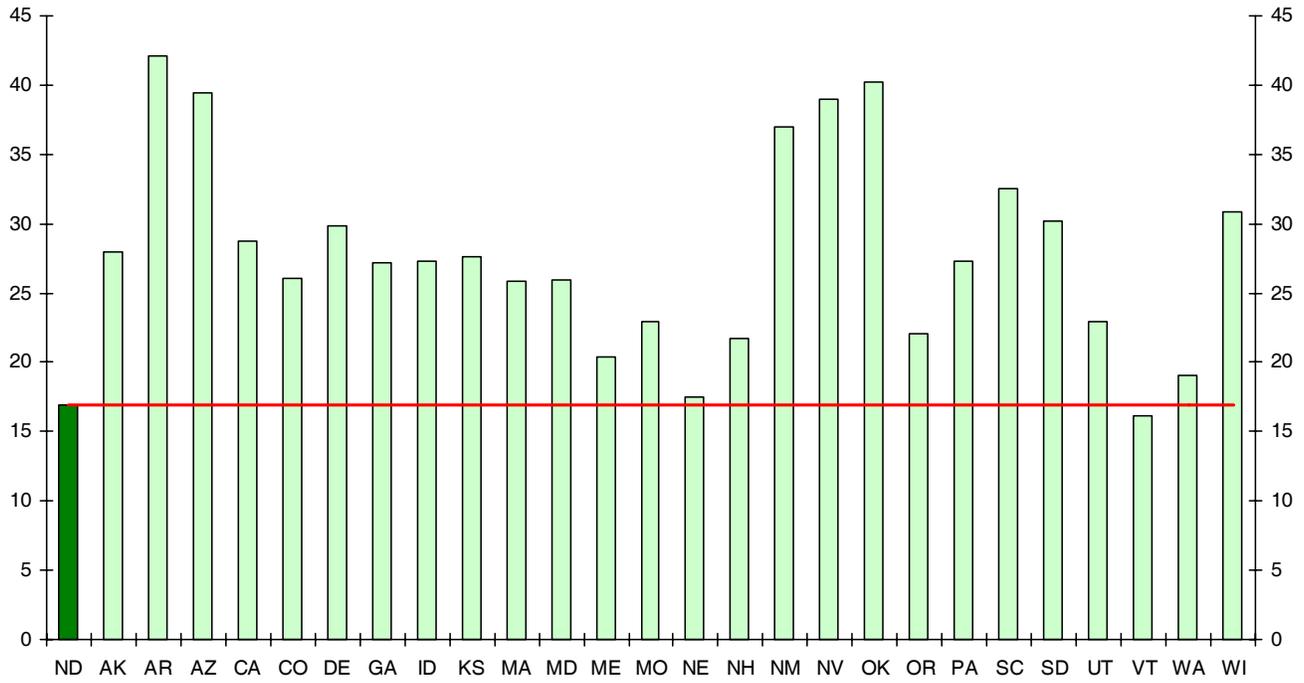
## Comparison to Other States

The Figures 1-3 compare the oral health of North Dakota's third grade children with the oral health of children from several other states. Each of the states represented in the figures gathered oral health status information using the same protocols as North Dakota. While the prevalence of caries experience in North Dakota is similar to other states, the prevalence of untreated decay is substantially lower in North Dakota – with only Vermont having a lower prevalence. The prevalence of dental sealants is higher in North Dakota than many other states – with only Vermont, Idaho and Massachusetts having a higher prevalence.

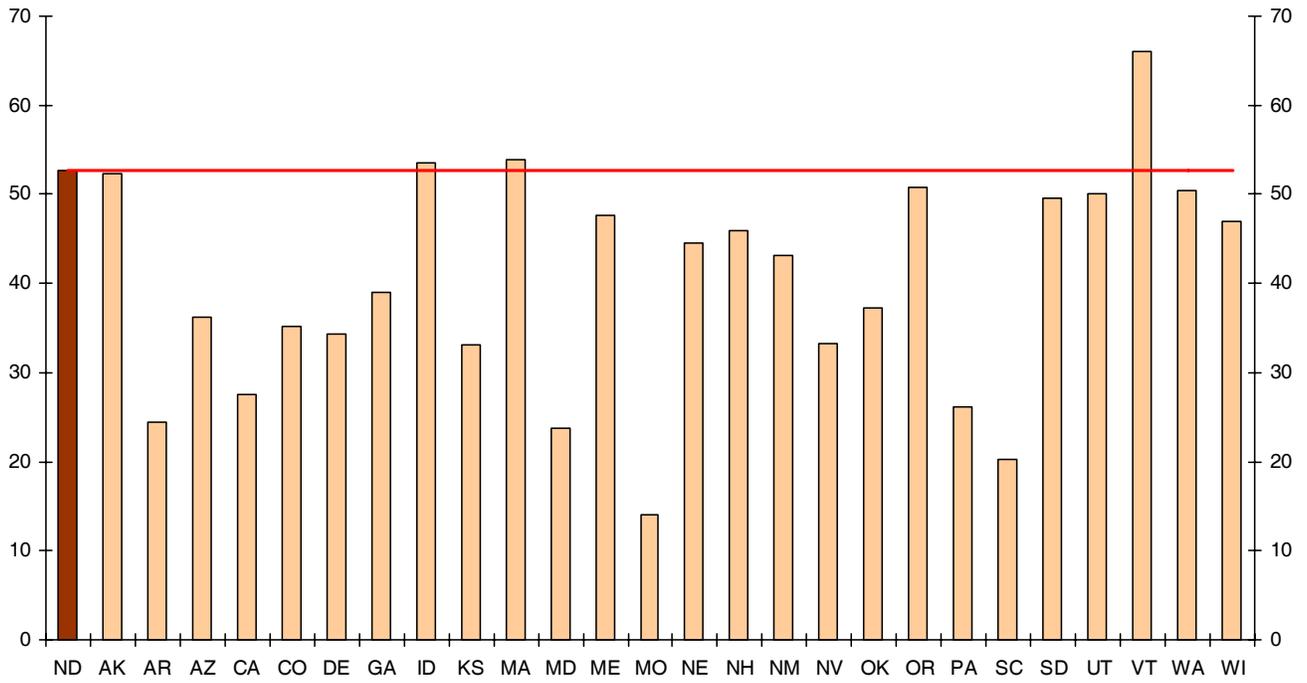
**Figure 1**  
**Prevalence of Decay Experience in 3<sup>rd</sup> Grade Children**  
**North Dakota Compared to Other States with Similar Data**



**Figure 2**  
**Prevalence of Untreated Decay in 3<sup>rd</sup> Grade Children**  
**North Dakota Compared to Other States with Similar Data**



**Figure 3**  
**Prevalence of Dental Sealants in 3<sup>rd</sup> Grade Children**  
**North Dakota Compared to Other States with Similar Data**



## DATA TABLES

**Table 1**  
**Participation in the North Dakota Oral Health Survey**

	Number of Schools	Number 3 <sup>rd</sup> Graders Enrolled	Number 3 <sup>rd</sup> Graders Screened	Response Rate
Sample Schools	53	1,524	1,015	66.6%
Participating Schools	50	1,393	1,015	72.9%

**Table 2**  
**Enrollment and Free/Reduced Price Lunch Program Participation in North Dakota Schools in  
Sampling Frame, Sample Schools and Participating Schools**

	3 <sup>rd</sup> Grade Enrollment	Percent on FRL
ND Schools in Sampling Frame (n=264)	7,785	29.0%
Sample Schools (n=53)	1,524	30.7%
Participating Schools (n=50)	1,393	31.1%

Source: North Dakota Department of Public Instruction, 2003-2004 School Year

**Table 3**  
**Age, Gender and Race/Ethnicity of 3<sup>rd</sup> Grade Children Screened**

<b>Variable</b>	<b>Number of Children With Valid Data</b>	<b>Mean or Percent</b>
<b>Age</b>		
Mean (Standard Deviation)	1,010	8.78 (0.55)
Range		8-11 years
<b>Gender</b>		
% Male	1,007	53.7%
% Female		46.3%
<b>Race</b>		
% White		88.9%
% American Indian/Alaska Native		6.7%
% African American	997	1.8%
% Asian		1.0%
% Hispanic		0.9%
% Native Hawaiian/Pacific Islander		0.7%

**Table 4**  
**Oral Health Status of North Dakota's 3<sup>rd</sup> Grade Children**

	Number with Data	Percent	95% CI
% with caries experience	1,014	55.6	52.5 – 58.7
% with untreated decay	1,015	16.9	14.7 – 19.4
% with dental sealants	1,015	52.7	49.6 – 55.8
<b>Treatment Need</b>			
% with no obvious problem	1,012	82.2	79.7 – 84.5
% needing early dental care		16.7	14.5 – 19.2
% needing urgent dental care		1.1	0.6 – 2.0

**Table 5**  
**Dental Visits, Oral Hygiene Habits, and Dietary Habits of North Dakota's 3<sup>rd</sup> Grade Children**

	Number with Data	Percent	95% CI
Has been to dentist (% yes)	1,015	95.2	93.6 – 96.4
Brushed teeth today (% yes)	1,015	73.4	70.5 – 76.1
<b>Toothbrush</b>			
Does not have one (% yes)	1,013	1.3	0.7 – 2.2
Shares one (% yes)		2.0	1.2 – 3.1
Has own toothbrush (% yes)		96.7	95.3 – 97.6
<b>Cans of soda in past 7 days</b>			
0	1,010	20.0	17.6 – 22.6
1		30.4	27.6 – 33.4
2		20.4	18.0 – 23.0
3		10.4	8.6 – 12.5
4 or more sodas		10.4	8.6 – 12.5
Other sugared beverages		8.4	6.8 – 10.3
Drinks milk everyday (% yes)	1,004	92.7	90.9 – 94.2

**Table 6**  
**Demographics, Oral Health Status, Oral Hygiene and Nutritional Habits**  
**Of North Dakota's 3<sup>rd</sup> Grade Children Stratified by Race**

<b>Variable</b>	<b>White (n=886)</b>	<b>American Indian (n=67)</b>	<b>All Minorities* (n=111)</b>
Mean age (standard deviation)	8.76 (0.53)	8.87 (0.65)	8.86 (0.68)
% with caries experience	54.1 (50.0- 57.4)	82.1 (70.8 – 90.4)	69.4 (59.9 – 77.8)
% with untreated decay	15.8 (13.5 – 18.4)	32.8 (21.8 – 45.4)	26.1 (18.2 – 35.3)
% with dental sealants	54.0 (50.6 – 57.3)	43.3 (31.2 – 56.0)	45.0 (35.6 – 54.8)
% needing treatment	16.4 (14.1 – 19.1)	35.8 (24.5 – 48.5)	28.8 (20.6 – 38.2)
% needing urgent treatment	0.5 (0.1 – 1.2)	7.5 (2.5 -16.6)	5.4 (2.0 – 11.4)
Has been to dentist (% yes)	95.0 (93.3 – 96.3)	97.0 (89.6 – 99.6)	96.4 (91.0 – 99.0)
Brushed teeth today (% yes)	74.7 (71.7 – 77.5)	55.2 (42.6 – 67.4)	64.0 (54.3 – 72.9)
Has own toothbrush (% yes)	97.9 (96.6 – 98.7)	80.6 (69.1 – 89.2)	88.3 (80.8 – 93.6)
Drinks milk everyday (% yes)	93.4 (91.5 – 94.9)	83.1 (71.7 – 91.2)	88.0 (80.3 – 93.4)
Drank soda or sugared beverages in last 7 days (% yes)	79.3 (76.4 – 81.9)	88.1 (77.8 – 94.9)	85.5 (77.5 – 91.5)

\* Includes children classified as American Indian, African American, Hispanic, Asian, or Pacific Islander

**Table 7**  
**Demographics, Oral Health Status, Oral Hygiene and Nutritional Habits**  
**Of North Dakota's 3<sup>rd</sup> Grade Children Stratified by Tooth Brushing Status**

Variable	Brushed Teeth Today (n=745)	Did Not Brush Teeth Today (n=270)
Mean age (standard deviation)	8.76 (0.52)	8.83 (0.60)
% white non-Hispanic	90.3 (87.9 – 92.3)	84.8 (79.9 – 88.9)
% with caries experience	53.5 (49.8 – 57.1)	61.5 (55.4 – 67.3)
% with untreated decay	13.8 (11.5 – 16.6)	25.6 (20.5 – 31.2)
% with dental sealants	54.8 (51.1 – 58.4)	47.0 (41.0 – 53.2)
% needing treatment	14.6 (12.1 – 17.3)	26.7 (21.5 – 32.4)
% needing urgent treatment	0.7 (0.2 – 1.7)	2.2 (0.8 – 4.8)
Has been to dentist (% yes)	94.9 (93.0 -96.3)	95.9 (92.8 – 97.9)
Has own toothbrush (% yes)	97.8 (96.4 – 98.7)	93.7 (90.1 – 96.3)
Drinks milk everyday (% yes)	93.9 (91.8 – 95.4)	89.6 (85.4 – 93.0)
Drank soda or sugared beverage in last 7 days (% yes)	81.0 (77.9 – 83.7)	77.3 (71.8- 82.2)

**Table 8**  
**Demographics, Oral Health Status, Oral Hygiene and Nutritional Habits**  
**Of North Dakota's 3<sup>rd</sup> Grade Children Stratified by Milk Consumption**

Variable	Drinks Milk Everyday (n=931)	Does Not Drink Milk Everyday (n=73)
Mean age (standard deviation)	8.78 (0.54)	8.82 (0.61)
% white non-Hispanic	89.6 (87.4 – 91.5)	81.7 (70.7 – 89.9)
% with caries experience	55.6 (52.3 – 58.8)	57.5 (45.4 – 69.0)
% with untreated decay	16.3 (14.0 – 18.9)	27.4 (17.6 – 39.1)
% with dental sealants	53.5 (50.2 – 56.7)	42.5 (31.0 – 54.6)
% needing treatment	16.9 (14.6 – 19.5)	28.8 (18.8 – 40.6)
% needing urgent treatment	1.0 (0.5 – 1.9)	2.7 (0.3 – 9.5)
Has been to dentist (% yes)	95.0 (93.3 – 96.2)	97.3 (90.5 – 99.7)
Brushed teeth today (% yes)	74.0 (71.0 – 76.8)	61.6 (49.5 – 72.8)
Has own toothbrush (% yes)	97.1 (95.7 – 98.0)	93.2 (84.7 – 97.7)
Drank soda in last 7 days (% yes)	80.5 (77.7 – 82.9)	76.7 (65.4 – 85.8)

**Table 9**  
**Demographics, Oral Health Status, Oral Hygiene and Nutritional Habits**  
**Of North Dakota's 3<sup>rd</sup> Grade Children Stratified by Soda and Sugared Beverage Consumption**

Variable	Did Not Drink Soda (n=202)	Drank Soda or Sugared Beverage (n=808)	Drank 4 or More Cans in Last 7 Days (n=105)
Mean age (standard deviation)	8.76 (0.52)	8.78 (0.55)	8.81 (0.56)
% white non-Hispanic	92.0 (87.3 – 95.3)	88.1 (85.6 – 90.3)	83.5 (74.9 – 90.1)
% with caries experience	52.0 (44.9 – 59.0)	56.5 (53.0 – 59.9)	61.0 (50.9 – 70.3)
% with untreated decay	14.4 (9.8 – 20.0)	17.7 (15.2 – 20.5)	26.7 (18.5 – 36.2)
% with dental sealants	58.4 (51.3 – 65.3)	51.2 (47.7 – 54.7)	45.7 (36.0 – 55.7)
% needing treatment	16.9 (12.0 – 22.8)	18.1 (15.5 – 21.0)	29.5 (21.0 – 39.2)
% needing urgent treatment	0.5 (0.0 – 2.7)	1.2 (0.6 – 2.3)	2.9 (0.6 – 8.1)
Has been to dentist (% yes)	97.0 (93.6 – 98.9)	94.7 (92.8 – 96.1)	93.3 (86.7 – 97.3)
Brushed teeth today (% yes)	69.8 (63.0 – 76.0)	74.3 (71.1 – 77.2)	72.4 (62.8 – 80.7)
Has own toothbrush (% yes)	95.5 (91.7- 97.9)	97.0 (95.5 – 98.0)	93.3 (86.7 – 97.3)
Drinks milk everyday (% yes)	91.4 (86.6 – 94.9)	93.0 (91.0 – 94.6)	84.6 (76.2 – 90.9)

**Appendix**  
**Sampling Strata, School District, School Name, Type of School, and Percent of Students in School that Participate in the Free or Reduced Price School Lunch Program**

STRATA	DISTRICT NAME	SCHOOL NAME	TYPE	FRL %
1	Mandaree Public School	Mandaree Public School	Public	0.0%
2	Ojibwa Indian School	Ojibwa Indian School	BIA	0.0%
3	MISSING STRATA			0.0%
4	Fargo Public Schools	Hawthorne Elem School	Public	8.1%
5	Bismarck Public Schools	Centennial Elem School	Public	9.5%
6	Pembina School District	Pembina Public School	Public	11.7%
7	North Sargent Public School	North Sargent Public School	Public	13.1%
8	Milnor Public School	Milnor Public School	Public	15.4%
9	West Fargo Public School	Westside Elem School	Public	17.1%
10	Neche Public School	Neche Public School	Public	18.6%
11	Grand Forks Public School	Century Elem School	Public	19.7%
12	Lisbon Public School	Lisbon Elem School	Public	21.6%
13	Mandan Public Schools	Roosevelt Elem School	Public	23.3%
14	Manvel Public School	Manvel Elem School	Public	24.1%
15	Beulah Public School	Beulah Elem School	Public	24.4%
16	Minot Public Schools	Edison Elem School	Public	25.3%
17	Hankinson Public School	Hankinson Public School	Public	26.1%
18	Tioga Public School	Central Elem School	Public	27.6%
19	Nesson Public School	Ray Public School	Public	28.7%
20	Fairmount Public School	Fairmount Public School	Public	29.0%
21	Fargo Public Schools	McKinley Elem School	Public	29.8%
22	Westhope Public School	Westhope Public School	Public	30.4%
23	Hettinger Public School	Hettinger Public School	Public	31.3%
24	Harvey Public Schools	Harvey Elem School	Public	32.0%
25	LaMoure Public School	LaMoure Public School	Public	32.5%
26	Minot Public Schools	Longfellow Elem School	Public	33.0%
27	MISSING STRATA			33.7%
28	Billings County School District	Prairie Elem School	Public	34.6%
29	Sheldon Public School	Sheldon Elem School	Public	35.0%
30	MISSING STRATA			35.7%
31	Stanton Public School	Stanton Public School	Public	36.3%
32	Williston Public School	Hagan Elem School	Public	37.4%
33	Fargo Public Schools	Carl Ben Eielson Elem	Public	37.9%
34	Kenmare Public School	Kenmare Elem School	Public	39.2%
35	Jamestown Public School	Louis L'Amour Elem Sch	Public	39.8%
36	St Thomas Public School	St Thomas Public School	Public	41.1%
37	New Public School District	Stony Creek Elem School	Public	42.4%
38	Williston Public School	Wilkinson Elem School	Public	42.5%

STRATA	DISTRICT NAME	SCHOOL NAME	TYPE	FRL %
39	Burke Central School	Burke Central Public School	Public	43.4%
40	Midway Public School	Midway Public School	Public	44.0%
41	Elgin/New Leipzig Public School	Elgin Public School	Public	46.3%
42	Minot Public Schools	North Plains Elem School	Public	47.9%
43	Edgeley Public School	Edgeley Public School	Public	49.2%
44	Flasher Public School	Flasher Public School	Public	50.4%
45	Hebron Public School	Hebron Public School	Public	51.3%
46	Midkota Schools	Midkota Elem School	Public	52.9%
47	McClusky Public School	McClusky Elem School	Public	54.5%
48	Grand Forks Public School	Lake Agassiz Elem School	Public	57.0%
49	Fargo Public Schools	Madison Elem School	Public	59.6%
50	Minnewaukan Public School	Minnewaukan Public School	Public	69.7%
51	Bismarck Public Schools	Riverside Elem School	Public	71.5%
52	Apple Creek	Apple Creek Elem School	Public	NA
53	South Heart	South Heart Public School	Public	NA