



**Saskatchewan
Dental Health
Screening Program
2008-2009 Report**

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December, 2010**

**Produced by the Dental Health Promotion
Working Group of Saskatchewan**

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The Saskatchewan Dental Health Screening Program 2008-2009 is a joint endeavour of all the health regions in Saskatchewan. The report recognizes and applauds the contribution of the members of the Dental Health Promotion Working Group of Saskatchewan and dental therapists who participated. This included:

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Message from the Chair of the Medical Health Officers Council of Saskatchewan



Medical Health Officers' Council of Saskatchewan

Dr. Mark Vooght, Chairman
Phone: 691-1540 Fax: 691-1539
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<p>Dr. David Torr Cypress</p> <p>Dr. Mark Vooght Five Hills</p> <p>Dr. Mohammad Khan Kelsey Trail</p> <p>Dr. James Irvine Dr. Moliehi Khaketla Mamawetan Churchill River, Keewatin Yatthé & Athabasca</p> <p>Dr. Brenda Cholin Prairie North</p> <p>Dr. Khami Chokani Prince Albert Parkland</p> <p>Dr. Tania Diener Dr. Maurice Hennink Regina-Qu'Appelle</p> <p>Dr. Cory Neudorf Dr. Johnmark Opondo Dr. Steve Whitehead Dr. Ross Findlater Saskatoon</p> <p>Dr. David Torr Heartland</p> <p>Dr. Shauna Hudson Sun Country</p> <p>Dr. Mandiangu Nsungu Sunrise</p> <p>Dr. Ibrahim Khan First Nations and Inuit Health Program-Sask, Health Canada</p> <p>Dr. Abayomi Olaniyi Northern Inter-Tribal Health Authority</p> <p>Dr. Moira McKinnon, CMHO Dr. Saqib Shahab, DMHO Dr. Val Mann, PhD Epidemiology Saskatchewan Health</p> <p>Dr. Greg Horsman Dr. Paul Levett Saskatchewan Disease Control Laboratory</p>	<p>December 17, 2010</p> <p>The Saskatchewan School Children's Dental Screening Report is a valuable account of child oral health status. Oral health is an important component of overall health and wellness, and is thus an important area for ongoing study.</p> <p>The report indicates a need for enhanced provincial preventive and treatment strategies, focusing on targeting and eliminating barriers to care in priority communities. These priority communities include children living in rural, low income, northern and non-fluoridated communities. Strategies need to embrace children who face unmet oral health needs.</p> <p>The Medical Health Officers Council of Saskatchewan (MHOCOS) is committed to the promotion of oral health in the province, and commends the authors of the report for its thoroughness. We look forward to continuing the partnerships with all those who strive to improve oral health in our province.</p> <p>Sincerely yours,</p> <p></p> <p>Mark Vooght MB. ChB. M.Med (Com Health); LMCC Chairman, MHOCOS</p> <p>MV/sp</p>
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Message from the Dean of the University of Saskatchewan, College of Dentistry



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January 21, 2011

Residents of Saskatchewan should be entitled to the fundamental human right of enjoying complete health and well-being which enables them to live full and productive lives. Simply stated, oral health is an intrinsic component of complete health and well-being and if people suffer oral health disparities then they cannot truly be *healthy*.

The Saskatchewan Dental Health Screening Program 2008-2009 Report provides a valuable point in time synopsis of the oral health status of Saskatchewan's grade one and grade seven schoolchildren. We know that the best predictor of future oral health disease is existing disease status and we also know that those at high risk for oral diseases face access to care barriers. The 2008-2009 Report clearly illustrates that we in Saskatchewan have a long way to go before we can demonstrate that everyone has equitable access to oral health care. I thank everyone involved in the development of the 2008-2009 Report for their efforts and hard work. The Report is a valuable resource that will enable the development and refinement of oral health strategies for Saskatchewan.

Oral diseases are all but completely preventable yet Saskatchewan still has far too many of its residents suffering from unmet dental needs because they face access to care barriers. The College of Dentistry is committed to working in partnership with all interested stakeholders so that we may move closer to achieving our ultimate goal of assuring sound oral health for all of Saskatchewan's residents.

Sincerely,



Dr. Gerry Uswak
Dean

Preface

The Dental Health Education program in each health region in Saskatchewan conducted an oral health screening of Grade One and Grade Seven students during the 2008-2009 school year.

The purpose of this screening was to assess oral health needs and to identify children with unmet dental needs and refer those in obvious need of dental treatment. The Dental Health Education program in each Saskatchewan health region will continue to use the screening results to develop strategies to decrease the number of children experiencing tooth decay. Since tooth decay is largely preventable, we collaborate with early childhood programs by enhancing oral health content in pre-natal, post-natal and parenting programs.

This report is available on the website of each health region.

Executive Summary

A visual dental health screening was conducted in Saskatchewan during the 2008-2009 school year to assess oral health status, monitor trends, identify children with unmet dental needs, determine the schools that are at high risk for caries, gauge the effectiveness of preventive dental programs and to provide needs-based assessment data for the health regions. Following the termination of Saskatchewan Children's Dental Plan in 1993, the Saskatchewan Health - Dental Health Education Program introduced a screening component to be repeated on a five year interval basis. The 2008-2009 marks the fourth of these screening surveys.

The screening recorded the proportion of children screened by location (See **Table 2**), gender distribution (See **Table 3**), mean age of student for Grade One and Grade Seven and proportion of schools that have access to community water fluoridation (See **Table 4**). The proportion of children with Malocclusion, Staining, Gingivitis and Calculus were included under Dental Health Needs. (See **Table 5-A, B, C**)

Unmet dental needs were measured based on Priority scores for both Grade One and Grade Seven students. In Grade One, 4.1% (375) of the children were found to have urgent dental treatment needs. In Grade Seven, 0.9% (78) of the children were found to have urgent dental treatment needs. In Grade One, 23.1% (2093) of the children were referred to see their dentist for treatment as soon as possible. In Grade Seven, 10.5 % (925) of the children were referred to see their dentist for treatment as soon as possible. (See **Table 13-A, B**)

Early Childhood Caries (ECC), defined as decay on primary anterior teeth, was experienced by 6.6% (604) of Grade One children. This percentage has decreased considerably since 2003-04 screenings. (See **Table 15**)

For children in Grade One, tooth decay in the primary dentition remains a significant childhood problem, equally also for children in Grade Seven, tooth decay in the

permanent dentition. The results of the 2008-2009 screening showed that children in Grade One, in Saskatchewan are experiencing more dental decay than in the 2003-04 screening year. In 2008-2009, 27.5 % of Grade One children have dental caries compared to 25.5% in 2003-04. (See **Table 15**)

The prevalence of Early Childhood Caries (ECC) was recorded only for Grade One students; where as decay by the number of affected quadrants (occlusal/interproximal) was recorded for both Grade One and Grade Seven students. The screening assessed the past and present dental caries experience by a measure of cumulative indices for both primary (dft) and permanent (DMFT) dentition, as well as individual components to gauge barriers to access dental care ('d'/'D' component) and access of dental care ('m', 'f'/'M', 'F' components). Additional information collected included: no evidence of dental care (NEC), no decay evident (NDE), early childhood caries (ECC), and the presence of pain and/ or infection. (See **Appendix 1**)

Optional information collected included tobacco usage for Grade Seven students, information regarding any type of dental insurance coverage, visit to a dental office, history of dental sealants placed and usage of mouth guards was collected.

Dental health trends were identified, by comparing results from previous screening years for only Grade One students, as Grade Seven students are included in the analysis for the first time. Dental health measurements were done between urban and rural school children, Hutterite and non-Hutterite schools, (only Cypress and Heartland Health Regions) children attending schools that have access to community water fluoridation and in schools located in low-income neighbourhoods. (City of Regina and Saskatoon)

Children from rural, low income neighbourhood schools, Hutterite schools and schools having no access to community water fluoridation were more likely to be experiencing caries, pain or infection, show no evidence of care (NEC) and at the same time are less likely to be cavity-free.

In Grade One, 41.5% of the students were cavity-free and the unmet dental needs was 27.1%. These findings do not meet the Canadian Oral Health Strategy Guidelines (2010) for Grade One.¹ In Grade Seven, only 66.2% of the students have never experienced decay in their permanent dentition, unmet dental needs were 11.4%, Average ‘DMFT’ was 0.80 and the ‘Significant Caries Index’ (SiC) was 3.00. These findings partially meet the Canadian Oral Health Strategy Guidelines (2010) for Grade Seven¹. (See **Table 17** and **18**)

In 2008-2009, dental health disparities were noted between children attending schools located in urban and rural communities. The average ‘deft/DMFT’ per child attending a school in urban community was 1.91 compared to 2.35 for a child attending a school in rural community. Also, 55.4% of children attending schools in urban communities were caries-free compared to 43.8% of children attending schools in rural communities. (See **Table 19**)

In 2008-2009, dental health disparities were noted between children attending schools with community water fluoridation and schools without access to community water fluoridation. The average ‘deft/DMFT’ per child attending a school with community water fluoridation was 1.61 compared to 2.48 for a child not attending a school with community water fluoridation. Also, 58.1% of children attending schools with community water fluoridation were caries-free compared to 43.9% of children attending schools without community water fluoridation. (See **Table 20**)

In 2008-2009, dental health disparities were measured between Hutterite and non-Hutterite school children residing in Cypress and Heartland Health Regions. The average ‘deft/DMFT’ per Hutterite child (Grade One or Grade Seven) was 4.51 compared to 1.89 for a non-Hutterite child. Also, 17.5% of Hutterite school children were caries-free compared to 53.9% of non-Hutterite school children. (See **Table 21**)

In 2008-2009, dental health disparities were noted between children attending schools located in low-income neighbourhoods and schools not located in low-income

neighbourhoods in the cities of Saskatoon and Regina. The average 'deft/DMFT' per child attending a school in low-income neighbourhood was 3.46 compared to 1.79 for a child not attending a school in low-income neighbourhood. Also, 37.2% of children attending schools located in a low-income neighbourhood were caries-free compared to 56.7% of children attending schools not located in a low-income neighbourhood. (See **Table 22**)

Epidemiological studies include relative risk and odds ratio for being cavity-free in comparison with other health regions, within the health region and Saskatchewan as a whole. (See **Tables 32-35**)

Introduction

“...oral health and general health should not be interpreted as separate entities”
- Surgeon General’s Report on Oral Health of America, 2000

Oral health is an inseparable and essential part of total health and contributes to overall well being. It has the potential to impact a person’s health status, affecting the ability to eat and speak properly, quality of life, self-esteem and levels of usual activity (Yost & Yihong, 2008)².

According to the World Health Organization, a healthy oral cavity is a state free from chronic oro-facial pain, oro-pharyngeal cancer, oral ulcers, congenital oro-facial defects such as cleft palate and cleft lips, dental caries, tooth fatality due to dental caries and other pathological factors that affect the oral cavity.³

Poor oral health and untreated tooth decay is a huge economic burden that exceeds most other health conditions. The burden is disproportionately more on lower income people and Aboriginal populations. These disparities were emphasized in the Canadian Oral Health Strategy guidelines for 2010, which states that in Canada, people from low income had 2.5 to 3 times higher treatment and decay rates, where as rates for First Nations and Inuit people for all age groups ranged from 3 to 5 times higher than non-aboriginal population.¹

Dental caries is the most common chronic disease affecting children, occurring 5-8 times more frequently than asthma, which is the second most common chronic disease among children.¹ Early Childhood Caries (ECC) is one of the most destructive forms of dental caries affecting primary teeth that can have a negative impact on the oral health of infants and children. It is preventable, with education, counselling, prevention and anticipatory guidance (AAPD, 2004). Lack of dental health education, improper pacifier use, improper feeding practices in which a child is put to bed with either milk or food in the oral cavity, improper oral hygiene practices in which a child is put to bed without

cleaning the oral cavity, dental health insurance and reduced access to dental care are some of the social variables that contribute to the prevalence of ECC.^{2,4}

Research has shown that fluoride at optimal levels in the drinking water is the most cost-effective community based preventive strategy for preventing and reducing the incidence of dental caries. Fluoride can be found in other sources such as mouthrinse and toothpaste, as well as professional applications. Long term exposure to optimal levels of fluoride results in diminishing levels of caries in both children and adult populations.⁵ Dental sealants placed on permanent teeth would prevent most of the dental caries in children.⁶

There is a clear co-relation between community socio-economic status and children's oral health. Caries experience in primary teeth was significantly higher in children with low socio-economic status. Also, the proportion of untreated caries in primary teeth and permanent teeth, dental treatment priority needs and incisor trauma was higher in children with low socio-economic status.⁷

The dental screening oral health status report has been tracking the patterns and trends of dental health indicators in Saskatchewan. This report will present information regarding Grade Seven students, epidemiological studies and optional information for the first time. This report also describes the methodology for conducting the 2008-2009 dental screening and the results, which will be shared with policy makers, dental fraternity and stakeholders.

Water Fluoridation in Canada

Community water fluoridation is the most cost-effective means of preventing tooth decay. A reduction of 20-40% of decay can be achieved with water fluoridation.^{8,9} In Canada, the Canadian Public Health Association states that fluoridation is one of the 12 greatest public health milestones of the past 100 years. In US, American Dental Association, Center for Disease Control and Prevention and the American Academy of Pediatric Dentistry support water fluoridation based on evidence as safe and effective.¹⁰ The Center for Disease Control and Prevention hails water fluoridation as one out of the ten great public health achievements of 20th century¹¹ and the World Health Organization believes access to fluoride is a basic human right.¹²

In Canada, during April 2008, Health Canada made public the findings and recommendations from the expert fluoride panel, which consisted of 6 members¹³. The panel concluded that 0.7mg/L of fluoride in drinking water protects teeth against decay, while minimizing the risk of dental fluorosis. Further, the panel found no health risks due to mild dental fluorosis and noted that the prevalence of moderate fluorosis in Canada is on a decline. Despite this, community water fluoridation remains a contentious issue.¹²

Based on the Provincial and Territorial estimates for community water fluoridation coverage (2007), the percentage of Canadian population with fluoridated water was 45.1% and in Saskatchewan it was 36.8%, which is below the national percentage.¹²

Methods

Dental screening was offered to all Grade One and Grade Seven students who attended schools in Saskatchewan between September 2008 and June 2009.

Licensed Saskatchewan Dental Therapists assessed the child's oral health via a visual examination, using a mouth mirror and LED (Light-emitting diode) flashlight. Oral health status indicators collected were the filled/ restored teeth (represents access to dental care) and cavitated lesions/ untreated tooth decay (represents a barrier to dental care).

Students were assessed for possible dental health needs, and these were communicated via a 'Dental Screening Advance Information Letter', 2008-2009. (See **Appendix 2**) and 'Dear Parent/Guardian' letter (See **Appendix 3**). All students received basic recommendations for oral hygiene, including illustrations of proper flossing and tooth brushing techniques.

Screening data, including basic demographic information for each child was entered into an Access database by regional Dental Health Educators. Data was exported to Excel and into SPSS 17.0 (SPSS Inc. 2009, Chicago, Ill.) for analysis. Data was cleaned and compared to the original database where anomalous or missing values which were not resolvable, were excluded from analysis.

For the purpose of dental health disparity, both Grade One and Grade Seven students were analyzed together. Based on the postal code of the school, children were classified either into 'urban' or 'rural'. Based on the school access to community water fluoridation, children were classified either into 'fluoridated' or 'non-fluoridated'; then based on ethnicity, either into 'Hutterite' or 'non-Hutterite' (only data from Cypress Health Region and Heartland Health Region included). Based on the location of a school in a low-income neighbourhood, children were classified either into 'low-income cut off'

and ‘non-low income cut off’ (Data from only City of Saskatoon and Regina included) categories respectively and analysed accordingly.

Epidemiological studies, involving Odds ratio for being cavity-free were calculated using the software OpenEpi, Version 2.3 (2009, Emory University, USA).

Results

Participation

Table 1: Participation in the Dental Health Screening, Saskatchewan, 2008-2009

Grade	Total Enrollment*	Screened Number	Refused Number*	Absent Number*	Consent forms not returned*
	(n)	n (%)	n (%)	n (%)	n (%)
Grade One	10688	9079 (85.0)	644 (6.0)	626 (5.8)	339 (3.2)
Grade Seven	11432	8835 (77.2)	1110 (9.7)	865 (7.5)	622 (5.6)

*Sun Country Health Region data not included.

Location

17914 students were included in the analysis. Of the total number of students screened, 10100 students (56.4%) attended urban schools and 7813 students (43.6%) attended rural schools.

Table 2: Percentage of Students Screened by Health Region, 2008-2009

Location of School	Screened Number	Percentage
Cypress Health Region	857	4.8
Five Hills Health Region	734	4.1
Heartland Health Region	877	4.9
Keewatin Yatthé Health Region	222	1.2
Kelsey Trail Health Region	770	4.3
Mamawetan Churchill River Health Region	355	1.9
Prince Albert Parkland Health Region	961	5.4
Prairie North Health Region	1208	6.7
Regina Qu'Appelle Health Region	4044	22.6
Saskatoon Health Region	5917	33.0
Sun Country Health Region	871	4.9
Sunrise Health Region	1098	6.1

Majority of the schools included in the analysis were from Saskatoon Health Region (33.0%), Regina Qu'Appelle Health Region (22.6%), and the rest were from other small health regions in Saskatchewan. (See **Table 2**)

Gender Distribution

The proportion of male students screened seems to be higher than female students.

Among Grade One students screened, 50.3 % (4564) were male, and 48.3 % (4387) were female. Among Grade Seven students screened 50.2 % (4438) were male, and 48.4 % (4275) were female. (See **Table 3**)

Table 3: Gender of Students Screened, Saskatchewan, 2008-2009

Grade	Male		Female	
	Number	Percentage	Number	Percentage
Grade One	4564	50.3	4387	48.3
Grade Seven	4438	50.2	4275	48.4

Gender not recorded for 1.4% (128) Grade One students.

Gender not recorded for 1.4% (122) Grade Seven students.

Age

Student's date of birth and date of examination were entered into the screening database. Mean age of a child was calculated with age as of January 30th 2009.

For Grade One students, the mean age as of January 30th 2009 was 6.59 years.

For Grade Seven students, the mean age as of January 30th 2009 was 12.65 years.

Water Fluoridation

The percentage of students screened attending schools that had access to community water fluoridation in Saskatchewan during 2008-2009 dental screening is 41.7% (7477/17914). Among all the health regions, Saskatoon Health Region had the highest number of children attending schools with access to fluoridated water. (See **Table 4**)

Table 4: Percentage of Students attending Schools having access to Community Water Fluoridation in each Health Region in Saskatchewan, 2008-2009

Location of School	Number	Percentage
Cypress Health Region	378	44.2
Five Hills Health Region	533	72.6
Heartland Health Region	335	38.2
Keewatin Yatthé Health Region	0	-
Kelsey Trail Health Region	309	40.1
Mamawetan Churchill River Health Region	0	-
Prince Albert Parkland Health Region	107	11.1
Prairie North Health Region	131	10.8
Regina Qu'Appelle Health Region	115	2.8
Saskatoon Health Region	5157	87.2
Sun Country Health Region	175	20.1
Sunrise Health Region	237	21.6

Dental Health Assessment

The basic measures of dental health included assessment of outstanding treatment needs, past and present dental caries experience. Decay experience includes decayed teeth, filled teeth, or teeth that were extracted due to decay.

There were 2203* (25.8%) Grade One students who participated in a fluoride mouth rinse program at school. There were 431 students (4.7%) that had existing fillings that required treatment, with 5104 (56.2%) students receiving a recommendation to have dental sealants placed.

There were 1116* (13.2%) Grade Seven students that participated in a regular fluoride mouth rinse program at school. There were 141 students (1.6%) that had existing fillings that required treatment, with 5605 (63.4%) of students receiving a recommendation to have dental sealants placed.

*Data from Prince Albert Parkland Health Region not recorded.

The factors malocclusion, staining, gingivitis and presence of calculus were included to assess other Dental Health Needs, the extent of which is illustrated in **Figure 1** and **Tables 5-A, B, C**.

Figure 1: Dental Health Needs, Grade One and Grade Seven Students, Saskatchewan, 2008-2009

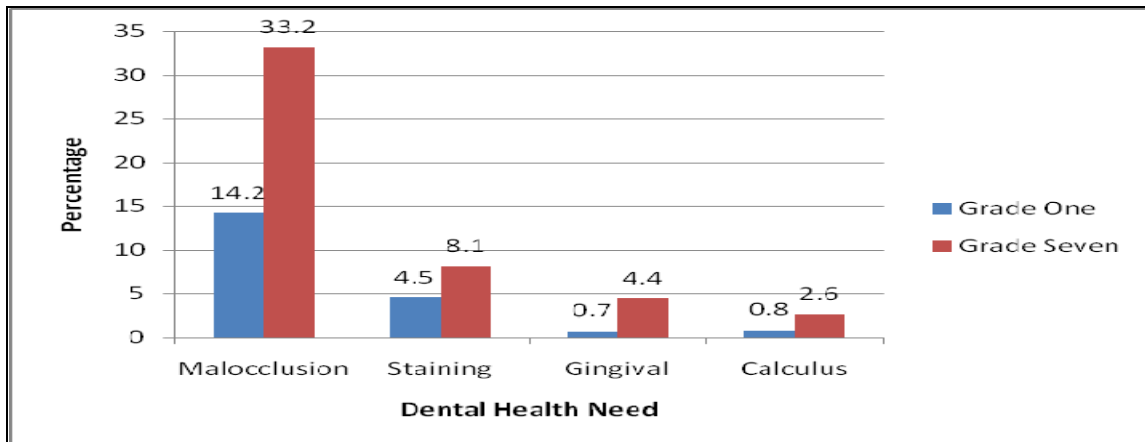


Table 5: Grade One and Grade Seven Students Dental Health Needs, Saskatchewan 2008-2009

Table 5A: Grade One Students Dental Health Needs, Saskatchewan, 2008-2009

Dental Health Need	Malocclusion	Staining	Gingival	Calculus
Number	1289	405	63	75
Percentage	14.2%	4.5%	0.7%	0.8%

Table 5B: Grade Seven Students Dental Health Needs, Saskatchewan, 2008-2009

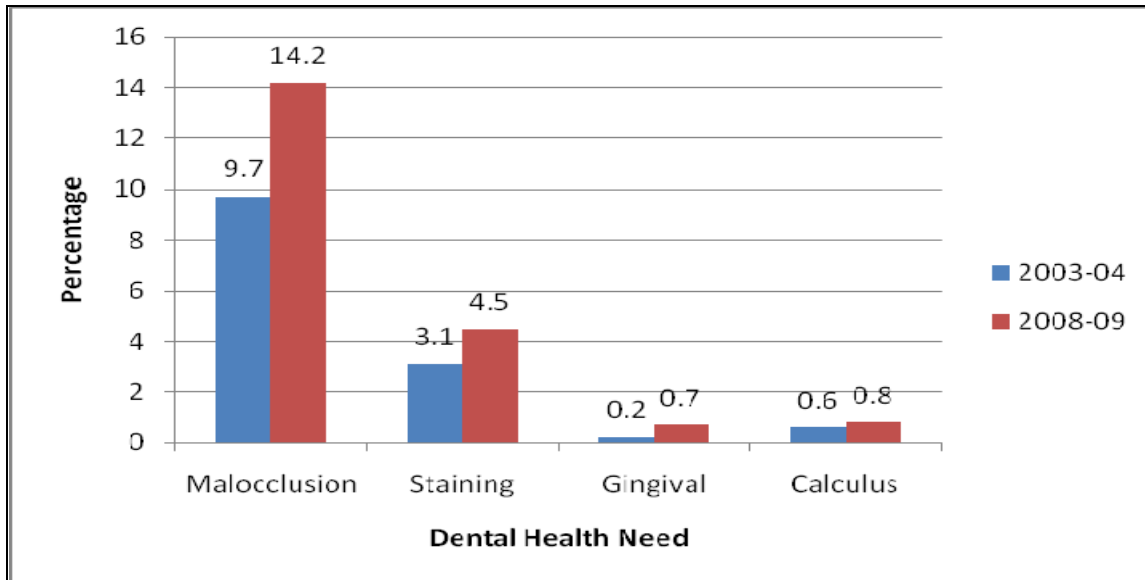
Dental Health Need	Malocclusion	Staining	Gingival	Calculus
Number	2930	713	391	227
Percentage	33.2%	8.1%	4.4%	2.6%

Table 5C: Grade One and Seven Students Dental Health Needs, Saskatchewan, 2008-2009

Dental Health Need	Malocclusion	Staining	Gingival	Calculus
Number	4219	1118	454	302
Percentage	23.5%	6.2%	2.5%	1.7%

The Dental Health Needs other than dental caries are higher among the Grade Seven students when compared with Grade One students. (See **Figure 1** and **Tables 5-A, B, C**)

Figure 2: Comparison of Grade One Students Dental Health Needs, Saskatchewan, 2003-04 and 2008-2009



The proportion of Grade One children with dental health needs has risen when compared with 2003-04 screening results.

Definitions:

Malocclusion: Crooked or crowded teeth and/or poor bite.

Staining: Suspicious areas (possible decay), tartar and/or frank surface staining.

Gingival: Bleeding gums, early signs of gum disease.

Calculus: Hardened plaque on teeth.

Early Childhood Caries

Students were classified as presenting with Early Childhood Caries (ECC) if the Dental Health Educator identified decay in the deciduous anterior central or lateral teeth. This classification was scored as ‘ECC+’ if pain or infection was present with caries. There were 6.6% (604/9079) of Grade One students that had evidence of Early Childhood Caries, with or without pain or infection. (See **Table 6**)

Table 6: Grade One Students with Early Childhood Caries, Saskatchewan, 2008-2009

Deciduous Caries	ECC	ECC+
Number	564	40
Percentage	6.6%	0.4%

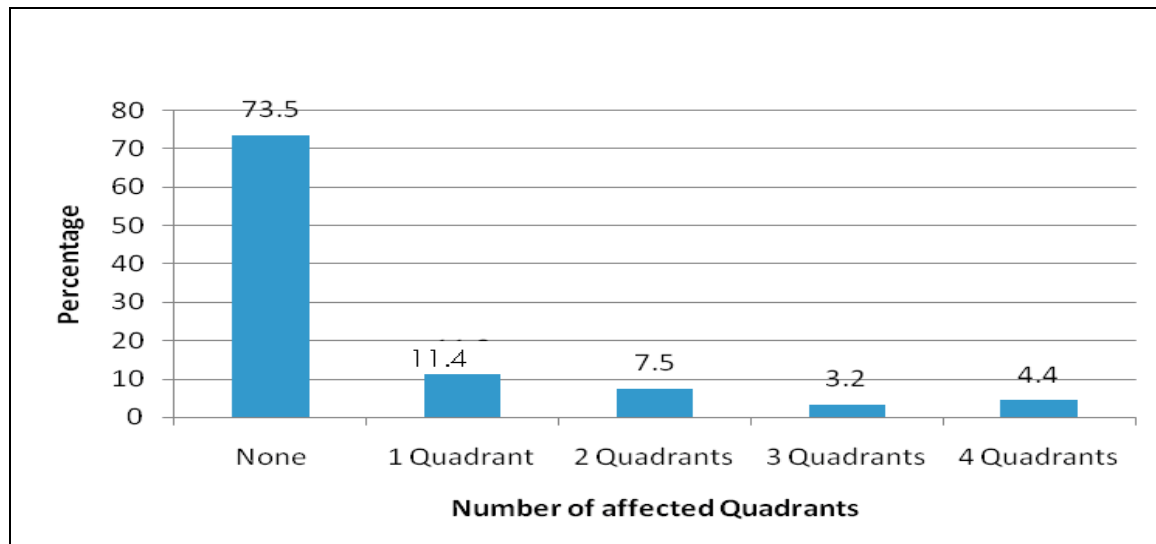
Children were assessed for visible, current tooth decay and scored on the number of quadrants of the mouth (0-4) affected by decay.

There were 2406 (26.5%) of Grade One students who had visible tooth decay at the time of examination; the extent is illustrated in **Table 7A** and **Figure 3**.

Table 7: Grade One and Grade 7 Students with Decay, Saskatchewan 2008-2009
Table 7A: Grade One Students with Decay, Saskatchewan, 2008-2009

Decay	None	1 Quadrant	2 Quadrants	3 Quadrants	4 Quadrants
Number	6673	1029	680	293	404
Percentage	73.5%	11.4%	7.5%	3.2%	4.4%

Figure 3: Proportion of Grade One Students by Number of Affected Quadrants, Saskatchewan, 2008-2009

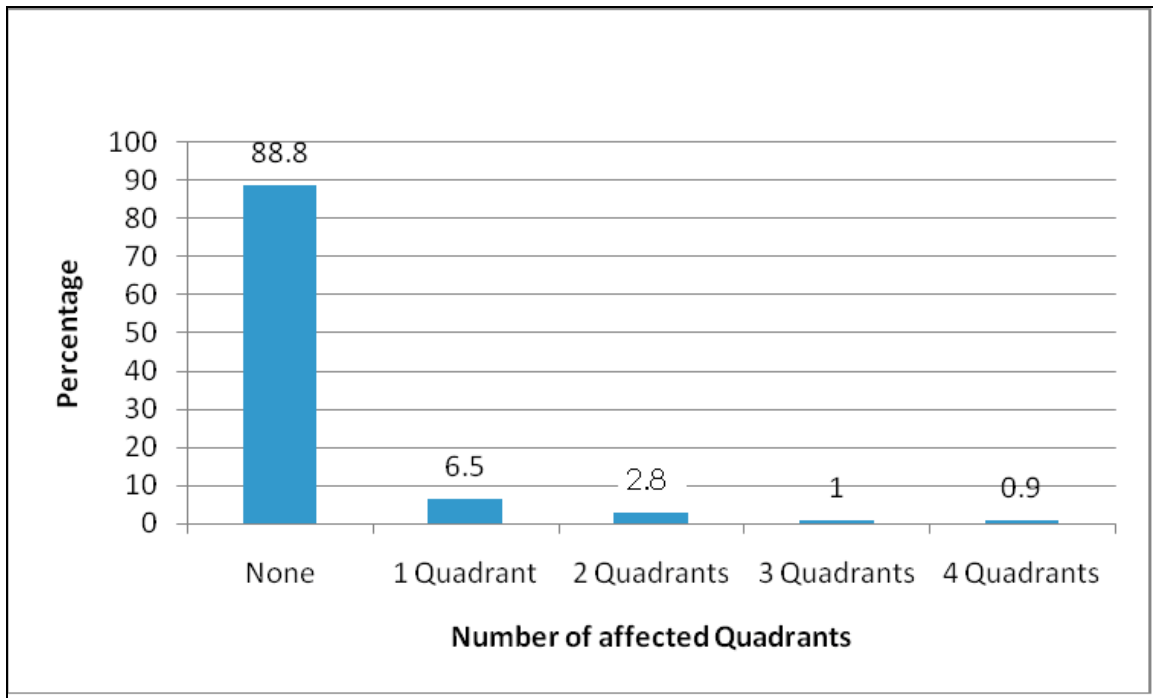


There were 988 (11.2%) of Grade Seven students who had visible tooth decay at the time of examination; the extent is illustrated in **Table 7B** and **Figure 4**.

Table 7B: Grade Seven Students with Decay, Saskatchewan, 2008-2009

Decay	None	1 Quadrant	2 Quadrants	3 Quadrants	4 Quadrants
Number	7847	571	242	91	84
Percentage	88.8%	6.5%	2.8%	1.0%	0.9%

Figure 4: Proportion of Grade Seven Students by Number of Affected Quadrants, Saskatchewan, 2008-2009



‘deft’ is an index used to measure disease experience in the primary dentition. It measures not only current dental disease, but the history of tooth decay as evidenced by fillings and extractions.

Table 8: Grade One Students ‘deft’ Components and Scores, Saskatchewan, 2008-2009

Table 8A: Grade One Students ‘deft’ Components, Saskatchewan, 2008-2009

Number of Affected Teeth	Decayed	Extracted	Filled
None	6638 (73.2%)	7747 (85.4%)	5144 (56.7%)
1-3	1686 (18.5%)	1008 (11.1%)	1636 (18.0%)
4-6	506 (5.6%)	266 (2.9%)	1395 (15.4%)
7+	249 (2.7%)	58 (0.6%)	904 (9.9%)

Of the Grade One students screened, 43.4% had at least one filled primary tooth. About 26.9% had at least one decayed primary tooth and the proportion with at least one extracted tooth as a result of dental caries was 14.7% (Tooth fatality rate). (See **Table 8A and Figure 5**)

The prevalence of dental caries for primary teeth was measured using deft score, a cumulative index, measuring the number of primary teeth that are decayed (d), extracted (e) or filled (f) due to caries.

Table 8B: Grade One Students ‘deft’ Scores, Saskatchewan, 2008-2009

‘deft’ Score	Number	Proportion
0	3826	42.1%
1-3	1887	20.8%
4-6	1521	16.7%
7+	1845	20.3%

Average deft for Grade One students was **3.05**.

The prevalence of dental caries (morbidity) for primary dentition among Grade One students in Saskatchewan, 2008-2009, was 57.9%. (See **Table 8B**)

Table 9: Grade Seven Students ‘deft’ Components and Scores, Saskatchewan, 2008-2009

Table 9A: Grade Seven Students ‘deft’ Components, Saskatchewan, 2008-2009

Number of Affected Teeth*	decayed	extracted	filled
None	8076 (95.9%)	8379 (99.5%)	7469 (88.7%)
1-3	336 (3.9%)	38 (0.45%)	806 (9.5%)
4-6	9 (0.1%)	4 (0.04%)	125 (1.5%)
7+	1 (0.1%)	1 (0.01%)	22 (0.3%)

Of the Grade Seven students screened, 11.3% had at least one filled primary tooth. About 4.1% had at least one decayed primary tooth and the proportion with at least one extracted tooth as a result of dental caries was 0.5% (Tooth fatality rate). (See **Table 9A and Figure 5**)

* Grade Seven ‘deft’ components not recorded for Prince Albert Parkland Health Region.

Table 9B: Grade Seven Students ‘deft’ Scores, Saskatchewan, 2008-2009

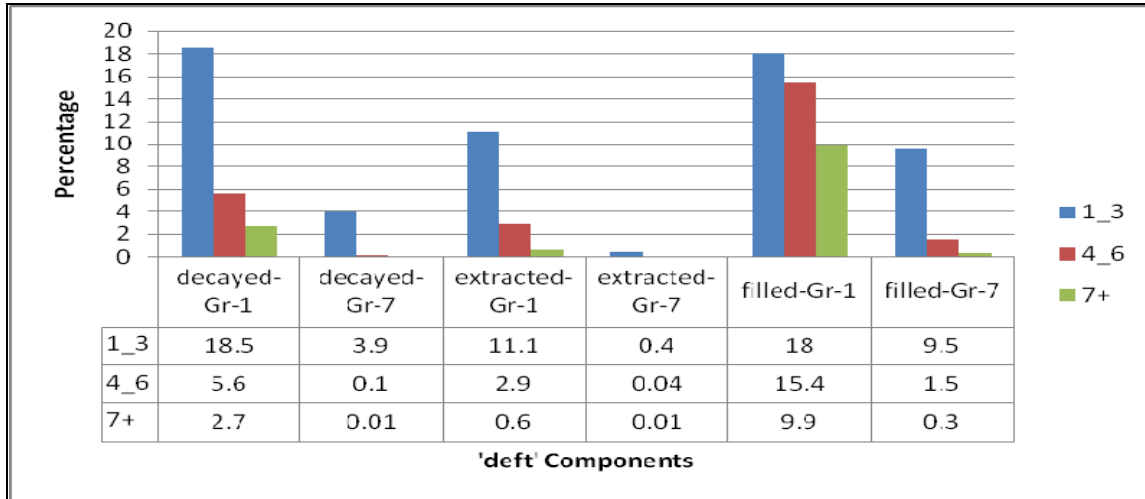
‘deft’ Score	Number*	Proportion
0	7222	85.7%
1-3	1013	12.0%
4-6	153	1.8%
7+	34	0.4%

Average ‘deft’ for Grade Seven students was **0.30***

*Grade Seven ‘deft’ scores not recorded for Prince Albert Parkland Health Region.

The prevalence of dental caries (morbidity) for primary dentition among Grade Seven students in Saskatchewan, 2008-2009, was 14.3%. (See **Table 9B**)

Figure 5: Grade One and Seven Students ‘deft’ Components, Saskatchewan, 2008-2009



The prevalence of dental caries for permanent teeth was measured using ‘DMFT’ score, a cumulative index, measuring the number of permanent teeth that are Decayed (D), Missing (M) or Filled (F) due to caries.

Table 10: Grade One Students "DMFT" Components and Scores, Saskatchewan, 2008-2009

Table 10A: Grade One Students ‘DMFT’ Components, Saskatchewan, 2008-2009

Number of Affected Teeth*	Decayed	Extracted/Missing	Filled
None	8298 (97.3%)	8529 (99.98%)	8338 (97.75%)
1-3	211 (2.5%)	2 (0.02%)	171 (2.0%)
4-6	22 (0.2%)	0	20 (0.2%)
7+	0	0	2 (0.03%)

*Grade One ‘DMFT’ components not recorded for Prince Albert Parkland Health Region.

Of the Grade One students screened, 2.3% had at least one filled permanent tooth. About 2.7% had at least one decayed permanent tooth and the proportion with at least one extracted tooth as a result of dental caries was negligible. (See **Table 10A and Figure 6**)

Table 10B: Grade One Students ‘DMFT’ Scores, Saskatchewan, 2008-2009

‘DMFT’ Score	Number*	Proportion
0	8125	95.3%
1	197	2.3%
2	117	1.4%
3	45	0.5%
4+	47	0.5%

* Grade One ‘DMFT’ scores not recorded for Prince Albert Parkland Health Region.

Average ‘DMFT’ for Grade One students was **0.09**.

The prevalence of dental caries (morbidity) for permanent dentition among Grade One students in Saskatchewan, 2008-2009, was 4.8%. (See **Table 10B**)

Table 11: Grade Seven Students ‘DMFT’ Components and Scores, Saskatchewan, 2008-2009

Table 11A: Grade Seven Students ‘DMFT’ Components, Saskatchewan, 2008-2009

Number of Affected Teeth	Decayed	Extracted/Missing	Filled
None	8085 (91.5%)	8644 (97.8%)	6311 (71.4%)
1-3	637 (7.2%)	160 (1.8%)	1897 (21.5%)
4-6	90 (1.0%)	30 (0.3%)	546 (6.2%)
7+	23 (0.3%)	1 (0.01%)	81 (0.9%)

Of the Grade Seven students screened, 28.6% had at least one filled permanent tooth. About 8.5% had at least one decayed permanent tooth and the proportion with at least one extracted tooth as a result of dental caries was just 2.2% (Tooth fatality rate). (See **Table 11A and Figure 6**)

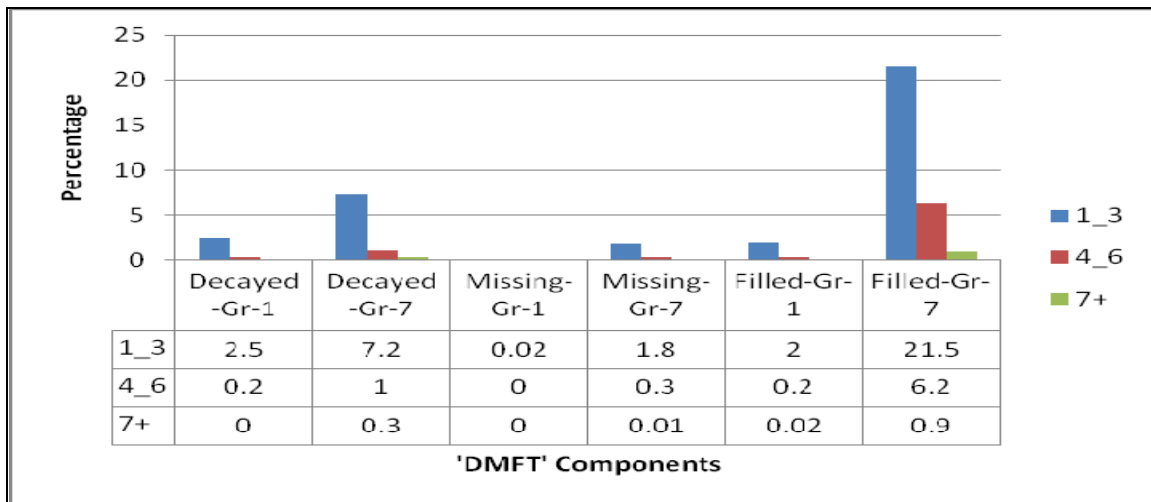
Table 11B: Grade Seven Students ‘DMFT’ Scores, Saskatchewan, 2008-2009

‘DMFT’ Score	Number	Proportion
0	5847	66.2%
1	921	10.5%
2	737	8.3%
3	426	4.8%
4+	904	10.2%

Average ‘DMFT’ for Grade Seven students was **0.94**.

The prevalence of dental caries (morbidity) for permanent dentition among Grade Seven students in Saskatchewan, 2008-2009, was 33.8%. (See **Table 11B**)

Figure 6: Grade One and Seven Students 'DMFT' Components, Saskatchewan, 2008-2009



Grade One students were shown to have caries experience with 14.8% partial caries care (PCC) and 11.9% of the students had no evidence of care (NEC). The results are indicated in **Table 12A**.

Table 12: Grade One and Grade Seven Students Dental Health Status, Saskatchewan, 2008-2009

Table 12A: Grade One Students Dental Health Status, Saskatchewan, 2008-2009

Classification	NDE	CCC	PCC	NEC
Number*	3766	2640	1345	1084
Percentage	41.5%	29.1%	14.8%	11.9%

*Status not recorded for 244 (2.7%) Grade One students.

Grade Seven students were shown to have caries experience with 5.8% partial caries care (PCC) and 5.3% of the students had no evidence of care (NEC). The results are indicated in **Table 12B**.

Table 12B: Grade Seven Students Dental Health Status, Saskatchewan, 2008-2009

Classification	NDE	CCC	PCC	NEC
Number*	5047	2513	517	465
Percentage	57.1%	28.4%	5.8%	5.3%

*Status not recorded for 293 (3.3%) Grade Seven students.

Grade One and Seven students were shown to have caries experience with 10.4% partial caries care (PCC) and 8.6% of the students had no evidence of care (NEC). The results are indicated in **Table 12C**.

Table 12C: Grade One and Seven Students Dental Health Status, Saskatchewan, 2008-2009

Classification	NDE	CCC	PCC	NEC
Number*	8813	5153	1862	1549
Percentage	49.2%	28.8%	10.4%	8.6%

*Status not recorded for 537 (3.0%) Grade One and Grade Seven students.

Definitions:

NDE = No decay, fillings or extractions evident.

CCC = All decayed teeth appear to have been treated.

PCC = Some teeth are treated; but decay still evident.

NEC = Decay with no evidence of past or present treatment.

Priority Scores

Students were scored for priority, depending on the urgency of their dental health needs.

Priority 1 = Urgent (pain or infection) requiring immediate treatment.

Priority 2 = Treatment required as soon as possible.

Priority 3 = No immediate treatment indicated.

Table 13: Grade One and Grade Seven Students Priority Scores, Saskatchewan, 2008-2009

Table 13A: Grade One Students Priority Scores, Saskatchewan, 2008-2009

Priority	1	2	3
Number	375	2093	6611
Percentage	4.1%	23.1%	72.8%

Table 13B: Grade Seven Students Priority Scores, Saskatchewan, 2008-2009

Priority	1	2	3
Number	78	925	7831
Percentage	0.9%	10.5%	88.6%

Unmet dental needs is a combination of Priority scores 1 and 2.

The percentage of unmet dental needs among Grade One students in Saskatchewan is 27.1%. (See **Table 13A**)

The percentage of unmet dental needs among Grade Seven students in Saskatchewan is 11.4%. (See **Table 13B**)

Optional Information

Tobacco Usage

Out of 8834 Grade Seven students screened, 6822* were included, of which 6264 (91.8%) were asked regarding tobacco usage, 6112 (97.6%) answered 'No', 23 (0.4%) students did not respond or the examiner did not ask the question, and 129 (2.0%) responded 'Yes' for tobacco usage.

* Information regarding tobacco usage was not recorded for Regina Qu'Appelle Health Region.

Dental Insurance

Out of 17914 students screened, 11038* (64.8%) responded to the question regarding their personal or family dental insurance plan (See **Table 14A**). 8434 (76.4%) students had some type of dental coverage, 1488 (13.5%) students did not have any dental coverage and 1116 (10.1%) were not sure if they have dental insurance or not.

Table 14: Comparison between Grade One and Grade Seven Students regarding Dental Insurance and Dental Health Measures, Saskatchewan, 2008-2009

Table 14A: Comparison between Grade One and Grade Seven Students regarding Dental Insurance, Saskatchewan, 2008-2009

Dental Insurance*	Yes	No	Not Sure
Grade One	4676 (42.4%)	793 (7.2%)	554 (5.0%)
Grade Seven	3758 (34.0%)	695 (6.3%)	562 (5.1%)
Total	8434 (76.4%)	1488 (13.5%)	1116 (10.1%)

* Optional information regarding Dental Insurance was not recorded for Sun Country Health Region.

Table 14B: Comparison of the Dental Health measures between Students who answered either Yes/No regarding Dental Insurance, Saskatchewan, 2008-2009

Dental Insurance*	Yes**	No***	Total
Cavity-free	4093 (53.2%)	673 (50.6%)	4766 (51.0%)
NEC	543 (7.1%)	173 (13.0%)	716 (7.7%)
Pain/Infection	153 (1.9%)	34 (2.4%)	187 (2.0%)
ECC	261 (3.3%)	45 (3.2%)	306 (3.2%)
Current Caries	1425 (17.8%)	346 (24.8%)	1771 (18.8%)
Total- Response	8004 (85.2%)	1394 (14.8%)	9398

*Data from Prince Albert Parkland HR and Sun Country HR are not included.

** Status recorded for only 7698 who responded 'Yes' for Dental Insurance.

***Status recorded for only 1331 who responded 'No' for Dental Insurance.

Dental Visit

Out of 17914 students screened, 11038* (64.8%) responded to the question, if they had visited the dentist in the past year (See **Table 14C**). 8537 (77.4%) students had visited the dentist in the past year, 1856 (16.8%) had not visited a dentist in the past year and 645 (5.8%) were not sure if they had visited the dentist in the past year.

Table 14C: Comparison between Grade One and Grade Seven Students regarding History of Visit to a Dentist Office in the Past Year, Saskatchewan, 2008-2009

Dental Visit*	Yes	No	Not Sure
Grade One	4580 (41.6%)	1127 (10.2%)	316 (2.9%)
Grade Seven	3957 (35.8%)	729 (6.6%)	329 (2.9%)
Total	8537 (77.4%)	1856 (16.8%)	645 (5.8%)

* Optional information regarding Dental Visit was not recorded for Sun Country Health Region.

Table 14D: Comparison of the Dental Health measures between Students who answered either Yes/No regarding History of Visit to a Dental Office in the Past Year, Saskatchewan, 2008-2009

Dental Visit*	Yes**	No***	Total
Cavity-free	4028 (51.7%)	934 (55.8%)	4962 (52.4%)
NEC	454 (5.8%)	325 (19.4%)	779 (8.2%)
Pain/Infection	145 (1.8%)	60 (3.5%)	205 (2.1%)
ECC	265 (3.3%)	64 (3.7%)	329 (3.3%)
Current Caries	1388 (17.1%)	502 (29.1%)	1890 (19.2%)
Total- Response	8119 (82.5%)	1723 (17.5%)	9842

*Data from Prince Albert Parkland HR and Sun Country HR are not included.

** Status recorded for only 7786 who responded 'Yes' for Dental Visit.

*** Status recorded for only 1674 who responded 'No' for Dental Visit.

Dental Sealants

Out of 17914 students screened, 11038* (64.8%) responded to the question regarding sealant application (See **Table 14E**). 3630 (32.9%) stated that sealants had been placed, 4171 (37.8%) stated that they did not have sealants placed before, and 3237 (29.3%) were not sure if they had sealants placed before.

Table 14E: Comparison between Grade One and Grade Seven Students regarding past history of Pit and Fissure Sealant application, Saskatchewan, 2008-2009

Dental Sealants*	Yes	No	Not Sure
Grade One	1359 (12.3%)	3016 (27.3%)	1648 (14.9%)
Grade Seven	2271 (20.6%)	1155 (10.5%)	1589 (14.4%)
Total	3630 (32.9%)	4171 (37.8%)	3237 (29.3%)

* Optional information regarding Dental Sealants was not recorded for Sun Country Health Region.

Table 14F: Comparison of the Dental Health measures between Students who answered either Yes/No regarding History of Pit and Fissure Sealant Application, Saskatchewan, 2008-2009

Dental Sealants*	Yes	No	Total
Cavity-free	1660 (49.0%)	2283 (60.6%)	3943 (55.1%)
NEC	164 (4.8%)	457 (12.1%)	621 (8.7%)
Pain/Infection	56 (1.6%)	93 (2.4%)	149 (2.0%)
ECC	121 (3.4%)	128 (3.3%)	249 (3.3%)
Current Caries	617 (17.3%)	794 (20.4%)	1411 (18.9%)
Total- Response	3560 (47.8%)	3888 (52.2%)	7448

*Data from Prince Albert Parkland HR and Sun Country HR are not included in the analysis.

Others

Out of 17914 students screened, only 16731* were included, of which 81 (0.5%) had restored fractures and 121 (0.7%) had non-restored fractures.

* Information regarding the above was not recorded for Prince Albert Parkland Health Region and Keewatin Yatthé Health Region.

Dental Health Trends in Saskatchewan

Table 15: Grade One Students Dental Health by Screening Year, Saskatchewan

Screening Year	Number of Children Screened	Average 'deft/DMFT'	% with Cavities	% with No Evidence of Dental Care	% with ECC	% with Pain and or Infection	% Cavity-free
1993-94	13398	2.74	20.0	9.6	1.7	5.8	45.2
1998-99	12701	2.61	24.9	12.4	2.4	3.6	46.7
2003-04	10832	2.94	25.5	13.2	7.1	3.9	44.7
2008-09	9079	3.14*	27.5*	11.9	6.6	4.0	41.5

* Data from Prince Albert Parkland Health Region not included.

Table 16: Grade Seven Students Dental Health by Screening Year in Saskatchewan

Screening Year	Number of Children Screened	Average 'deft/DMFT'	% with Cavities	% with No Evidence of Dental Care	% with Pain and or Infection	% Cavity-free
2008-09*	8835	1.24**	11.3**	5.3	0.9	57.1

*As Grade Seven students are included in the analysis for the first time, comparisons with past results is not available.

** Data from Prince Albert Parkland Health Region not included.

Interpretation of Average 'deft/DMFT' ratio according to the WHO scale of severity:

Less than 1.2	Very low risk for dental caries
1.2-2.6	Low risk for dental caries
2.7-4.4	Moderate risk for dental caries
Greater than 4.4	High risk for dental caries

Canadian Oral Health Strategy (COHS) Guidelines for 2010: Goal 2

2.2: Reduction of dental decay

- At age 6, 50% of children have never experienced dental decay.
- At age 6, no more than 20% of children have unmet dental treatment needs.
- At age 12, 75% of children have never experienced decay in their permanent teeth.
- At age 12, no more than 10% of children have unmet dental treatment needs.
- At age 12, an average ‘DMFT’ of 1.0 or less.
- At age 12, a ‘Significant Caries Index’, ‘DMFT’ of 3.0 or less.

Table 17: Canadian Oral Health Strategy (COHS) Guidelines for 2010: Goal 2 (Grade One/Age 6), Saskatchewan, 2008-2009

Health Region	50% of children have never experienced dental decay	No more than 20% of children have unmet dental treatment needs
Cypress	45.5%	21.1%
Five Hills	47.5%	27.8%
Heartland	35.0%	28.1%
Kelsey Trail	34.0%	32.8%
Keewatin Yatthé	11.1%	62.2%
Mamawetan Churchill	21.6%	56.5%
Prince Albert Parkland	26.6%	29.0%
Prairie North	37.8%	27.1%
Regina Qu’Appelle	42.9%	31.9%
Saskatoon	50.8	19.4%
Sun Country	43.4%	29.6%
Sunrise	35.7%	26.5%
Saskatchewan	41.5%	27.1%

The Canadian Oral Health Strategy (COHS) Guidelines for Saskatchewan Grade One students are not met, as 41.5% of students have never experienced dental decay and 27.1% of students have unmet dental treatment needs.

Note: Red font in ‘percentage caries-free’ and ‘percentage unmet oral/dental health needs’ indicates schools that do not meet the Canadian Oral Health Strategy Guidelines (2010) for Grade One Students having ‘50% and above caries-free’ and ‘no more than 20% with unmet oral/dental health needs’ respectively.

Table 18: Canadian Oral Health Strategy (COHS) Guidelines for 2010: Goal 2 (Grade Seven/Age 12), Saskatchewan, 2008-2009

Health Region	75% of children have never experienced decay in their permanent teeth	No more than 10% of children have unmet dental treatment needs	Average 'DMFT' of 1.0 or less	'Significant Caries Index', 'DMFT' of 3.0 or less.
Cypress	76.7%	8.3%	0.7	2.58
Five Hills	80.7%	9.3%	0.5	1.42
Heartland	64.3%	12.9%	0.9	2.59
Kelsey Trail	59.0%	14.1%	3.9	3.00
Keewatin Yatthé	13.7%	47.1%	3.9	7.21
Mamawetan Churchill	53.5%	24.2%	1.4	3.79
Prince Albert Parkland	31.7%	12.1%	2.8	6.02
Prairie North	62.9%	14.9%	0.9	2.57
Regina Qu'Appelle	62.7%	14.9%	1.0	3.04
Saskatoon	74.8%	6.5%	0.6	1.81
Sun Country	69.5%	15.0%	0.8	2.32
Sunrise	57.6%	9.4%	1.1	2.64
Saskatchewan	66.2%	11.4%	0.8	3.00

The Canadian Oral Health Strategy (COHS) Guidelines for Grade Seven students are partially met with the average 'DMFT' of 0.8 and the 'Significant Caries Index' of 3.00. As 66.2 % of students have never experienced decay in their permanent teeth and 11.4% of students have unmet dental treatment needs, these do not meet the COHS Guidelines.

Note: Red font in 'percentage unmet oral/dental health needs', 'percentage 'DMFT'=0 and Average 'DMFT' indicates those schools that do not meet the Canadian Oral Health Strategy Guidelines for Grade Seven Students having ' no more than 10% with unmet oral health needs', 'percentage DMFT=0 greater than 75%' and the 'Average DMFT less than or equal to 1' respectively.

Significant Caries Index (SiC) ¹³: Grade Seven Students , Saskatchewan, 2008-2009

Significant Caries Index for Grade Seven Students, Saskatchewan, 2008-2009: **3.00**

Significant Caries Index:

- New goal set by World Health Organization (WHO).
- New goal set by the Canadian Oral Health Strategy Guidelines for Grade Seven/ children who are twelve years of age.
- For countries, who still did not achieve the WHO/FDI (Fédération dentaire international) global health goal of 'DMFT' less than or equal to 3, this goal is an urgent priority.
- Ideally 'SiC' should be less than 3, by the year 2015.
- Calculated by recording the mean 'DMFT' scores of one-third of the population with highest 'DMFT' scores.

Dental Health Disparities

In this section, we analyzed the screening data for Grade One and Grade Seven students together. Comparisons among students:

- Attending schools located in rural versus urban areas.
- Attending schools located in communities with and without access to fluoridated water systems.
- Attending Hutterite versus non-Hutterite schools.
- Residing in Regina and Saskatoon neighbourhoods by income status.

Urban/Rural, water fluoridation, neighbourhoods by income status and Hutterite categories were determined according to where each child attended school i.e. school location.

The results for these comparisons are provided in the following section.

Results:

All children were assigned as attending a rural or urban school based on the location of the school they attended during the screening year. Rural or urban status was defined using the postal codes as determined by Canada Post.

Table 19 illustrates the results from the comparative analysis of dental health between urban and rural school children in Saskatchewan during the screening year 2008-2009.

Table 19: Dental Health of Students by Urban or Rural School Location (Grade One and Seven), Saskatchewan, 2008-2009

Dental Health Measure	School Location		p-value	Total
	Urban n (%)	Rural n (%)		
Average 'deft/DMFT' ^b	1.91	2.35	<0.05	2.11
With current caries ^a	1752 (18.3)	1576 (21.3)	<0.05	3328 (19.6)
No evidence of dental care ^a	867 (9.1)	601 (8.1)	<0.05	1468 (8.6)
ECC present ^a	322 (3.4)	266 (3.6)	0.43	588 (3.5)
Cavity-free ^a	5291 (55.4)	3246 (43.8)	<0.05	8537 (50.3)
Pain and Infection ^a	246 (2.6)	184 (2.5)	0.71	430 (2.5)
Total Screened	9549 (56.3)	7403 (43.7)		16952*

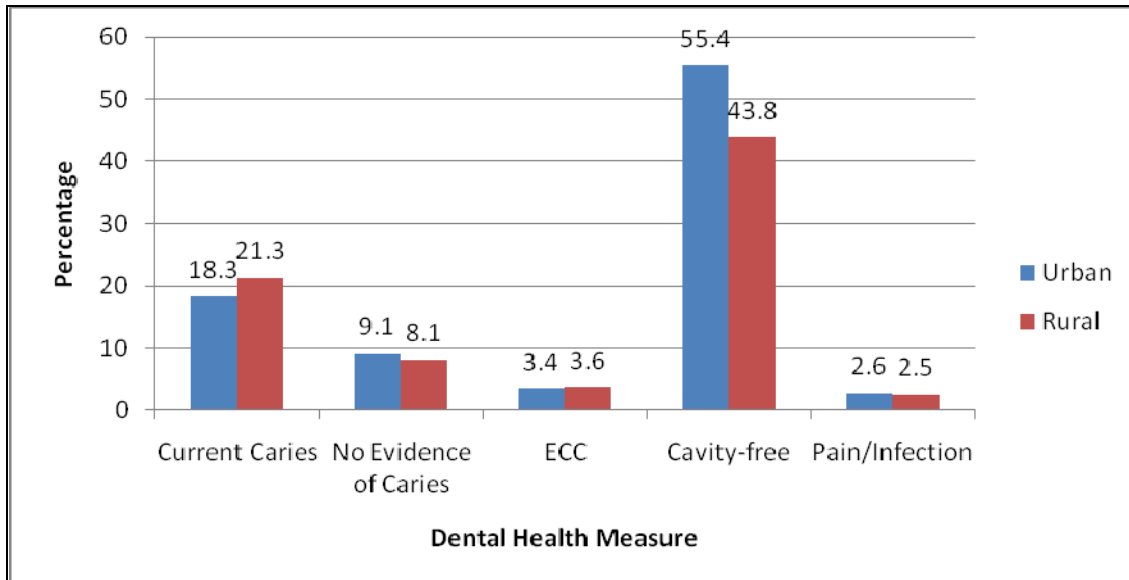
* Data from Prince Albert Parkland Health Region not included.

^a Chi-square test

^b t-test

Note: **Red** font indicates statistical significance of 95% confidence.

Figure 7: Dental Health of Students by Urban/Rural School Location, Saskatchewan, 2008-2009



Overall it appears that urban school children in Saskatchewan have better oral health when compared with rural school children. This is evident from the lower average ‘deft/DMFT’ value which is statistically significant. Furthermore, rural school children had higher proportions with current caries, which is statistically significant and ECC which is statistically insignificant. Urban school children had higher proportions that are cavity-free and showing absence of care being statistically significant and children with pain/infection being statistically insignificant. (See **Table 19** and **Figure 7**)

Table 20 illustrates the results from the comparative analysis of dental health between children attending schools that have access to community water fluoridation and children attending schools that do not have access to community water fluoridation in Saskatchewan during the screening year 2008-2009.

Table 20: Dental Health of Students by access to Community Water Fluoridation (Grade One and Seven), Saskatchewan, 2008-2009

Dental Health Measure	Community Water Supply		p-value	Total
	Fluoridated/ Optimally adjusted n (%)	Non- Fluoridated/Not Optimally adjusted n (%)		
Average 'deft/DMFT' ^b	1.61	2.48	<0.05	2.11
With current caries ^a	974 (13.5)	2166 (24.4)	<0.05	3328 (19.6)
No evidence of dental care ^a	470 (6.5)	899 (10.1)	<0.05	1468 (8.6)
ECC present ^a	184 (2.5)	378 (4.2)	<0.05	588 (3.5)
Cavity-free ^a	4178 (58.1)	3903 (43.9)	<0.05	8537 (50.3)
Pain and Infection ^a	161 (2.2)	238 (2.7)	0.03	430 (2.5)
Total screened	7194 (42.4)	8888 (52.4)		16952*

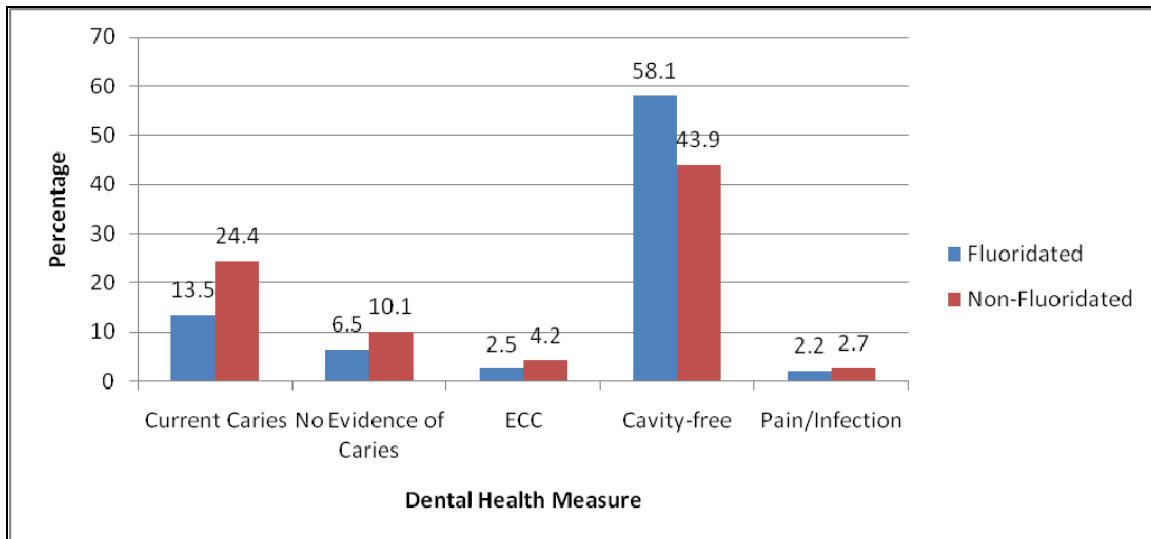
* Data from Prince Albert Parkland Health Region not included.

^a Chi-square test

^b t-test

Note: **Red** font indicates statistical significance of 95% confidence.

Figure 8: Dental Health of Students by access to Community Water Fluoridation, Saskatchewan, 2008-2009



Overall it appears that children attending schools that have access to fluoridated water have better oral health when compared with children attending schools that do not have access to optimally adjusted fluoridated water in Saskatchewan. This is evident from the lower average ‘deft/DMFT’ value which is statistically significant. In addition, schools with access to optimally adjusted fluoridated water had lesser proportions with current caries, ECC, pain/infection and absence of care, being statistically significant. Also, schools with access to optimally adjusted fluoridated water had higher proportions being cavity-free which is statistically significant. (See **Table 20** and **Figure 8**)

Table 21 illustrates the results from the comparative analysis of dental health between Hutterite and non-Hutterite school children in Saskatchewan during the screening year 2008-2009.

Table 21: Dental Health of Students by Hutterite and Non-Hutterite School (Grade One and Seven), Saskatchewan, 2008-2009

Dental Health Measure	School Location*		p-value	Total
	Hutterite n (%)	Non-Hutterite n (%)		
Average 'deft/DMFT' ^b	4.51	1.89	<0.05	2.17
With current caries ^a	49 (26.1)	248 (16.0)	0.001	297 (17.1)
No evidence of dental care ^a	8 (4.2)	104 (6.7)	0.24	112 (6.4)
ECC present ^a	7 (3.7)	40 (2.6)	0.4	47 (2.7)
Cavity-free ^a	33 (17.5)	833 (53.9)	<0.05	866 (49.9)
Pain and Infection ^a	3 (1.6)	30 (1.9)	0.7	33 (1.9)
Total screened	187 (10.8)	1547 (89.2)		1734

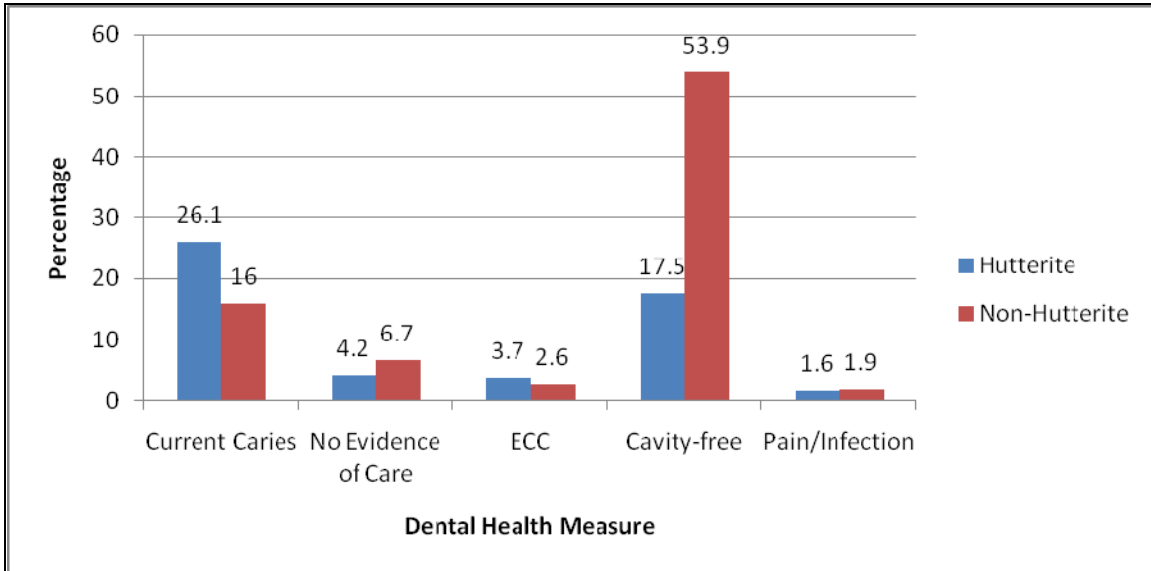
^a Chi-square test

^b t-test

* Data from only Cypress Health Region and Heartland Health Region is included in the analysis due to small numbers in all other health regions.

Note: Red font indicates statistical significance of 95% confidence.

Figure 9: Dental Health of Students by Hutterite and Non-Hutterite School, Saskatchewan, 2008-2009



Overall it appears that non-Hutterite school children have better oral health when compared with Hutterite school children in Saskatchewan. This is evident from the lower average ‘deft/DMFT’ value which is statistically significant. Furthermore, Hutterite school children had higher proportions with current caries which is statistically significant and ECC which is statistically insignificant. Non-Hutterite school children had a higher proportions who are cavity-free, which is statistically significant and children with pain/infection and showing absence of dental being statistically insignificant. (See **Table 21** and **Figure 9**)

Table 22 illustrates the results from the comparative analysis of dental health between children attending schools located in low income neighbourhoods and non-low income neighbourhoods in Saskatchewan (City of Regina and Saskatoon) during the screening year 2008-2009.

According to Statistics Canada, a neighbourhood is designated as low-income (or high poverty) when more than 30% of the families in the neighbourhood meet the definition of low-income cut off (LICO).¹⁵

Low-income cut off is a set dollar value and based on the 2001 Statistics Canada Census, a household earnings is considered low-income when the annual income of the household is \$30,429 or less.¹⁵

Table 22: Dental Health of Students by Neighbourhood Income Status (Grade One and Seven), Saskatchewan (City of Regina and Saskatoon), 2008-2009

Dental Health Measure	Neighbourhood Location*		p-value	Total
	LICO n (%)	Non-LICO n (%)		
Average 'deft/DMFT' ^b	3.46	1.79	<0.05	1.90
With current caries ^a	245 (37.2)	1496 (16.1)	<0.05	1741 (17.5)
No evidence of dental care ^a	111 (16.9)	741 (7.9)	<0.05	852 (8.6)
ECC present ^a	75 (11.4)	304 (3.3)	<0.05	379 (3.8)
Cavity-free ^a	245 (37.2)	5278 (56.7)	<0.05	5523 (55.4)
Pain and Infection ^a	37 (5.6)	233 (2.5)	<0.05	270 (2.7)
Total screened	658 (6.6)	9302 (93.4)		9960

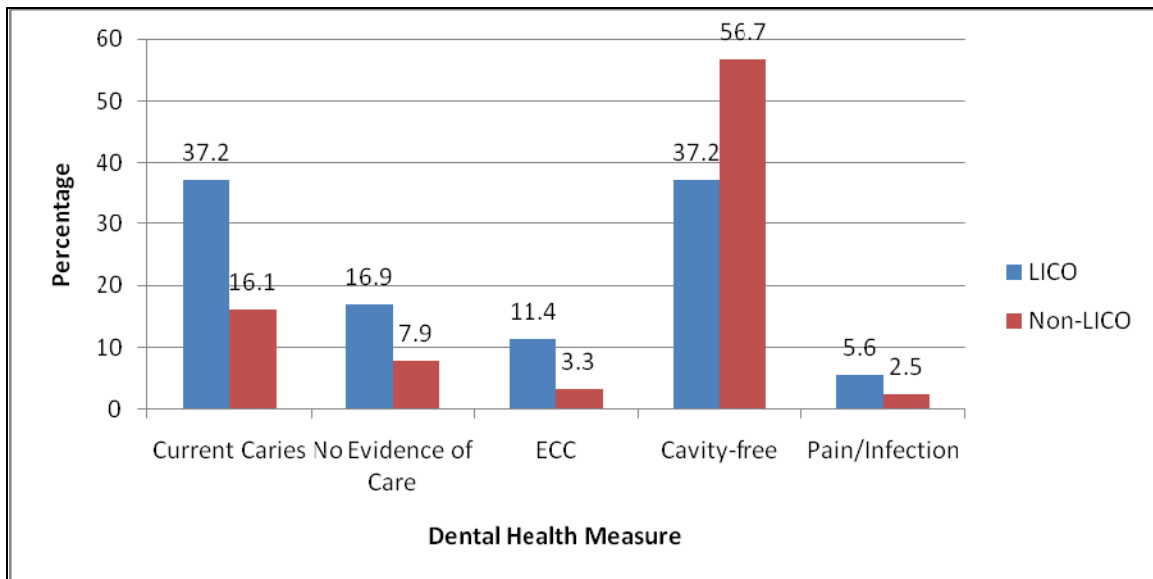
^a Chi-square test

^b t-test

* Data from only Saskatoon Health Region and Regina Qu'Appelle Health Region is included.

Note: Red font indicates statistical significance of 95% confidence.

Figure 10: Dental Health of Students by Neighbourhood Income Status, Saskatchewan (City of Regina and Saskatoon), 2008-2009



Overall it appears that children attending schools that are not located in low income neighbourhoods in the cities of Regina and Saskatoon, have better oral health when compared with children attending schools that are located in low income neighbourhoods. This is evident from the lower average ‘deft/DMFT’ value which is statistically significant. In addition, schools that are located in low income neighbourhoods had higher proportions with current caries, ECC, pain/infection and showing absence of dental care which is statistically significant. Furthermore, schools that are not located in low income neighbourhoods had higher proportion being cavity-free, which is statistically significant. (See **Table 22** and **Figure 10**)

Dental Health Status by Region

The following tables provide a summary of dental health status indicators by Health Region. Table 23 illustrates the dental health status by health region. Tables 24 and 25 illustrate regional statistics for urban and rural students, respectively.

Table 23: Dental Health of Students by Health Region, 2008-2009

Health Region	Average deft/ DMFT	% With Current Caries	% No evidence of dental care	% ECC present	% Cavity- free	% Pain &/ Infection	Total screened
Cypress	1.89	15.6	5.9	2.4	56.3	1.3	857
Five Hills	1.63	19.5	9.9	1.2	57.1	0.4	734
Heartland	2.42	18.7	6.9	2.9	43.6	2.5	877
Kelsey Trail	2.45	22.0	10.7	4.3	41.4	3.5	770
Prince Albert Parkland	NR*	NR*	8.5	1.9	28.8	1.4	961
Prairie North	2.41	23.5	9.6	0.6	42.0	1.9	1208
Regina Qu'Appelle	2.37	24.6	11.8	5.2	50.2	3.1	4044
Saskatoon	1.57	12.6	6.3	2.9	59.1	2.4	5917
Sun Country	1.92	21.6	11.4	2.9	52.3	3.5	871
Sunrise	2.55	20.7	10.0	1.3	42.9	2.0	1098
Northern**	4.51	48.4	13.6	21.3	21.6	3.6	577
Total	2.11	19.6	8.6	3.5	50.3	2.5	17914

*NR: Not Recorded

**Northern: Mamawetan Churchill River Health Region and Keewatin Yatthé Health Region.

Table 24: Dental Health of Students by Health Region, Urban School, 2008-2009

Health Region	Average deft/ DMFT	% With Current Cavities	% No evidence of dental care	% ECC present	% Cavity-free	% Pain&/ Infection	Total screened
Cypress	1.21	12.9	6.6	1.1	66.1	1.4	348
Five Hills	1.28	18.8	10.6	0.2	62.7	0.0	461
Heartland	-	-	-	-	-	-	-
Kelsey Trail	-	-	-	-	-	-	-
Prince Albert Parkland	NR*	NR*	8.7	1.9	26.5	1.3	631
Prairie North	2.45	23.3	9.5	0.3	42.8	1.9	797
Regina Qu'Appelle	2.30	25.2	13.2	6.1	52.6	3.4	2999
Saskatoon	1.6	12.9	6.3	2.9	59.3	2.8	4171
Sun Country	1.71	13.9	7.9	1.4	59.	0.7	288
Sunrise	2.72	20.9	9.1	0.2	40.9	0.9	405
Northern**	-	-	-	-	-	-	-
Total	1.91	18.3	9.1	3.4	55.4	2.6	9549

*NR: Not Recorded

**Northern: Mamawetan Churchill River Health Region and Keewatin Yatthé Health Region.

Table 25: Dental Health of Students by Health Region, Rural School, 2008-2009

Health Region	Average deft/ DMFT	% With Current Cavities	% No evidence of dental care	% ECC present	% Cavity-free	% Pain&/ Infection	Total screened
Cypress	2.38	17.3	5.5	3.3	49.7	1.2	509
Five Hills	2.21	20.5	8.8	2.9	47.6	1.0	273
Heartland	2.42	18.7	6.9	2.9	43.6	2.5	877
Kelsey Trail	2.45	22.0	10.67	4.3	41.4	3.5	770
Prince Albert Parkland	NR*	NR*	8.2	1.8	33.3	1.8	330
Prairie North	2.32	21.9	9.7	1.0	40.6	2.0	411
Regina Qu'Appelle	2.60	23.0	7.9	2.5	43.1	2.3	1044
Saskatoon	1.51	11.7	6.4	2.6	58.5	1.5	1746
Sun Country	2.02	25.4	13.0	3.8	49.0	4.9	583
Sunrise	2.45	20.5	10.5	1.8	44.1	2.6	693
Northern**	4.51	48.4	13.6	21.3	21.6	3.6	577
Total	2.35	21.3	8.1	3.6	43.8	2.5	7403

*NR: Not Recorded

**Northern: Mamawetan Churchill River Health Region and Keewatin Yatthé Health Region.

Tables 26 and 27 illustrate regional statistics based on access to community water fluoridation, respectively.

Table 26: Dental Health of Students by Health Region, Access to Community Water Fluoridation, 2008-2009

Health Region	Average deft/ DMFT	% With Current Cavities	% No evidence of dental care	% ECC present	% Cavity-free	% Pain&/ Infection	Total screened
Cypress	1.20	11.6	6.0	1.0	67.5	1.6	378
Five Hills	1.36	18.2	9.9	0.6	60.6	0.0	533
Heartland	1.96	14.3	5.4	1.8	48.4	1.5	335
Kelsey Trail	2.26	21.3	12.0	4.5	45.8	1.9	309
Prince Albert Parkland	NR*	NR*	4.7	0.9	33.6	0.0	107
Prairie North	2.05	8.4	9.2	0.0	47.3	3.1	131
Regina Qu'Appelle	2.47	18.2	5.2	2.6	40.8	0.8	115
Saskatoon	1.54	14.6	7.1	3.5	71.8	3.04	5157
Sun Country	1.69	14.8	9.1	0.6	58.8	1.7	175
Sunrise	2.35	16.4	9.2	2.1	50.6	2.9	237
Total	1.61	13.5	6.5	2.5	58.1	2.2	7194

*NR: Not Recorded

Table 27: Dental Health of Students by Health Region, No Access to Community Water Fluoridation, 2008-2009

Health Region	Average deft/ DMFT	% With Current Cavities	% No evidence of dental care	% ECC present	% Cavity-free	% Pain&/ Infection	Total screened
Cypress	2.44	18.5	5.8	3.5	47.5	1.0	479
Five Hills	2.33	22.9	9.9	2.9	47.7	1.5	201
Heartland	2.71	21.4	7.9	3.7	40.8	3.1	542
Kelsey Trail	2.58	22.3	9.3	4.1	37.1	4.5	461
Prince Albert Parkland	NR*	NR*	9.0	2.0	28.2	1.6	854
Prairie North	2.46	25.3	9.6	0.6	41.4	1.7	1077
Regina Qu'Appelle	2.36	24.8	12.0	5.2	50.4	3.2	3928
Saskatoon	1.82	18.6	11.1	3.4	65.0	1.95	760
Sun Country	1.97	23.3	11.9	3.6	50.7	4.0	696
SRHR	2.61	21.8	10.2	1.0	40.8	1.7	861
Total	2.48	24.4	10.1	4.2	43.9	2.7	8888

*NR: Not Recorded

Tables 28 and 29 illustrate regional statistics for Hutterite and non-Hutterite school children, respectively.

Table 28: Dental Health of Students by Health Region, Hutterite Schools, 2008-2009

Health Region	Average deft/ DMFT	% With Current Cavities	% No evidence of dental care	% ECC present	% Cavity-free	% Pain&/ Infection	Total screened
Cypress	4.40	31.3	6.1	4.3	19.1	0.8	115
Heartland	4.60	18.0	1.4	1.4	15.3	2.8	72
Total	4.50	24.7	3.75	2.9	17.2	1.8	187

Table 29: Dental Health of Students by Health Region, Non-Hutterite Schools, 2008-2009

Health Region	Average deft/ DMFT	% With Current Cavities	% No evidence of dental care	% ECC present	% Cavity-free	% Pain&/ Infection	Total screened
Cypress	1.50	13.1	5.9	2.1	62.1	1.3	742
Heartland	2.23	18.7	7.4	3.1	46.2	2.5	805
Total	1.89	15.9	6.7	2.6	54.2	1.9	1547

Tables 30 and 31 illustrate regional statistics based on income status of a neighbourhood, respectively.

Table 30: Dental Health of Students by Health Region, Low Income Neighbourhood Schools, 2008-2009

Health Region	Average deft/ DMFT	% With Current Cavities	% No evidence of dental care	% ECC present	% Cavity-free	% Pain&/ Infection	Total screened
Saskatoon	2.97	30.5	12.6	8.4	34.1	4.2	167
Regina Qu'Appelle	3.62	42.1	19.5	13.2	40.8	6.5	491
Total	3.30	36.3	16.1	10.8	37.5	5.4	658

Table 31: Dental Health of Students by Health Region, Non-Low Income Neighbourhood Schools, 2008-2009

Health Region	Average deft/ DMFT	% With Current Cavities	% No evidence of dental care	% ECC present	% Cavity-free	% Pain&/ Infection	Total screened
Saskatoon	1.53	12.1	6.1	2.7	59.8	2.4	5750
Regina Qu'Appelle	2.19	22.6	10.9	4.2	51.8	2.7	3552
Total	1.86	17.4	8.5	3.4	55.8	2.6	9302

Epidemiological studies

Table 32: Calculation of Odds Ratio for being Cavity-free between Urban and Rural communities in Saskatchewan, 2008-2009

Odds Ratio	Not Cavity-free (+)	Cavity-free (-)	Total
Urban (+)	4258	5291	9549
Rural (-)	4157	3246	7403
Total	8415	8537	16952

Odds ratio: **0.62** (p-value: <0.0000001)

As the value is less than 1, a student (either Grade One or Grade Seven) who resides in a rural Saskatchewan community is at a higher odds for not being cavity-free (having caries), than when a student resides in an urban community.

Table 33: Calculation of Odds Ratio for being Cavity-free between Schools that have access to Community Water Fluoridation (CWF) and Schools that do not in Saskatchewan, 2008-2009

Odds ratio	Not Cavity-free (+)	Cavity-free (-)	Total
CWF (+)	3016	4178	7194
No-CWF (-)	4984	3904	8888
Total	8000	8082	16082

Odds Ratio: **0.56** (p-value: <0.0000001)

As the value is less than 1, a student (either Grade One or Grade Seven), who attends a school that has access to community water fluoridation, is at a lower odds for not being cavity-free (having caries), than when a student who attends school that does not have access to community water fluoridation in Saskatchewan.

Table 34: Calculation of Odds Ratio for being Cavity-free between Low Income (LICO) Cut-off Neighbourhood School and Non-Low Income Cut-off (LICO) Neighbourhood School in Saskatchewan (City of Regina and Saskatoon), 2008-2009

Odds Ratio	Not Cavity-free (+)	Cavity-free (-)	Total
LICO (+)	413	245	658
Non-LICO (-)	4024	5278	9302
Total	4437	5523	9960

Odds ratio: **2.21** (p-value :< 0.0000001)

As the value is greater than 1, a student (either Grade One or Grade Seven) who attends a school located in a low income cut-off neighbourhood is at a higher odds for not being cavity-free (having caries) than when a student who attends a school located in a non-low income cut-off neighbourhood, in Saskatchewan (City of Regina and Saskatoon).

Table 35: Calculation of Odds Ratio for being Cavity-free between Hutterite Schools and Non-Hutterite Schools in Saskatchewan (Cypress and Heartland Health Regions), 2008-2009

Odds Ratio	Not Cavity- free (+)	Cavity-free (-)	Total
Hutterite (+)	154	33	187
Non-Hutterite (-)	714	833	1547
Total	868	866	1734

Odds ratio: **5.44** (p-value :< 0.0000001)

As the value is greater than 1, a student (either Grade One or Grade Seven) who attends a Hutterite school, is at a higher odds for not being cavity-free (having cavities), than when a student who does not attend a Hutterite school in Saskatchewan (Cypress and Heartland Health Regions), 2008-2009.

Interpretation for both Relative Risk (RR) and Odds Ratio (OR):

RR / OR	Interpretation
If RR/OR = 1	No association.
If RR/OR > 1	Positive association; possibly causal.
If RR/OR < 1	Negative association; possibly protective.

Discussion

The participation rate for Grade One and Grade Seven students was 85% and 77.2% respectively and the overall participation rate was 81.1%. In total 15.79% of enrolled students refused the screening with 13.3% being absent on the day of screening and 8.9% of children not returning signed consent forms from their parents/guardians in time, are not included in the analysis. The percentage of students not screened represents hidden morbidity, as they might have cavities. The number of Grade One students screened was the lowest since the 1993-94 screening and also the number of Grade One students screened declined over the past two decades at an attrition rate of 16.2% compared to the previous screening in 2003-04. There is a need to understand the barriers that exist which might have prevented a child from receiving a screening.

The majority of children included in the analysis for the screening year 2008-2009 are from Saskatoon Health Region and Regina Qu'Appelle Health Region, as one in every three children (either Grade One or Seven) screened in Saskatchewan is from the Saskatoon Health Region and more than one in every other child (either Grade One or Seven) screened in Saskatchewan is either from Saskatoon Health Region or Regina Qu'Appelle Health Region.

Only 41.7% of children screened attended schools that had access to community water fluoridation in Saskatchewan during the screening year 2008-2009. Among all the health regions in Saskatchewan, Saskatoon Health Region, , with a coverage of 87.2% has the highest percentage of children screened attending schools that have access to fluoridated water and the least being in Regina Qu'Appelle Health Region with a coverage of 2.8%. The caries prevention fraction was higher for the students who attended schools that had access to community water fluoridation (0.58) compared to children who did not attend schools that had access to community water fluoridation (0.44) in Saskatchewan. Individually among the health regions, caries prevention fraction for students attending schools that has access to community water fluoridation was the highest for Saskatoon

Health Region with 0.72, followed by Cypress Health Region with 0.68 and least being recorded for Prince Albert Parkland Health Region with 0.34.

The factors of malocclusion, staining, gingivitis and the presence of calculus were included to assess other dental health needs. These needs are higher among the Grade Seven children than the Grade One children. Especially, the proportion of children experiencing malocclusion, as 33.2% of Grade Seven students are experiencing malocclusion compared to only 14.2% of Grade One students. Nearly one in every three Grade Seven children screened in Saskatchewan are experiencing malocclusion. This can lead to poor facial appearance and related psychological disturbances, increased risk of cavities due to malaligned teeth, poor oral hygiene, may lead to gingivitis and periodontitis due to plaque/calculus accumulation, abnormalities in mastication of food, deglutition (swallowing), and phonetics (speech), etc ¹⁶. There is a need to improve parent's understanding of preventive orthodontics. This calls for a shift in the balance from interceptive orthodontics to preventive orthodontics as all of the practicing dentists in Saskatchewan who are specialists in orthodontics are concentrated in the cities of Regina and Saskatoon¹⁷. The screening did not record the severity of the malocclusion to establish the need to take immediate action.

The percentage of children with ECC decreased from 7.1% in 2003-04 to 6.6% in 2008-2009, a decrease of 0.5% in Saskatchewan. The improvement was evident in the low income cut-off neighbourhoods, in the cities of Regina and Saskatoon. The percentage of children with ECC decreased from 21.7% in 2003-04 to 8.4% in the low income cut-off neighbourhoods in the city of Saskatoon in 2008-2009. The percentage of children with ECC decreased from 21.3% in 2003-04 to 13.2% in the low income cut-off neighbourhoods in the city of Regina in 2008-2009. The significant reduction in the ECC by 13.3% and by 8.1% can be attributed to the success of preventive dental programs such as targeted fluoride varnish application, dental screening and referral for treatment in the low income neighbourhoods in Saskatoon and Regina respectively.

For children in Grade One, tooth decay in the primary dentition remains a significant childhood problem, equally also for children in Grade Seven, tooth decay in the permanent dentition. The results of the 2008-2009 screening indicated that for the primary dentition tooth fatality rate, prevalence of dental caries (morbidity) and the average 'deft' score was higher among the Grade One students. Also for permanent dentition tooth fatality rate, prevalence of dental caries (morbidity) and the average 'DMFT' score was higher among the Grade Seven students.

Optional information collected included dental insurance, history of visit to a dental office and dental sealants. Social health insurance which was designed to be the cornerstone of Canada's health care system is not totally universal and does not provide dental coverage. Based on the 2008-2009 screening results, more than 75% of children screened had some type of dental insurance. Nearly one in every four children (either Grade One or Grade Seven) in Saskatchewan either do not have any type of dental insurance or are not sure about it. The utilization of public health dental clinics must be expanded to meet the needs of children without dental insurance.

Dental office visits are vital to maintaining good oral health. Based on the 2008-2009 screening results, nearly 77.4% of children visited the dentist in the past year. However, the reason for the dental visit was not recorded, if it was for preventive (fluoride treatment), diagnostic (check up) or treatment (fillings). The time of the last visit was not noted, and may have revealed any waiting time that existed. There is a need to improve basic oral health knowledge and practices that includes private dental practitioners teaching and advocating preventive dental health education to their patients.

Based on the 2008-2009 screening results, dental sealants utilization was only 32.9%, 12.3% among Grade One students and 20.6% among Grade Seven students respectively. The reason for the lower utilization of dental sealants requires further investigation when 56.2% of Grade One and 63.4% of Grade Seven students received a recommendation to have dental sealants placed. This could be due to lack of public knowledge, insurance

companies reluctant to compensate for dental sealants, reimbursement issues, or concerns not detecting dental caries before deciding to place the sealants.

Limitations of the study

Hidden Morbidity: The screening was conducted using a mouth mirror and LED flashlight. Cavities not detected visually might have been detected with radiographs. Not all students were screened, either due to lack of consent, absence on the day of screening or delay in receiving the consent forms from the parents/guardians. This represents the proportion of cases that were missed being detected or diagnosed.

Misclassification Bias¹⁸: This occurs when the method for collecting information about a subject is inadequate. Due to this, some of the information gathered regarding disease and/or exposure may be incorrect.

For the data collected regarding Low Income Cut-off information (LICO), students were grouped under LICO, if they attended a school located in low-income neighbourhood. A child who attends a school located in low-income neighbourhood might reside in a higher or medium income neighbourhood and vice-versa.

For the data collected regarding community water fluoridation (CWF), students were grouped under CWF, if they attended a school that has access to CWF. However, a child who attends a school that has access to CWF may reside in an area that does not have access to CWF and vice-versa.

Appendices

Appendix 1: Dental Screening Program Definitions

Average ‘deft/DMFT’:

- index used to measure the caries experience of a population. It is the count of the number of decayed, missing (due to caries), and filled teeth of a group of individuals.
- calculated by adding the mean ‘deft’ and mean ‘DMFT’ of a group of individuals.

The term ‘deft’ refers to decay, extracted and filled primary teeth

decay:

- visual or obvious decay of primary teeth.
- discolouration or loss of translucency typical of undermined or de-mineralized enamel.
- the tooth may not be restorable.

extracted:

- the primary teeth that have been extracted because of dental caries. Teeth missing for other reasons (i.e.: orthodontic, trauma, heredity) are not recorded.

filled:

- a primary tooth with a permanent or temporary restoration as a result of caries.
- if the tooth has a defective restoration without evidence of decay.

The term ‘DMFT’ refers to decay, missing and filled permanent teeth

Decay:

- visual or obvious decay of permanent teeth.
- discolouration or loss of translucency typical of undermined or de-mineralized enamel.
- the tooth may or may not be restorable.

Missing:

- the permanent teeth that have been extracted as a result of dental caries. Teeth lost for other reasons (i.e.: orthodontic, trauma, heredity) are not recorded.

Filled:

- a permanent tooth with a permanent or temporary restoration as a result of caries.
- if the tooth has a defective restoration without evidence of decay.

Attrition Rate:

- The rate of decline in the number or size.

Caries Prevention Fraction:

- Proportion of caries prevented due to exposure to community water fluoridation.

Morbidity:

- A measure of sickness, which could be either incidence rate or prevalence.

Hidden Morbidity:

- An undiagnosed or a missed measure of sickness.

Tooth Fatality Rate:

- Tooth fatality rate represents the potential for a tooth to be lost due to dental caries.

Recurrent Decay:

- when a tooth has a visible recurrent decay then it is marked as decayed even though it may have a restoration in place.

Pain:

- pain as a result of tooth decay, injury, periodontal disease, or over retention.

Infection:

- infection visible. (abscess)

Broken/Fractured/Lost:

- a tooth that has been restored where the restoration (i.e.: crown, amalgam) has failed and there is no obvious decay.

Restored/Fractured:

- fracture of the crown involving the dentin. The tooth is restored.

Non- Restored/ Fractured:

- fracture of the crown involving the dentin. The tooth is not restored or the restoration has been lost.

Early Childhood Caries:

- any decay evident in the deciduous anterior centrals and laterals.

Early Childhood Caries+:

- pain and/or infection present with anterior caries on deciduous centrals and laterals.

Supernumerary Teeth:

- supernumerary teeth are not counted. You must decide which tooth is the legitimate occupant of the space.

Over Retained:

- where both primary and permanent teeth occupy the same tooth space only the permanent tooth is considered.

Non-Vital Teeth:

- are to be scored as if they are vital.

Treatment Priorities:

Priority 1:

- pain and/or infection present, in teeth distal to deciduous laterals.
- early childhood caries+.
- urgent, requires immediate attention.

Priority 2:

- visible decay in 1-4 quadrants in teeth, distal to deciduous laterals.
- treatment required as soon as possible.

Priority 3:

- no visible decay.

Oral Health Status:

NDE:

- indicates that no decay, fillings or extractions are evident.

CCC:

- indicates that all decayed teeth appear to have treated.

PCC:

- indicates that some teeth have been treated, but decay is still evident.

NEC:

- indicates that there is decay but no evidence of past or present dental treatment.

Appendix 2: Dental Screening Advance Information Letter, 2008-2009

Dental Health Screening Program Grade One and Seven Students

Dear Parent or Guardian,

A dental health educator/coordinator will provide a dental health screening for your child on _____

The screening will be performed by a licensed dental therapist. A small flashlight and tongue depressor or a sterilized mouth mirror will be used. After the dental screening has been done, a letter will be sent home with each child. This screening does not replace regular checkups at your dental office.

The information collected from the screening will be used to plan and develop preventive programs and services based on the needs of your community.

Your child will receive a dental health screening **unless** you contact _____

Your child's Personal Health Services Plan number is required for statistical purposes. Please complete the bottom portion of this letter and return to the school by: _____

Dental Health Screening Program

Enter your child's Personal Health Services Plan # here

Health Region: _____
School: _____
Grade: _____

Saskatchewan

Health Services

Child's Name: _____

(Last)

(First)

Birthdate: ____/____/____
(month) (day) (year)

Male: Female:

Address: _____ Phone # (H) _____

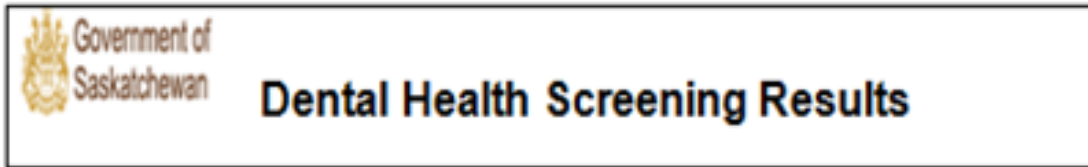
(Town/City) _____ Phone # (W) _____

(Postal Code) _____ Call Phone # _____

Please answer the following questions (optional):

- | | | | |
|---|------------------------------|-----------------------------|-----------------------------------|
| 1. Does your child have dental insurance/coverage? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not sure <input type="checkbox"/> |
| 2. Has your child been to the dentist in the past year? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not sure <input type="checkbox"/> |
| 3. Has your child ever had dental sealants? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not sure <input type="checkbox"/> |

Appendix 3: Dental Screening Results Letter (Ministry of Health, Govt. of SK)



Date: _____

Dear Parent/Guardian:

Dental screening results for _____

at _____

If you have questions call: _____

- | | |
|---|---|
| <input type="checkbox"/> No obvious cavities seen. If your dentist takes X-rays, hidden cavities between teeth may be seen. | <input type="checkbox"/> Dental sealants may be needed, if not already done. Dental sealants are clear plastic coatings that are painted on the chewing surfaces of permanent molars to prevent cavities. |
| <input type="checkbox"/> Pain and/or infection [s] present. Your child needs to see a dentist urgently . | <input type="checkbox"/> Early signs of gum disease (gingivitis/bleeding gums). Your child needs to see a dentist. |
| <input type="checkbox"/> Your child has a cavity/cavities. Your child needs to see a dentist soon. | <input type="checkbox"/> Crooked or crowded teeth and/or poor bite. You may already know about this. Ask your dentist at next dental visit. |
| <input type="checkbox"/> Cavity/cavities seen on your child's front baby teeth. These teeth may fall out soon, however, if there is pain or infection, see a dentist immediately . | <input type="checkbox"/> Tartar or stains on the surface of the teeth. Your child needs to see a dentist. |
| <input type="checkbox"/> Broken or lost filling, or lost crown. Your child needs to see a dentist soon. | <input type="checkbox"/> Daily flossing and brushing; brush two times a day with fluoride toothpaste and floss once a day. (See back) |
| <input type="checkbox"/> Suspicious areas on your child's teeth may be cavities. Your child needs to see a dentist soon. | |
| <input type="checkbox"/> Space maintainer/appliance/retainer requires attention. Your child needs to see a dentist soon. | |

Comments: _____

If your child needs dental treatment you can:

- ◆ Visit your family dentist, at your own expense.
- ◆ If you do not have a family dentist you can:
 - Visit a dentist in your area. You can call the College of Dental Surgeons of Saskatchewan at (306) 244-5072 for more information about dentists in your area (e.g. accessibility for people with disabilities, different languages).
- ◆ Dental students at the following locations can provide treatment at reduced rates:
 - First Nations University of Canada
National School of Dental Therapy, Prince Albert
Tel: 1-800-359-3575 or (306) 763-8800
 - Saskatchewan Institute of Applied Science and Technology
Dental Clinic, Regina
Tel: (306) 966-798-4326
 - University of Saskatchewan
College of Dentistry Dental Clinic, Saskatoon
Tel: (306) 966-5056

Dental Coverage

- ◆ Dental coverage for children 0-17 is provided through the Family Health Benefits Program. The program is available to families that receive the Saskatchewan Child Benefit, Employment Supplement, Provincial Training Allowance, or Community Resources Allowance. For more information call 1-888-488-6385.
- ◆ Dental coverage for First Nations children is available through First Nations and Inuit Health Branch, Health Canada. For more information call 1-877-780-5458

**Brush twice a day – In the morning and at bedtime –
Children need help brushing until about the age of 8.**

outside



Angle brush, place half on tooth, half on gum, vibrate side to side

inside



Brush the inside surfaces of the front and the back teeth

chewing surfaces



Vibrate back and forth

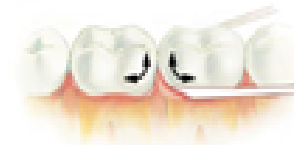
Floss once a day - Children younger than 9 will need a parent's help.



Wrap floss around middle fingers (about 1/2 meter or 18 inches)



Gently guide floss between teeth



Move floss up and down, sliding under gum line, on both adjacent teeth

Appendix 4: Grade One Dental Health Status Indicators, 1993-94, 1998-99, 2003-04 and 2008-09 Screening Years, by Health Region

Screening Year	Health Region	# children screened	Average 'deft/DMFT'	% with cavities	% with no evidence of care	% children with ECC	% children with pain and or infection	% children cavity-free
93/94	Cypress	598	2.65	15.1	7.5	1.3	3.0	46.5
98/99*	Cypress	163	3.08	29.4	11.7	8.6	1.8	39.3
03/04	Cypress	499	2.63	21.2	9.8	3.2	1.6	43.7
08/09	Cypress	411	2.80	21.9	7.4	5.1	2.2	45.5
93/94	Five Hills	790	2.10	12.5	8.9	0.1	3.4	53.5
98/99	Five Hills	646	2.07	15.5	8.4	1.1	2.3	55.0
03/04	Five Hills	480	2.09	25.5	14.5	2.3	1.7	49.4
08/09	Five Hills	402	2.34	19.1	12.4	2.2	0.5	47.5
93/94	Heartland	509	3.11	23.4	6.1	1.8	7.3	35.0
98/99	Heartland	576	2.95	28.5	11.8	2.8	4.7	38.0
03/04	Heartland	467	3.31	34.3	14.8	4.5	3.9	34.9
08/09	Heartland	445	3.45	26.2	9.7	5.8	4.3	35.0
93/94	Kelsey Trail	514	3.70	23.4	12.5	0.4	4.7	31.9
98/99	Kelsey Trail	459	3.99	34.6	17.6	0.2	6.1	29.0
03/04	Kelsey Trail	472	3.36	32.6	14.6	4.9	4.4	37.3
08/09	Kelsey Trail	372	3.54	31.7	12.7	9.4	6.4	34.0
93/94	Prince Albert Parkland	1082	3.03	21.7	13.0	1.7	5.6	41.9
98/99	Prince Albert Parkland	1113	2.74	30.3	15.1	2.9	3.6	42.9
03/04	Prince Albert Parkland	870	3.37	35.5	17.6	6.4	5.6	36.0
08/09	Prince Albert Parkland	548	NR	NR	12.6	3.3	2.5	26.6
93/94	Prairie North	1098	3.37	26.4	12.5	2.0	5.5	38.1
98/99	Prairie North	1139	3.45	36.2	17.8	0.6	3.7	33.7
03/04	Prairie North	960	3.63	35.3	17.7	5.6	4.5	31.6
08/09	Prairie North	691	3.20	29.7	10.7	1.0	2.2	37.8
93/94	Regina Qu'Appelle	3286	3.85	21.1	10.0	3.4	6.4	45.0
98/99	Regina Qu'Appelle	3202	3.87	22.9	12.1	6.2	4.3	48.0
03/04	Regina Qu'Appelle	2441	2.93	24.3	13.2	6.9	3.4	51.4
08/09	Regina Qu'Appelle	2031	3.34	33.5	16.3	10.3	5.2	42.9
93/94	Saskatoon	3963	3.13	17.3	8.2	0.9	6.0	51.6
98/99	Saskatoon	3960	2.45	20.5	10.0	0.4	3.3	53.8
03/04	Saskatoon	3085	2.15	16.6	10.3	6.8	2.7	53.9
08/09	Saskatoon	2849	2.36	19.2	9.3	5.9	4.0	50.8

* Cypress Health Region 1998-1999 screening data incomplete due to loss of computer data.

Screening Year	Health Region	# children screened	Average 'deft/DMFT'	% with cavities	% with no evidence of care	% children with ECC	% children with pain and or infection	% children cavity-free
93/94	Sun Country	811	2.76	19.7	8.4	0.5	5.5	46.5
98/99	Sun Country	808	2.43	25.7	13.5	1.2	3.7	49.3
03/04	Sun Country	653	2.71	29.1	12.7	4.6	3.5	38.9
08/09	Sun Country	432	2.74	29.2	15.5	5.8	5.8	43.4
93/94	Sunrise	727	3.80	25.0	11.4	2.9	6.9	31.2
98/99	Sunrise	635	3.36	29.6	14.2	0.9	1.3	37.8
03/04	Sunrise	545	3.47	20.9	10.6	6.8	2.4	38.0
08/09	Sunrise	565	3.84	28.6	13.6	2.5	3.3	35.7
93/94	Northern**	14	4.79	50.0	35.7	28.6	21.4	28.6
98/99	Northern**	NR***	NR***	NR***	NR***	NR***	NR***	NR***
03/04	Northern**	361	6.20	46.3	20.5	38.2	21.1	14.1
08/09	Northern**	333	5.95	59.7	21.1	21.3	5.7	15.5
93/94	Total	13392	2.74	20.0	9.6	1.7	5.8	45.2
98/99	Total	12701	2.61	24.9	12.4	2.4	3.6	46.7
03/04	Total	10833	2.94	25.5	13.2	7.1	3.9	44.7
08/09	Total	9079	3.14	27.5	11.9	6.6	4.0	41.5

** Mamawetan Churchill River Health Region and Keewatin Yatthé Health Region.

*** NR: Not Recorded

Appendix 5: Grade One Dental Health Status Indicators for each Health Region, by Screening Year

Screening Year	Health Region	# children screened	Average 'deft/DMFT'	% with cavities	% with no evidence of care	% children with ECC	% children with pain and or infection	% children cavity-free
93/94	Cypress	598	2.65	15.1	7.5	1.3	3.0	46.5
93/94	Five Hills	790	2.10	12.5	8.9	0.1	3.4	53.5
93/94	Heartland	509	3.11	23.4	6.1	1.8	7.3	35.0
93/94	Kelsey Trail	514	3.70	23.4	12.5	0.4	4.7	31.9
93/94	Prince Albert Parkland	1082	3.03	21.7	13.0	1.7	5.6	41.9
93/94	Prairie North	1098	3.37	26.4	12.5	2.0	5.5	38.1
93/94	Regina Qu'Appelle	3286	3.85	21.1	10.0	3.4	6.4	45.0
93/94	Saskatoon	3963	3.13	17.3	8.2	0.9	6.0	51.6
93/94	Sun Country	811	2.76	19.7	8.4	0.5	5.5	46.5
93/94	Sunrise	727	3.80	25.0	11.4	2.9	6.9	31.2
93/94	Northern*	14	4.79	50.0	35.7	28.6	21.4	28.6
93/94	Total	13392	2.74	20.0	9.6	1.7	5.8	45.2
98/99**	Cypress	163	3.08	29.4	11.7	8.6	1.8	39.3
98/99	Five Hills	646	2.07	15.5	8.4	1.1	2.3	55.0
98/99	Heartland	576	2.95	28.5	11.8	2.8	4.7	38.0
98/99	Kelsey Trail	459	3.99	34.6	17.6	0.2	6.1	29.0
98/99	Prince Albert Parkland	1113	2.74	30.3	15.1	2.9	3.6	42.9
98/99	Prairie North	1139	3.45	36.2	17.8	0.6	3.7	33.7
98/99	Regina Qu'Appelle	3202	3.87	22.9	12.1	6.2	4.3	48.0
98/99	Saskatoon	3960	2.45	20.5	10.0	0.4	3.3	53.8
98/99	Sun Country	808	2.43	25.7	13.5	1.2	3.7	49.3
98/99	Sunrise	635	3.36	29.6	14.2	0.9	1.3	37.8
98/99	Northern*	NR***	NR***	NR***	NR***	NR***	NR***	NR***
98/99	Total	12701	2.61	24.9	12.4	2.4	3.6	46.7
03/04	Cypress	499	2.63	21.2	9.8	3.2	1.6	43.7
03/04	Five Hills	480	2.09	25.5	14.5	2.3	1.7	49.4
03/04	Heartland	467	3.31	34.3	14.8	4.5	3.9	34.9
03/04	Kelsey Trail	472	3.36	32.6	14.6	4.9	4.4	37.3
03/04	Prince Albert Parkland	870	3.37	35.5	17.6	6.4	5.6	36.0
03/04	Prairie North	960	3.63	35.3	17.7	5.6	4.5	31.6
03/04	Regina Qu'Appelle	2441	2.93	24.3	13.2	6.9	3.4	51.4
03/04	Saskatoon	3085	2.15	16.6	10.3	6.8	2.7	53.9
03/04	Sun Country	653	2.71	29.1	12.7	4.6	3.5	38.9
03/04	Sunrise	545	3.47	20.9	10.6	6.8	2.4	38.0
03/04	Northern*	361	6.20	46.3	20.5	38.2	21.1	14.1
03/04	Total	10833	2.94	25.5	13.2	7.1	3.9	44.7

Screening Year	Health Region	# children screened	Average 'deft/DMFT'	% with cavities	% with no evidence of care	% children with ECC	% children with pain and or infection	% children cavity-free
08/09	Cypress	411	2.80	21.9	7.4	5.1	2.2	45.5
08/09	Five Hills	402	2.34	19.1	12.4	2.2	0.5	47.5
08/09	Heartland	445	3.45	26.2	9.7	5.8	4.3	35.0
08/09	Kelsey Trail	372	3.54	31.7	12.7	9.4	6.4	34.0
08/09	Prince Albert Parkland	548	NR***	NR***	12.6	3.3	2.5	26.6
08/09	Prairie North	691	3.20	29.7	10.7	1.0	2.2	37.8
08/09	Regina Qu'Appelle	2031	3.34	33.5	16.3	10.3	5.2	42.9
08/09	Saskatoon	2849	2.36	19.2	9.3	5.9	4.0	50.8
08/09	Sun Country	432	2.74	29.2	15.5	5.8	5.8	43.4
08/09	Sunrise	565	3.84	28.6	13.6	2.5	3.3	35.7
08/09	Northern*	333	5.95	59.7	21.1	21.3	5.7	15.5
08/09	Total	9079	3.14	27.5	11.9	6.6	4.0	41.5

* Mamawetan Churchill River Health Region and Keewatin Yatthé Health Region.

**Cypress Health Region 1998-1999 screening data incomplete due to loss of computer data

*** NR: Not Recorded

Appendix 6: Grade Seven Dental Health Status Indicators, 1993-94, 1998-99, 2003-04 and 2008-09 Screening Years, by Health Region

Screening Year	Health Region	# children screened	Average 'deft/DMFT'	% with cavities	% with no evidence of care	% children with pain and or infection	% children cavity-free
08/09	Cypress	446	1.06	9.8	4.7	0.4	67.0
08/09	Five Hills	332	0.78	7.2	6.6	0.3	68.7
08/09	Heartland	432	1.35	10.8	4.2	0.7	52.5
08/09	Kelsey Trail	398	1.42	13.0	8.1	0.7	50.6
08/09	Prince Albert Parkland	413	NR*	NR*	3.2	0.0	31.8
08/09	Prairie North	517	1.3	15.3	8.4	1.5	49.0
08/09	Regina Qu'Appelle	2013	1.37	15.9	7.5	1.1	58.6
08/09	Saskatoon	3068	0.85	6.4	3.6	0.9	66.6
08/09	Sun Country	439	1.06	14.1	7.3	1.4	61.3
08/09	Sunrise	533	1.39	12.2	6.2	0.6	50.6
08/09	Northern**	244	2.51	32.8	3.0	0.8	30.1
08/09	Total	8835	1.24	11.3	5.3	0.9	57.1

* NR: Not Recorded

** Mamawetan Churchill River Health Region and Keewatin Yatthé Health Region.

Appendix 7: List of Hutterite Colony Schools, 2008-2009

List of Hutterite Colony Schools in Cypress Health Region, 2008-2009	
Abbey Hutterite Colony School	Grassy Hill Hutterite Colony School
Bone Creek Hutterite Colony School	Haven Hutterite Colony School
Box Elder Hutterite Colony School	Hulbert Hutterite Colony School
Butte Hutterite Colony School	Norfolk Hutterite Colony School
Capeland Hutterite Colony School	Pelletier Hill Hutterite Colony School
Carmichael Hutterite Colony School	Pennant Hutterite Colony School
Creston Bench Hutterite Colony School	Ruskin Hutterite Colony School
Cypress Hutterite Colony School	Haven Hutterite Colony School
Downie Lake Hutterite Colony School	Sand Lake Hutterite Colony School
Earview Hutterite Colony School	Spring Lake Hutterite Colony School
East Fairwell Hutterite Colony School	Vanguard Hutterite Colony School
Estuary Hutterite Colony School	Webb Hutterite Colony School
Friesen Hutterite Colony School	Wheatland Hutterite Colony School
Garden Plane Hutterite Colony School	

List of Hutterite Colony Schools in Heartland Health Region, 2008-2009

Beechy Hutterite Colony School	Milden Hutterite Colony School
Clelland Hutterite Colony School	Prairieland Hutterite Colony School
Dinsmore Hutterite Colony School	Scott Hutterite Colony School
Eagle Creek Hutterite Colony School	Smiley Hutterite Colony School
Eatonia Hutterite Colony School	Springfield Hutterite Colony School
Glidden Hutterite Colony School	Springwater Hutterite Colony School
Goldenview Hutterite Colony School	Sunnydale Hutterite Colony School
Kyle Hutterite Colony School	Valley Centre Hutterite Colony School
Lakeview Hutterite Colony School	Willowpark Hutterite Colony School

Appendix 8: List of communities with fluoridated water and communities receiving fluoridated water, Saskatchewan, 2008-2009

Communities with Fluoridated Water and Communities Receiving Fluoridated Water Saskatchewan, 2008-2009	
Allan*	Meadow Lake
Annaheim*	Melfort
Assiniboia	Melville
Balgonie	Milden Colony, Outlook
Bradwell*	Moose Jaw
Bruno*	Moosomin
Canora	Muenster*
Carnduff	Osler*
Clavet*	Outlook
Cudworth*	Prince Albert
Dalmeny*	Quill Lake
Dinsmore Colony, Outlook*	Rosetown
Domremy*	Saskatoon
Estevan	St. Isidore de Bellevue*
Eston*	Star City*
Flying Dust First Nation*	Star City Colony, Melfort*
Gronlid*	Swift Current
Gull Lake	Tisdale
Hague*	Turtleford
Humboldt*	Wadena
Indian Head	Wakaw
Kamsack	Warman*
Kindersley	Watson
Lake Lenore*	Weyburn
Luseland	Wynyard
Martensville*	

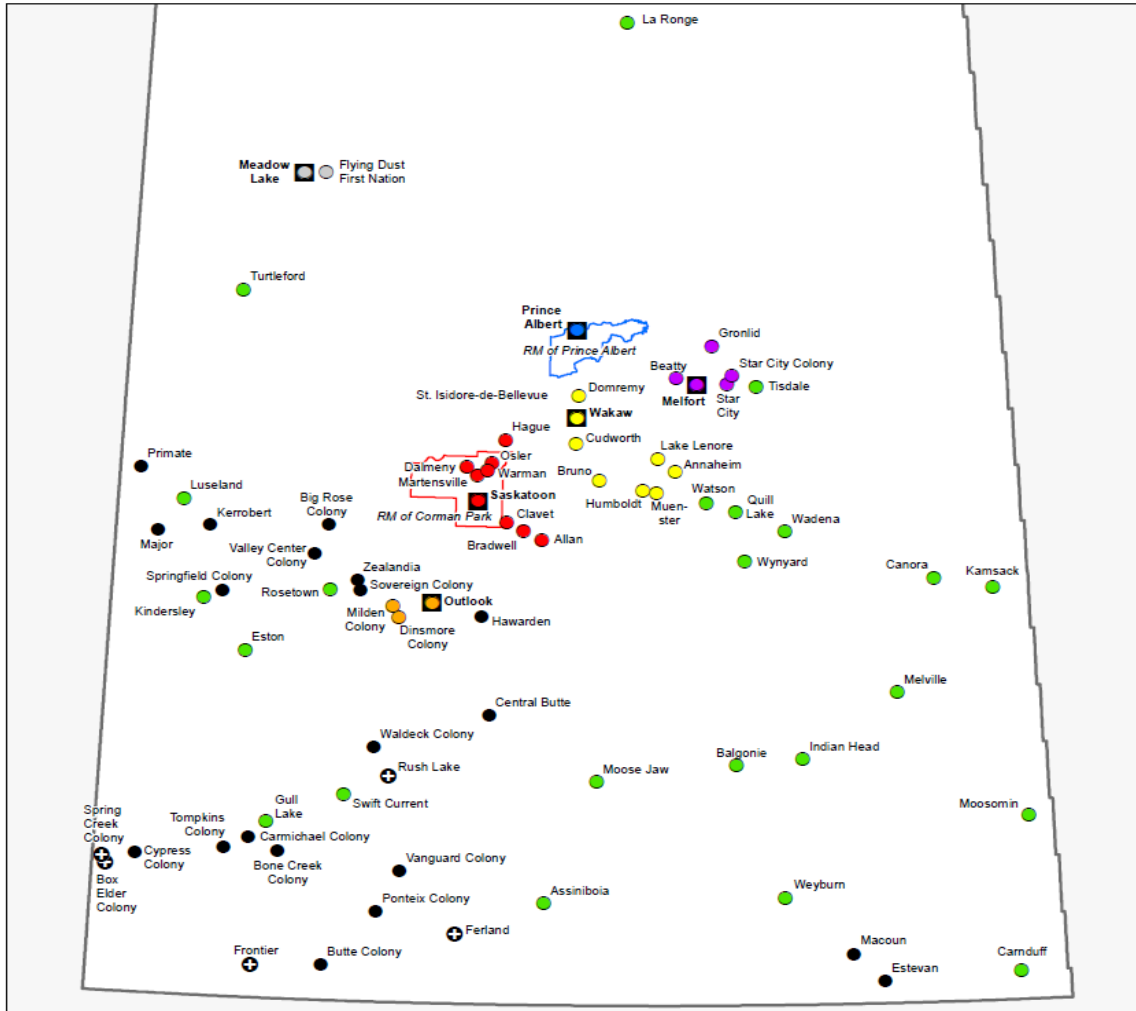
*Receive fluoridated water via pipeline.

Appendix 9: List of communities with naturally occurring optimal (0.7 mg/L) and above fluoride levels

Communities with Naturally Occurring Optimal (0.7mg/L) and Above Fluoride Levels	
Big Rose Colony, Biggar	Major
Bone Creek Colony), Gull Lake	Ponteix Colony, Ponteix
Box Elder Colony, Maple Creek	Prairieland School Colony, Sovereign
Butte Colony, Val Marie	Primate
Carmichael Colony, Carmichael	Rush Lake
Central Butte	Spring Creek Colony, Maple Creek
Cypress Colony, Maple Creek	Springfield Colony, Kindersley
Ferland	Tompkins Colony, Tompkins
Frontier	Vanguard Colony, Vanguard
Hawarden	Valley Centre Colony, Rosetown
Kerrobert	Waldeck Colony, Waldeck
Macoun	Zealandia

Appendix 10: Map of communities with Fluoride in water, Saskatchewan, 2008-2009

Community Water Fluoridation



Community receives fluoridated water from:

- Saskatoon
- Outlook
- Wakaw
- Prince Albert
- Melfort
- Meadow Lake

- Community fluoridates independently
- Community with natural fluoride content
- ⊕ Community with natural fluoride content above MAC

□ Community providing fluoridated water

Saskatoon Health Region | Public Health Services
 Produced by the Public Health Observatory
 Updated 25 October 2010

Appendix 11: Preventive Dental Care Services in each Health Region in Saskatchewan, 2008-2009

Services Health Regions	Fluoride Mouthrinse	Fluoride Varnish	Pit and Fissure Sealants	Public Health Dental Clinic
Cypress Health Region	Yes	Yes	No	No
Five Hills Health Region	Yes	No	No	No
Heartland Health Region	Yes	No	No	No
Kelsey Trail Health Region	Yes	Yes	No	No
Keewatin Yatthé Health Region	Yes	Yes	Yes	Yes
Mamawetan Churchill River Health Region	Yes	Yes	Yes	Yes
Prince Albert Parkland Health Region	Yes	Yes	Yes	Yes
Prairie North Health Region	Yes	Yes	No	No
Regina Qu'Appelle Health Region	Yes	Yes	No	No
Saskatoon Health Region	Yes	Yes	Yes	Yes
Sun Country Health Region	Yes	Yes	No	No
Sunrise Health Region	Yes	Yes	No	No

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<http://www.fptdwc.ca/assets/PDF/Canadian%20Oral%20Health%20Strategy%20-%20Final.pdf>
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