B.C. Dental Survey of Aboriginal Kindergarten Children 2012-2013

A Provincial and First Nations School Analysis

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BRITISH COLUMBIA

Ministry of Health

First Nations Health Authority

Health through wellness

Contents

Executive Summary ... 3
Introduction ... 5
B.C. Public Health Dental Screening Criteria and Definitions ... 7
Target Population ... 7
Survey Findings for Aboriginal Children ... 8
Survey Findings for First Nations Schools ... 14
Conclusion ... 22
Appendix A ... 23

Executive Summary

In the 2012-2013 school year, 40,323 children participated in the provincial kindergarten dental survey (91.8% of all those enrolled). This survey was administered in public schools, independent schools, and 50 participating First Nations schools. Within these schools, a total of 3427 children who participated in the survey self-identified as Aboriginal, representing 89.7% of enrolled Aboriginal children within participating schools. Dental screening for Aboriginal children under age six is a key action item in the *Transformative Change Accord: First Nations Health Plan.*

Dental Survey Results for Aboriginal Children (includes public, independent and First Nations schools)

Improvements since 2009-10:

- The percentage of Aboriginal kindergarten children who are caries free has increased by **4.0** percentage points.
- The percentage of Aboriginal kindergarten children who have visible decay has decreased by **3.7** percentage points.

Across B.C. in 2012-2013:

- **43.3%** of Aboriginal kindergarten children were caries free[1] (no visible decay or broken enamel), compared to **69.5%** of non-Aboriginal children.
- **31.9%** of Aboriginal kindergarten children had treated caries (no visible decay but existing restorations), compared to **16.8%** of non-Aboriginal children.
- **24.8%** of Aboriginal kindergarten children had evidence of visible decay, compared to **13.7%** of non-Aboriginal children.

Dental Survey Results for First Nations Schools

During the 2012-2013 school year, 475 kindergarten children attending 50 participating First Nations schools were screened (87.3% of those enrolled in participating schools).

Improvements since 2009-10:

- The percentage of kindergarten children attending First Nations schools who are caries free has increased by **3.4** percentage points.
- The percentage of kindergarten children attending First Nations schools who have visible decay has decreased by **4.8** percentage points.

Across B.C. in 2012-2013:

- **21.5%** of kindergarten children attending First Nations schools were caries free (no visible decay or broken enamel), compared to **47.0%** of Aboriginal children attending public or independent schools.
- **48.8%** of kindergarten children attending First Nations schools had treated caries (no visible decay but existing restorations), compared to **29.1%** of Aboriginal children attending public or independent schools.

- **29.7%** of kindergarten children attending First Nations schools had evidence of visible decay, compared to **23.9%** of Aboriginal children attending public or independent schools.

While there have been encouraging improvements over the past several years, the disparity in oral health for First Nations and Aboriginal children is recognized as a key ongoing issue and work is continuing to address it. In 2011, an environmental scan was completed of oral health services available both on and off reserve for First Nations and Aboriginal children from birth to seven years of age in British Columbia. The environmental scan confirmed that oral health preventive services for First Nations and Aboriginal children vary considerably by type and frequency, and vary in terms of who provides the services.

As well, this work recommended that to improve oral health for First Nations and Aboriginal children on and off-reserve, a clear, co-ordinated and comprehensive provincial preventive oral health strategy be developed.

In early 2014, *Healthy Smiles for Life: B.C.'s First Nations and Aboriginal Oral Health Strategy*[2] was finalized. The strategy's goal is to guide the delivery of collaborative public health and community services focused on improving the oral health of First Nations and Aboriginal children aged 0-18 and their families in British Columbia. The strategy provides a comprehensive, evidence-based and multi-level set of recommendations that will inform public health and community planning, policy development and program implementation. Implementation planning for this strategy is currently underway. It is our goal that sustained partnered effort at all levels of the system will continue to show results in improving oral health for B.C.'s First Nations and Aboriginal children and families.

Introduction

Oral health is a fundamental component of overall health and well-being. Public health dental programs focus on the prevention of early childhood caries (tooth decay). Tooth decay can cause pain and affect sleep, ability to eat, speech development and self-esteem.[3] Caries is an infectious and transmissible disease which children often acquire through a primary caregiver before age three.[4] Prevention strategies are especially important in the early years to promote healthy development and establish a foundation for oral health throughout one's life.[5]

Health authority early intervention dental programs include: provision of information about oral health care and oral hygiene practices to families and care providers; screening for caries risk behaviours; application of fluoride varnish for children identified at risk of caries; promotion of healthy eating as it relates to dental health; and applying a dental health lens to policy development (e.g., dental health messaging is considered during the development of healthy food guidelines, sugar sweetened beverage policies, school food sales guidelines, etc.). In addition, dental public health staff work with community organizations, schools, and pregnancy outreach programs to support vulnerable populations and improve oral health.

First Nations people on reserve receive a mix of dental health prevention services and programs funded by the First Nations Health Authority (FNHA) and the regional health authorities. Some First Nations communities have contracts with other organizations to provide services or they provide services directly. Not all communities receive the same level of services or programs.

Some First Nations communities receive services through the Children's Oral Health Initiative (COHI). The COHI program was transferred to the FNHA from Health Canada in 2013. It was developed as a means to address the disparity between the oral health of First Nations and Inuit and that of the general Canadian population. Launched on a test basis in 2004, the program has expanded to 79 communities in British Columbia. The program focuses on the prevention of dental disease and promotion of good oral health practices.

In 2011, an environmental scan was completed of oral health services available both on and off reserve for First Nations and Aboriginal children from birth to seven years of age in British Columbia.[6] The environmental scan confirmed that oral health preventive services for First Nations and Aboriginal children vary considerably by type and frequency, and vary in terms of who provides the services. It also confirmed that in a number of First Nations communities, oral health preventive services are not offered.

In 2014, an oral health strategy was launched to guide the delivery of collaborative public health and community services that are focused on improving the oral health of First Nations and Aboriginal infants, children and youth (aged 0-18 years) and their families in British Columbia. Funding for the development of this strategy was provided by Health Canada.

Healthy Smiles for Life: B.C.'s First Nations and Aboriginal Oral Health Strategy provides a comprehensive, evidence-based and multi-level set of recommendations that will inform public health and community planning, policy development and program implementation. Implementation planning for this strategy is currently underway.

Methodology

Every three years, health authority dental staff conduct a provincial kindergarten dental survey. The survey does not replace a regular dental exam; rather, its purpose is to determine the prevalence of obvious or visible dental decay, to identify trends in dental health, and where possible, to obtain a measure of the effectiveness of early childhood dental public health strategies.

During the survey, kindergarten children are assessed for:

- no evidence of visible dental decay/no broken enamel (caries free);
- no evidence of visible decay but evidence of existing restorations;
- evidence of pain or infection at the time of screening;
- evidence of visible dental decay (caries) in one or more teeth; and
- the number of quadrants affected.

In the 2012-2013 school year, this provincewide dental survey was administered in public schools, independent schools, and participating First Nations schools. 40,323 children participated (91.8% of all those enrolled). Within these schools, a total of 3427 children who participated in the survey self-identified as Aboriginal, representing 89.7% of enrolled Aboriginal children. The full report of the provincial survey, *BC Dental Survey of Kindergarten Children 2012-2013: A Provincial and Regional Analysis* can be found at: www.health.gov.bc.ca/women-and-children/children-and-youth/early-childhood.html#dental.

This sub-report compares the 2012-2013 provincial kindergarten dental survey results of B.C.'s Aboriginal kindergarten children to non-Aboriginal kindergarten children. It also compares the dental survey results of Aboriginal children in public or independent schools to those of children in First Nations schools. Finally, it compares the dental survey results to those of 2009-2010.

Dental screening for Aboriginal children under the age of six is a key action item in the *Transformative Change Accord: First Nations Health Plan.* In order to report progress on this action item, health authorities were asked to collect Aboriginal identifiers for all children surveyed in both public and independent schools.

Information from teachers and school enrolment was used to determine Aboriginal identity for kindergarten children surveyed. The *School Act* provides the authority for public health staff to access student demographic information for public health programs delivered in school settings. Health authorities use a practice of parent notification with an 'opt out' process for the dental survey. Parents are notified by letter about the dental health survey

and when it will occur and are provided with the health authority contact phone number if further information is needed or to decline participation in the survey. The ‘opt out’ process allows parents to decline services with no consequences to future service provision or care of their child. If the parent does not contact public health, the child is screened.

B.C. Public Health Dental Screening Criteria and Definitions

Caries Free	No evidence of visible decay (no broken enamel) and no existing restorations.
Treated Caries	No evidence of visible decay, but evidence of existing restorations.
Visible Decay	Evidence of obvious decay in one or more teeth.
Decay in Quadrants	Evidence of decay in one or more teeth in one, two, three, or four quadrants.
Urgent Referrals	Children who were referred for further treatment due to the urgency of their conditions.
Non-urgent Referrals	Children who did not have urgent conditions but were referred for further treatment.

Target Population[1]

The population for the dental survey is all kindergarten children between the ages of four and six across the province. For the purposes of this report the sub-population is children identified as Aboriginal attending public, independent and participating First Nations schools.

Limitations of the Data:

The following limitation needs to be considered when analysing the dental survey data. The First Nations school survey was conducted on a small number of children in a small number of schools. Currently, there are 68 First Nations Schools in B.C. offering classes for kindergarten aged children, of which 50 participated in the survey. This equates to a 73% First Nations school participation rate for the dental survey. It is not known whether these 50 schools were chosen due to enrolment size, location, history of prior service delivery or other factors.

[1] Aboriginal is a collective term used to describe the three constitutionally recognized Indigenous populations in Canada – “Indians” (First Nations), Métis and Inuit. While the term Aboriginal is commonly accepted, identifying each of these populations specifically by name is preferable where appropriate.

Survey Findings for Aboriginal Children

In the 2012-2013 school year, 3427 Aboriginal children participated in the provincial dental survey, representing 89.7% of those enrolled and identified as Aboriginal. These children were attending public, independent, or First Nations schools.

Table 1 shows the number and percentage of Aboriginal children screened by health authority across two screening years. The provincial participation rate in the survey increased by 6.2 percentage points for Aboriginal children since 2009-2010. This may be partially due to a change in the consent process for First Nations schools. See page 16 for more information about the change in the consent process.

Table 1. Number and percentage of Aboriginal children screened by health authority, 2009-2010 & 2012-2013

	2009-2010			2012-2013		
Health Authority	**Enrolled**	**Screened**	**Percentage Screened**	**Enrolled**	**Screened**	**Percentage Screened**
Fraser	748	655	87.6%	753	693	92.0%
Interior	666	547	82.1%	851	747	87.8%
Island	647	542	83.8%	886	754	85.1%
Northern	532	416	78.2%	999	936	93.7%
Vancouver Coastal	310	265	85.5%	333	297	89.2%
B.C.	**2,903**	**2,425**	**83.5%**	**3,822**	**3,427**	**89.7%**

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2009-2010 and 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

In 2012-2013, Northern Health had the highest percentage of Aboriginal children screened (93.7%), which was higher from the previous screening year when they had the lowest percentage of Aboriginal children screened (78.2%). This increase in the screening rate may be due, in part, to a return to a parent notification with an opt-out process that is used in public school.

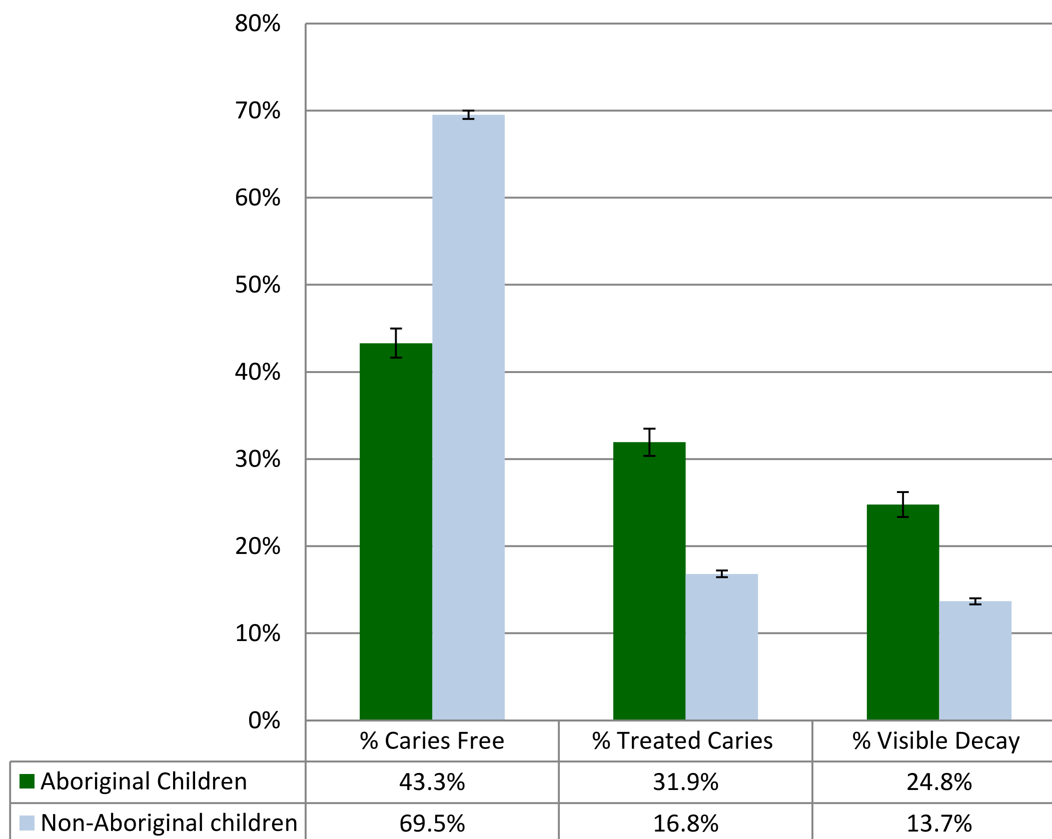
Figure 1 compares the 2012-2013 dental survey results of Aboriginal and non-Aboriginal children.

Across B.C. in 2012-2013:

- **43.3%** of Aboriginal kindergarten children were caries free[1] (no visible decay or broken enamel), which was significantly lower than non-Aboriginal children (**69.5%**).
- **31.9%** of Aboriginal kindergarten children had treated caries (no visible decay but existing restorations), which was significantly higher compared to non-Aboriginal children (**16.8%**).
- **24.8%** of Aboriginal kindergarten children had evidence of visible decay, which was significantly higher compared to non-Aboriginal children (**13.7%**).

These findings are statistically significant.

Figure 1. Percentages for select dental survey measures among Aboriginal and non-Aboriginal kindergarten children attending public, independent and First Nations schools: 2012-2013, British Columbia (95% confidence intervals displayed)



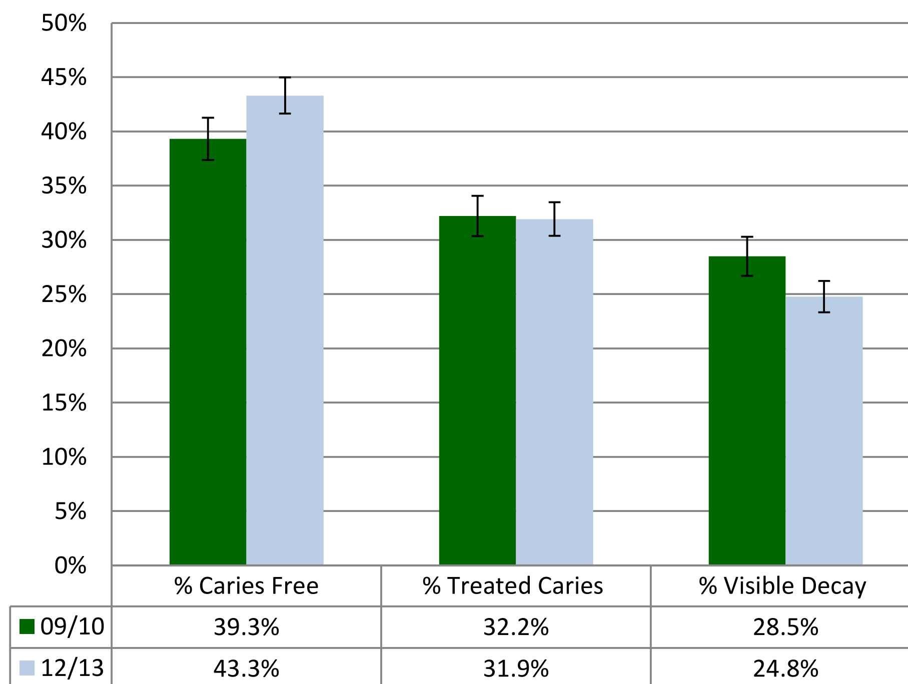
	% Caries Free	% Treated Caries	% Visible Decay
Aboriginal Children	43.3%	31.9%	24.8%
Non-Aboriginal children	69.5%	16.8%	13.7%

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

Figure 2 compares the 2012-2013 dental survey results of Aboriginal children to the results from 2009-2010. Comparisons are limited to 2009-2010 because prior to that screening year, Aboriginal identifiers were not collected in public and independent schools.

Since 2009-10, the percentage of Aboriginal kindergarten children who are caries free[1] has increased by 4.0 percentage points, and the percentage of Aboriginal kindergarten children who have visible decay has decreased by 3.7 percentage points. These differences are statistically significant. Treated caries remains consistent between the two survey years.

Figure 2. Comparison of dental survey results for Aboriginal kindergarten children attending public, independent and First Nations schools. Survey Years 2009-2010 and 2012-2013, British Columbia (95% confidence intervals displayed)

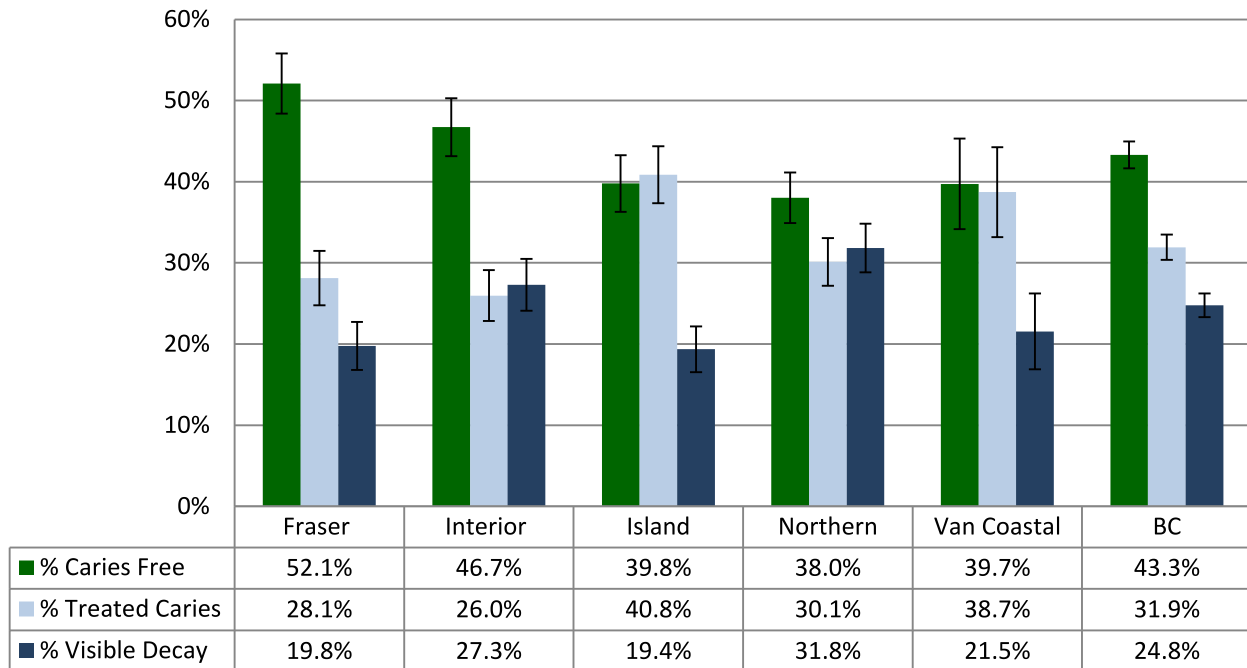


	% Caries Free	% Treated Caries	% Visible Decay
09/10	39.3%	32.2%	28.5%
12/13	43.3%	31.9%	24.8%

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

Figure 3 compares the 2012-2013 dental survey results for Aboriginal children by health authority. In comparison to B.C. overall, Fraser Health had a significantly higher percentage of Aboriginal children who were caries free[1] (52.1%). However, it was the only health authority that did not survey any First Nations schools. Alternatively, Northern Health had a significantly lower percentage of Aboriginal children who were caries free (38.0%). With respect to treated caries, Interior Health had a significantly lower percentage among Aboriginal children (26.0%), whereas Island Health and Vancouver Coastal Health had significantly higher percentages (40.8% and 38.7%, respectively). In terms of visible decay, Island Health and Fraser Health had significantly lower percentages among Aboriginal children (19.4% and 19.8%, respectively), whereas Northern Health had a significantly higher percentage (31.8%).

Figure 3. Percentages for select dental survey measures by health authority for Aboriginal kindergarten children attending public, independent and First Nations schools: 2012-2013, British Columbia (95% confidence intervals displayed)



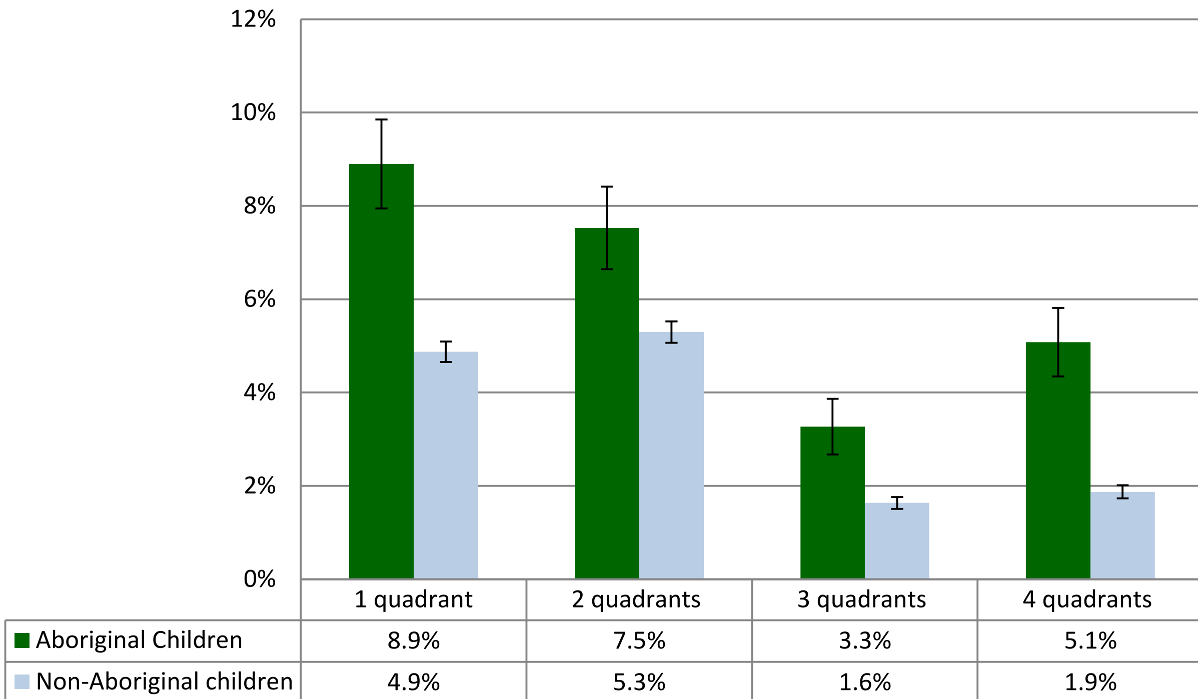
	Fraser	Interior	Island	Northern	Van Coastal	BC
% Caries Free	52.1%	46.7%	39.8%	38.0%	39.7%	43.3%
% Treated Caries	28.1%	26.0%	40.8%	30.1%	38.7%	31.9%
% Visible Decay	19.8%	27.3%	19.4%	31.8%	21.5%	24.8%

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

At the time of the survey, the number of quadrants in the mouth affected by visible decay was determined. Figure 4 compares the percentage of visible decay within one, two, three or four quadrants for Aboriginal children and non-Aboriginal children. Overall, Aboriginal children were significantly more likely to have decay in one or more quadrants compared to non-Aboriginal children. Nearly twice as many (1.8 times) Aboriginal kindergarten children had visible decay in one quadrant compared to non-Aboriginal children. The percentage of children with decay in three and four quadrants was 2.1 and 2.7 times higher, respectively. These differences were all statistically significant.

More dental appointments may be needed to provide treatment when a child has more quadrants affected with decay. However, the number of quadrants does not indicate the number of teeth in each quadrant affected by decay, nor does it indicate the seriousness of decay.

Figure 4. Percentage of Aboriginal and non-Aboriginal kindergarten children with visible decay in quadrants: 2012-2013, British Columbia (95% confidence intervals displayed)



	1 quadrant	2 quadrants	3 quadrants	4 quadrants
Aboriginal Children	8.9%	7.5%	3.3%	5.1%
Non-Aboriginal children	4.9%	5.3%	1.6%	1.9%

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

Tables 2a and 2b compare the percentage of non-urgent and urgent referrals by health authority, for Aboriginal and non-Aboriginal children. The results are shown for two screening years. Children who did not have urgent conditions but were referred for further treatment were classified as non-urgent.

In 2012-2013:

- **20.3%** of Aboriginal children across B.C. were referred for non-urgent conditions, compared to **12.2%** of non-Aboriginal children.
- **5.7%** of Aboriginal children across B.C. were referred for urgent conditions, compared to **1.8%** of non-Aboriginal children.
- Island Health had the lowest rate of non-urgent referrals for Aboriginal children (**15.5%**).
- Vancouver Coastal had the lowest rate of urgent referrals for Aboriginal children (**2.7%**).

Overall, in 2012-13, 1.7 times more non-urgent referrals were made among Aboriginal kindergarten children (20.3%) compared to non-Aboriginal children (12.2%). There was an even larger difference for urgent referrals, with 3.2 times as many urgent referrals among Aboriginal children (5.7%) compared to non-Aboriginal children (1.8%).

Since 2009-2010:

- The percentage of non-urgent referrals for Aboriginal children across B.C. has decreased by 4.1 percentage points.
- The percentage of urgent referrals for Aboriginal children across B.C. has increased by 0.7 percentage points.

Table 2a. ***Percentage of non-urgent and urgent referrals by health authority, for Aboriginal and non-Aboriginal kindergarten children, 2012-2013***

2012-2013	Non-Urgent		Urgent	
HA	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
Fraser	16.2%	13.1%	3.8%	1.8%
Interior	22.5%	11.3%	5.6%	2.3%
Island	15.5%	8.3%	6.0%	1.3%
Northern	25.6%	12.9%	7.9%	1.6%
Vancouver Coastal	19.5%	13.2%	2.7%	1.7%
B.C.	**20.3%**	**12.2%**	**5.7%**	**1.8%**

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis (Excel file). Healthy Development and Women's Health Directorate. Population and Public Health.

Table 2b. ***Percentage of non-urgent and urgent referrals by health authority, Aboriginal and non-Aboriginal kindergarten children, 2009-2010***[2]

2009-2010	Non-Urgent		Urgent	
HA	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
Fraser	22.0%	14.9%	5.0%	2.1%
Interior	27.8%	13.9%	5.7%	2.8%
Island	21.4%	12.0%	4.1%	0.5%
Northern	28.4%	16.2%	7.0%	2.6%
Vancouver Coastal	23.0%	15.4%	2.3%	1.2%
B.C.	**24.4%**	**14.6%**	**5.0%**	**1.8%**

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2009-10 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health

Survey Findings for First Nations Schools

Table 3 lists the First Nations schools that participated in the Provincial Dental Survey by health authority for three screening years. It also indicates the year that a Children's Oral Health Initiative (COHI) program was established in the community, if applicable. An asterisk (*) indicates schools that were engaged to participate in the provincial survey in 2012-2013 but where no children were screened (e.g., no kindergarten age children enrolled at time of screening, or children did not participate in survey). These three schools are not included in the total count of schools for 2012-2013.

Table 3. ***First Nations schools participating in the Provincial Dental Survey by survey year***[4]

Health Authority	School Name	2012-2013	2009-2010	2006-2007	Year COHI program established
Interior	Aqumnik	●		●	
	Nagwantaloo		●		
	Neqweyqwelsten	●	●		2005
	Nlakapamux (Stein Valley)	●		●	
	Nta'mtquen Snm'alm'ayatr	●	●		
	Outma Squilxw	●	●		
	Sen Pok Chin	●	●	●	
	Sensisyusten	●	●	●	
	Shihiya	●			2009
	Skeetchestn			●	
	Skel'ep School of Excellence	●	●	●	2005
	Sn-c'c'a-mala	●			
	Sxoxmic		●		
	Tl'etinqox	●	●		
	Tsi Deldel	●	●		
	Yaquan Nukiy	●	●		
	Yunest'in Esgul	●	●		
	Total schools screened	**14**	**12**	**6**	
Island	Gwasala-Nakwaxda'xw School	●	●	●	2011
	Haa Huu Payak School	●			
	Kakolatsi (Quatsino)	●	●	●	2008
	Kyuquot Elementary	*			
	LauWelNew	●	●	●	2012
	Lelawagila School (Kingcome Inlet)	●	●		2009
	Maaqtusis School Elementary	●			
	Penelakut	●	●	●	2012
	Qu wutsen Smuneem	●			2005

Health Authority	School Name	2012-2013	2009-2010	2006-2007	Year COHI program established
	Qwam Qwum Stuwixwulh	●	●	●	
	S-hXiXnu-tun Lelum	●	●	●	
	T'Lisalagi"Lakw School	●	●		
	Wagalus School	●	●		
	Total schools screened	**12**	**9**	**6**	
Northern	Alvin A McKay Elementary	●			
	Blueberry First Nations	●			
	Chalo	●	●	●	2010
	Chief Matthew School	●	●	●	
	Coast Tsimshian School	●			
	Eugene Joseph Elementary	●	●		2008
	Gitanyow School	●	●		2009
	Gitsegukla Elementary	●	●		2005
	Gitwinksihlkw Elementary	●			
	Haisla Community School	●	●		
	Hartley Bay School	*			
	Kispiox Elementary School	●	●		2004
	Klappan School	●	●		2006
	Lach Klan Elementary	●	●		
	Lhoosk'uz Elementary	●			2012
	Moricetown School	●			2005
	Morris Williams			●	
	Nakabun	●		●	2009
	Nathon Barton Elementary	●			
	Nisga'a Elementary School	●	●		
	Prophet	*		●	2010
	Saulteau			●	
	Tahltan School	●			2005
	Woyenne Kindergarten	●			
	Total schools screened	**20**	**10**	**6**	
Vancouver Coastal	Acwsalcta School	●	●		2012
	Capilano Little Ones	●	●	●	
	Head of the Lake School	●	●		
	Xit'Olacw Community school	●	●	●	
	Total schools screened	4	4	2	
B.C. Total		**50**	**35**	**20**	

Table 4 includes the number and percentage of children screened in participating First Nations schools by health authority for two screening years. The percentage of children screened increased significantly across the two screening years, from 71.3% in 2009-2010 to 87.3% in 2012-2013. This increase may be attributed to a change in the consent process. In 2009-2010, signed parental consent was required in First Nations schools prior to providing screening services. In 2012-2013, a process of parent notification and "opt-out" was used in First Nations schools, which is consistent with the process used in public and independent schools.

Table 4. ***Number and percentage of children screened in First Nations schools by health authority*, 2009-2010 & 2012-2013**

	2009-2010			2012-2013		
Health Authority	**Enrolled**	**Screened**	**Percentage Screened**	**Enrolled**	**Screened**	**Percentage Screened**
Fraser	0	0	0.0%	0	0	0.0%
Interior	72	41	56.9%	121	108	89.3%
Island	123	95	77.2%	189	148	78.3%
Northern	93	61	65.6%	189	175	92.6%
Vancouver Coastal	29	29	100.0%	45	44	97.8%
B.C.	**317**	**226**	**71.3%**	**544**	**475**	**87.3%**

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2009-2010 and 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

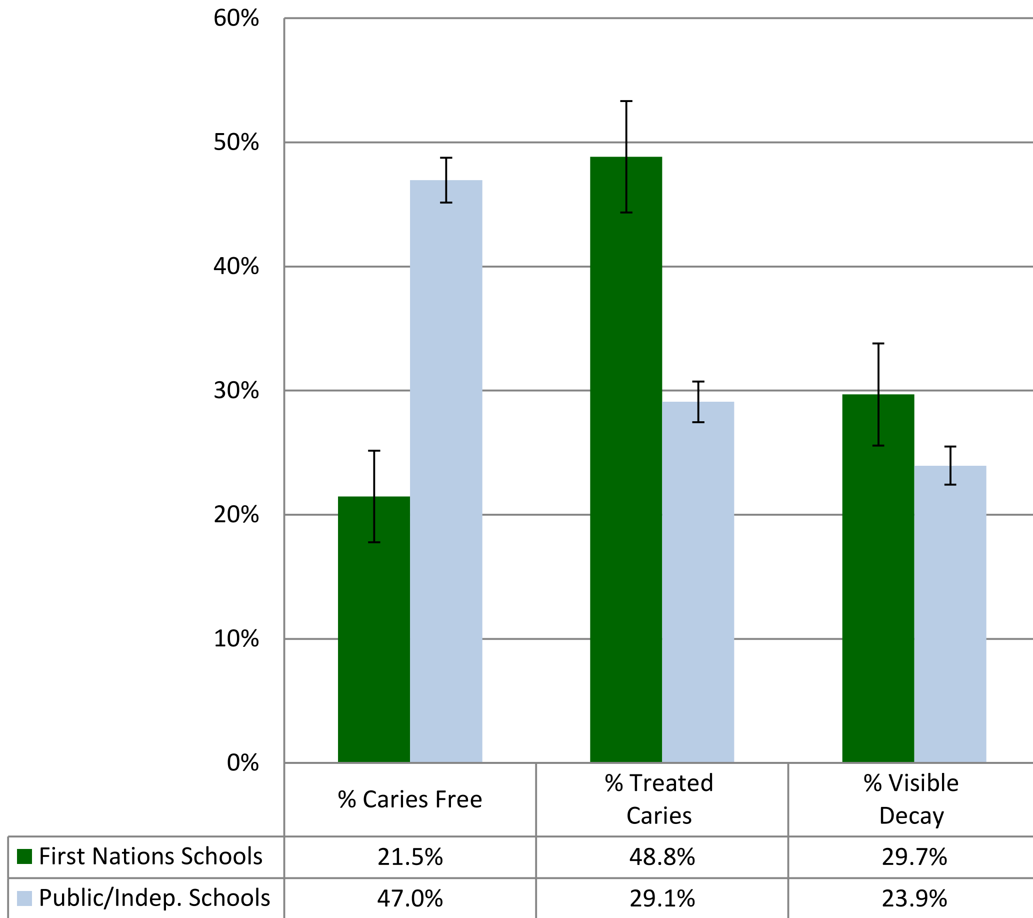
There are two First Nations schools in Fraser. Health authority dental staff indicated that these schools declined to participate in the survey as the oral health needs of the children were being met through a local dental clinic and the Children's Oral Health Initiative program.

Figure 5 compares the 2012-2013 dental survey results of children attending First Nations schools and Aboriginal children attending public or independent schools.

Across B.C. in 2012-2013:

- **21.5**% of kindergarten children attending First Nations schools were caries free[1] (no visible decay or broken enamel), which was significantly lower compared to Aboriginal children attending public or independent schools (**47.0**%).
- **48.8**% of kindergarten children attending First Nations schools had treated caries (no visible decay but existing restorations), which was significantly higher compared to Aboriginal children attending public or independent schools (**29.1**%).
- **29.7**% of kindergarten children attending First Nations schools had evidence of visible decay, which was significantly higher compared to Aboriginal children attending public or independent schools (**23.9**%).

Figure 5. Percentages for select dental survey measures for Aboriginal kindergarten children attending public, independent and First Nations schools: 2012-2013, British Columbia (95% confidence intervals displayed)



	% Caries Free	% Treated Caries	% Visible Decay
First Nations Schools	21.5%	48.8%	29.7%
Public/Indep. Schools	47.0%	29.1%	23.9%

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

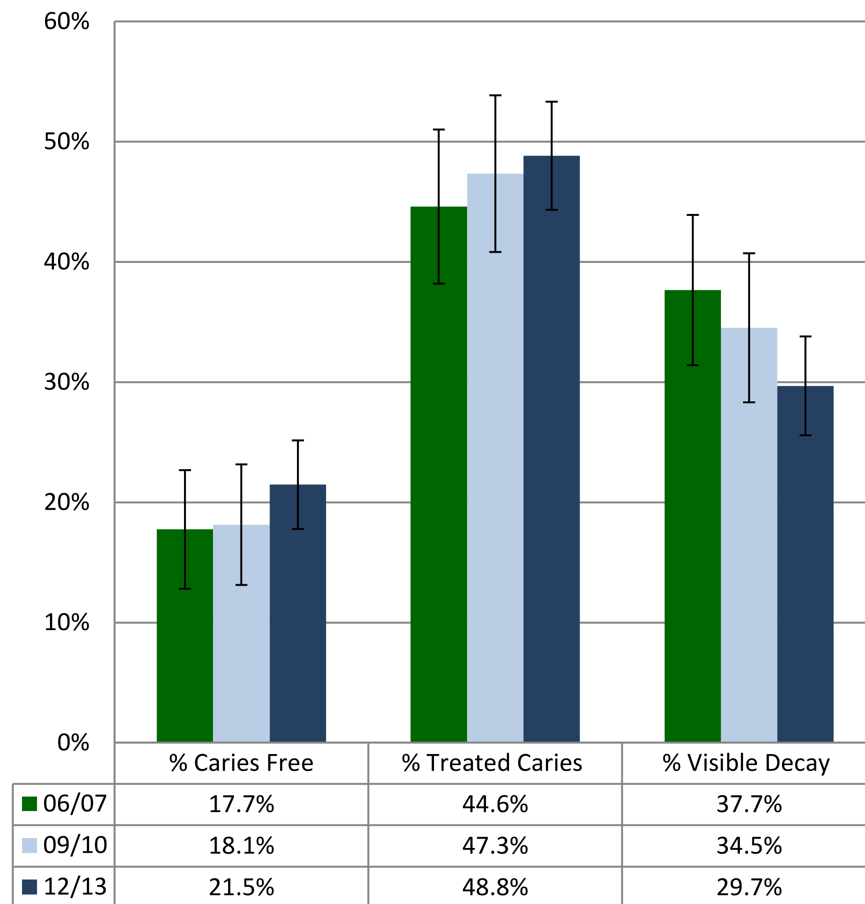
Figure 6 compares the dental survey results of First Nations students across three survey years: 2006-2007 (n = 231), 2009-2010 (n = 226), and 2012-2013 (n = 475). Results should be interpreted with caution as the survey represents a small sample size and may or may not be representative of all kindergarten children attending First Nations schools.

Since 2006-2007 in First Nations schools:

- The percentage of caries free[1] children increased by **3.8** percentage points
- The percentage of children with treated caries increased by **4.2** percentage points
- The percentage of children with visible decay decreased by **8.0** percentage points

These results are not statistically significant.

Figure 6. Percentages for select dental survey measures First Nations schools: 2006-2007, 2009-2010 & 2012-2013, British Columbia (95% confidence intervals displayed)

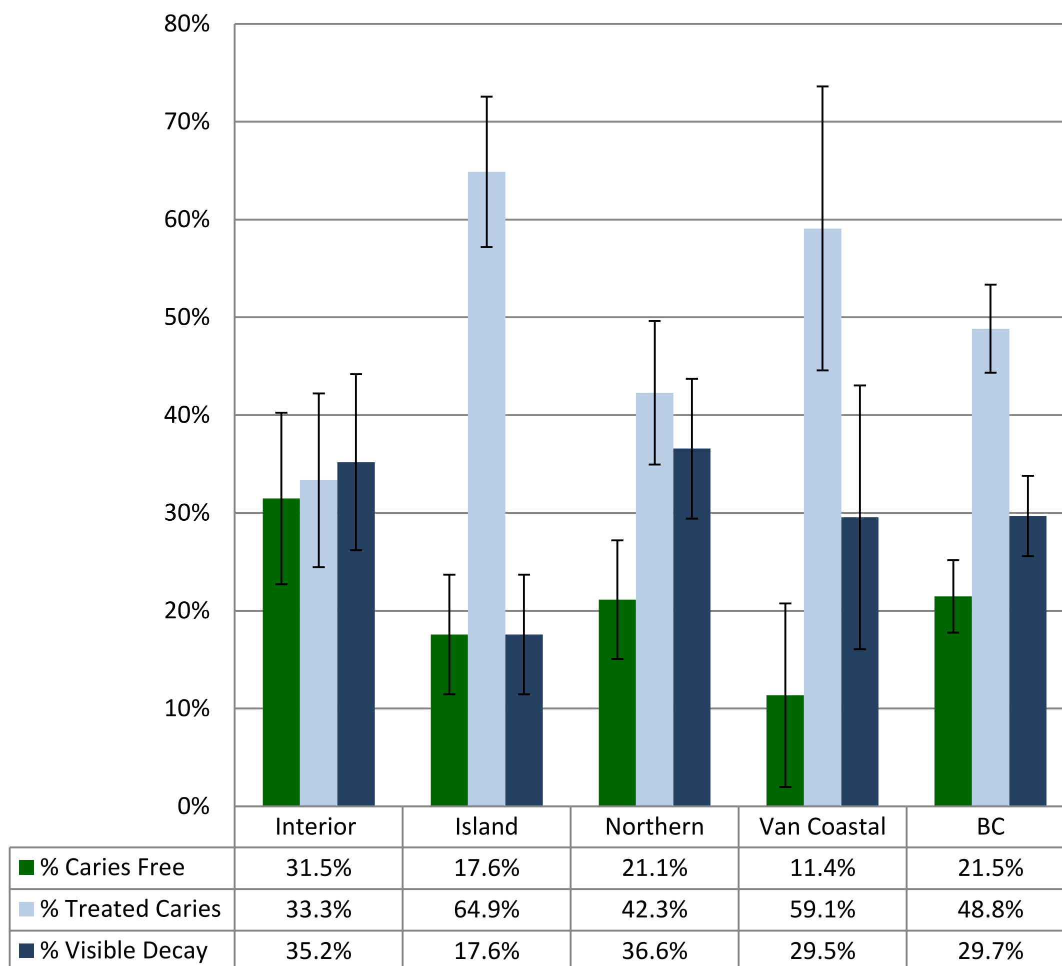


	% Caries Free	% Treated Caries	% Visible Decay
06/07	17.7%	44.6%	37.7%
09/10	18.1%	47.3%	34.5%
12/13	21.5%	48.8%	29.7%

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

Figure 7 compares the 2012-2013 dental survey results of kindergarten children attending First Nations schools by health authority. Interior Health had the highest percentage of children who were caries free[1] (31.5%), while Vancouver Coastal Health had the lowest percentage (11.4%). However, these differences were not statistically significant compared to B.C. overall. Interior Health also had a statistically significant lower percentage of children with treated decay (33.3%) compared to B.C. overall. Island Health had a significantly lower percentage of children with visible decay (17.6%) and significantly higher percentage of children with treated decay (64.9%) compared to B.C. overall. Results for Vancouver Coastal Health should be interpreted with caution as only four First Nations schools were screened. Therefore, the sample size was small (n = 44).

Figure 7. Percentages for select dental survey measures by health authority, kindergarten children attending First Nations schools: 2012-2013, British Columbia (95% confidence intervals displayed)



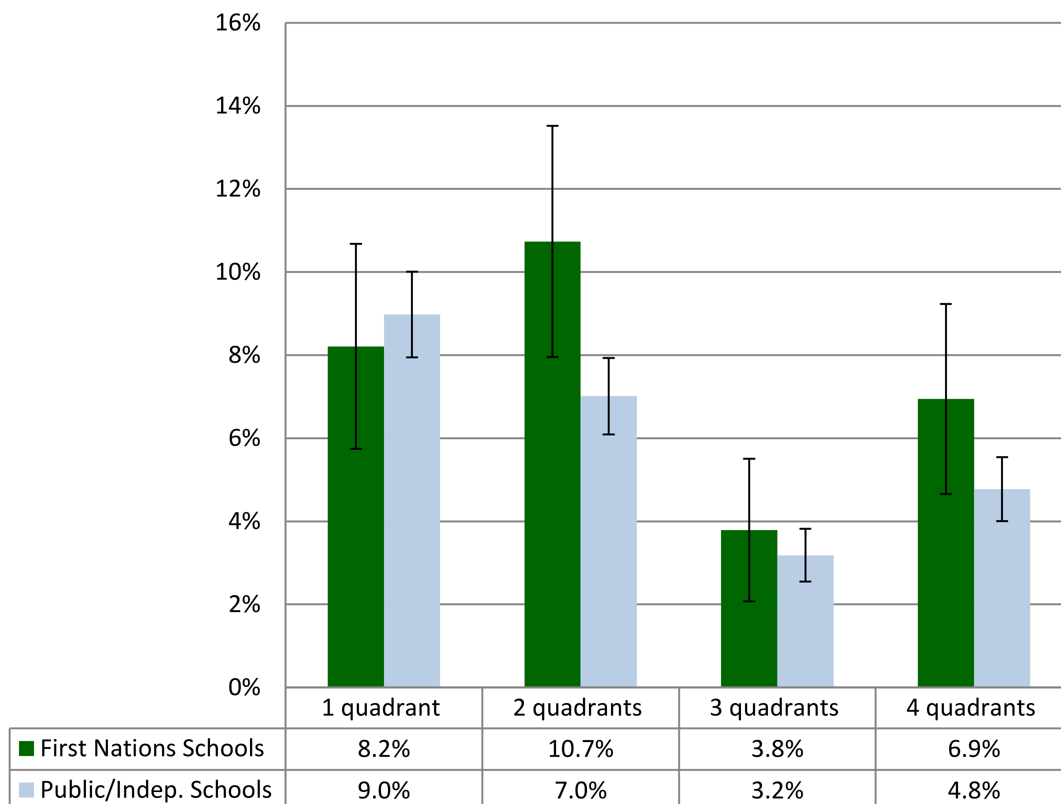
	Interior	Island	Northern	Van Coastal	BC
% Caries Free	31.5%	17.6%	21.1%	11.4%	21.5%
% Treated Caries	33.3%	64.9%	42.3%	59.1%	48.8%
% Visible Decay	35.2%	17.6%	36.6%	29.5%	29.7%

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

At the time of the survey, the number of quadrants in the mouth affected by visible decay was determined. Figure 8 compares the percentage of visible decay within one, two, three, or four quadrants for children attending First Nations schools and Aboriginal children attending public or independent schools. In 2012-2013, the percentage of children with decay in one quadrant was slightly higher for Aboriginal children attending public or independent schools; however this difference was not statistically significant. Alternatively, the percentage of children with decay in two, three or four quadrants was higher for children attending First Nations schools. However, the difference was only statistically significant for two quadrants.

The number of quadrants affected with visible decay may reflect the number of dental appointments needed to provide treatment. However, the number of quadrants does not indicate the number of teeth in each quadrant affected by decay, nor does it indicate the seriousness of decay.

Figure 8. Percentages for visible decay by quadrants for Aboriginal kindergarten children attending public and independent schools and kindergarten children attending First Nations schools: 2012-2013, British Columbia (95% confidence intervals displayed)



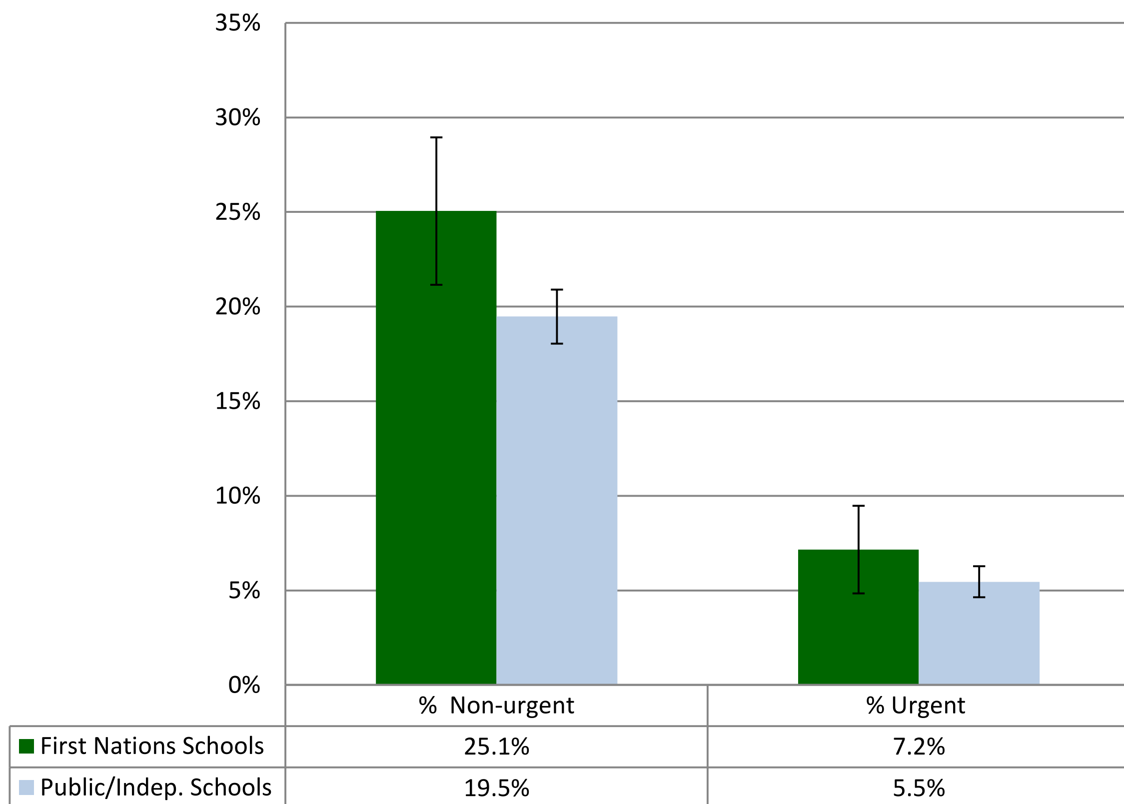
	1 quadrant	2 quadrants	3 quadrants	4 quadrants
First Nations Schools	8.2%	10.7%	3.8%	6.9%
Public/Indep. Schools	9.0%	7.0%	3.2%	4.8%

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2009-2010 and 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

Figure 9 shows the percentage of non-urgent and urgent referrals for children attending First Nations schools and Aboriginal children attending public or independent schools. Children who did not have urgent conditions but were referred for further treatment were classified as non-urgent.

In 2012-2013, the percentage of children with both non-urgent and urgent referrals was higher for children attending First Nations schools. However, this difference was not statistically significant for urgent referrals.

Figure 9. Percentage of non-urgent and urgent referrals, Aboriginal kindergarten children attending public and independent schools and kindergarten children attending First Nations schools: 2012-2013, British Columbia (95% confidence intervals displayed)



	% Non-urgent	% Urgent
First Nations Schools	25.1%	7.2%
Public/Indep. Schools	19.5%	5.5%

Data source: B.C. Ministry of Health. (2014). K Dental Screening 2009-2010 and 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

Conclusion

Good dental health has a significant impact on overall health and wellness. The 2012-2013 Aboriginal kindergarten dental survey provides an indication of the dental health of Aboriginal children in British Columbia. In 2012-2013, 3427 Aboriginal children participated in the provincial dental survey, representing 89.7 per cent of those enrolled and identified as Aboriginal.

Since 2009-10, the percentage of Aboriginal kindergarten children who are caries free has increased by 4.0 percentage points and the percentage of Aboriginal kindergarten children who have visible decay has decreased by 3.7 percentage points.

Although there has been an improvement in dental survey results, disparities remain. For example, survey findings indicated that children attending First Nations schools had evidence of worse dental health than Aboriginal children attending public or independent schools. Evidence also indicates that Aboriginal children and families experience barriers to good dental health.[7]

The provincial Aboriginal dental survey is an important tool for monitoring regional trends, as well as for evaluating the effectiveness of early childhood dental health activities within *Healthy Smiles for Life*.

Recommendations

- To achieve ongoing improvements in dental health, continued collaboration and program planning is needed between First Nations communities, health authorities, the First Nations Health Authority, Ministry of Health and service providers.

- Additional work is needed to extend the reach of the kindergarten dental survey to more First Nations schools so that results can inform public health program planning and allocation of resources to those areas with identified need, where those needs can be addressed through preventative programs.

- Ongoing work is needed to address the disparities in early childhood dental health and to close the gap between Aboriginal and non-Aboriginal children. The implementation of the recently released *Healthy Smiles for Life: BCs First Nations and Aboriginal Oral Health Strategy* will be essential for improving the oral health of First Nations and Aboriginal children.

Appendix A

Dental survey results by health authority, kindergarten children identified as Aboriginal, attending public, independent and First Nations schools, 2012-2013

Health Authority	# Enrolled	# Screened	# Caries Free	# Treated Caries	# Visible Decay	1 Quadrant	2 Quadrants	3 Quadrants	4 Quadrants
Fraser	753	693	361	195	137	44	45	20	28
Interior	851	747	349	194	204	81	63	23	37
Island	886	754	300	308	146	58	38	16	34
Northern	999	936	356	282	298	93	96	49	60
Vancouver Coastal	333	297	118	115	64	29	16	4	15
B.C.	**3,822**	**3,427**	**1,484**	**1,094**	**849**	**305**	**258**	**112**	**174**

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

Dental survey results by health authority, kindergarten children attending First Nations schools, 2012-2013 (see Figure 7 for charts)

Health Authority	# Enrolled	# Screened	# Caries Free	# Treated Caries	# Visible Decay	1 Quadrant	2 Quadrants	3 Quadrants	4 Quadrants
Interior	121	108	34	36	38	16	13	1	8
Island	189	148	26	96	26	7	9	5	5
Northern	189	175	37	74	64	10	25	12	17
Vancouver Coastal	45	44	5	26	13	6	4	0	3
B.C.	**544**	**475**	**102**	**232**	**141**	**39**	**51**	**18**	**33**

Data source: B.C. Ministry of Health. (2014). Kindergarten Dental Screening 2012-13 Aboriginal Analysis. Healthy Development and Women's Health Directorate. Population and Public Health.

Endnotes

[1] It is difficult to determine if someone is truly caries free. The term is used to indicate that there was no visible decay or broken enamel.

[2] Tripartite collaboration: B.C. First Nations, Government of B.C., and Government of Canada. (2014). *Healthy Smiles for Life: B.C.'s First Nations and Aboriginal Oral Health Strategy*. Accessed Oct. 7, 2014 from: www.fnha.ca/about/news-and-events/news/healthy-smiles-for-life-bcs-first-nations-and-aboriginal-oral-health-strategy

[3] Centre for Disease Control. Division of Oral Health. Accessed Oct. 7, 2014 from: www.cdc.gov/oralhealth/children_adults/child.htm.

[4] Evidence Review: Dental Health. B.C. Ministry of Health, 2014. Accessed Oct. 7, 2014 from: www.health.gov.bc.ca/public-health/pdf/Dental_Health_Evidence_Review.pdf.

[5] Ibid

[6] B.C. Ministry of Health, Health Canada, & B.C. regional health authorities (2012). *Environmental scan: Oral health services in British Columbia for First Nations and Aboriginal children aged 0-7 years*. Accessed Oct. 7, 2014 from: www.health.gov.bc.ca/women-and-children/pdf/environmental-scan-report.pdf.

[7] Tripartite collaboration: B.C. First Nations, Government of B.C., and Government of Canada (2014). *Healthy Smiles for Life: B.C.'s First Nations and Aboriginal Oral Health Strategy*. Accessed Oct. 7, 2014 from: www.fnha.ca/about/news-and-events/news/healthy-smiles-for-life-bcs-first-nations-and-aboriginal-oral-health-strategy.