

**NCOHR WORKING PAPERS — REPORT**

# **Kungatsiajuk (Healthy Smiles) Project Research Team**

Report on Child and Youth Oral Health  
Survey Results for NunatuKavut, 2012–13

NunatuKavut, Newfoundland and Labrador (NL), Canada

## The Research Team

### Principal Investigators

Debbie Martin  
Mary McNally  
Heather Castleden

### Investigators

Stephen Bornstein  
Joanne Clovis  
Mark Filiaggi  
Ferne Kraglund  
Jennifer MacLellan  
Debora Matthews

### Dalhousie Research Staff

Iona Worden-Driscoll  
Michelle Clarke  
Martha Brilliant  
Marissa Ley  
Claire McKibbin  
Amanda Demsey  
Barbara Campbell  
James Gray

### Collaborators

Sandra Crowell  
John Graham  
Rosamund Harrison  
Peter Hornett  
Darlene Wall

### Community Advisory Committee

Regan Burden, Youth Representative,  
*Port Hope Simpson*  
Laverne Campbell, *Charlottetown*  
Megan Hudson, *Labrador-Grenfell Health*  
Joan Jenkins, *St. Lewis*  
Judy Pardy, *Cartwright*  
Margaret Rumbolt, *Mary's Harbour*

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## Executive Summary

Over the past decade, there has been a growing call to action in Canada to reduce oral health disparities affecting Aboriginal Peoples. This report presents findings that are part of a larger study developed to respond to this priority identified by the NunatuKavut Social Sector in 2007. There were concerns about suboptimal oral health and dental care services affecting children and youth particularly since the Inuit of NunatuKavut (represented by the NunatuKavut Community Council) are currently not included among ‘recognized Inuit’ and therefore do not have access to federally sponsored Non-Insured Health Benefits in the manner available to members of other Canadian Aboriginal communities. However, all children aged twelve and under have basic dental services covered under a publicly financed provincial dental care program. Oral health care services are coordinated and delivered through the Labrador Grenfell Regional Health Authority which is under the jurisdiction of the Government of Newfoundland and Labrador.

This report summarizes oral health survey results for children (both Inuit and non Inuit) living in NunatuKavut on the South East coast of Labrador. The aim of the survey was to collect baseline oral health information in order to provide community leaders and health service providers in NunatuKavut with relevant data to inform health care planning and service delivery.

The survey consisted of two components: (1) a structured interview of caregivers that centered on participants’ perceptions of general oral health as well as oral health care habits, utilization and cost of oral health care services and (2) a clinical dental examination to gather baseline information on individual oral health status and treatment needs.

Survey methods follow from those developed for the *Oral Health Component of the Canadian Health Measures Survey* and the *Inuit Oral Health Survey*, national initiatives led by Health Canada’s Office of the Chief Dental Officer. For the first time in approximately forty years, these surveys report on national estimates of the oral health status of both non Aboriginal and Inuit Canadians and provide a valuable backdrop for comparisons with this study.

### The key descriptive findings summarized below provide evidence for oral disease patterns and service utilization trends for children and adolescents of this region:

- Participation rate was not statistically representative of the general population for the various age groups. However, findings are informative in providing the most comprehensive oral health status information available for this region.
- Fewer than ten percent of NunatuKavut children and adolescents (0-17 years) reported that their oral health is fair to poor. Overall, females were more likely to report fair or poor oral health. As well, those respondents who had not visited the dentist in the last year were more likely to report fair or poor oral health.
- Seventy percent of respondents reported visiting the dentist at least once a year for checks-ups or treatment. Children aged 6-11 years were most likely to visit the dentist for prevention and children aged 0-5 years the least likely.
- Just over thirty percent of children and adolescents had missed time from normal activities, work or school activities in the past 12 months because of dental problems, with adolescents reporting lost-time most frequently.
- Two-thirds of participants reported seeing a dental professional within the last year with nearly one-half accessing dental care within their community and thirty percent accessing care both in and out of their community. Just over ten percent of respondents accessed care exclusively outside of their community.
- Over seventy percent of children and adolescents have access to employer sponsored or private **dental insurance\*** or a government program (i.e., provincial Children’s Dental Health Program of Newfoundland and Labrador) that covers all or part of their dental expenses. Only thirty percent of respondents reported being aware that the Children’s Dental Health Program offers dental coverage for youth (aged 13-17 years) for families receiving income support/eligible families on low income. Less than one percent of respondents reported that they did not know whether they have access to a plan.
- In general, caries rates for all age groups were slightly higher than for non-Aboriginal Canadians as reported in the Oral Health Component of the Canadian Health Measures Survey but lower than that of other Inuit within Canada.
- Thirty percent of preschoolers presented with one or more cavities and on average, experienced 1.42 decayed, missing, or filled primary teeth.

- Approximately seventy percent of children and adolescents ranging in age from birth to 17 years who live in the South Eastern Labrador region of NunatuKavut were participants in the oral health survey.

- Almost sixty-percent of school-aged children aged 6-11 years experienced an average of 2.25 decayed, missing or filled primary teeth. One quarter of the children in this age group experienced at least one decayed tooth in their **permanent teeth**\*. The total average of both primary and permanent decayed, missing or filled teeth was 2.79 for over sixty-five percent of those examined.
- Just over seventy percent of adolescents aged 12 to 17 years experienced at least one decayed tooth and had an average of 3.40 decayed, missing or filled teeth due to caries.
- One-fifth of preschool children, two-fifths of school aged children (6-11 years) and one-third of adolescents (12-17 years) experienced one or more untreated dental cavities, with the latter age group experiencing slightly more than three teeth that required some form of dental restorative treatment.
- Evidence of dental fluorosis was negligible with fewer than twenty percent of all age groups experiencing questionable or mild fluorosis.
- Less than three percent of participants were receiving or had received orthodontic treatment at the time of the survey.

## 1.0 Background

The *Kungatsiajuk* (a healthy smile) research project bridges Inuit knowledge with that of oral health sciences to identify the oral health needs of children and adolescents living in South East Labrador communities from Cartwright to Lodge Bay and, with an understanding of these needs, aims to develop culturally appropriate and sustainable oral health promotion and disease prevention programs for Inuit children and youth.

The research team is an interdisciplinary collaborative health research partnership with representatives from NunatuKavut; Dalhousie University's Faculties of Dentistry and Health Professions; Labrador-Grenfell Regional Health Authority; the Healthy Populations Institute (formerly the Atlantic Health Promotion Research Centre); the Atlantic Aboriginal Health Research Program; and the Newfoundland and Labrador Centre for Applied Health Research.

### 1.1 Oral Health is a Research Priority in Labrador

The recognition that poor oral health is an important health priority for people living in communities along the South East coast of Labrador is not new. The Grenfell Mission organized volunteer dentists to provide dental services in these communities as early as the 1800s (Messer 1990). Dunning (1989, p.212), a volunteer dentist in southern Labrador in the 1930s, noted "restorative dentistry was almost unknown...I had to extract four teeth for every one that I could fill". Although dental facilities began to appear in larger centres in Labrador in the 1960s, they did not reach many of the more isolated communities in Labrador until the 1970s and 80s and even then, could not provide more than sporadic service (Messer 1990). In 2006, community leaders and researchers participated in an interdisciplinary community-based health planning workshop, 'Community Health Research in Labrador: Listening, Learning and Working Together', which identified poor oral health as among the top research priorities requiring immediate attention.

Following the 2006 workshop, a preliminary scan outlining disease rates and access to oral health care in Labrador was undertaken to inform the healthcare community and provide a foundation for further collaboration (Hunter & Cunningham 2008). Findings of the report were reviewed at the 'Labrador Aboriginal Oral Health' workshop held in Happy Valley-Goose Bay (November 2008). The report indicated that oral disease rates were high and access to dental services in Labrador is extremely limited for most Aboriginal communities, especially the communities of NunatuKavut. Moreover, dental services in this

region have focused on individualized services, with very little ability or resources to address more systemic issues concerning oral disease prevention or health promotion (Hunter & Cunningham 2008). There was concern that conventional professionally delivered dental services were doing very little to address high rates of oral disease. Members of the workshop *determined that a preventive approach to oral disease for children and youth held the most promise for success and sustainability*. A steering committee, consisting of representatives of various Aboriginal groups, including NunatuKavut, Labrador oral health care providers, researchers, and government representatives was formed to move forward on this priority for action.

In 2011, following four years of team building and collaboration, our *Kungatsiajuk* Research Team (representatives from the south Labrador Inuit communities of NunatuKavut, academic researchers and dental professionals) was successful in securing a three-year CIHR Open Operating Grant entitled "*Kungatsiajuk: Supporting the Healthy Smiles of NunatuKavut Children*".

### 1.2 Importance of Oral Health

Associations between oral health and general health are well documented. For example, early childhood caries (ECC) refers to **dental decay\*** that affects primary teeth in children under 72 months of age (Drury et al. 1999), and can range from mild to severe forms (Wyne 1999). Children with severe ECC may suffer recurring pain, have difficulty eating and experience altered sleep habits (Low, Tan & Schwartz 1999). ECC has also been associated with reduced height and body weight in children (Ayhan, Suskan & Yildirim 1996; Acs et al. 1992; Acs et al. 1999). Children who suffer from ECC are known to have reduced oral health-related quality of life (Filstrup et al. 2003) and the appearance of a diseased mouth has been connected to low self-esteem (First Nations Information Governance Centre 2007). The presence of ECC in the primary teeth leads to an increased risk of developing caries in the **permanent teeth\*** in later childhood and into the teenage years (Alm 2008; Almeida et al. 2000; Peretz et al. 2003; Li & Wang 2002). Establishing good oral health in early years is key to ensuring that children can thrive without the pain, suffering and even disfigurement associated with dental disease.

### 1.3 Oral Health Disparities in Aboriginal Children and Adolescents

Compared with non-Aboriginal children, Aboriginal children face ‘shocking’ rates of tooth decay both internationally (Mejia et al. 2010; Parker, 2010) and within Canada (Health Canada 2011; FNIGC 2012; Lawrence et al. 2009; Schroth et al. 2007). Poor oral health influences a wide spectrum of chronic health conditions, including diabetes, obesity, and heart disease. Unlike many other chronic conditions, oral disease is visible and measurable; it is, in many cases treatable, and in most cases, preventable. However, ‘conventional’ oral health interventions that target individual level health behaviours have been ineffective in combatting oral disease among Aboriginal populations, suggesting that alternative approaches are needed.

A CIHR-funded two-day national forum held in Winnipeg in June 2007 entitled ‘Oral health and the Aboriginal Child’ brought community members, researchers and policy-makers together to discuss issues related to oral health among Canadian Aboriginal children. Key recommendations that emerged included the need for: 1. Aboriginal people to share their stories about youth oral health; 2. Indigenous knowledge to be integrated into the oral health sciences; 3. Oral health to be considered in terms of overall youth health; 4. Oral health to be considered in terms of the social **determinants of health\***; and 5. Oral health research with Aboriginal youth to include participatory, community-based, and qualitative methodologies. Recognizing that these recommendations were formulated in direct consultation with key Aboriginal, dental, academic and policy representatives, they were instrumental in shaping the direction of our Kungatsiajuk research project. Also influencing our research has been the repeated calls for oral health research that targets Aboriginal children using community-based participatory research (CBPR) approaches, considers oral health in terms of overall child health, and connects oral health with the social **determinants of health\*** (Schroth et al. 2007). To date, examples of research that has accomplished these goals is exceedingly rare.

Community-based intervention research combines the principles of CBPR with that of an intervention model of research. CBPR involves an iterative relationship between the researchers and community where communities help to identify, guide and direct the processes of researching, implementing and disseminating the research in which they are involved (Viswanathan et al. 2004). Applied to Aboriginal communities, CBPR also ensures cultural relevance, engages traditional knowledge, and provides a means for community to engage with the social and political processes that affect them (LaVeaux & Christopher 2009; Minkler 2005). Intervention research involves designing programs or policies that act upon the knowledge gained through research. This approach has been supported by many Aboriginal communities in recent years, as it moves beyond simply describing health issues toward addressing them (Campbell,

Pyett & McCarthy 2007; Evans et al. 2009; Hawe & Potvin 2009). Incorporating community-based participation with intervention research ensures that Indigenous knowledge and conventional science are positioned in an equitable relationship where one approach to knowledge generation is not privileged over another (Iwama et al. 2009; Jacklin & Kinoshameg 2008; Martin 2009).

### 1.4 Access to Oral Health Care Services in NunatuKavut

Of the Aboriginal Peoples in Canada, only registered First Nation and recognized Inuit have access to dental benefits through the Non-Insured Health Benefits (NIHB) Program offered by Health Canada (First Nations and Inuit Health Branch 2009). The Inuit of NunatuKavut are currently not included among ‘recognized Inuit’ and do not receive NIHB (Clarke & Mitchell 2010). The Inuit of NunatuKavut rely upon oral health care services provided by the Government of Newfoundland and Labrador through the Labrador-Grenfell Regional Health Authority. Under provincial jurisdiction, all children 12 and under are covered by a publicly-financed dental care program. Children aged 17 years and under are also covered by this program if they live in low-income households, or households on social assistance. Some of the costs associated with travelling to appointments (outside of NunatuKavut if they require general anesthetic) are subsidized, but there are many ‘hidden’ costs such as food and lodging expenses that still make travel for dental care unaffordable for some (Martin et al. 2012).

The NunatuKavut Community Health Needs Assessment conducted in 2009-11 highlighted a number of important findings related to oral health. Logistic and financial barriers associated with geographic isolation and travel costs were identified as being among the greatest impediments to oral health (Martin et al. 2012). This suggests that even though children have publicly-funded dental coverage, there are many additional barriers that prevent them from receiving consistent oral health care. Furthermore, access to healthy food options is limited due to lack of availability and high cost, leading to less healthy food choices; these are also **risk factors\*** for oral health (Martin et al. 2012).

### 1.5 Oral Health Data of Aboriginal Children and Adolescents in Canada

For over thirty years, the Nutrition Canada National Survey (1970-72) remained the only nation-wide, clinical information data on the oral health of Canadians. The more recent (2007-2009) Oral Health Module of Statistics Canada’s Canadian Health Measures Survey (OHM-CHMS) collected information on the oral health of Canadians aged 6 to 79 years. The oral health information consisted of self-report data collected through a household interview and direct physical measures collected during a clinical

dental examination. Although the survey was national in scope, the target population excluded persons living on First Nations reserves and Inuit Canadians living in Labrador and the northern territories (Health Canada 2011).

Health Canada's Office of the Chief Dental Officer (OCDO) worked in partnership with First Nations and Inuit peoples to address the gap in Canadian Aboriginal oral health information. The Inuit Oral Health Survey (IOHS) and the First Nations Oral Health Survey (FNOHS) (2008 – 2010), were conducted to measure the oral health of individuals (aged 3 to 79 years). Surveys were conducted in six Inuit and six First Nations communities that were randomly selected throughout Canada but excluded the people of NunatuKavut. These surveys, modeled after the OHM-CHMS, provided the methodology used for this project and consisted of self-report data and direct physical measures. They included additional questions tailored to address areas of specific interest for each of these population groups.

## 1.6 Oral Health Data of Aboriginal Children and Adolescents in Labrador

Data on the oral health status of Aboriginal people in Labrador is limited, even more so for the people of NunatuKavut. Differences exist across Labrador with respect to access to dental services and all coastal communities face geographic and logistical barriers. A 1991 survey of Aboriginal youth (age 5-22 years) in two Inuit communities in northern Labrador found **dental caries\*** (cavities) were present in nearly all (97%) participants (Zammit et al. 1994). A 1993 survey from a southern Labrador community revealed similar high rates of decay (82%) in 7-12 year-olds (Ismail, Messer & Hornett 1998). A 1998/1999 survey of both Aboriginal and non-Aboriginal children (kindergarten to grade 3) in 10 communities in West, Central and South East Labrador found visible caries in 50 percent of children. Caries rates varied according to accessibility to oral health care from 47 percent (Happy Valley-Goose Bay) to 72 percent (NunatuKavut) to 91 percent (First Nations community) (CIET 2000). Parents reported that nearly a quarter of their children had experienced a toothache in the six months prior to the survey (Jong 2009). There were no reports on rates of ECC in preschool age children in this region. Anecdotally, oral health practitioners reported the severe or rampant form of ECC, particularly among the very young (Hunter & Cunningham 2008). This is problematic for young children in isolated communities, as treatment often requires general anesthetic in a regional hospital. A very recent survey involving two Nunatsiavut communities found moderate to high rates of decay for all age groups of children and youth (Kraglund et al., 2012).

## 1.7 Oral Health: What Will We Measure?

The need for treatment of oral diseases based on clinical findings compared with individuals' perceived health care needs is often inconsistent (Coulter et al. 2002; Locker & Slade 1994). The relationships between these two are complex and mediated by numerous factors (Wilson and Cleary 1995). Clinicians are trained to diagnose and manage disease, whereas individuals perceive oral health as it impacts their daily living. Oral disease is not always symptomatic. For example, caries may not be painful until a more advanced stage; one could have **periodontal disease\*** (an inflammatory disease affecting the gums and bone supporting the teeth) and be completely unaware. Assessing both individual perceptions of health and the presence or absence of clinical disease enriches the data to provide a more meaningful basis on which to promote health and implement disease prevention programs (Allen et al. 1999), and allocate health resources (Bennett & Leake 1999). Thus, both normative (oral science) and subjective (individual) indicators are essential to our understanding of oral health.

Clinical indices such as **DMFT\*** (decayed, missing and filled teeth) (CDC 1999-2010) and the Community Periodontal Index of Treatment Needs (CPITN) (Ainamo et al. 1982) are objective measures to assess the burden of disease. They have been used for over 30 years to describe **prevalence\*** and severity of dental disease within populations. This information is useful in planning health care service needs; however, it does not take into account the impact of disease on the functioning or psychosocial well-being of individuals (Allen et al. 1999). As such, the NunatuKavut survey used validated instruments (briefly described in Section 3.1) to collect information pertaining to both objective and subjective indicators of health as well as availability and perceptions regarding health services.

## 2.0 Dental Care Delivery System in NunatuKavut

### 2.1 Role of Labrador-Grenfell Regional Health Authority

The Labrador-Grenfell Regional Health Authority (LGRHA) is the provincial regional health authority, and is responsible for administering and delivering health and community services in the Labrador-Grenfell region (LGRHA, 2012-2013). The organization started in April 2005, when the health and community services in the Labrador-Grenfell region were consolidated.

LGRHA's mission is to improve in key areas such as population health, systems performance, and the quality and safety of its services, in order to improve the accessibility of health and community services to better serve the people residing in the region. The LGRHA assesses health and community services regularly, develops priorities for these services, and manages resources and programs in the region to provide residents with quality health care. Additionally, the health authority works with other organizations to coordinate health services, to collect and analyze information related to these services, and provide information about health and community services available to the residents of the Labrador-Grenfell region (LGRHA, 2013).

One of its medium-term goals is to improve accessibility to selected health and community services by decreasing wait times, improving access to culturally appropriate services, expanding the use of Telehealth services, and improving the amount and variety of services available to the region (LGRHA, 2014).

### 2.2 Dental Services in NunatuKavut

The following information was retrieved from the LGRHA website Facilities, Programs and Services Community Links pages (available at <http://www.lghealth.ca/index.php?pageid=37>). The LGRHA provides dental services in NunatuKavut. Dentists travel to the communities on the South East coast of Labrador for 3-4 day visits approximately every 4-6 weeks to provide dental services to these remote communities. Services include regular oral hygiene care, **extractions\*** and basic restorative care such as fillings.

Six dental suites are located on the South East coast of Labrador. Each dental suite is housed within a community health clinic:

- The Charlottetown clinic provides primary health care to Charlottetown, Norman Bay, and Pinsent's Arm residents. This clinic has two examination rooms, an emergency room, a dental suite, and a public health office.
- The health clinic in Mary's Harbour provides primary care to residents of Mary's Harbour and Lodge Bay. This clinic has three examination rooms, an emergency room and a dental suite.
- In Cartwright there is a community health clinic with basic trauma equipment for emergencies, and has had a locum dentist scheduled regularly since 2011.
- The Black Tickle clinic provides primary health care to the community, and has basic emergency equipment, with a locum dentist regularly scheduled since 2011.

Severe emergencies and medical conditions that cannot be treated at one of the community health clinics are medevac'd to a referral center such as the hospital in St. Anthony, which is a community in Northern Newfoundland. Since these procedures or emergencies often require patients to incur costs associated with travel (gas/flight, accommodation, etc.), there is a program in place to provide some financial assistance. Specifically, the Medical Transportation Assistance Program provides financial assistance to members of the provincial Medical Care Plan (MCP) to access medical services not available near their homes (Newfoundland and Labrador, 2014). This program offsets costs to residents traveling in personal vehicles or by airplane. It also provides a per diem for accommodations and meals (Newfoundland and Labrador, 2014).

In 2008/09, Labrador-Grenfell Regional Health Authority received funding from the provincial Department of Health and Community Services and the International Grenfell Association to upgrade the dental suites in Cartwright and Black Tickle. Subsequently, upgrades were made to the remaining four suites in the other South Eastern Labrador communities included in this study.

At approximately the same time, the remuneration for dentists was increased to 90 percent of the remuneration rate for physicians. It is likely that these changes – upgrades to the dental suites and improved remuneration for dentists – are thought to have contributed to attracting and retaining more skilled dentists to the region in recent years. Moreover, the number of client visits for Labrador Grenfell Health's dental services (selected sites; includes dentists, hygienists, and dental surgery) increased by 21.5 percent from 9,232 (2009/10) to 11,213 (2013/14) (LGRHA, 2011; LGRHA, 2014).

- The health clinic in Port Hope Simpson was built in 1975 and serves the primary health needs of Port Hope Simpson and William's Harbour. The facility has an emergency room with basic trauma equipment, a dental suite, public health office and holding bed.
- The clinic in St. Lewis opened in the 1980s and includes an emergency room, a dental suite, and a public health office.

## 3.0 Methods

### 3.1 Brief Description

The overall research design follows a community-based participatory approach using mixed methodology. This report focuses solely on one aspect of the research—the baseline oral health survey.

The *Kungatsiajuk* oral health survey measured the oral health status of children and adolescents in South East Labrador communities from Cartwright to Lodge Bay. The baseline survey includes: 1) a clinical assessment of all children age birth-17 years in the participating communities; and 2) a self-report/proxy survey to determine four domains of oral health-related quality of life (oral symptoms, functional limitations, emotional and social well-being), as well as oral care habits and utilization of oral health care services. The survey used standardized instruments previously developed and validated for the OHM-CHMS and the IOHS.

Specifically, the oral health survey consists of two components: (1) a structured (self-report or proxy) interview designed to collect information on participants' perceptions of their general oral health as well as oral health care habits, utilization of oral health care services, cost of dental treatment and third party dental coverage and (2) a clinical dental examination to collect information on individual oral health status using the clinical oral health components of the Canadian Health Measures Survey.

**Structured Interview:** Adapted from the IOHS, data was collected by self-report or proxy from children and parents. The structured interview covers the following areas:

- General health of the mouth;
- Avoidance of eating;
- Presence of persistent pain;
- Lost time from school due to dental problems;
- Frequency of oral health care practices;
- Access to dental care and cost of dental treatment;
- Awareness of the provincially-funded Children's Dental Health Program; and
- Frequency of sedation or general anesthetic for dental work.

**Clinical Dental Examination:** The examination was performed using a light source, mouth mirror, and a (blunt-ended) periodontal probe. The OHM-CHMS clinical component rele-

vant to children includes: the presence or absence of any oral pathology; a fluorosis score for the anterior permanent **maxillary\* incisors\*** (using Dean's Fluorosis Index); the orthodontic status (for respondents aged 12 years and up) and any current orthodontic treatment; periodontal health using the Gingival Index to assess the severity and **prevalence\*** of **gingivitis\***, the Debris Index to assess oral debris, and the **Calculus\*** Index to assess the oral **calculus\***; the status of each tooth (e.g., presence of **dental caries\***, missing teeth, whether teeth have been restored), the number of tooth surfaces restored with amalgam fillings, and traumatic injury to any of the permanent **incisors\***.

The decayed criterion used to measure the number of decayed surfaces in primary and **permanent teeth\*** included only "cavitated" where the surface is demineralized with visible loss of surface integrity of **enamel\*** and/or dentin. Radiographs (x-rays) were not used. This information was used to calculate decayed, missing, filled teeth in the primary (cumulative dmft) and permanent (DMFT) teeth.

### 3.2 Survey Operations

The oral health survey was conducted through the collaborative efforts of NunatuKavut, a Community Advisory Committee (CAC) and oral health researchers from Dalhousie University.

NunatuKavut facilitated local activities related to the project including: hiring a local Healthy Smiles Coordinator (responsible for participant recruitment, informed consent, structured interviews, scheduling and support activities related to the clinical survey) and a research assistant (responsible for assisting with the clinical survey and data entry); and coordination with school administrators and community clinic facilities to ensure relevant permissions and logistical details were in place.

The CAC ensured that the study and its findings were as useful and relevant as possible to South East Labrador communities. Specifically, the committee provided suggestions on how the study should be conducted, whom to include in the study, when to conduct the study, and what to do with the study findings. CAC members also provided guidance on logistics of travelling to the remote areas of NunatuKavut.

The Dalhousie research team was responsible for the study design, training of the clinical examiner who conducted all clinical examinations, providing feedback and oral hygiene instructions related to participants' oral health status as well as overseeing all aspects of the oral health survey. The survey planning, training, and analysis occurred during 2012-2014 with data

collection taking place in May 2012 and April 2013. The survey team visited each community for one to three days.

The research team sought, and was given, permission for use of space to conduct the dental examination in the schools, Family Resource Centres, and Labrador-Grenfell Health Authority dental clinics within NunatuKavut. Spaces were conveniently located and private. The Healthy Smiles Coordinator worked closely with school administrators and teachers to facilitate examinations conducted in schools; participating students were given permission to leave class with minimal disruption to classroom activities.

### 3.3 Recruitment Strategy

Children and adolescents (birth to age 17 years) were recruited from NunatuKavut communities to participate in structured interviews (n=276) and clinical examinations (n=290). The entire population (N=419) was sampled (i.e., a census was taken). **Response rates\*** are 65.9 percent for the structured interview and 69.2 percent for the dental examination. The **response rates\***, by age group, range between 52.3 percent and 91.7 percent and are highest for the 6 to 11 age group. The **response rates\*** for the six sites range between 25.3 percent and 82.9 percent.

**Figure 1: Survey Response Rates (Ages 0 to 17 years) for South East Labrador, by Age Group**

AGE GROUPS (YEARS)	SURVEY RESPONSE RATES	
	Structured Interview %	Dental Examination %
0 to 5 (n= 109)	52.3	56.9
6 to 11 (n=120)	88.3	91.7
12 to 17 (n=190)	59.5	62.1
<b>TOTAL (n=419)</b>	<b>65.9</b>	<b>69.2</b>

Source - Population Statistics: NunatuKavut Social Sector for South East Labrador, 2012

**Figure 2: Survey Response Rates (Ages 0 to 17 years) for South East Labrador, by Community**

COMMUNITIES	SURVEY RESPONSE RATES	
	Structured Interview %	Dental Examination %
Cartwright /Paradise River (n=98)	67.3	70.4
Port Hope Simpson (n= 82)	78.0	81.7
Mary's Harbour/Lodge Bay (n=82)	81.7	82.9
Charlottetown/Pinsent's Arm/ Norman Bay/William's Harbour (n=83)	25.3	32.5
St. Lewis (n=42)	78.6	80.9
Black Tickle (n= 32)	78.1	78.1
<b>TOTAL (n=419)</b>	<b>65.9</b>	<b>69.2</b>

### 3.4 Structured Interview

The Healthy Smiles Coordinator invited members of the community to participate directly through Facebook, a telephone call or a personal visit prior to the research team arriving to the community.

Once a respondent confirmed their interest, an appointment was scheduled. At the outset of the scheduled visit, the respondent was guided through the consent process by the Healthy Smiles Coordinator and provided with sufficient time to review the consent materials, ask questions and then asked whether they consent or assent to take part in the study. If a parent or guardian accompanied the child to the examination, the structured interviews were conducted at that time. Otherwise, they were contacted and interviewed by the Healthy Smiles Coordinator via telephone or in their homes. Overall, the consent and interview process took approximately 30 minutes.

Questionnaire responses were recorded by hand on a printed copy of the survey and later entered into a laptop database by the Healthy Smiles Coordinator or research assistant.

### 3.5 Dental Examination

The dental examination took place at six sites:

1. Cartwright – *Henry Gordon Academy*;
2. Port Hope Simpson – *Bayside Academy*;
3. Mary's Harbour – *St. Mary's All-Grade*;
4. Charlottetown – *Family Ties Family Resource Centre*;
5. St. Lewis – *St. Lewis Academy*; and
6. Black Tickle – *St. Peter's School*.

The dentist examiner conducted the oral examination and all findings were recorded directly into a laptop computer by the research assistant. Less than 10 minutes was required to conduct each clinical examination.

At the end of the clinical examination, the dentist examiner recorded whether the participant needed care and whether or not it was urgent. The information was communicated to the participants/guardians verbally and by means of a short form summarizing the urgency. The forms indicated whether the person required regular maintenance; attention from a dental professional in the near future; or immediate attention from a dental or medical professional.

### 3.6 Training of Oral Health Survey Staff

The Healthy Smiles Coordinator and an additional community based research assistant were trained by research team leads and staff to: facilitate informed consents, conduct struc-

tured interviews, record questionnaire responses, use computer software to record the clinical measurements, and follow principles established for the Guidelines for Infection Control in Dental Health-Care Settings (CDC 2003) for the clinical examinations. Training was conducted through the review of a dental **recorder\*** manual and on-site instruction.

### 3.7 Calibration of the Dentist Examiner

The sole dentist examiner was calibrated to the WHO gold standard by trained examiners from the OCDO. The **calibration\*** process was consistent with that of the IOHS and the OHM-CHMS.

The **calibration\*** consisted of a classroom session and a clinical component. The classroom session described the rationale and criteria for oral health measures. The clinical component involved the dentist examining volunteers and completing a series of exercises to ensure the consistent measurement of oral conditions. Standard photographs representing categories of fluorosis and various occlusal conditions were also used for **calibration\***.

### 3.8 Ethical and Consent Review

The project was reviewed by the Health Sciences Research Ethics Board at Dalhousie University, the NunatuKavut Research Advisory Committee, the Labrador-Grenfell Health Research Review Committee, and the Health Research Ethics Authority (HREA) for Newfoundland and Labrador.

The consent form included: description of the survey, informed consent, benefits for participants, privacy protection, right of refusal, compensation, contact information for researchers and university representative, and statement of consent. Verbal consent was sought from parents/legal guardians for participants between birth and 17 years of age. Participants (ages 7 to 17 years) were also invited to provide their verbal assent, subject to their age and ability.

All information gathered from the communities (including signed consent and assent forms) was securely transferred to the Healthy Populations Institute (formerly the Atlantic Health Promotion Research Centre) at Dalhousie University where it is securely stored.

## 4.0 Results

### 4.1 Introduction

In this section, the oral health survey findings are summarized and, in some cases, outcomes are compared by select determinants (age, gender, and preventive behaviour) of oral health. The reader is cautioned that the small sample sizes within the categories preclude drawing conclusions that are **statistically significant\***. Only broad comparisons are made between children and adolescents from this survey and those of the IOHS and OHM-CHMS. Findings are based on descriptive summaries and not on statistical comparisons.

### 4.2 Orientation to Detailed Tables

The findings of the oral health survey are summarized in figures within the main report and in detailed tables (Appendix 9.0). For ease of comparison, tables are arranged similarly to those found in the IOHS and the OHM-CHMS. Tables are presented in a consistent format, with outcomes defined in the heading for the table and the values are found in each cell. Unlike the IOHS, the results come from a census survey, and not a sample survey, therefore the 95 percent **confidence intervals\*** were not calculated. Findings are presented for all categories regardless of the sample size.

### 4.3 Findings

#### 4.3.1 Sample Size

Tables 1A and 1B identify the number of children and adolescents who participated in the two components of the oral health survey. Overall, 276 NunatuKavut children and adolescents completed the structured interview and 290 participants took part in the clinical examination.

The overall participation by gender is fairly evenly distributed – 48 percent males and 52 percent females. However, there is a gap in gender participation rates (42% males; 59% females) for children in the 6-11 age group.

Of the 276 NunatuKavut children and adolescents who completed the structured interview, 76.1 percent regularly visit a dental professional, 12.7 percent visit a dental professional only for emergency care, and 10.1 percent reported never seeing a dental professional. Of the 237 who reported seeing a dental professional, two-thirds (67.5%) visited a dental care provider in the last year.

One of the 290 participants who had a dental examination was found to be **edentulous\*** (Table 1B).

#### 4.3.2 Self-reported Outcomes

##### General Health of the Mouth

Figure 3 summarizes the findings for eight survey questions relating to the general health of the mouth. Bleeding gums when brushing teeth followed by pain when consuming hot or cold foods were the most frequently reported conditions. A negligible percentage (1.1%) of respondents reported having persistent dry mouth.

Approximately seven percent of NunatuKavut children and adolescents (0-17 years) report that their oral health is fair or poor (Table 2). Females reported fair or poor oral health more than males (9.7% compared to 4.5%). As well, children and adolescents who had not visited the dentist in the last year were more often (10.4%) to report fair or poor oral health.

These findings are below national averages reported for Inuit children and youth (Health Canada 2011, p. 49) where 34.2 percent of children (age 3 to 5 years) and 29.3 percent of adolescents (age 12 to 19 years) reported fair or poor oral health<sup>1</sup>. Findings for NunatuKavut children and youth are more comparable to non-Aboriginal Canadian children and youth where 8.2 percent of Canadian children (age 6-11 years) and 11.4 percent of Canadian adolescents (age 12-19 years) report fair or poor oral health (Health Canada 2010, p. 71).

##### Avoidance of Eating

Approximately ten percent of NunatuKavut children and adolescents avoid foods due to problems with their mouth (Table 3). The younger age group (age 0-5 years) had the highest rate (14.0%) of food avoidance. Females report avoiding foods more than males (13.2% versus 6.8%). Approximately 13 percent of those who recently visited the dentist and 5.2 percent of those who visited the dentist more than a year ago report avoiding food.

The national averages show that 7.6 percent of children (age 6-11 years) and 12.5 percent of adolescents (age 12-19 years) avoid foods (Health Canada 2010, p. 72). In contrast, the **prevalence\*** of food avoidance is quite high for IOHS children aged 3 to 5 years (23.5%) and adolescents aged 12 to 19 years (36.3%) (Health Canada 2011, p. 50).

<sup>1</sup>IOHS estimates for children (6 to 11 years) were not reported due to extreme sampling variability or small sample size.

**Figure 3: Status of General Health of the Mouth**

IN THE PAST MONTH: (N=276)	HEALTH OF MOUTH	
	Yes %	No %
Has had a toothache	6.2	93.8
Has had pain in teeth when consuming hot or cold foods or drinks	9.1	90.9
Has had severe tooth or mouth pain at night	2.2	97.8
Has had pain in or around jaw joints	2.5	97.5
Has had other pain in mouth	5.8	94.2
Has had bleeding gums when brushing teeth	9.8	90.2
Has had persistent dry mouth	1.1	98.9
Has had persistent bad breath	8.0	92.0

Source – Population Statistics: NunatuKavut Social Sector for South East Labrador, 2012

### Presence of Persistent Pain

Approximately ten percent of participants (age 0-17 years) reported persistent or ongoing pain in their mouth (Table 4). The younger age group (age 0-5 years) reported oral pain more frequently (14.0%) than the other two age groups. Individuals having frequented the dentist over the past year (12.5%) were more often to report persistent or ongoing pain than those who visited a dental professional more than a year ago (5.2%). NunatuKavut participants reported less oral pain than IOHS respondents (16.5% - 34.2%) (Health Canada 2011, p.51) and similar or higher **prevalence\*** rates than OHM-CHMS children and adolescents (5.4% - 10.4%) (Health Canada 2010, p. 73).

### General Anesthetic for Dental Treatment

Thirty-nine out of 224 respondents (17.4%) reported that their child/dependent has received general anesthetic (GA) for dental treatment. The IOHS and OHM-CHMS did not include a survey question related to the use of general anesthesia for dental treatment.

The Canadian Institute for Health Information (CIHI) reports that day surgery for ECC occurred about once for every 100 Canadian children age 1 to younger than 5 during the two-year period 2010–2011 to 2011–2012 (CIHI 2013, p. vii). The volume of ECC day surgeries is 57.1 per 1,000 for young children receiving dental services from the Labrador–Grenfell Regional Integrated Health Authority (CIHI 2013, p. 19).

The day surgery rates for dental work among NunatuKavut children and adolescents are relatively high (17%) compared to young Canadian children (1%) and compared to the average

number of children seen within the LGRIHA (5.7%). It is difficult to speculate on whether the high number of children who underwent GA for dental work at a young age is relevant to their subsequent relatively good oral status later in childhood and adolescence. From a caries risk perspective, it is possible that the removal of high levels of decay at a young age served to mitigate the presence of cariogenic bacteria later in life although this is not a conventional pattern. Typically, a high rate of ECC is a predictor of disease risk. Another explanation for higher numbers of children being referred for GA is that the dentists providing service at the time were more diligent in making referrals when caries was identified. Either way, exposing so many young children to GA comes with risks so oral disease prevention and oral health promotion efforts targeted at younger ages are indicated.

### Lost Time for Dental Problems

Table 5 shows that 31.2 percent of 0 to 17 year-olds had missed time from normal activities, work or school activities in the past 12 months because of dental problems, with adolescents (37.2%) reporting lost-time most frequently. A higher percentage of NunatuKavut respondents reported missing time when compared to the IOHS findings (Health Canada 2011, p. 52). Interestingly, the OHM-CHMS reported high levels of missed time with 45.7% of children aged 6 to 11 years and 49.5 percent of adolescents aged 12 to 19 years reported time-loss (Health Canada 2010, p. 74).

### Frequency of Oral Health Care Practices

Tables 6 and 7 summarize the oral hygiene practices of NunatuKavut children and adolescents (0 to 17 year-olds). The majori-

ty (86.9%) reported brushing their teeth two or more times per day (Table 6). The **prevalence\*** of brushing increases across the age groups and ranges between 66.7 percent for children (0 to 5 years) and 93.8 percent for adolescents (12 to 17 years). Approximately 20 percent reported flossing more than five times per week (Table 7). The **prevalence\*** of flossing also increased (7.0% - 27.4%) across the age groups.

Brushing frequencies were higher in the NunatuKavut survey than for participants in the IOHS and OHM-CHMS. The IOHS reports that 40.9 percent to 51.7 percent of 3 to 19 year-olds brush their teeth at least two times per day (Health Canada 2011, p. 55). The OHM-CHMS reported brushing frequencies of 70.6 percent for children, aged 6 to 11 years, and 71.4 percent for adolescents, aged 12 to 19 (Health Canada 2010, p. 81).

The IOHS results show that 25.1 percent of 6-11 year-olds and 31.0 percent of 12-19 year-olds floss at least five times per week (Health Canada 2011, p. 56) which is higher than that reported for NunatuKavut participants (Table 7). The OHM-CHMS reported fewer children (11.7% compared to 17.0%) and adolescents (18.4% compared to 27.4%) flossing than the NunatuKavut participants (Health Canada 2010, p. 82).

#### Access to Dental Care and Cost of Dental Treatment

Of the 237 children and adolescents who reported seeing a dental professional, two-thirds (67.5%) had made a visit within the last year (Table 8). Children, aged 0-5 years, reported the highest rate (75.8%) and adolescents (12-17 years) the lowest (62.0%). NunatuKavut survey participants reported higher **prevalence\*** of dental visits than their same age counterparts from the IOHS.

Table 9 reports on preventive behaviour patterns for NunatuKavut children and adolescents. Close to 70 percent of all respondents reported visiting the dentist at least once a year for check-ups or treatment. Children (aged 6-11 years) more often (79.8%) visit the dentist for prevention; whereas children (aged 0-5 years) less so (52.6%). The IOHS participants reported similar rates with the exception of children (aged 6-11 years) who are slightly less likely (67.9% compared to 79.8%) to visit a dentist at least once per year for check ups or treatment.

Non-Aboriginal Canadian children and adolescents were more likely to visit a dental professional within the last year for any reason (84.0%-91.0%) or to visit at least once a year for check-ups or treatment (84.7%-92.2%) (Health Canada 2010, pp. 77- 78).

Over seventy percent (72.1%: i.e., 199 of 276) of NunatuKavut respondents reported that they have access to insurance or a government program that covers all or part of their child's/dependent's dental expenses. Specifically, they reported having access through an employer-sponsored dental plan (n=89), a provincial program for children (n=108), a private plan (n=3), a government program for social services or welfare clients (n=10) and a government program for Inuit (n=9). Only 2 out of 276 (0.7%) of respondents 'did not know' or 'refused to answer' whether they

have access to insurance or a government program.

For children and adolescents (n=227) who have visited a dental professional within the last three years, two out of five respondents experienced problems accessing dental care services. The more frequently reported problems include waiting list was too long (n=62), dental services were not available at the time requested or needed (n=47), difficulty booking an appointment (n=24), dental services were not available in community (n=20), uncertainty of when dental professional is available and/or what services are offered (n=6).

Forty-one respondents (14.8%) reported that their child/dependent have not visited a dentist in the past three years. The main reasons for not visiting a dentist during this time include that a visit was not considered necessary (n=15), child/dependent too young (n=9), waiting time was too long (n=7), and difficulty booking an appointment (n=6).

For those who have seen a dental professional, nearly one-half (48.9%) access dental care in their community and over one-quarter (30.2%) access their dental care both in and out of their community. A smaller proportion (12.7%) of respondents access dental care exclusively out of their community.

Respondents were asked how often they have been asked by their dental provider to pay for the dental services. Over one-quarter (29.3%) of respondents have been asked by their dental provider to pay for their child's/dependent's dental services during their visit.

#### Awareness of the Children's Dental Health Program

Over 80 percent of respondents reported being aware that the Newfoundland and Labrador Children's Dental Health Program provides government sponsored dental coverage for children 12 and under. Of those who were aware of dental coverage, 82 percent have used this coverage for his/her child/dependent.

Eighty-one of respondents (or 29.3%) reported being aware that the Children's Dental Health Program offers dental coverage for youth (aged 13-17 years) for families receiving income support/eligible families on low income.

### 4.3.3 Clinical Exam Findings

#### Dental Decay\* (dmft\*/DMFT\*)

A major oral health concern for children and adolescents is the presence of **dental decay\*** (or **dental caries\***). Tables 10 to 14 demonstrate the **prevalence\*** and severity of this disease. The severity of the condition is recorded using the DMFT index for permanent (adult) teeth and dmft for deciduous or primary (baby) teeth. This index represents the **mean\*** number of teeth that were decayed (d/D), with or without fillings; missing (m/M) prematurely due to decay; or filled (f/F) with a **restoration\*** to replace tooth structure lost to **dental decay\***. **Prevalence\*** is recorded if the participant had at least one tooth that was decayed, missing or filled.

### Children Aged 0 to 5 Years

Participants in this age group only have deciduous teeth. Over one-quarter of preschoolers (29.0%) in the NunatuKavut survey presented with one or more cavities (Table 10), which is considerably lower than that found in the IOHS (85.3%) for children aged 3-5 years (Health Canada 2011, p. 17). It is possible that the lower caries rate observed in NunatuKavut children is influenced by the inclusion of 30 children aged 0-3 years. This very young age group would be expected to demonstrate lower caries rates as teeth would have had more limited exposure to **risk factors\*** associated with oral disease and less time for caries to manifest.

There is difference in **dental decay\*** by dental visit pattern for NunatuKavut children – 48.0 percent for visitors within the last year and 37.5 percent for visitors more than a year ago. Males (30.3%) more often had **dental caries\*** than females (27.6%). In general, children in this age group experienced 1.42 decayed, missing, or filled teeth (dmft). Again, this is markedly lower than that found for the same age group in the IOHS (8.22 dmft) (Health Canada 2011, p. 17).

NunatuKavut participants who had visited a dentist within the past year presented higher dmft scores (2.96 dmft) than those who had more irregular dental visits (1.13 dmft).

### Children Aged 6 to 11 Years

Participants in this age group typically have a mixed **dentition\***, consisting of both deciduous and **permanent teeth\***. The **prevalence\*** and severity of **dental caries\*** in this age group are considered for: primary teeth only (Table 11), **permanent teeth\*** (Table 12), and mixed **dentition\***, i.e., both primary and **permanent teeth\*** (Table 13).

Nearly three-fifths of 6 to 11 year-olds (57.3%) presented with **dental caries\*** in their primary teeth (Table 11), which was higher than that found in preschool children. Overall, the children in this survey experienced less severe primary tooth decay (2.25 dmft) than participants of the same age group from the IOHS (5.08 dmft) (Health Canada 2011, p. 18). The severity of decay, however, was higher than participants of the same age group examined in the OHM-CHMS (1.99 dmft) (Health Canada 2010, p. 83).

Table 12 indicates that 6-11 year-olds had a mean DMFT of 0.54 in their **permanent teeth\***. One quarter (25.5%) of the children in this age group experienced at least one decayed tooth in their **permanent teeth\***. This is considerably lower than the findings from the IOHS (59.6% with a mean DMFT of 2.01) (Health Canada 2011, p. 59) and slightly higher than the OHM-CHMS findings (23.6% with a mean DMFT of 0.49) (Health Canada 2010, p. 84).

Table 13 displays the results of combining **dental caries\* prevalence\*** for primary and **permanent teeth\***. Close to 70 percent had experienced decay at the time of the survey. The mean number of teeth affected (i.e., dmft + DMFT) was 2.79, with males experiencing more decayed teeth (3.00) than their fe-

male counterparts (2.65). In comparison, the IOHS reports 93.4 percent of participants had experienced decay and demonstrated an average 7.08 decayed, missing or filled teeth for this age group (Health Canada 2011, p. 18). Relative to the OHM-CHMS, the 6 to 11 year-olds in NunatuKavut had slightly higher **prevalence\*** rates (66.4% compared to 56.8%) and severity of **dental caries\*** (2.79 compared to 2.48) in their primary and **permanent teeth\*** (Health Canada 2010, p. 85).

### Adolescents Aged 12 to 17 Years

NunatuKavut adolescents (Table 14) had both a lower **prevalence\*** (72.9%) and DMFT (3.36) than their IOHS counterparts (aged 12 to 19 years) where 96.7 percent of participants experienced an average 9.49 DMFT (Health Canada 2011, p. 61). The **prevalence\*** and severity of **dental caries\*** was higher for NunatuKavut participants than for those who participated in the OHM-CHMS. The OHM-CHMS reported 58.8 percent of adolescents (aged 12 to 19 years) had one or more decayed, missing, or filled teeth and a mean DMFT of 2.49 (Health Canada 2010, p. 89).

### Untreated Dental Decay

To better understand the burden of disease and how it is distributed across the age groups, Table 15 reports the amount of untreated **dental decay\*** (d/D) in those participants who experienced at least one or more **coronal\*** cavities. Approximately one-fifth (21.0%) of 0 to 5 year-olds presented at the dental examination with one or more untreated cavities. Within this group, an average of 3.46 primary teeth required treatment.

Two-fifths (40.0%) of 6-11 year-olds had one or more untreated cavity in a primary or permanent tooth. The combined average number of deciduous and **permanent teeth\*** requiring treatment was 2.82. This is lower than both of the other two age groups likely because participants in this age group have a mixed **dentition\***, in which many participants would have newly erupted teeth. Due to the shorter time that they would be influenced by caries **risk factors\***, they would be expected to demonstrate less disease and therefore require less treatment.

Over one-third (34.7%) of 12 to 17 year-olds experienced 1 or more untreated cavities. An average of 3.05 teeth required some form of dental treatment amongst this group. The IOHS and OHM-CHMS did not report rates of untreated **dental decay\*** for children and youth.

### Dental Debris and Gingival Inflammation

Table 16 outlines the level of debris (soft, cream-coloured deposits or stain) and **calculus\*** (calcified, adherent material, also known as 'tartar') found on specific indicator teeth. Neither is a measure of disease but they are seen as local factors that, if present for sufficient periods of time, are associated with the development of **gingivitis\***. Both can be prevented with home care, but **calculus\*** can only be removed with scaling by a dental professional.

Best scores (0 or 1) for debris scores (i.e., no debris or up to 1/3 of the surface covered) were found for 48.8% of the participants, while 56.4% presented with no **calculus\*** deposits. One-third of the children and adolescents had no or mild gingival inflammation (Table 17). The IOHS and OHM-CHMS did not report debris and gingival inflammation scores for children and youth.

### Dental Enamel Fluorosis

**Dental enamel fluorosis\*** is a form of hypoplasia of the dental **enamel\***, which, depending on the amount of **fluoride\*** exposure and the period of tooth development at which the exposure occurs, can be seen as ranging from a mild chalky discolouration of the tooth surface, to brown staining, to pitting, to **enamel\*** loss. According to Health Canada's expert panel on **fluoride\*** (Fluoride Expert Panel 2007), the end-point of concern for **fluoride\*** intake is still considered to be "moderate dental fluorosis" which is considered a cosmetic, not a toxicological, problem.

The examiner found that 80.0 percent of the children aged 6 to 11 years had teeth that exhibited no signs of dental fluorosis (Table 18) and the remaining 20.0 percent were characterized in the questionable and very mild fluorosis categories. The IOHS also reports that none of the children had moderate or severe dental fluorosis (Health Canada 2011, p. 22). Likewise, a negligible number of Canadian children have moderate or severe fluorosis (Health Canada 2010, p.41).

### Orthodontic Treatment

Only 2.8 percent of participants, all in the 12-17 year-old group (Table 19), were receiving or had received orthodontic treatment at the time of the survey. Orthodontic treatment rates are similarly low for IOHS children (0.6%) and adolescents (5.6%) (Health Canada 2011, p. 22). In contrast, rates are noticeably higher for children (7.9%) and adolescents (35.9%) examined in the OHM-CHMS (Health Canada 2010, p. 110).

### Occlusion

Fifty out of 118 (42.4%) adolescents (aged 12-17 years) demonstrated abnormal occlusion characterized by crowding, anterior or posterior crossbite, severe overjet or overbite or a combination of conditions. The OHM-CHMS reports that 18.5 percent of adolescents have less than acceptable occlusion (Health Canada 2010, p. 109). The IOHS did not provide data on occlusion.

### Soft Tissue Lesions

Approximately four percent of participants presented with a soft tissue lesion at the time of the clinical examination (Table 20). Lesions were most common (5.0%) for children and adolescents who visited a dental professional in the last year. The IOHS and OHM-CHMS reports did not provide findings for soft tissue lesions for children and youth.

### Type of Treatment Needed

Table 21 shows the distribution of the treatment needs identified by the examiner at the clinical examination. Close to 15 percent of participants had no treatment needs, with the tendency being higher for the youngest age group. Nearly 86 percent of all children and adolescents required some type of preventive therapy, with **prevalence\*** being highest among 6-11 and 12-17 year-olds. About a quarter of participants required **restorations\*** (fillings). Orthodontic treatment was identified as a treatment need for 11.0 percent of the participants.

The IOHS reported that 38.6-39.6 percent E (interpret with caution due to statistical reasons) of Inuit children and adolescents had need for **restorations\*** with 11.5 percent in need of surgical services (Health Canada 2011, p. 72). In comparison, the OHM-CHMS reported 12.1 percent of children and 13.0 percent E of adolescents had a need for **restorations\*** (Health Canada 2010, p. 111). Orthodontic treatment was the next most prevalent treatment need — 8.2 percent E of children and 6.4 percent E of adolescents. A low percentage (1.4%) of Canadian children had a need for oral surgery. Estimates for adolescents are suppressed because of extreme sampling variation or small sample size (Health Canada 2010, p 111).

## 5.0 Implications

The findings suggest that over the past thirty years there has been a slight downward trend in rates of dental disease affecting the children and youth on the South East coast of Labrador when compared to surveys done in 1991 (Zammit et al. 1994) and 1993 (Ismail, Messer & Hornett 1998). Overall, reported visits for dental services in NunatuKavut lag behind non-Aboriginal Canadians by 15 to 20 percent.

Yet, access to professional dentistry services appears to have improved in NunatuKavut since the 1990s. This has likely been influenced by enhancements to services through dental suite upgrades in the communities and incentivizing recruitment and retention of dentists through higher rates of remuneration. In spite of upward trends toward less disease and better access to professional service, this study revealed that almost one in five children were required to undergo general anesthesia to manage dental disease. The earlier Labrador surveys (Zammit et al. 1994; and Ismail, Messer & Hornett 1998) did not report on the rates of general anesthesia use that is typically required to manage ECC so it is difficult to know whether this represents an equally positive trend.

Interestingly, the OHM-CHMS reported high levels of missed time with almost 50 percent of children and adolescents reporting time-loss for dental care (Health Canada 2010). NunatuKavut participants reported higher rates of time lost than Inuit children and youth but less than those reported for non-Aboriginals in the OHS-CHMS. No explanation is provided for the high rates of missed time and the finding is not consistent with disease rates and/or reporting of pain. It suggests that dental care may be sought for reasons other than dental disease such as orthodontics or elective cosmetic procedures such as bleaching. However, very few NunatuKavut children and adolescents had sought orthodontic treatment.

Missing from the quantitative results outlined in this report is an appreciation of potential barriers to health promoting and service delivery practices that impact opportunities for optimizing oral health. It is known that the NunatuKavut communities are remote, isolated and must be responsive to climate conditions that impact significantly on health promotion and service.

Compared to non-Aboriginal Canadians, the trend toward lower rates of disease is likely accompanied by a greater number of challenges, including higher personal costs. The other arm of this study looks into the “why” and “how” of oral health attitudes and trends in NunatuKavut through interviews with key community knowledge keepers and through story-telling with children and families. These findings will be reported elsewhere. They will provide insights on the influence of broader **determinants of health\*** as well as local and contextual factors accompanying the current oral health trends reported here.

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## 7.0 Glossary

### Adapted from:

AIHW Dental Statistics and Research Unit 2007. Australia's dental generations: the National Survey of Adult Oral Health 2004-06. Dental statistics and research series 34. Cat. no. DEN 165. Canberra: AIHW. Viewed 3 May 2016 <<http://www.aihw.gov.au/publication-detail/?id=6442467953>>.

**95% confidence interval:** Defines the uncertainty around an estimated value. There is a 95% probability that the true value falls within the range of the upper and lower limits.

**Calculus:** Hard deposit of mineralized material adhering to the tooth surface.

**Calibration:** A procedure to promote standardization between examiners performing the oral examinations.

**Coronal:** Pertaining to the crown of a tooth.

**Crown:** The portion of tooth covered by white enamel that usually is visible in the mouth.

**Dental caries:** The process in which tooth structure is destroyed by acid produced by bacteria in the mouth. See dental decay.

**Dental caries experience:** The cumulative effect of the caries process through a person's lifetime, manifesting as teeth that are decayed, missing or filled.

**Dental decay:** Cavity resulting from dental caries.

**Dental enamel fluorosis:** Discolouration or pitting of the dental enamel caused by exposure to excessive amounts of fluoride during enamel formation.

**Dental insurance:** Universal dental care is not included in Canada's provincial and territorial publicly-funded "medicare" programs, and many employers have elected to include private dental insurance as a benefit to employees and their dependents. Publicly funded dental care is limited to First Nations people, to the elderly in the Territories and Alberta and to children in Quebec and three Atlantic provinces and to those receiving social (welfare) services.

**Dentate:** Having one or more natural teeth.

**Dentition:** The set of teeth. A complete dentition\* comprises 28 adult teeth with some people having an additional 4 "wisdom" teeth.

**Determinant of health:** A characteristic that influences the health of people but usually is difficult for the individual to change; for example, air pollution, exposure to lead in paint, or socio-economic status.

**dmft (lower case letters):** An index of dental caries experience\* measured by counting the number of decayed (d), missing (m), and filled (f) baby (primary or deciduous) teeth (t).

**DMFT (Upper Case Letters):** An index of dental caries experience\* measured by counting the number of decayed (D), missing (M), and filled (F) adult (or permanent) teeth (T).

**Edentulous:** A state of complete loss of all natural teeth.

**Enamel:** Hard white mineralized tissue covering the crown of a tooth.

**Extraction:** Removal of a natural tooth.

**Fluoride:** A naturally occurring trace material that helps to prevent tooth decay.

**Gingiva:** Gum tissue.

**Gingivitis:** Redness, swelling or bleeding of the gums caused by inflammation.

**Incisor:** One of eight front teeth used during eating for cutting food.

**Mandible:** Lower jaw.

**Maxilla:** Upper jaw.

**Mean:** The arithmetic average of a set of values.

**Natural teeth:** Refers to a person's own teeth as opposed to artificial teeth.

**Periodontal disease:** Disease of the gums and other tissues that attach to and anchor teeth to the jaws.

**Permanent teeth:** Adult teeth.

**Prevalence:** The proportion of people with a defined disease within a defined population.

**Recorder:** A person, who recorded the results of an oral examination onto a computer.

**Response rate:** The proportion of people from whom survey information is collected among the total number of people selected as intended study participants.

**Restoration:** A filling to repair a tooth damaged by decay or injury.

**Risk factor for health:** A characteristic, often a behaviour, that reduces health that can be changed by the individual, for example, smoking, seat-belt use, tooth cleaning, obesity.

**Statistical significance:** An indication from a statistical test that an observed association is unlikely (usually less than 5% probability) to be due to chance created when a random sample of people is selected from a population.

**Wisdom tooth:** One of four molar teeth, each one positioned at the back of the mouth.

## 8.0 Appendices

### 8.1 Appendix 1 Dentist Examiners and Coordinators

#### Dentist Examiner

Dr. Mary McNally (6 sites)

#### Site Coordinators

Barbara Campbell (5 sites)

Michelle Clarke (6 sites)

### 8.2 Appendix 2 Variable Definitions; Selected Characteristics

**Sex:** Male vs Female

**Age group:** grouped according to the IOHS sampling plan: 3-5, 6-11, 12-19. Age was measured at both the structured interview and the dental examination. For this report, age was defined based on the clinical exam.

#### Visiting a dental professional in the past year:

Visited in past year

- Answered 1 (less than 1 year ago) to question on when the last time they saw a dental professional (OHM\_Q34)

More than one year ago

- Answered 2-6 on OHM\_Q34

#### Dentate status: Dentate versus edentulous

Dentate

- Dental status of respondent of 1-3 on OHE\_N11 (dentate-both arches, upper arch only and lower arch only)

Edentulous

- Dental status of respondent of 4-5 on OHE\_N11 (edentulous with one or more implants and edentulous)

#### TABLES (GENERAL):

- Frequencies always defined according to response
- Those with missing values (don't know, refusal, not applicable) set to missing (so not included in proportions)
- No need to specify dentate because only one was edentulous

#### TABLES (SPECIFIC):

##### Table 1A, 1B

- Frequencies of demographic variables for those who participated in the structured interview and the dental examination.

##### Table 2

- Prevalence of self reported fair or poor oral health: (respondents who answered 4 (fair) or 5 (poor) response to OHM\_Q11 – self-reported health of mouth)

##### Table 3

- Prevalence of persons reporting avoiding foods: (respondents who answered 1 (often) or 2 (sometimes) to OHM\_Q22 – how often have you avoided eating particular foods because of mouth problems)

##### Table 4

- Prevalence of persons reporting persistent pain: (respondents who answered 1 (often) or 2 (sometimes) to OHM\_Q23 – how often have you had any other persistent or ongoing pain anywhere in your mouth)

##### Table 5

- Prevalence of persons reporting time lost from normal activities, work or school activities in the past 12 months: (respondents who answered 1 (yes) to OHM\_Q24 – have you taken time away from work or school for dental check-ups etc.)

##### Table 6

- Percent of persons brushing 2 or more times per day: (based on OHM\_Q31 and OHM\_N31; respondents who answered 2+ on how often they usually brush their teeth and 1 (per day) for reporting period OR respondents who answered 14+ on how often they usually brush their teeth and 2 (per week) for reporting period)

##### Table 7

- Percent of persons flossing at least 5 times per week: (based on OHM\_Q32 and OHM\_N32; respondents who answered 1+ on how often they usually floss their teeth and 1 (per day) for reporting period OR respondents who answered 5+ on how often they usually floss their teeth and 2 (per week) for reporting period)

##### Table 8

- Percent of persons reporting having visited within the last year (for any reason): (respondents who answered 1 (less than 1 year ago) to question on when the last time they saw a dental professional (OHM\_Q34))

##### Table 9

- Percent of persons reporting visiting at least once per year for

check-ups or treatment: (respondents who answered 1 (more than once per year) or 2 (about once a year) to question on how often they usually see a dental professional (OHM\_Q33)

**Table 10**

- Ages 0-5
- Prevalence and severity of dental caries in primary teeth: (based on OHE\_N41 codes for primary teeth: 51-55, 61-65, 71-75, 81-85)
- Decayed: codes 7-10; Missing: codes 5+19; Filled: codes 12-17
- dmft – sum of teeth with codes listed above

**Table 11**

- Ages 6-11
- Prevalence and severity of dental caries in primary teeth: (based on OHE\_N41 codes for primary teeth: 51-55, 61-65, 71-75, 81-85)
- Decayed: codes 7-10; Missing: codes 5+19; Filled: codes 12-17
- dmft – sum of teeth with codes listed above

**Table 12**

- Ages 6-11
- Prevalence and severity of dental caries in permanent teeth: (based on OHE\_N41 codes for adult crowns: 11-17, 21-27, 31-37, 41-47)
- Decayed: codes 7-10; Missing: codes 5+19; Filled: codes 12-17
- DMFT – sum of teeth with codes listed above

**Table 13**

- Ages 6-11
- Prevalence and severity of dental caries in primary and permanent teeth: (based on OHE\_N41 codes for baby teeth and adult crowns: 51-55, 61-65, 71-75, 81-85, 11-17, 21-27, 31-37, 41-47)
- Decayed: codes 7-10; Missing: codes 5+19; Filled: codes 12-17; summed those from tables 11 and 12
- DMFT – sum of teeth with codes listed above

**Table 14**

- Ages 12-17
- Prevalence and severity of dental caries in permanent teeth: (based on OHE\_N41 codes for adult crowns: 11-17, 21-27, 31-37, 41-47)
- Decayed: codes 7-10; Missing: codes 5+19; Filled: codes 12-17
- DMFT – sum of teeth with codes listed above
- Same as Table 12 but different age group

**Table 15**

- Prevalence of untreated decay: (based on OHE\_N41 codes for primary teeth: 51-55, 61-65, 71-75, 81-85 and/or adult crowns: 11-17, 21-27, 31-37, 41-47)
- Untreated coronal caries: codes 7-10

**Table 16**

- Debris: (based on OHE\_32D1-D6); scale 1 – 5
- Responses subtract 1 for a scale of 0-4; those with code 5 were teeth missing so set to missing
- Calculus: (based on OHE\_32C1-C6); scale 1 – 5
- Responses subtract 1 for a scale of 0-4; those with code 5 (in debris) were teeth missing so set to missing)
- Took highest score at any site

**Table 17**

- Gingivitis: (based on OHE\_31D1-D6); scale 1 – 5
- Responses subtract 1 for a scale of 0-4; those with code 5 were teeth missing so set to missing)
- Took highest score at any site

**Table 18**

- Ages 6-11
- Fluorosis: (based on OHE\_N20); scale 1-6
- Responses subtract 1 for a scale of 0-5; those with code 7 were teeth missing so set to missing

**Table 19**

- Prevalence of receiving orthodontic treatments currently or in the past
- Based on OHE\_N23=1 and OHE\_N22=2-5
- OHE\_N23 did not ask individuals who responded OHE\_N22=2-5 (currently receiving ortho treatment)

**Table 20**

- Prevalence of soft tissue lesions: based on OHE\_N14
- None versus one+ based on yes/no of OHE\_N14=1

**Table 21**

- Prevalence of requiring a need
- Urgent: based on yes to OHE\_N61-OHE\_N68
- Prevention: OHE\_N53=2
- Surgery: OHE\_N53=5
- Endodontics: OHE\_N53=8
- Restorations: OHE\_N53=3
- Prosthodontics: OHE\_N51=2-6 or OHE\_N52=2-6
- Periodontics: OHE\_N53=6
- Orthodontics: OHE\_N53=9
- Miscellaneous: OHE\_N53=4,7,10,11;
- No treatment needed: OHE\_N53=1;
- Mutually exclusive

**Table 22 (Additional question, not included in IOHS or OHM-CHMS)**

- General Anesthetic for dental work: based on yes

## 9.0 Detailed Tables

**Table 1A: Frequencies of Demographic Variables – Structured Interview**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All	57	20.7%	106	38.4%	113	40.9%	276	100.0%
Male	29	50.9%	44	41.5%	59	52.2%	132	47.8%
Female	28	49.1%	62	58.5%	54	47.8%	144	52.2%
Visited a dental professional in the last year	25	75.8%	68	70.8%	67	62.0%	160	67.5%
Visited a dental professional more than a year ago	8	24.2%	28	29.2%	41	38.0%	77	35.2%

**Table 1B: Frequencies of Demographic Variables – Dental Examination**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All	62	21.4%	110	37.9%	118	40.7%	290	100.0%
Male	33	53.2%	45	40.9%	62	52.5%	140	48.3%
Female	29	46.8%	65	59.1%	56	47.5%	150	51.7%
Dentate	61	98.4%	110	100.0%	118	100.0%	289	99.7%
Edentulous	1	1.6%	0	0.0%	0	0.0%	1	0.3%

**Table 2: Prevalence of self-reported fair or poor oral health because of problems with their oral health**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=276)	4	7.0%	8	7.5%	8	7.1%	20	7.2%
Male (n=132)	1	3.4%	2	4.5%	3	5.1%	6	4.5%
Female (n=144)	3	10.7%	6	9.7%	5	9.3%	14	9.7%
Visited a dental professional in the last year (n=160)	3	12.0%	5	7.4%	4	6.0%	12	7.5%
Visited a dental professional more than a year ago (n=77)	1	12.5%	3	10.7%	4	9.8%	8	10.4%

**Table 3: Prevalence of persons reporting avoiding foods because of problems with their mouth**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=276)	8	14.0%	11	10.4%	9	8.0%	28	10.1%
Male (n=132)	2	6.9%	4	9.1%	3	5.1%	9	6.8%
Female (n=144)	6	21.4%	7	11.3%	6	11.1%	19	13.2%
Visited a dental professional in the last year (n=160)	5	20.0%	7	10.3%	9	13.4%	21	13.1%
Visited a dental professional more than a year ago (n=77)	1	12.5%	3	10.7%	0	0.0%	4	5.2%

**Table 4: Prevalence of persons reporting persistent pain or ongoing pain anywhere in their mouth**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=276)	8	14.0%	10	9.4%	10	8.8%	28	10.1%
Male (n=132)	4	13.8%	5	11.4%	4	6.8%	13	9.8%
Female (n=144)	4	14.3%	5	8.1%	6	11.1%	15	10.4%
Visited a dental professional in the last year (n=160)	4	16.0%	8	11.8%	8	11.9%	20	12.5%
Visited a dental professional more than a year ago (n=77)	1	12.5%	1	3.6%	2	4.9%	4	5.2%

**Table 5: Prevalence of persons reporting time lost from normal activities, work or school activities in the past 12 months**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=276)	13	22.8%	31	29.2%	42	37.2%	86	31.2%
Male (n=132)	7	24.1%	12	27.3%	18	30.5%	37	28.0%
Female (n=144)	6	21.4%	19	30.6%	24	44.4%	49	34.0%
Visited a dental professional in the last year (n=160)	12	48.0%	27	39.7%	39	58.2%	78	48.8%
Visited a dental professional more than a year ago (n=77)	1	12.5%	4	14.3%	3	7.3%	8	10.4%

**Table 6: Percent of dentate persons brushing 2 or more times per day**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=274)	38	66.7%	94	90.4%	106	93.8%	238	86.9%
Male (n=132)	20	69.0%	37	84.1%	53	89.8%	110	83.3%
Female (n=142)	18	64.3%	57	95.0%	53	98.1%	128	90.1%
Visited a dental professional in the last year (n=160)	20	80.0%	62	91.2%	61	91.0%	143	89.4%
Visited a dental professional more than a year ago (n=77)	3	37.5%	24	85.7%	40	97.6%	67	87.0%

**Table 7: Percent of dentate persons flossing at least 5 times per week**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=276)	4	7.0%	18	17.0%	31	27.4%	53	19.2%
Male (n=132)	2	6.9%	11	25.0%	12	20.3%	25	18.9%
Female (n=144)	2	7.1%	7	11.3%	19	35.2%	28	19.4%
Visited a dental professional in the last year (n=160)	4	16.0%	11	16.2%	18	26.9%	33	20.6%
Visited a dental professional more than a year ago (n=77)	0	0.0%	5	17.9%	13	31.7%	18	23.4%

**Table 8: Percent of persons reporting having visited a dental professional within the last year for any reason**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=237)	25	75.8%	68	70.8%	67	62.0%	160	67.5%
Male (n=114)	12	70.6%	32	76.2%	35	63.6%	79	69.3%
Female (n=123)	13	81.3%	36	66.7%	32	60.4%	81	65.9%

**Table 9: Percent of persons reporting visiting at least once per year for check-ups or treatment**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=273)	30	52.6%	83	79.8%	77	68.8%	190	69.6%
Male (n=131)	16	55.2%	38	86.4%	39	67.2%	93	71.0%
Female (n=142)	14	50.0%	45	75.0%	38	70.4%	97	68.3%
Visited a dental professional in the last year (n=160)	24	96.0%	67	98.5%	61	91.0%	152	95.0%
Visited a dental professional more than a year ago (n=77)	4	50.0%	16	57.1%	16	39.0%	36	46.8%

**Table 10: Prevalence and severity of dental caries in primary teeth – Ages 0 to 5**

CHARACTERISTIC	PREVALENCE		MEAN NUMBER OF PRIMARY TEETH			
	dmft>0		decayed	missing	filled	decayed, missing & filled (dmft)
	n	%	mean	mean	mean	mean
All (n=62)	18	29.0%	0.73	0.27	0.42	1.42
Male (n=33)	10	30.3%	0.21	0.33	0.73	1.27
Female (n=29)	8	27.6%	1.31	0.21	0.07	1.59
Visited a dental professional in the last year (n=25)	12	48.0%	1.44	0.56	0.96	2.96
Visited a dental professional more than a year ago (n=8)	3	37.5%	0.50	0.38	0.25	1.13

**Table 11: Prevalence and severity of dental caries in primary teeth – Ages 6 to 11**

CHARACTERISTIC	PREVALENCE		MEAN NUMBER OF PRIMARY TEETH			
	dmft>0		decayed	missing	filled	decayed, missing & filled (dmft)
	n	%	mean	mean	mean	mean
All (n=110)	63	57.3%	0.97	0.28	1.00	2.25
Male (n=45)	28	62.2%	0.60	0.36	1.36	2.31
Female (n=65)	35	53.8%	1.23	0.23	0.75	2.22
Visited a dental professional in the last year (n=68)	39	57.4%	0.60	0.16	1.21	1.97
Visited a dental professional more than a year ago (n=28)	17	60.7%	1.46	0.46	0.75	2.68

**Table 12: Prevalence and severity of dental caries in permanent teeth – Ages 6 to 11**

CHARACTERISTIC	PREVALENCE		MEAN NUMBER OF PERMANENT TEETH			
	percent with DMFT>0		decayed	missing	filled	decayed, missing & filled
	n	%	mean	mean	mean	mean
All (n=110)	28	25.5%	0.15	0.03	0.35	0.54
Male (n=45)	11	24.4%	0.24	0.04	0.40	0.69
Female (n=65)	17	26.2%	0.09	0.02	0.32	0.43
Visited a dental professional in the last year (n=68)	18	26.5%	0.04	0.04	0.47	0.56
Visited a dental professional more than a year ago (n=28)	8	28.6%	0.43	0.00	0.21	0.64

**Table 13: Prevalence and severity of dental caries in primary and permanent teeth – Ages 6 to 11**

CHARACTERISTIC	PREVALENCE		MEAN NUMBER OF PRIMARY AND PERMANENT TEETH			
	percent with dmft + DMFT>0		decayed	missing	filled	decayed, missing & filled
	n	%	mean	mean	mean	mean
All (n=110)	73	66.4%	1.13	0.31	1.35	2.79
Male (n=45)	31	68.9%	0.84	0.40	1.76	3.00
Female (n=65)	42	64.6%	1.32	0.25	1.08	2.65
Visited a dental professional in the last year (n=68)	45	66.2%	0.65	0.21	1.68	2.53
Visited a dental professional more than a year ago (n=28)	19	67.9%	1.89	0.46	0.96	3.32

**Table 14: Prevalence and severity of dental caries in permanent teeth – Ages 12 to 17**

CHARACTERISTIC	PREVALENCE		MEAN NUMBER OF PERMANENT TEETH			
	percent with DMFT>0		decayed	missing	filled	decayed, missing & filled
	n	%	mean	mean	mean	mean
All (n=118)	86	72.9%	1.06	0.25	2.04	3.36
Male (n=62)	44	71.0%	1.35	0.29	1.98	3.63
Female (n=56)	42	75.0%	0.73	0.21	2.11	3.05
Visited a dental professional in the last year (n=67)	50	74.6%	0.91	0.27	2.37	3.55
Visited a dental professional more than a year ago (n=41)	30	73.2%	1.32	0.20	1.78	3.29

**Table 15: Prevalence of untreated decay (coronal caries)**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years (n=62)		Children 6 to 11 years (n=110)		Children 6 to 11 years (n=110)		Adolescents 12 to 17 years (n=118)	
	% with 1 or more	Mean number of untreated primary teeth among those with >=1	% with 1 or more	Mean number of untreated primary teeth among those with >=1	% with 1 or more	Mean number of untreated primary and permanent teeth among those with >=1	% with 1 or more	Mean number of untreated permanent teeth among those with >=1
All	21.0%	3.46	37.3%	2.61	40.0%	2.82	34.7%	3.05
Male	15.2%	1.40	35.6%	1.69	40.0%	2.11	43.5%	3.11
Female	27.6%	4.75	38.5%	3.20	40.0%	3.31	25.0%	2.93
Visited a dental professional in the last year	28.0%	5.14	29.4%	2.05	30.9%	2.10	25.4%	3.59
Visited a dental professional more than a year ago	37.5%	1.33	50.0%	2.93	53.6%	3.53	48.8%	2.70

**Table 16: Percent of participants by highest score for debris and calculus by highest score**

CHARACTERISTIC	DEBRIS SCORE (N=289)				CALCULUS SCORE (N=289)			
	<b>0</b> No soft debris or stain	<b>1</b> Less than 1/3 of surface covered	<b>2</b> 1/3 to 2/3 of surface covered	<b>3</b> More than 2/3 of surface covered	<b>0</b> No calculus	<b>1</b> Less than 1/3 of surface covered	<b>2</b> 1/3 to 2/3 of surface covered	<b>3</b> More than 2/3 of surface covered
	%	%	%	%	%	%	%	%
All	7.3%	41.5%	49.8%	1.4%	56.4%	35.6%	6.6%	1.4%
Male	8.6%	38.6%	50.7%	2.1%	60.0%	32.9%	6.4%	0.7%
Female	6.0%	44.3%	49.0%	0.7%	53.0%	38.3%	6.7%	2.0%
Age 0 to 5	32.8%	54.1%	13.1%	0.0%	95.1%	4.9%	0.0%	0.0%
Age 6 to 11	0.0%	38.2%	60.9%	0.9%	59.1%	34.5%	5.5%	0.9%
Age 12 to 17	0.8%	38.1%	58.5%	2.5%	33.9%	52.5%	11.0%	2.5%
Visited a dental professional in the last year	2.5%	44.4%	51.2%	1.9%	53.1%	38.8%	6.2%	1.9%
Visited a dental professional more than a year ago	1.3%	41.6%	55.8%	1.3%	51.9%	40.3%	7.8%	0.0%

**Table 17: Percent of participants by highest score for gingivitis**

CHARACTERISTIC	GINGIVITIS			
	0 No inflammation	1 Mild inflammation	2 Moderate inflammation	3 Severe inflammation
	%	%	%	%
All (n=243)	10.3%	23.0%	66.7%	0.0%
Male (n=114)	11.4%	19.3%	69.3%	0.0%
Female (n=129)	9.3%	26.4%	64.3%	0.0%
Age 0 to 5 (n=56)	42.9%	37.5%	19.6%	0.0%
Age 6 to 11 (n=80)	1.2%	25.0%	73.8%	0.0%
Age 12 to 17 (n=107)	0.0%	14.0%	86.0%	0.0%
Visited a dental professional in the last year (n=126)	5.6%	23.8%	70.6%	0.0%
Visited a dental professional more than a year ago (n=68)	1.5%	19.1%	79.4%	0.0%

**Table 18: Prevalence and severity of fluorosis (Dean's Index) – ages 6 to 11**

CHARACTERISTIC	FLUOROSIS					
	Normal %	Questionable %	Very mild %	Mild %	Moderate %	Severe %
All (n=90)	80.0%	8.9%	11.1%	0.0%	0.0%	0.0%
Male (n=37)	78.4%	10.8%	10.8%	0.0%	0.0%	0.0%
Female (n=53)	81.1%	7.5%	11.3%	0.0%	0.0%	0.0%
Visited a dental professional in the last year (n=59)	78.0%	11.9%	10.2%	0.0%	0.0%	0.0%
Visited a dental professional more than a year ago (n=21)	76.2%	4.8%	19.0%	0.0%	0.0%	0.0%

**Table 19: Prevalence of receiving orthodontic treatment currently or in the past**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=289)	0	0.0%	0	0.0%	8	6.8%	8	2.8%
Male (n=140)	0	0.0%	0	0.0%	4	6.5%	4	2.9%
Female (n=149)	0	0.0%	0	0.0%	4	7.1%	4	2.7%
Visited a dental professional in the last year (n=160)	0	0.0%	0	0.0%	7	10.4%	7	4.4%
Visited a dental professional more than a year ago (n=77)	0	0.0%	0	0.0%	0	0.0%	0	0.0%

**Table 20: Prevalence of soft tissue lesions by type**

CHARACTERISTIC	SOFT TISSUE LESIONS							
	1 or more lesions	Angular Chelitis	Mucosal White Patches	Glossitis	Sinus or Fistula	Aphthous ulcer	Traumatic or other ulcer	Other
	%	%	%	%	%	%	%	%
All (n=290)	3.8%	0.0%	0.3%	0.0%	2.1%	0.0%	0.7%	0.7%
Male (n=140)	4.3%	0.0%	0.7%	0.0%	2.1%	0.0%	0.7%	0.7%
Female (n=150)	3.3%	0.0%	0.0%	0.0%	2.0%	0.0%	0.7%	0.7%
Age 0 to 5 (n=62)	4.8%	0.0%	0.0%	0.0%	1.6%	0.0%	3.2%	0.0%
Age 6 to 11 (n=110)	2.7%	0.0%	0.0%	0.0%	2.7%	0.0%	0.0%	0.0%
Age 12 to 17 (n=118)	4.2%	0.0%	0.8%	0.0%	1.7%	0.0%	0.0%	1.7%
Visited a dental professional in the last year (n=160)	5.0%	0.0%	0.0%	0.0%	3.1%	0.0%	0.6%	1.3%
Visited a dental professional more than a year ago (n=77)	2.6%	0.0%	1.3%	0.0%	0.0%	0.0%	1.3%	0.0%

**Table 21: Percent of individuals by type of treatment need**

CHARACTERISTIC	Prevention	Surgery	Endo-dontics	Restorations	Prosthodontics	Periodontics	Orthodontics	Misc.	No treatment needed
	%	%	%	%	%	%	%	%	%
	All (n=290)	84.8%	4.5%	1.4%	24.5%	0.3%	0.3%	11.0%	0.8%
Male (n=140)	84.3%	5.7%	1.4%	25.7%	0.0%	0.0%	7.1%	0.8%	15.0%
Female (n=150)	85.3%	3.3%	1.3%	23.3%	0.7%	0.7%	14.7%	0.7%	14.0%
Age 0 to 5 (n=62)	61.3%	1.6%	0.0%	14.5%	0.0%	0.0%	0.0%	0.0%	38.7%
Age 6 to 11 (n=110)	90.9%	4.5%	0.9%	24.5%	0.0%	0.0%	6.4%	0.0%	8.2%
Age 12 to 17 (n=118)	91.5%	5.9%	2.5%	29.7%	0.8%	0.8%	21.2%	1.9%	7.6%
Visited a dental professional in the last year (n=160)	88.8%	5.0%	1.9%	20.6%	0.0%	0.6%	9.4%	0.7%	10.0%
Visited a dental professional more than a year ago (n=77)	92.2%	5.2%	1.3%	36.4%	1.3%	0.0%	18.2%	1.4%	7.8%

**Table 22: Percent of children/dependents who have ever been sedated or had general anesthetic for dental work**

CHARACTERISTIC	AGE GROUP							
	Children 0 to 5 years		Children 6 to 11 years		Adolescents 12 to 17 years		Ages 0 to 17 years	
	n	%	n	%	n	%	n	%
All (n=224)	4	9.3%	13	16.3%	22	21.8%	39	17.4%
Male (n=113)	3	13.6%	7	18.4%	13	24.5%	23	20.4%
Female (n=111)	1	4.8%	6	14.3%	9	18.8%	16	14.4%
Visited a dental professional in the last year (n=128)	2	10.5%	9	18.0%	12	20.3%	23	18.0%
Visited a dental professional more than a year ago (n=67)	2	28.6%	4	17.4%	9	24.3%	15	22.4%