

**Sunrise Health Region  
Public Health Services**

March 2011

**Dental Health Screening Program Report  
Grade one and Grade seven  
2008-2009**



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### **Examiners and Data Collection**

The following Dental Health Coordinators participated as examiners and recorded the results:

- Bernie Laevens
- Wendy Griffith

### **Data Analysis**

Vinay K. Pilly, M.P.H. Practicum Student (U of S), Saskatoon Health Region

### **Writing and Editing**

- Vinay K. Pilly, M.P.H. Practicum Student (U of S), Saskatoon Health Region
- Wendy Griffith - Registered Dental Therapist, Registered Dental Hygienist
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- Christ the Teacher School Division
- Good Spirit School Division
- Horizon School Division
- Prairie Valley School Division

**Message from Medical Health Officer  
Public Health Services  
Sunrise Health Region**





## Preface

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Public Health Services (PHS), Dental Health Education program, Sunrise Health Region, conducted an oral health screening of Grade One and Grade Seven students in the region during the 2008-09 school year.

The purpose of this screening was to assess oral health needs and to identify children with unmet dental needs and to allow referral, who were in obvious need of dental treatment. Public Health Services, Sunrise 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 also available on the Sunrise Health Region website. To obtain additional copies of the report, to make suggestions, or to request further information, please contact:

Sunrise Health Region  
Public Health Services  
Dental Health Education Program  
150 Independent St  
Yorkton, Saskatchewan  
S3N 0S7  
Phone: (306) 786-0600  
Website: <http://www.shr.sk.ca>



## Executive Summary

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A Dental Health Screening was conducted in the Sunrise Health Region during the 2008-2009 school year to assess oral health status and to identify children with unmet dental needs. The 2008- 09 dental health screening of children is the fourth in a series of dental screening carried out every five years since 1993.

The screening assessed the past and present dental caries experience by a measure of combination indices for both primary (deft) and permanent (DMFT) dentition. 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 (Appendix 1).

Optional information collected included: dental insurance coverage, visit to a dental office, history of pit and fissure sealants done and usage of mouth guards was collected from all students.

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.

This report is divided into the following parts:

1. Executive Summary
2. Introduction
3. Methods
4. Results
5. Assessment
6. Discussion
7. Limitations of the study

## Key Findings

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Forty Six schools and 1,098 children across the health region participated in the screening, for a response rate of 91.3% (1098/1202) (Appendix 3)

## Introduction

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Oral health is an inseparable and essential part of total health and contributes to overall well being, and 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 (Drum, Chen & Duffy, 1998).<sup>4</sup>

Early Childhood Caries (ECC) is one of the most destructive form affecting primary teeth that can have a negative impact on oral health of infants & children, which is preventable, by proper education, counselling, prevention and anticipatory guidance (AAPD, 2004). Lack of dental health education, dental health insurance and barrier to access dental health care are some of the social variables contributing to prevalence of ECC.<sup>4</sup>

Research has shown that fluoride in optimal levels in drinking water is the most cost-effective community based preventive strategy for dental caries. Apart from that fluoride can be obtained from salt, milk, mouthrinse, toothpaste as well from professionally applied fluorides. Long term exposure to optimal levels of fluoride results in diminishing levels of caries in both children and adult populations.<sup>5</sup>

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

children from low socio-economic status.<sup>6</sup>

Poor oral health and untreated tooth decay is a huge economic burden that exceed 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.<sup>1</sup>

The Dental Health Educators (DHE's) within Public Health Services (PHS) conducted visual oral screening of Grade One and Grade Seven students in the Sunrise HR in the 2008-09 school year.

This report describes the methodology for conducting the 2008-09 dental screening and the results, which will be shared with policy makers, dental fraternity and stakeholders.



## Water Fluoridation in Canada

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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.<sup>7, 8</sup> In US, American Dental Association, Center for Disease Control and Prevention and the American Academy of Pediatric Dentistry supports water fluoridation based on evidence as safe and effective.<sup>9</sup> The Center for Disease Control and Prevention hails water fluoridation as one out of the ten great public health achievements of 20<sup>th</sup> century<sup>10</sup> and World Health Organization believes access to fluoride as a basic human right.<sup>11</sup>

In Canada, during April 2008, Health Canada made public, its findings and recommendations from fluoride expert panel. The panel concluded that 0.7mg/L ppm of fluoride in drinking water protects teeth against decay, while minimizing risk of dental fluorosis. Further, the panel found no health risks due to mild dental fluorosis and noted that prevalence of moderate fluorosis in Canada is on a decline. Despite this, community water fluoridation remains a contentious issue.<sup>11</sup>

Based on the Provincial and territorial estimates for community water fluoridation coverage in 2007, the percentage of Canadian population with fluoridated water was 45.1% and in Saskatchewan it was 36.8%, which is way below the national percentage.<sup>11</sup>

## Methods

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Dental screening was offered to all Grade One and Grade Seven students who attended schools in the Sunrise Health Region between September 2008 and June 2009. (**Appendix 3**)

Dental Health Educators (licensed Saskatchewan Dental Therapists) assessed the child's oral health by a visual examination, using a mouth mirror and LED flashlight.

Students were assessed for possible dental health needs, and these were communicated via a "Dear Parent/Guardian" letter. All students were provided with basic recommendations for oral hygiene, including illustrations of proper flossing and brushing techniques. (**Appendix 4**)

Screening data, including basic demographic information about each child was entered into an Access database by the 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".

Epidemiological studies, involving Odds ratio and Relative risk, were calculated using the software OpenEpi, Version 2.3 (2009, Emory University, USA)

## Results

### Participation

The total Grade One and Grade Seven student screened in Saskatoon Health Region for this period was 1098.

**Table 1: Participation in the Sunrise HR Dental Health Screening, 2008-09**

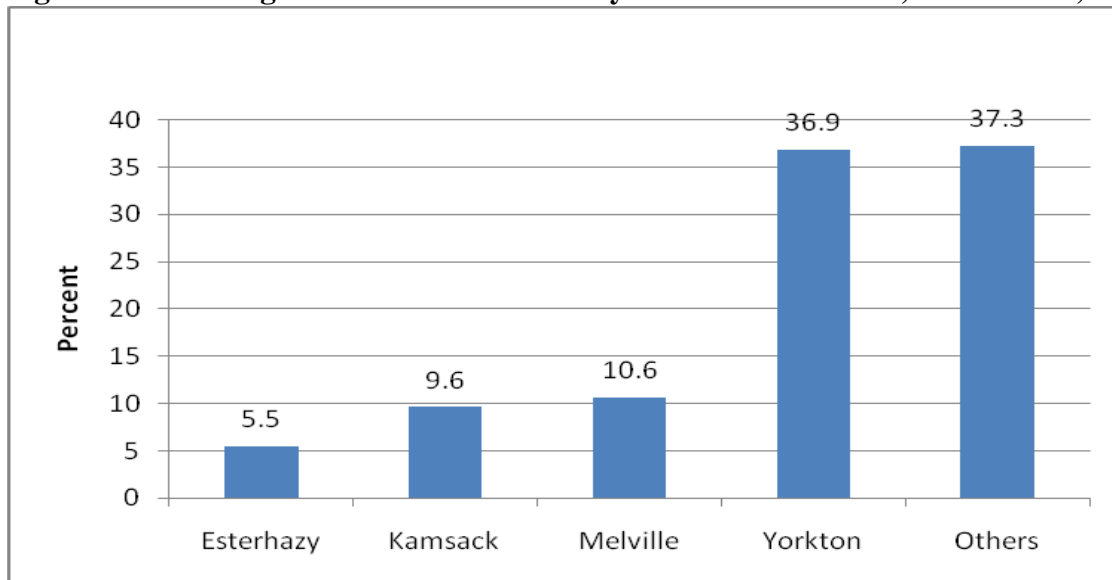
Grade	Total Enrollment	Screened Number (%)	Refused Number (%)	Absent Number (%)
Grade One	603	565(93.7)	9(1.5)	29(4.8)
Grade Seven	599	533(88.9)	15(2.5)	51(8.5)

### Location

1098 students were included in this analysis. Of the total number of students screened, 36.8 % (405) attended urban schools and 63.1 % ( 693) attended rural schools.

Of the 1098 students screened, 405 (36.9%) were from schools in the City of Yorkton, 60 (5.5%) were from Esterhazy, 106(9.6%) were from Kamsack, 117(10.6%) were from Melville, and the rest 410(37.3%) were from other communities in Sunrise HR.

**Figure 1: Percentage of Students Screened by Location of Schools, Sunrise HR, 2008-09**





**Table 2: Students screened by Location of School, Sunrise HR, 2008-09**

Location of School	Number	Percentage
Esterhazy	60	5.5%
Kamsack	106	9.6%
Melville	117	10.6%
Yorkton	405	36.9%
Others	410	37.3%

### **Gender Distribution**

**Table 3: Gender of School Students Screened, Sunrise HR, 2008-9**

Grade	Male		Female	
	Number	Percent	Number	Percent
Grade One	283	50.1%	266	47.1%
Grade Seven	266	49.9%	244	45.8%

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

Gender not recorded for 2.83% (16) of Grade One students and 4.3% (23) of 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 on June 30<sup>th</sup> 2009

For Grade One students, the mean age as on June 30<sup>th</sup> 2009 was 7.14 years

For Grade Seven students, the mean age as on June 30<sup>th</sup> 2009 was 13.22 years

## Water fluoridation

Approximately 20.2 % ( n=114) of Grade One students were reported to have attended schools located in communities with optimally adjusted community water fluoridation.

A similar proportion of Grade Seven students, 23.0 % ( n=123) attended schools in communities with access to fluoridated water.

Only three communities in the Sunrise Health Region receive fluoridated water. Most of the students screened did not attend schools with water fluoridation.

**Table 4: Communities with Fluoridated Water and Students Screened, Sunrise HR, 2008-09**

Community	Number	Percent
Canora	53	4.8%
Kamsack	67	6.1%
Melville	117	10.6%

## Dental Health Assessment

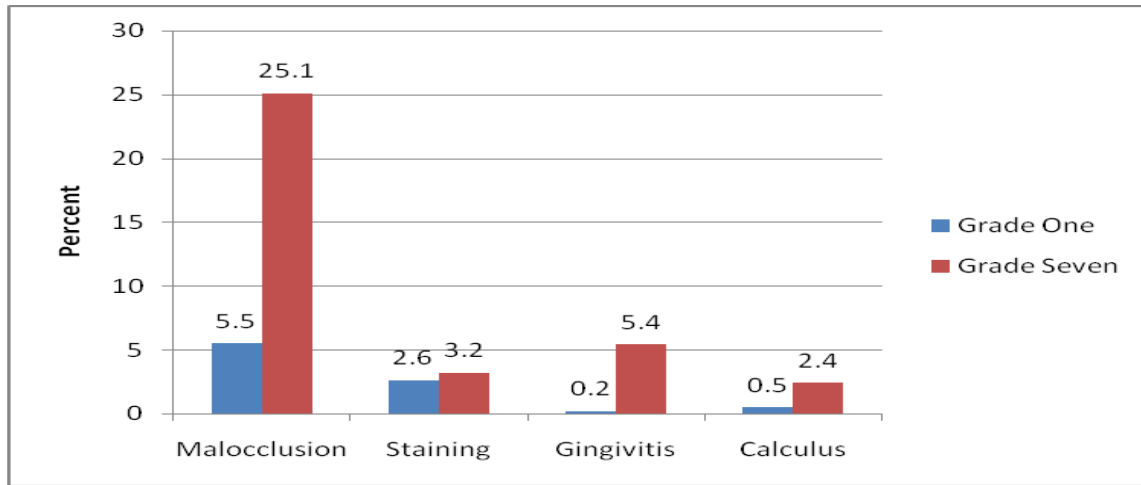
The basic measures of dental health included assessment of outstanding treatment needs, past and present dental caries experience. Decay experience includes decayed teeth, filled teeth, or teeth that were extracted due to decay.

349 students (61.6%) of Grade One participated in a regular fluoride mouth rinse program at school. 221 students (39.1%) were sent home a recommendation to receive sealants and 21 students (3.7%) had existing fillings that required treatment.

295 students (55.3%) of Grade Seven participated in a regular fluoride mouth rinse program at school. 181 students (33.9%) received a sealant recommendation and 3(0.5%) had existing fillings that required treatment.

The factors malocclusion, staining, gingivitis and presence of calculus were included to assess the other Dental Health Care Needs, the extent of which is illustrated in the Figure 2.

**Figure 2: Dental Health Care Needs, Grade One and Grade Seven Students, Sunrise HR, 2008-09**



**Table 5 A: Grade One Dental Health Care Needs, Sunrise HR, 2008-09**

Dental Health Need	Malocclusion	Staining	Gingivitis	Calculus
Number	31	15	1	3
Proportion	5.5%	2.6%	0.2%	0.5%

**Table 5 B: Grade Seven Dental Health Care Needs, Sunrise HR, 2008-09**

Dental Health Need	Malocclusion	Staining	Gingivitis	Calculus
Number	134	17	29	13
Proportion	25.1%	3.2%	5.4%	2.4%

**Table 5 C: Grade One and Seven Dental Health Care Needs, Sunrise HR, 2008-09**

Dental Health Need	Malocclusion	Staining	Gingivitis	Calculus
Number	165	32	30	16
Proportion	15.0%	3.0%	2.7%	1.4%

**Definitions:**

Malocclusion: Crooked or crowded teeth and/or poor bite

Staining: Suspicious areas (possible decay), tartar 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. 2.5 % of (14/565) Grade One students had evidence of Early Childhood Caries, with or without pain or infection.

**Table 6: Prevalence of Early Childhood Caries (ECC) and ECC+, Sunrise HR, 2008-9**

Deciduous Caries	ECC	ECC+
Number	14	0
Proportion	2.5%	0%

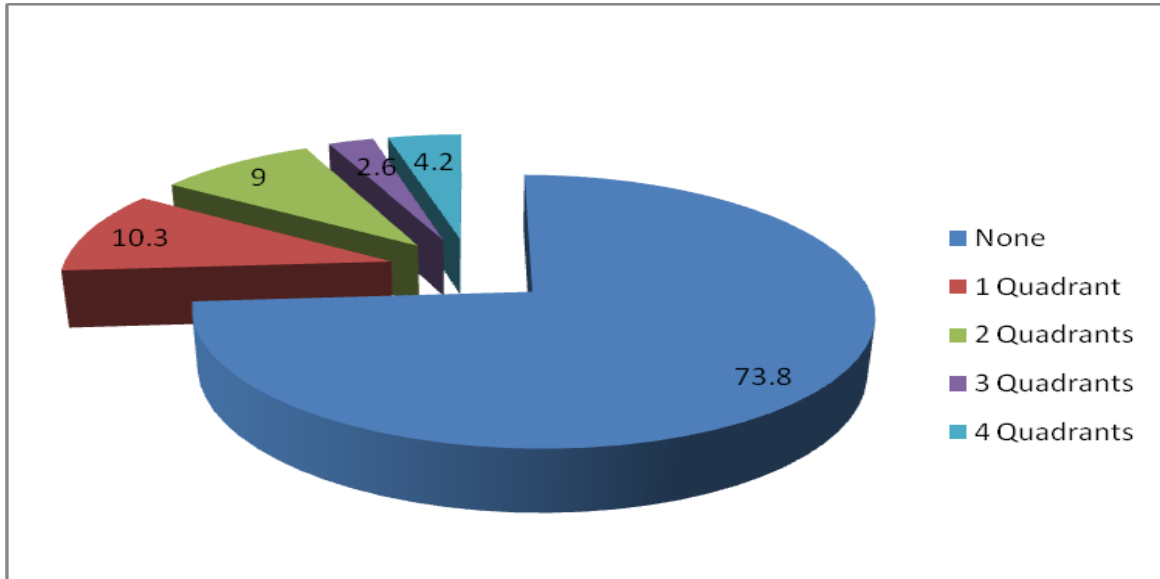
Children were assessed for visible, current tooth decay and scored on the number of quadrants of the mouth (0-4) affected by decay.

Of the 148(26.2%) Grade One students who had visible tooth decay at the time of examination; the extent is illustrated in Table 7A

**Table 7A: Grade One Decay, Sunrise HR, 2008-09**

Decay	None	1 Quadrant	2 Quadrants	3 Quadrants	4 Quadrants
Number	417	58	51	15	24
Proportion	73.8%	10.3%	9.0%	2.6%	4.2%

**Figure 3 : Proportion of Grade One Students by Number of Affected Quadrants, Sunrise HR, 2008-09**

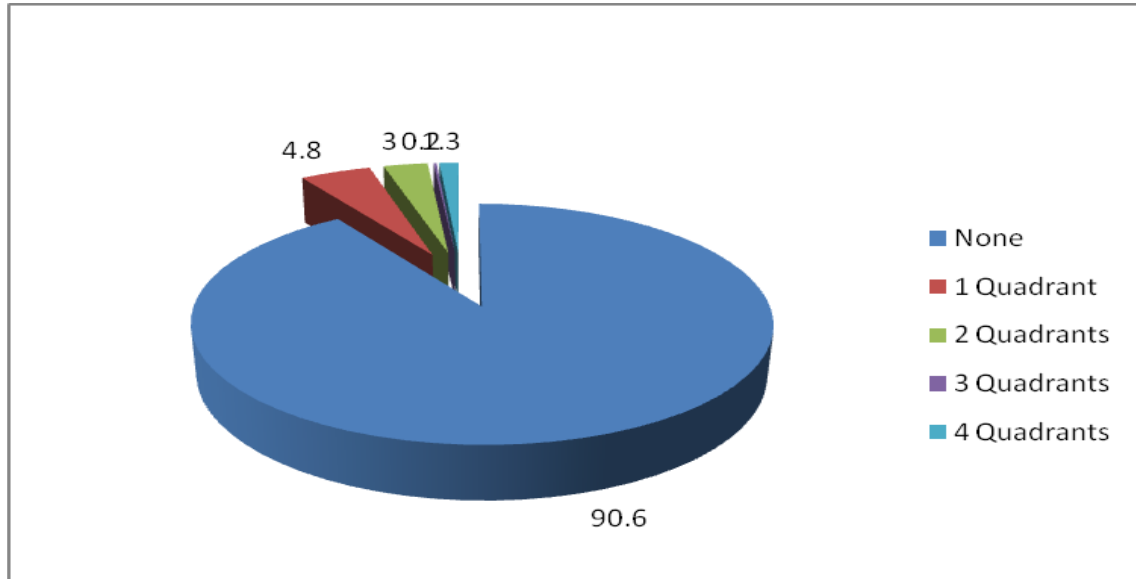


Of the 50(9.4%) Grade Seven students who had visible tooth decay at the time of examination; the extent is illustrated in Table 7B

**Table 7B: Grade Seven Decay, Sunrise HR, 2008-09**

Decay	None	1 Quadrant	2 Quadrants	3 Quadrants	4 Quadrants
Number	483	26	16	1	7
Proportion	90.6%	4.8%	3.0%	0.2%	1.3%

**Figure 4 : Proportion of Grade Seven Students by Number of Affected Quadrants, Sunrise HR, 2008-09**



‘deft’ is an index used to measure disease experience in dental screening. It measures not just current dental disease, but a history of tooth decay as evidence by fillings or extractions.

**Table 8A: Grade One ‘deft’ component, Sunrise HR, 2008-09**

Number of affected teeth	Decayed	Extracted	Filled
None	407(72.0%)	477(84.4%)	289(51.2%)
1-3	109(19.3%)	59(10.4%)	103(18.2%)
4-6	32(5.7%)	20(3.5%)	86(15.2%)
7+	17(3.0%)	9(1.6%)	87(15.4%)

Of the Grade One students screened, 48.8% had atleast one filled primary tooth. About 28.0% had at least one decayed primary tooth and the proportion with at least one extracted tooth as a result of dental caries was 15.6%

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), missing (m) or filled (f) due to caries

**Table 8 B: Grade One ‘deft’ scores, Sunrise HR, 2008-09**

deft score	Number	Proportion
0	203	35.9%
1-3	115	20.3%
4-6	106	18.7%
7+	141	24.9%

The average (mean) deft score among Grade One students was **3.74**

The prevalence of dental caries for primary dentition among Grade One students in Sunrise HR, 2008-09, was 64.1%.

**Table 9A: Grade Seven ‘deft’ component, Sunrise HR, 2008-09**

Number of affected teeth	Decayed	Extracted	Filled
None	521(97.7%)	530(99.4%)	469(88.0%)
1-3	11(2.1%)	3(0.6%)	54(10.1%)
4-6	0(0.0%)	0(0.0%)	10(1.9%)
7+	1(0.2%)	0(0.0%)	0(0.0%)

Of the Grade Seven students screened, 12.0% had atleast one filled primary tooth. About 2.3% had at least one decayed primary tooth and the proportion with at least one extracted tooth as a result of dental caries was 0.6%

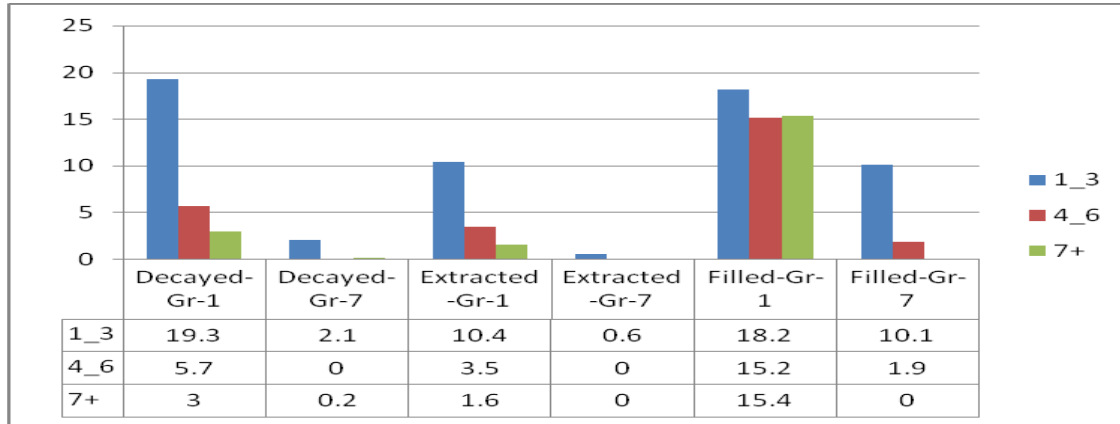
**Table 9 B: Grade Seven ‘deft’ scores, Sunrise HR, 2008-09**

deft score	Number	Proportion
0	458	85.9%
1-3	62	11.6%
4-6	12	2.2%
7+	1	0.2%

The average (mean) deft score among Grade Seven students was **0.30**

The prevalence of dental caries for primary dentition among Grade Seven students in Sunrise HR, 2008-09, was 14.1%.

**Figure 5: Grade One and Grade Seven “deft” components, Sunrise HR, 2008-09**



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 10A: Grade One ‘DMFT’ components, Sunrise HR, 2008-09**

Number of affected teeth	Decayed	Extracted/Missing	Filled
None	556(98.4)	565(100.0)	549(97.2)
1-3	7(1.2)	0	13(2.3)
4-6	2(0.3)	0	3(0.5)
7+	0	0	0

Of the Grade One students screened, 2.8% had at least one filled permanent tooth. About 1.5% had at least one decayed permanent tooth and the proportion with at least one extracted tooth as a result of dental caries was none.

**Table 10B: Grade One ‘DMFT’ scores, Sunrise HR, 2008-09**

DMFT score	Number	Proportion
0	541	95.7%
1	6	1.06%
2	6	1.06%
3	7	1.23%
4+	5	0.88%



The average DMFT score among Grade One students was **0.10**

The prevalence of dental caries for permanent dentition among Grade One students in Sunrise HR, 2008-09, was 4.3%.

**Table 11A: Grade Seven ‘DMFT’ components, Sunrise HR, 2008-09**

Number of affected teeth	Decayed	Extracted/Missing	Filled
None	480(90.0)	525(98.5)	334(62.6)
1-3	42(7.9)	8(1.5)	160(30.0)
4-6	11(2.1)	0	36(6.7)
7+	0	0	3(0.5)

Of the Grade Seven students screened, 37.4% had atleast one filled permanent tooth. About 10.0% had at least one decayed permanent tooth and the proportion with at least one extracted tooth as a result of dental caries was just 1.5%

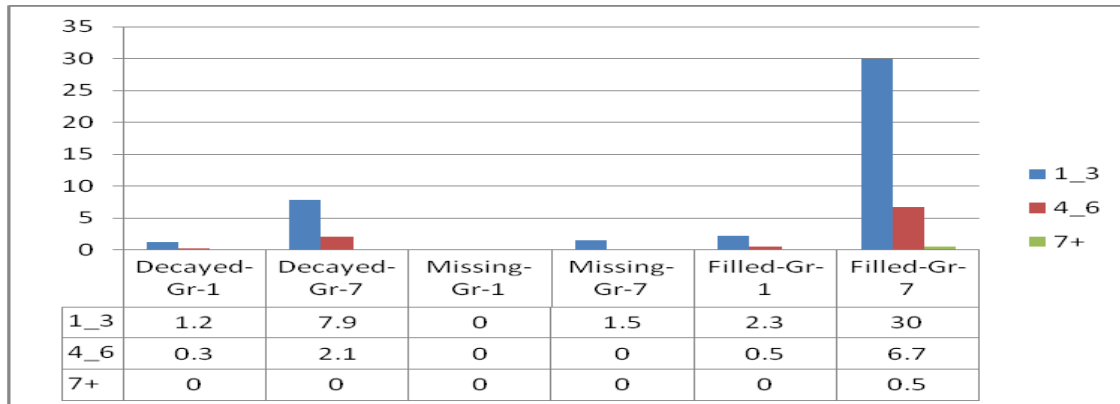
**Table 11 B: Grade Seven ‘DMFT’ scores, Sunrise HR, 2008-09**

DMFT score	Number	Proportion
0	307	57.6%
1	70	13.1%
2	61	11.44%
3	33	6.2%
4+	62	11.6%

The average DMFT score among Grade Seven students was **1.09**

The prevalence of dental caries for permanent dentition among Grade Seven students in RQHR, 2008-09, was 42.4%.

**Figure 6: Grade One and Grade Seven “DMFT” components, Sunrise HR, 2008-09**



Grade One students were shown to have caries experience with 14.8% partial caries care (PCC) and 13.6% of the students had no evidence of care (NEC). The results are indicated in the Table 12A.

**Table 12A: Grade One Status, Sunrise HR, 2008-09**

Classification	NDE	CCC	PCC	NEC
Number	202	200	84	77
Proportion	35.7%	35.4%	14.8%	13.6%

Grade Seven students were shown to have caries experience with 6.2% partial caries care (PCC) and 6.2% of the students had no evidence of care (NEC). The results are indicated in the Table 12B.

**Table 12B: Grade Seven Status, Sunrise HR, 2008-09**

Classification	NDE	CCC	PCC	NEC
Number	270	197	33	33
Proportion	50.6%	37.0%	6.2%	6.2%

**Definitions:**

- NDE = No decay, fillings or extractions evident
- CCC = All decay teeth appear to have been treated
- PCC = Some teeth 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 13A: Grade One Priority Scores, Sunrise HR, 2008-09**

Priority	1	2	3
Number	16	134	415
Proportion	2.8%	23.7%	73.4%

**Table 13B: Grade Seven Priority Scores, Sunrise HR, 2008-09**

Priority	1	2	3
Number	2	48	483
Proportion	0.4%	9.0%	90.6%

Unmet Dental Needs is a combination of Priority 1 and 2.

The % of Unmet Dental Needs among Grade One students in Sun Rise Health Region is 26.5%

The % of Unmet Dental Needs among Grade Seven students in Sun Rise Health Region is 9.4%

## Optional Information

### Insurance:

Out of 1098 students screened, 711(64.7) responded to the question regarding their personal or family dental insurance plan. 512(72.0%) students had some sort of dental coverage, 127(17.9%) students did not have any dental coverage and 72(10.1%) were not sure if they have dental insurance or not.

**Table 14A: Comparison between Grade One and Grade Seven students regarding Dental Insurance, Sunrise HR, 2008-09**

Insurance	Yes	No	Not Sure
Grade One	282(39.7)	71(10.0)	35(4.9)
Grade Seven	230(32.3)	56(7.9)	37(5.2)
Total	512(72.0)	127(17.9)	72(10.1)

### Dentist:

Out of 1098 students screened, 711(64.7) responded to the question, if they had seen a dentist before or not. 516(72.6%) students had seen a dentist before, 149(20.9%) had not seen a dentist before and 46(6.5%) were not sure if they had seen a dentist before or not.

**Table 14B: Comparison between Grade One and Grade Seven students regarding history of visit to a Dentist office, Sunrise HR, 2008-09**

Seen Dentist	Yes	No	Not Sure
Grade One	268(37.7)	98(13.7)	22(3.1)
Grade Seven	248(34.9)	51(7.2)	24(3.4)
Total	516(72.6)	149(20.9)	46(6.5)

### Sealants:



Out of 1098 students screened, 711(64.7) responded to the question regarding sealant application. 204(28.7%) had sealants done before, 275 (38.7%) had sealants not done before and 232(32.6%) were not sure if they had or not.

**Table 14C: Comparison between Grade One and Grade Seven students regarding past history of Pit and Fissure Sealant application, Sunrise HR, 2008-09**

Sealants	Yes	No	Not Sure
Grade One	89(12.5)	184(25.9)	115(16.2)
Grade Seven	115(16.2)	91(12.8)	117(16.4)
Total	204(28.7)	275(38.7)	232(32.6)

**Others:**

Out of 1098 students screened 3(0.3%) students had restored fractures, 15(1.4%) had non-restored fractures and none were using mouth guards.

**Comparison with Past Screening**



Similar dental health screenings were carried out in 1993-94, 1998-99 and 2003-04.

**Figure 7: Percentage of Sunrise HR Grade One Students Screened who were Cavity-free during Dental Screenings, 1993-94, 1998-99, 2003-04 and 2008-09**

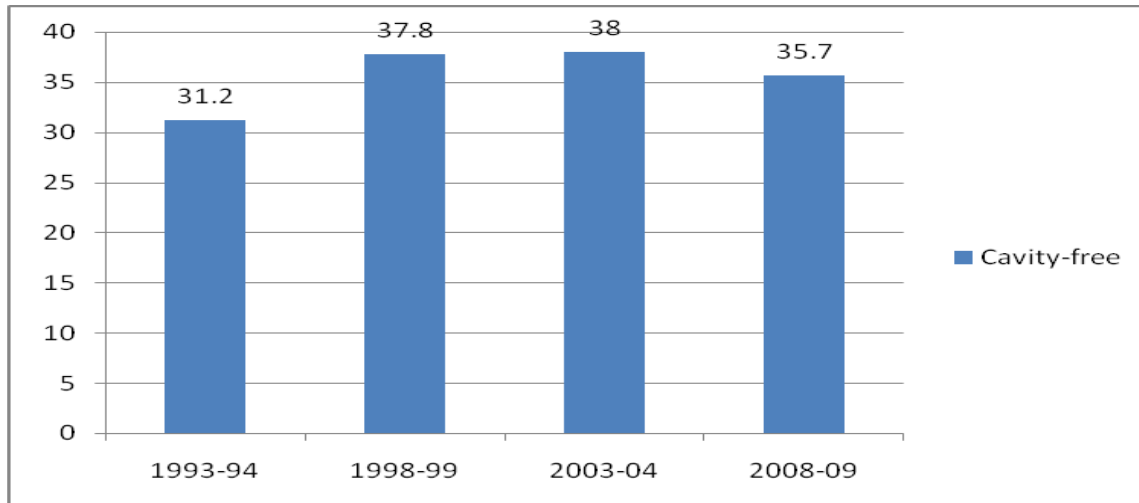
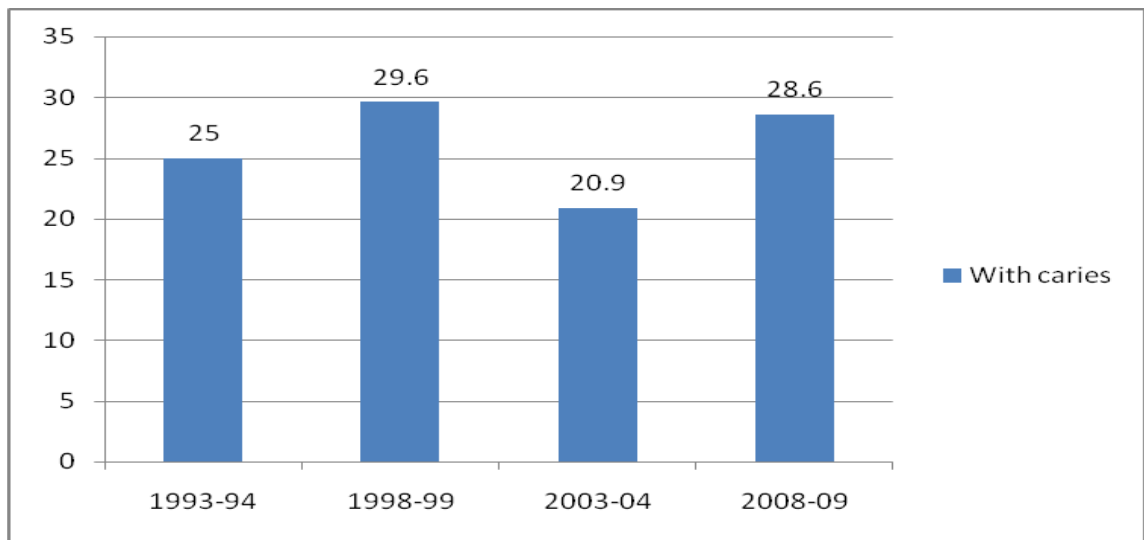


Figure 7 compares the percentages of Grade One students who were cavity-free during the past screenings. The percentage of Grade One students who were cavity-free decreased from 38% in 2003-04 to 35.7% in 2008-09, which is the lowest in the past decade.

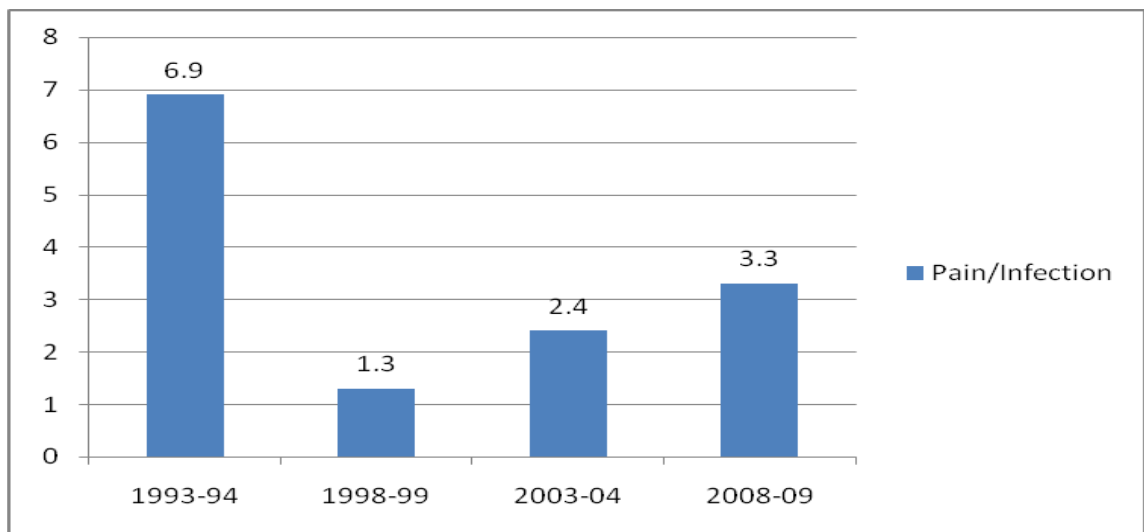
**Figure 8: Percentage of Sunrise HR Grade One Students Screened who had Cavities during Dental Screenings, 1993-94, 1998-99, 2003-04 and 2008-09**





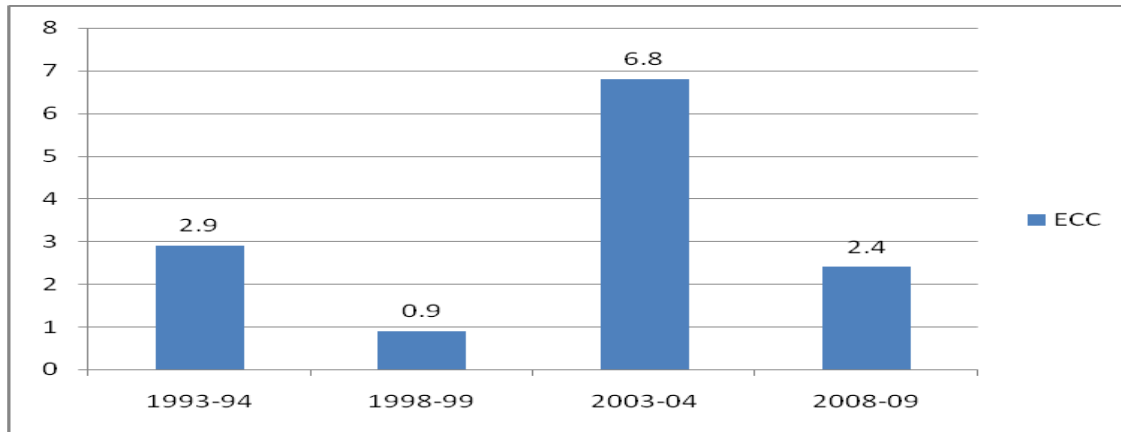
The proportion of Grade One students with cavities increased from 20.9% in 2003-04 to 28.6% in 2008-09 (Figure 8)

**Figure 9 : Percentages of Sunrise HR Grade One Students Screened who had Pain and/or Infection at the time of Dental Screenings, 1993-94, 1998-99, 2003-04 and 2008-09**



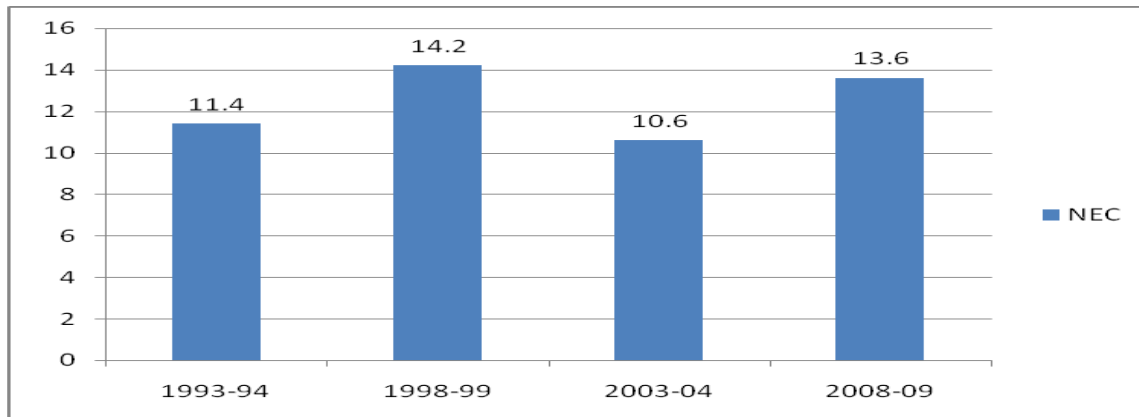
The percentage of students in need of urgent dental care due to pain and/or infection increased from 2.4% in 2003-04 to 3.3% in 2008-09 among Grade One students, which is the highest recorded in the past decade ( Figure 9)

**Figure 10 : Percentage of Sunrise HR Grade One Students with Early Childhood Caries at the time of Dental Screening, 1993-94, 1998-99, 2003-04 and 2009-09**



The percentage of Grade One students with ECC decreased from 6.8% in 2003-04 to 2.4% in 2008-09 (Figure 10)

**Figure 11 : Percentage of Sunrise HR Grade One Students Screened who had No Evidence of Care, 1993-94, 1998-99, 2003-04 and 2009-09**



The percentage of Grade One Students Screened who had No Evidence of Care, increased from 10.6% in 2003-04 to 13.6% in 2008-09 (Figure 11)

**Table 15: Grade One Dental Health by screening year, Sunrise Health Region, 2008-09**

Screening	Number	Average	% with	% with	% with	% with	%
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year	of children screened	deft/DMFT	cavities	no evidence of dental care	ECC	pain and or infection	cavity-free
1993-4	727	3.80	25.0	11.4	2.9	6.9	31.2
1998-9	635	3.36	29.6	14.2	0.9	1.3	37.8
2003-4	545	3.47	20.9	10.6	6.8	2.4	38.0
2008-9	565	3.84	28.6	13.6	2.4	3.3	35.7

**Table 16: Grade Seven Dental Health by screening year, Sunrise Health Region, 2008-09**

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
2008-9*	533	1.39	12.2	6.2	0	0.6	50.6

\* As Grade 7 students are included in the analysis for the first time, comparisons are not done with any past results.

**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, a 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), Sunrise HR, 2008-09**

COHS	50% of children have never	No more than 20% of children have
------	----------------------------	-----------------------------------



	experienced dental decay	unmet dental treatment needs
Sunrise HR, 2008-09	35.7%	26.5%

**Table 18: Canadian Oral Health Strategy (COHS) guidelines for 2010: Goal 2(Grade Seven/ Age 12), Sunrise HR, 2008-09**

COHS	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.
Sunrise HR, 2008-09	57.6%	9.4%	1.09	2.64

**Significant Caries Index (SiC) <sup>3</sup>: Grade Seven, Sunrise HR, 2008-09**

Significant Caries Index for Grade Seven, Sunrise HR 2008-09: **2.64**

Significant Caries Index:

- New goal set by 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 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 1/3 rd of the population with highest DMFT scores.

**Dental Health Disparities:**

Table 19 illustrates the results from the comparative analysis between urban and rural dental health screening indicators in Sun Rise Health Region, 2008-09

**Table 19: Dental Health by Urban/Rural School Location, Sunrise HR, 2008-09**

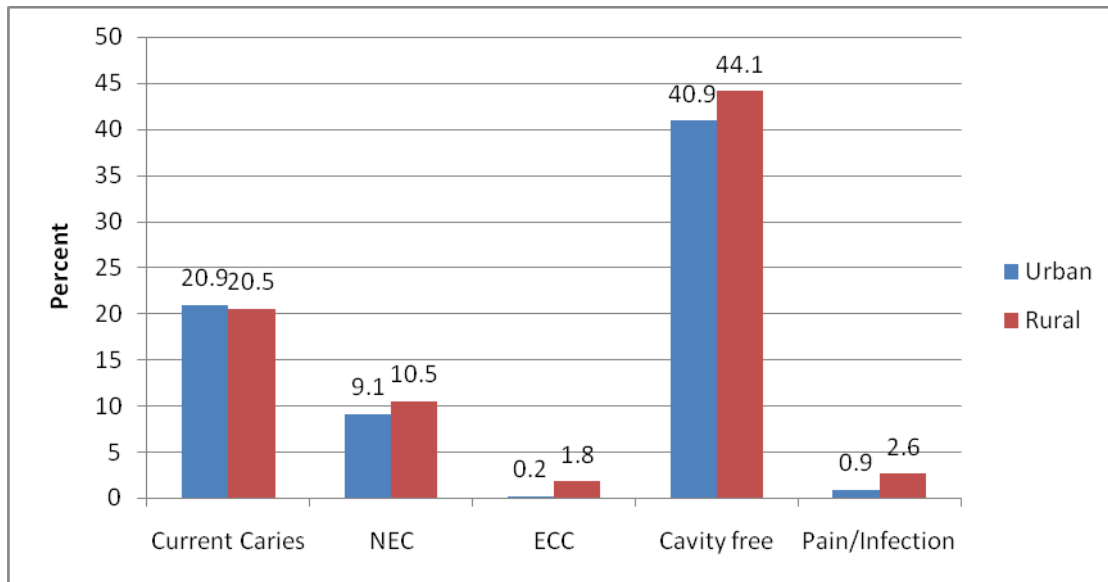
Dental Health Measure	School Location		p-value	Total
	Urban	Rural		
Average deft/DMFT	2.72	2.45	<.0001	2.55
With Current Caries	85(20.9)	142(20.5)	0.80	227(20.7)
No evidence of dental care	37(9.1)	73(10.5)	0.37	110(10.0)
ECC present	1(0.2)	13(1.8)	0.02	14(1.3)
Cavity-free	166(40.9)	306(44.1)	0.44	472(42.9)
Pain and or infection	4(0.9)	18(2.6)	0.05	22(2.0)
Total screened	405(36.8)	693(63.1)		1098

<sup>a</sup> Chi-square test

<sup>b</sup> t-test

**Figure 12: Dental Health by Urban/Rural Residence, Sunrise HR, 2008-09**





Overall it appears that rural school children in Sunrise HR have better oral health when compared with urban school children. This is evident from the average deft/DMFT value which is statistically significant. Furthermore, rural school children had slightly lesser proportions with current caries, higher proportions being cavity free and showing No evidence of dental care. However, those comparisons were not statistically significant. Urban school children had a lesser proportion with ECC and pain/infection, which is statistically significant.

Table 20 illustrates the results from the comparative analysis of oral health between children studying in schools that have access to Community Water Fluoridation and children studying in schools that do not have access to Community Water Fluoridation in Sunrise Health Region, 2008-09

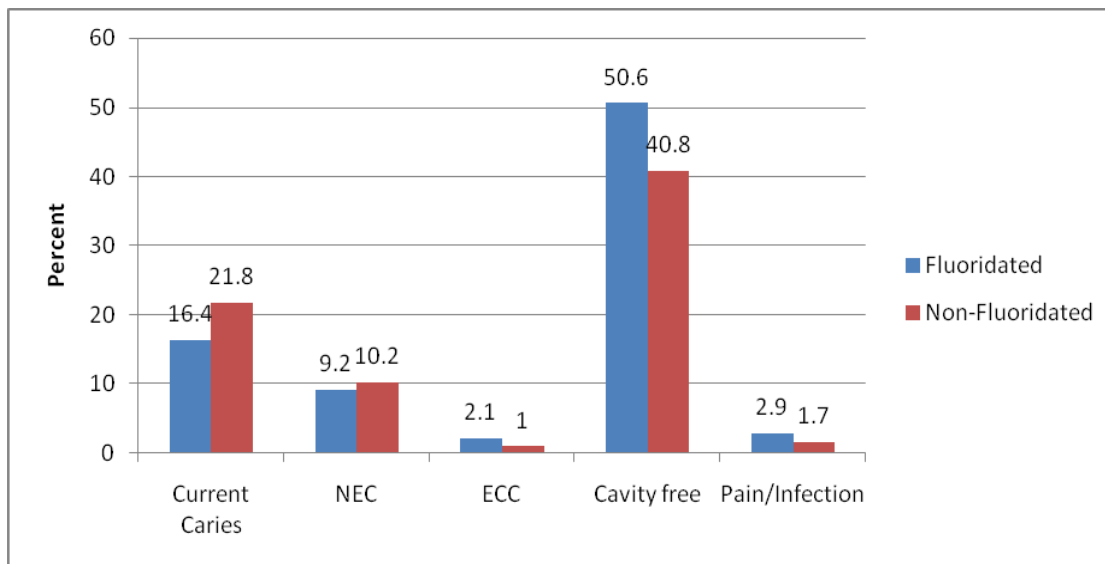
**Table 20: Dental Health by Community Water Fluoridation, Sunrise HR, 2008-09**

Dental Health Measure	School Location		p-value	Total
	Optimally adjusted	Not Optimally adjusted		
Average deft/DMFT	2.35	2.61	0.001	2.55
With Current Caries	39(16.4)	188(21.8)	0.05	227(20.7)
No evidence of dental care	22(9.2)	88(10.2)	0.70	110(10.0)
ECC present	5(2.1)	9(1.0)	0.19	14(1.3)
Cavity-free	120(50.6)	352(40.8)	0.007	472(42.9)
Pain and or infection	7(2.9)	15(1.7)	0.09	22(2.0)
Total screened	237(21.6)	861(78.4)		1098

<sup>a</sup> Chi-square test

<sup>b</sup> t-test

**Figure 13: Dental Health by Community Water Fluoridation, Sunrise HR, 2008-09**



Overall it appears that in children attending schools that have access to optimally adjusted fluoridated water have better oral health when compared with children attending schools that do

not have access to optimally adjusted fluoridated water. This is evident from the average deft/DMFT value which is statistically significant. In addition, schools with access to optimally adjusted fluoridated water had lesser proportions with current caries and higher proportions being cavity free, which is statistically significant.

Also, children attending schools that have access to optimally adjusted fluoridated water had lesser proportion with No evidence of dental care, higher proportion with ECC and pain/infection, which is not statistically significant.

### Epidemiological Studies

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**Table 21: Calculation of Relative Risk for being Cavity free between Sunrise HR and rest of Saskatchewan**

Relative Risk	Not Cavity Free(+)	Cavity Free(-)	Total
Sunrise HR(+)	626	472	1098
Rest of Saskatchewan(-)	8475	8341	16816
Total	9101	8813	17914

Relative Risk: 1.13 (p- value: 0.00001)

As the value is greater than 1, the risk of not being cavity free is greater when a student (either Grade One or Grade Seven) resides in Sunrise HR, than when the student resides elsewhere in Saskatchewan.

**Table 22: Calculation of Odds Ratio for being Cavity free between Urban and Rural communities in Sunrise HR, 2008-09**

Odds Ratio	Not Cavity Free(+)	Cavity Free(-)	Total
Urban (+)	239	166	405
Rural (-)	387	306	693
Total	626	472	1098

Odds Ratio: 1.14 (p-value: 1.04)



As the value is greater than 1, a student (either Grade One or Grade Seven), who resides in a Rural community in Sunrise HR, is at a lower odds for not being cavity free, than when resides in an Urban community.

**Table 23: Calculation of Relative Risk for being Cavity Free between schools that have access to Community water fluoridation (CWF) in Sunrise HR and rest of Saskatchewan**

Relative Risk	Not Cavity Free(+)	Cavity Free(-)	Total
CWF_Sunrise HR(+)	117	120	237
CWF_Rest of Saskatchewan(-)	2816	4011	6827
Total	2933	4131	7064

Relative Risk: 1.20(p-value: 0.006)

As the value is greater than 1, a student (either Grade One or Grade Seven), who attends school that has access to Community water fluoridation in Sunrise HR, is at a higher risk for not being cavity free, than when a student who attends a school elsewhere in Saskatchewan that has access to Community water fluoridation.

**Table 24: Calculation of Odds ratio for being Cavity free between schools that have access to Community water fluoridation (CWF) and schools that do not in Sunrise HR, 2008-09**

Odds Ratio	Not Cavity Free(+)	Cavity Free(-)	Total
CWF(+)	117	120	237
No-CWF(-)	509	352	861
Total	626	472	1098

Odds Ratio: 0.67 (p-value: 0.003)

As the value is less than 1, a student (either Grade One or Grade Seven), who attends school that has access to Community water fluoridation, is at a lower odds for not being cavity free, than when a student who attends school that does not have access to Community water fluoridation in Sunrise HR, 2008-09.

## Discussion

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This report presents the findings from the Dental Health Screening conducted during the school year 2008-09 in Sunrise Health Region. The 2008-09 Dental Screening Report is the fourth such report from Public Health Services, featuring Grade Seven students for the first time, continues to provide information about the dental health status of Grade One students in Sunrise HR.

## Limitations of the study

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**Misclassification Bias**<sup>12</sup>: This occurs when the method for collecting information about a subject is inadequate. Due to which some of the information gathered regarding disease and/or exposure might be incorrect.

For the data collected regarding Community Water Fluoridation (CWF), students were grouped under CWF, if they studied in a school that has access to CWF. But, a child who attends a school that has access to CWF might be residing in a neighbourhood that does not have access to CWF and vice-versa.



# Appendices



## **Appendix 1: Dental Screening Program Definitions**

### **deft/DMFT:**

- index used to measure disease experience. It is the count of the number of decayed, missing (due to caries), and filled teeth of an individual

### **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

#### **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: Interpretation of Average deft/DMFT ratio according to the WHO scale of severity<sup>2</sup>:**

Less than 1.2	Being very low risk
1.2-2.6	Low risk
2.7-4.4	Moderate risk
Greater than 4.4	High risk

**Appendix 3: List of Schools in Sunrise Health Region, 2008-09**

- |                                      |                                 |
|--------------------------------------|---------------------------------|
| Calder School                        | Davison School                  |
| Canora Composite School              | Dr. Brass Elementary            |
| Canora Junior Elementary             | Esterhazy Central High School   |
| Chief Gabriel Cote Education Complex | Foam Lake Composite High School |
| Churchbridge Public                  | Foam Lake Elementary            |
| Columbia Elementary                  | Fort Livingstone School         |
| Countryside School                   | Grayson School                  |
|                                      | Hoffman School                  |



Invermay School

Ituna School

Kamsack Comprehensive School

Keeseekoose Chiefs Education Centre

Langenburg High School

M.C.Knoll School

Macdonald School

Melville Comprehensive

Miller School

Norquay School

North Star School

North Valley Elementary

Preschool Yorkton

Preeceville School

P.J.Gillen School

Saltcoats School

Springside School

St. Alphonsus Elementary

St. Henry's Junior School

St. Henry's Senior School

St. Mary's School

St. Michael's Elementary

St. Paul's Elementary

St. Theodore Catholic School

Sturgis Composite High School

Sturgis Elementary

Victoria School

Yorkdale Central School

Appendix: 4



## Dental Health Screening Results

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 have been 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 <b>urgently</b> .   | <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 <b>immediately</b> . | <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 gums, 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 5: Dental Screening Advance Information Letter, 2008-09

**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: \_\_\_\_/\_\_\_\_/\_\_\_\_ Male:  Female:   
(month) (day) (year)

Address: \_\_\_\_\_ Phone # (H) \_\_\_\_\_  
\_\_\_\_\_  
(Town/City) Phone # (W) \_\_\_\_\_  
(Postal Code) Cell Phone # \_\_\_\_\_

Please answer the following questions (optional):  
1. Does your child have dental insurance/coverage? Yes  No  Not sure   
2. Has your child been to the dentist in the past year? Yes  No  Not sure   
3. Has your child ever had dental sealants? Yes  No  Not sure





## Appendix 6: Dental Health for each school, Sunrise HR, 2008-09

School Name (Grade 1 and 7)	Avg. deft/DMFT	% Caries free	% Unmet Oral Health Needs	% with Pain/Infection	% Current Caries
Calder School	0.00	100	0.0	0.0	0.0
Canora Composite School	1.20	68.4	5.2	5.2	5.2
Canora Junior Elementary	2.93	52.9	14.7	2.9	14.7
Chief Gabriel Cote Education Complex	4.11	17.6	17.6	5.9	41.2
Churchbridge Public	0.92	61.5	15.3	0.0	15.3
Columbia Elementary	2.51	46.2	14.8	0.0	27.7
Countryside School	1.87	50.0	12.5	0.0	25.0
Davison School	3.35	41.1	11.7	5.8	29.4
Dr. Brass Elementary	4.59	40.7	11.1	3.7	22.2
Esterhazy Central High School	1.18	46.8	9.3	0.0	9.3
Foam Lake Composite High School	1.45	45.0	0.0	0.0	0.0
Foam Lake Elementary	3.11	23.5	17.6	0.0	23.5
Fort Livingstone School	3.11	29.4	5.9	0.0	47.0
Invermay School	3.35	25.0	15.0	5.0	35.0
Kamsack Comprehensive School	1.57	47.2	5.5	2.8	13.8
Kamsack Public Health	0.00	100	0.0	0.0	0.0
Keeseekoose Chiefs Education Centre	2.70	30.0	25.0	5.0	45.0
Ituna School	1.96	46.7	6.7	0.0	13.3
Langenburg High School	0.85	66.7	0.0	0.0	4.7
Macdonald School	1.82	64.7	0.0	0.0	5.9
M.C.Knoll School	2.61	40.0	3.6	0.0	12.7
Melville Comprehensive	1.17	58.8	14.7	2.9	14.7
Miller School	0.61	76.9	7.7	7.7	7.7
Norquay Public Health	4	100	0	0	0
Norquay School	2.34	30.0	30.0	3.3	33.3
North Star School	2.20	60.0	0.0	0.0	0.0

North Valley Elementary	4.13	25.0	12.5	0.0	12.5
P. J. Gillen School	1.92	42.9	7.1	0.0	14.3
Preeceville Public Health	0	100	0	0	0
Preeceville School	3.54	32.2	12.9	6.5	29.0
Preschool Yorkton	0.00	100	0.0	0.0	0.0
Saltcoats School	0.83	78.9	5.3	5.3	10.5
Springside School	4.18	0.00	18.2	9.0	54.5
St. Alphonsus Elementary	3.56	30.4	13.0	0.0	34.7
St. Henry's Junior School	3.10	42.1	21.0	5.3	31.5
St. Henry's Senior School	1.13	50.0	0.0	0.0	0.0
St. Mary's School	3.40	37.1	17.1	2.8	42.8
St. Michael's Elementary	1.82	59.2	8.2	0.0	8.2
St. Paul's Elementary	1.89	50.0	5.0	0.0	11.7
St. Theodore Catholic School	4.76	23.0	0.0	0.0	15.4
Sturgis Elementary	5.05	18.7	12.5	6.3	25.0
Victoria School	5.67	32.3	6.5	9.7	35.5
Yorkdale Central School	3.30	29.0	8.0	0.0	23.0

Note: Blue font indicates those schools who are above (worse than) the Sunrise Health Region average (2.55).

**Appendix 7: Schools that have access to Community Water Fluoridation (CWF), Sunrise Health Region, 2008-09**

Canora Composite School

St. Henry's Junior School

Canora Junior Elementary

St. Henry's Senior School

Davison School

Kamsack Comprehensive School

Melville Comprehensive

Victoria School

Miller School



**Appendix 8: Preventive dental care services in each health region in Saskatchewan, 2008-09**

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

<b>Sunrise Health Region: Fluoride Mouth rinse Program 2008-2009</b>		
Calder School, Calder	22 (K-6)	95%
Columbia Elementary, Yorkton	298 (1-8)	96%
Dr. Brass Elementary, Yorkton	130 (1-8)	92%
Foam Lake Elementary, Foam Lake	148 (1-6)	99%
Fort Livingston School, Pelly	46 (1-6)	98%
Grayson School, Grayson	66 (K-9)	98%
Invermay School, Invermay	63 (1-7)	95%
Ituna School, Ituna	81 (1-6)	99%
Macdonald School, Stockholm	83 (K-9)	99%
M.C. Knoll School, Yorkton	248 (1-8)	98%
Norquay School, Norquay	128 (K-7)	98%
North Star School, Hvas	23 (1-8)	100%
P.J. Gillen School, Esterhazy	179 (1-5)	97%
Preeceville School, Preeceville	96 (1-6)	96%

Saltcoats School, Saltcoats	116 (K-8)	98%
Springside School, Springside	89 (1-6)	96%
St. Alphonsus Elementary, Yorkton	147 (1-8)	97%
St. Mary's School, Yorkton	211 (1-8)	98%
St. Michael's School, Yorkton	252 (1-8)	96%
St. Paul's Elementary, Yorkton	174 (1-8)	99%
Sturgis Elementary, Sturgis	91 (1-5)	98%
Theodore School, Theodore	48 (K-6)	100%
Yorkdale Central School, Yorkton	402 (K-8)	99%
<b>23 schools</b>	<b>3,141 participants</b>	<b>98%</b>

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