

Oral Health In Peterborough

December 2013

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Reference

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Distribution

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Table of Contents

Reference..... 1

Reviewers 1

Acknowledgements 1

Distribution..... 1

Report Overview 4

 Introduction..... 4

 Data Sources..... 5

 Definitions & Notes..... 6

Executive Summary 8

List of Tables 9

List of Figures 9

Section 1: Oral Health Services Offered by Public Health..... 11

 1.1 School Screening 11

 1.2 Administration of Publically Funded Dental Programs 13

 1.2.2. Dental Treatment Assistance Fund..... 13

 1.3 Community Dental Health Services 14

 1.3.2 Denture Pilot 14

 1.4 Community Water Fluoridation (CWF) 15

Section 2: Utilization of Oral Health Services & Oral Health Status 16

 2.1 Utilization of Oral Health Services..... 17

 2.2 Oral Health Status 24

Section 3. Impact of Oral Health on the Medical System..... 26

 3.1 Emergency Department Visits 26

 3.2 Oral Cancers 30

Section 4. Discussion & Recommendations	32
4.1 Discussion	32
4.2 Recommendations	32
References	34

Report Overview

Introduction

Oral health is an integral part of overall health and well-being and it has been shown that poor oral health may be associated with some major systematic disease such as diabetes, heart disease or poor overall health. In addition, dental diseases can severely affect one's quality of life by causing considerable pain and discomfort as well as interfering with normal activities such as social interactions, work and school tasks. Children who experience dental decay early in life are shown to lag behind others in terms of growth and learning abilities.

Oral diseases are mostly preventable. However, once such conditions develop, they impose significant direct and indirect costs on individuals as well as the society. For instance, it has been estimated that in 2009 approximately 40 million hours of school and work were lost due to dental conditions in Canada.

Unfortunately and despite the above evidence, dental services are not publicly covered for the most part. Public Health Units are required to monitor the oral health of children through screenings which take place in schools, and to offer preventive services, and financial assistance through the Children in Need of Treatment program. The data from these assessments are made available at a provincial level, to inform planning and service delivery programs. The Healthy Smiles Ontario program was introduced in 2011 and provides additional funds and coverage for both preventive and treatment dental services to low income children below the age of 18 years.

The purpose of this report is to describe the dental health of people living in Peterborough County and City and First Nation communities (Peterborough residents) and demonstrate the scope and impact of the Oral Health programs at the Peterborough County-City Health Unit (PCCHU). Having this information should help inform decision-makers on the nature and distribution of dental challenges and opportunities in the community. The report utilizes several key databases, accessible to the public health system, to complement direct patient observation to provide a more robust assessment of local oral health.

The information contained in the report can be used to:

- Identify and explain current local public health dental services
- Identify health inequalities and community needs
- Plan and secure future service delivery for priority populations
- Set priorities for local health promotion and disease prevention activities

Data Sources

Multiple data sources were used in this report:

Section 1.

Oral health screening data were collected in accordance with the Ontario Public Health Standards (OPHS): [Oral Health Assessment and Surveillance Protocol](#). The mandatory information was collected and uploaded into Ministry of Health and Long-term Care's Oral Health Information Support System (OHISS) as aggregate data in accordance with Personal Health Information Protection Act (PHIPA). In this report, OHISS analysis tools were used to retrieve information on number of children screened, percentage of Children with Urgent Care needs (CUC), percentage of caries-free children, average number of decayed, missing, filled teeth (deft/DMFT) and percentage of high-risk schools (see definition pg. 7). These variables were extracted for 2011-12 and 2012-13 school years.

ClearDent™ is a paperless dental office management software system which integrates patient information, digital imaging, electronic charting, treatment plans and recall, management reports and billings, lab tracking and scheduling. This software is used at both Peterborough County-City Health Unit dental clinics to manage and plan all clinical activities, events, and client flow. At the time of writing, ClearDent™ was not set up to run surveillance or population health reports. Administrative data, such as billing and scheduling appear in this report. Data was extracted on the number of clients and the procedures performed at the clinics for the time period April 2012 to March 2013.

Section 2.

Data regarding the utilization of *oral health services and oral health status*, such as insurance coverage, visiting a dentist, and sociodemographic indicators are derived from the Canadian Community Health Survey (CCHS) 2009-2010 Share File. The CCHS collects health determinants, health status and health system utilization data from people aged 12 years or older living in households across Canada. The CCHS has several limitations, notably: sample sizes for Peterborough are small and as a result there is large degree of variability associated with some of the estimates provided, particularly in groups which there is low representation (e.g. youth) and for those variables where positive responses are relatively rare (e.g. presence of a specific oral health issue). In addition, people living in First Nations communities are not included in the sample for the CCHS. Estimates from the CCHS have been presented with 95% confidence intervals.

Section 3.

Emergency department (ED) data were obtained from the National Ambulatory Care Reporting System (NACRS). Emergency departments in Ontario are required to submit data to NACRS. Variables contained in NACRS include: demographic information about the patient (e.g., age, sex, region of residence); and information about the ED visit admission (e.g., date of visit, unscheduled emergency).

Records from NACRS are classified according to the International Classification of Diseases, 10th Revision (ICD-10) and data were retrieved using ICD-10 main problem code block *K00-14 – Diseases of oral cavity, salivary glands and jaws*. This code block includes the following diagnoses:

- K00: Disorders of tooth development and eruption
- K01: Embedded and impacted teeth
- K02: Dental caries

- K03: Other diseases of hard tissues of teeth
- K04: Diseases of pulp and periapical tissues
- K05: Gingivitis and periodontal diseases
- K06: Other disorders of gingival and edentulous alveolar ridge
- K07: Dentofacial anomalies [including malocclusion]
- K08: Other disorders of teeth and supporting structures
- K09: Cysts of oral region, not elsewhere classified
- K10: Other diseases of jaws
- K11: Diseases of salivary glands
- K12: Stomatitis and related lesions
- K13: Other diseases of lip and oral mucosa
- K14: Diseases of tongue



Population data are provided by two sources, Statistics Canada and the Ontario Ministry of Finance. Population estimates are final inter-censal (i.e. between census) estimates that are interpolated using the adjusted census counts around the year that the estimates are for. Data are retrieved using IntelliHEALTH, an Ontario Ministry of Health and Long-Term Care data portal.

Cancer data are provided by Cancer Care Ontario (CCO) from the Ontario Cancer Registry. Cancer Care Ontario monitors cancer incidence, mortality, survival patterns and trends over time. The Ontario Cancer Registry includes data on all newly diagnosed cases of cancer in Ontario since 1964 and includes approximately 97% of all cancer cases in Ontario. Records of new cancer diagnoses and deaths in Ontario are based on hospital discharge summaries, pathology reports, records from regional cancer centres and death records. This data is disseminated using SEER*Stat software, Release 8 - OCRIS (May 2010) released February 2011.

Definitions & Notes

A *95%CI*, or 95% confidence interval, is a range of values within which 19 times out of 20 the *true* estimate will lie. Confidence intervals provide an indication of the reliability of the estimate. In some cases reliable estimates could not be obtained and therefore data are suppressed.

An *age-specific rate* is total number of events (e.g. new cases of cancer, deaths) that occur in a specified age group divided by the total population of that age group in that given year. Often these figures are very small and are therefore multiplied by a factor of 100,000 to make them more meaningful.

$$\text{age specific rate} = \frac{\text{number of ED visits in 2012 in Peterborough residents aged 20 to 24}}{\text{total Peterborough population aged 20 to 24 in 2012}} \times 100,000$$

The *avg DMFT/deft* is the average number of decayed, missing, filled tooth per child. Lower case letters refer to counts of primary teeth and upper case letters refer to counts of permanent teeth.

Caries free refers to children with no present or past experience of cavities.

The *crude rate* is the total number of events (e.g. new cases of cancer, deaths) that occur in a population in a given year divided by the total population in that given year. Often these figures are very small and are therefore multiplied by a factor of 100,000 to make them more meaningful.

$$\text{crude rate} = \frac{\text{number of oral cancer cases in 2007 in Peterborough}}{\text{total Peterborough population in 2007}} \times 100,000$$

A *high- risk school* is a school that has received oral health screening and has more than 14% of their Grade 2 students with an average DMFT/deft of equal or greater than 2.

High and low educational attainment categories indicate the self-reported highest level of education acquired by the CCHS respondent and are broken down as follows:

- low education: less than high school graduation OR high school graduation, no post-secondary education
- high education: some post-secondary education OR post-secondary degree/diploma

High and low income categories are derived from the CCHS using a combination of total household income from all sources and the number of people residing in the household. For this report, *low income* refers to the ‘lowest’ and ‘lower middle’ income categories as defined in Table I; *high income* refers to the ‘upper middle’ and ‘highest’ categories.

Table I. Income categories used in Social Determinants of Health (SDOH) analysis

Household size	Total Household Income - Categories			
	Lowest	Lower middle	Upper middle	Highest
1 or 2	< \$15,000	\$15,000 - \$29,999	\$30,000 - \$59,999	>= \$60,000
3 or 4	< \$20,000	\$20,000 - \$39,999	\$40,000 - \$79,999	>= \$80,000
5+	< \$30,000	\$30,000 - \$59,999	\$60,000 - \$79,999	>= \$80,000

Peterborough refers to Peterborough County, the City of Peterborough, Curve Lake and Hiawatha First Nations.

Peterborough resident refers to a person whose place of residence at the time of data collection was Peterborough County, the City of Peterborough, Curve Lake or Hiawatha First Nations (with the exception of CCHS data).

Standardization removes the effects of differences in the age and gender structure of populations among areas and over time. These rates show the number of events per 100,000 population that would have occurred in a given area if the age structure of the population of that area was the same as the age structure of a specified standard population. To ensure consistency and comparability of age-adjusted rates, it is suggested that the 1991 Total Canadian Population (Version 2) be used as the standard.

The *urban/rural* variable identifies whether the respondent lives in an urban or rural area. Urban areas are those continuously built-up areas having a population concentration of 1,000 or more and a population density of 400 or more per square kilometre based on current census population counts. This variable is grouped into two categories based on the composition of the blocks within the dissemination areas and is a pre-defined variable in the CCHS.

Executive Summary

Oral health is an integral part of overall health. Poor oral health has been associated chronic diseases such as diabetes and heart disease. In addition, oral diseases are largely preventable. The Peterborough County-City Health Unit's (PCCHU) approach to oral health is holistic in nature. Its goals are to re-orient health services to achieve a balance between disease prevention and treatment, to foster development of healthy public policy, and to achieve positive and equitable oral health outcomes.

Ontario boards of health are mandated to offer a range of oral health services including school screenings, administration of oral health public assistance, supporting policies for community water fluoridation, and reducing barriers to access including operating a community dental health centre and a mobile dental health centre.

Highlights from this report include:

- Approximately three-quarters of JK students are caries free
- Treatment plans for 3,323 people were approved between April 2012 and April 2013
- In 2009/2010, three quarters of Peterborough residents reported that they had visited the dentist in the past 12 months
- The most common reason for not visiting a dentist in the past three years was cost
- Two-thirds of Peterborough residents have dental insurance
- One-quarter of people in Peterborough do not brush their teeth twice or more daily
- On average, there are over 1,000 visits per year to the emergency department (ED) for oral care
- Young adults between the ages of 20 and 39 make up over half the ED visits
- Abscesses and toothaches were the most common reason for visits to the ED

Based on the data presented in this report, PCCHU has identified the following priority populations for oral health programs and services:

- low income families and individuals;
- those without dental insurance;
- older adults, young children and young adults.

Given the findings of this report, the following actions are recommended as priorities for the Peterborough County-City Board of Health and its partners:

- Promote and support policies and provisions for continued access to optimally fluoridated community drinking water;
- Maintain, and expand where possible, the current level of data collection concerning oral health;
- Continue to remove barriers to accessing dental services including operating the community dental health centre and the mobile dental health centre; and
- Work in partnership with community champions to maintain the emergency dental fund, and develop health promotional materials and increase the profile of oral health importance in Peterborough.

List of Tables

Table I. Income categories used in Social Determinants of Health (SDOH) analysis.....	7
Table 1. School screening intensity level, decayed teeth, and grades screened by public health.....	11
Table 2. School screening data, 2011-2013	12
Table 3. Reasons for not visiting the dentist in the past three years, Peterborough and Ontario; 2009/10.....	18
Table 4. Type of dental insurance plan, Peterborough and Ontario; 2009/10	19
Table 5. Proportion of people reported oral or facial pain or other conditions in the past 12 months, Peterborough and Ontario; 2009/10.....	24
Table 6. Number and relative frequency of DOC ED visits by gender and age group, Peterborough and Ontario; 2003-2012.....	27
Table 7. Five most frequent DOC ED visit types by ICD-10 code, Peterborough and Ontario; 2003-2012.....	29
Table 8. New cases, deaths, and incidence and mortality rates per 100,000 of oral cancer by gender, Peterborough; 1986-2007	31

List of Figures

Figure 1. Proportion of Peterborough and Ontario residents who have visited the dentist in the past 12 months by gender; 2009/10	18
Figure 2. Proportion of Peterborough and Ontario residents who have visited the dentist in the past 12 months by age group; 2009/10	18
Figure 3. Proportion of Peterborough and Ontario residents who have dental insurance by gender; 2009/10...	19
Figure 4. Proportion of Peterborough and Ontario residents who have dental insurance by age group; 2009/10	19
Figure 5. Proportion of Peterborough residents who have dental insurance by SDI; 2009/10	20
Figure 6. Proportion of Ontario residents who have dental insurance by SDI; 2009/10	20
Figure 7. Proportion of Peterborough residents who have visited the dentist in the past 12 months by SDI and insurance coverage; 2009/10	21
Figure 8. Proportion of Ontario residents who have visited the dentist in the past 12 months by SDI and insurance coverage; 2009/10	21
Figure 9. Proportion of Peterborough and Ontario residents who usually only visit the dentist for emergencies by gender; 2009/10	22

Figure 10. Proportion of Peterborough and Ontario residents who usually only visit the dentist for emergencies by age group; 2009/10	22
Figure 11. Proportion of Peterborough residents who usually only visit the dentist for emergencies by SDI and insurance coverage; 2009/10	23
Figure 12. Proportion of Ontario residents who usually only visit the dentist for emergencies by SDI and insurance coverage; 2009/10	23
Figure 13. Proportion of Peterborough and Ontario residents who brush their teeth twice or more per day by gender; 2009/10	25
Figure 14. Proportion of Peterborough and Ontario residents who brush their teeth twice or more per day by age group; 2009/10	25
Figure 15. Number and crude rate of DOC ED visits by sex, Peterborough; 2003-2012	26
Figure 16. Number and crude rate of DOC ED visits by sex, Ontario; 2003-2012	27
Figure 17. Age-specific rates of DOC ED visits by age group, Peterborough and Ontario; 2003-2012	28
Figure 18. Standardized rates of ED visits due to Doc, Peterborough and Ontario; 2003-2012.....	29

Section 1: Oral Health Services Offered by Public Health

The Public Health model is holistic in approach, promoting broad awareness of the key role of oral health in good overall health and a wide range of health outcomes. Its goals are to re-orient health services to achieve a balance between disease prevention and treatment, to foster development of healthy public policy, to achieve positive and equitable oral health outcomes, and to use innovative approaches to services for those clients who need them most.



1.1 School Screening

Oral health screening has been conducted in local elementary schools by the Board of Health since 1979. Since the inception of the Children in Need of Treatment (CINOT) financial assistance program in 1986, the screening program has proven extremely successful in ensuring that children with unmet urgent treatment needs are able to access care. All Boards of Health in the province are mandated under the Ontario Public Health Standards to provide oral health screening in elementary schools.

The screening team offers oral health screening in 48 elementary schools in Peterborough – including Curve Lake First Nation, public, separate, and private schools. Schools screenings, operated by a registered dental hygienist and a dental assistant, are scheduled each month and parents/guardians are notified of the screening by a letter. A secure laptop is used to collect the data from the screenings which is then uploaded to the provincial database (OHIS). Following the visual assessment, the findings are entered into the OHIS application and a screening report card is sent home. Notification letters, advising on the need for treatment, are issued, and mailed to parent/guardian for children with urgent dental care needs.

Through screening, children with urgent treatment needs are identified, as well as children who need care and are not yet in crisis, and other students who require preventive services such as cleaning, fluoride treatments, and pit and fissure sealants. In addition, Board of Health staff encounters many students with various physical and mental disabilities and school screening provides an excellent opportunity for these children to have a positive, non-invasive, dental experience which builds confidence.

The proportion of students in Grade 2 with two or more decayed teeth, determines the screening intensity level of a school. The intensity level, corresponding proportion of Grade 2 students with two or more decayed teeth, and the grades screened are presented in Table 1.

Table 1. School screening intensity level, decayed teeth, and grades screened by public health

Intensity Level	Proportion with 2+ Decayed Teeth	Grades Screened
High	14% or more	JK, SK, 2, 4, 6, 8
Medium	9.5-13.9%	JK, SK, 2, 8
Low	<9.5%	JK, SK, 8

Student data are recorded using a provincial database as required by the Ontario Public Health Standards (OPHS). These data are analyzed at a provincial level, to assist in the planning and development of community dental programs.

During the 2012-2013 school year, PCCHU oral health staff screened 4,116 children in grades JK through 8, with most (56.3%) enrolled in JK and SK (Table 2). There were slightly fewer children screened in the 2012-2013 school year compared to the previous year (4,824) though the distribution of students across grades was similar. Overall, more than half of students screened in either year were caries-free or had never experienced dental decay (59% and 60%, respectively). The proportion of caries-free children was the highest among JK students at approximately 73%; Grade 4 had the smallest proportion of caries-free children at approximately 38.5%.

As defined under the CINOT program, urgent treatment needs refer to conditions such as pain, infection, hemorrhage, trauma, large open caries in permanent teeth or in crucial primary teeth, pathology requiring further investigation, or non-reversible periodontal disease may be considered urgent. As shown in Table 2, the overall proportion of children with urgent treatment needs declined slightly from 8.1% in 2011-12 to 7.3 % in 2012-13. This trend is consistent among students of all grades except Grade 6 students where there was increase in the number of children with urgent needs. The average DMFT/deft (decayed/missing/filled teeth) was consistent between 2011-12 and 2012-13 at around 1.5. However, similar to the increase in the proportion of children with urgent treatment needs in Grade 6, DMFT/deft increased from 1.2 to 2.0 between 2011-12 and 2012-13 among Grade 6 students. Finally, the proportion of high-risk schools has increased during the reported school years, from 9.3% to 13.6%.

Table 2. School screening data, 2011-2013

Indicator	School Year	Grade						
		JK	SK	G2	G4	G6	G8	Total
Children Screened (n)	11-12	1,366	1,243	1,245	147	142	647	4,824
	12-13	1,185	1,131	1,121	93	105	480	4,116
Caries-free Children (%)	11-12	72	65	48	38	56	50	59
	12-13	74	68	46	39	40	50	60
Children with Urgent Treatment Needs (%)	11-12	8.2	8.5	9.3	10.2	2.1	5.7	8.1
	12-13	7.9	6.8	8.1	8.6	7.6	5.6	7.3
Avg. DMFT/deft	11-12	1.0	1.4	2.1	2.3	1.2	1.4	1.5
	12-13	0.9	1.0	2.2	2.5	2.0	1.4	1.4
High-risk Schools (%)	11-12	9.3						
	12-13	13.6						

1.2 Administration of Publically Funded Dental Programs

Public health also has a role in the administration of a range of services for eligible children, youth and adults. Healthy Smiles Ontario (HSO), CINOT and Ontario Works Mandatory Basic Dental Care are programs that target children and youth under the age of 18 whose families may face financial difficulties. PCCHU's main role is to administer these programs and if needed, review children's eligibility according to each program.



In addition, PCCHU on behalf of the City of Peterborough, administers the Ontario Works Discretionary Benefit (OWDB) program for adults. Under this program, rules and conditions of any treatment plan that exceeds \$400 per calendar year must be reviewed and adjudicated by the PCCHU Dental Consultant. Between April 2012 and April 2013, PCCHU reviewed and approved the treatment plans of:

- 262 CINOT applicants;
- 277 HSO applicants;
- 898 children covered under Ontario Works (OW); and
- 1,886 individual adults' OWDB treatment plans

1.2.2. Dental Treatment Assistance Fund

The Dental Treatment Assistance Fund (DTAF) originally commenced in 2007 by the former Oral Health Coalition of Peterborough to meet the emergency needs of uninsured adults and seniors in our community. The Oral Health Coalition was created by the Peterborough Social Planning Council, the United Way, the Victorian Order of Nurses (VON), City of Peterborough Social Services, the Multiple Sclerosis Society, the PCCHU and community members. Originally the VON administered the fund.

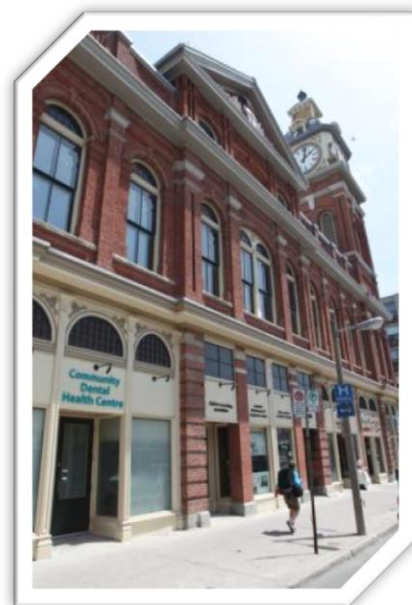
Now, DTAF is overseen by the Basic Needs Committee of the Peterborough Poverty Reduction Network. PCCHU provides the administrative support (at no cost to the fund). DTAF is funded strictly by donations, and provides a maximum of \$200 per calendar year to individuals, 18 and older, who are not covered by any form of dental insurance and who require but unable to afford, emergency dental assessment and/or treatment. Clients are referred from partner organizations as well as by themselves.

DTAF supported 115 individuals in 2012 between 18 and 82 years of age. The average cost of emergency treatment from the fund was \$122 per person. It is estimated that \$25,000 a year is needed; to fully meet the needs of the community.

1.3 Community Dental Health Services

In 2010 PCCHU submitted a proposal to HSO to establish a clinic in downtown Peterborough and to provide outreach to the County of Peterborough from a fully-equipped mobile dental treatment unit. This proposal was successful and in an effort to address the current gaps and barriers in dental service provision, PCCHU provides dental services in the centrally-located Community Dental Health Centre (CDHC) in downtown Peterborough as well as a mobile dental health centre (MDHC).

The CDHC opened to the public in May 2011 and transitioned to a fully operational dental health centre by April 2012. It provides high quality, accessible and comprehensive oral health treatment and preventive services which meet the needs of eligible children and families. Services are offered six days a week by a team of oral health professionals including a dentist, a registered dental hygienist, certified dental assistants and a secretary. Contract and relief staff work on occasion to help manage demand.



The vast majority of health and social services are located in the City of Peterborough. Transportation to dental services from outside the city can be a challenge for many individuals, especially for those without a private car and those with mobility issues. In January 2012 PCCHU began offering mobile dental health services across Peterborough County via the MDHC. The fully accessible mobile clinic features two treatment areas and carries equipment to provide 360 degree diagnostic x-rays, cleaning, filling and other preventive and treatment services.

The MDHC operates two days per week on a rotating basis and sees clients in Apsley, Buckhorn, Curve Lake First Nation, Havelock, Hiawatha First Nation, Keene, Lakefield, Millbrook, Norwood, and Warsaw. County residents, who otherwise cannot access dental care, have been provided professional dental services on board the MDHC. Starting in 2013, the PCCHU also began offering services within the City - targeting priority populations including low-income youth.

In total, there are 2,769 registered clients at the CDHC and MDHC, just over half of whom (1,478 or 53.4%) were female and 898 (32.4%) were under the age of 18. Between April 2012 and March 2013, there were 2,518 completed appointments which consisted of 1,271 patient visits. Most of the services provided were diagnostic in nature (41.7%). This includes dental examinations and x-rays. Roughly one-quarter (28.0%) of procedures performed were restorative (i.e. filling and restoring teeth). The remainder of the services were either surgical (17.1%; removal of teeth), preventative (10.9%; cleaning) or endodontic (2.3%; root canal therapies and treatments of the pulp of the teeth). Coverage for dental health services are paid for by publically-funded programs administered by PCCHU.

1.3.2 Denture Pilot

As previously mentioned, poor oral health and untreated oral diseases can have a significant impact on a person's quality of life. Missing and broken teeth are not only painful, but can mean that a person has difficulty eating and sleeping. Sometimes people will avoid certain foods and

this can impact the ability to maintain a nutritiously balanced diet. Therefore, dentures can be essential for health and wellbeing. They can help people with speech, affect nutrition, support people in finding and keeping employment and play a role in self esteem and social interactions.

In Peterborough, adults receiving OW have limited access to the provision of dentures (partial and complete) with approval from their OW case manager. In November 2012, the CDHC initiated a pilot program assessing readiness of the new CDHC team and financial viability, to offer denture service to clients alongside the other preventive and treatment services available. Clients were assessed by the dentist and recommendations were made to the client's OW case manager for approval of treatment. Between November 2012 and March 2013, 40 dentures were provided for clients. A survey was sent to clients who had received dentures to capture their comments and suggestions in order to evaluate the project; one third (30.0%) responded to the survey.

Feedback from clients was positive:

- 100% reported they felt better about the way they looked following receiving dentures
- 100% felt more confident around people.
- 90% felt more confident to find or keep work.

1.4 Community Water Fluoridation (CWF)

Fluoride is a natural element that can be found in rocks, soil, and water. For more than half a century, fluoride has been added to public drinking water supplies around the world in order to prevent dental decay and promote oral health. The fluoridation of drinking water is a well-accepted public health measure which protects all members of a community regardless of age, socioeconomic status, education, employment, or dental coverage. It is endorsed by Health Canada and by more than 90 national and international professional health organizations. Fluoridating municipal water supplies remains an especially vital public health intervention for our most vulnerable populations, including seniors, and is considered one of the ten greatest public health achievements in the twentieth century. Studies confirm that water fluoridation can reduce caries in children's primary teeth by up to 60 percent and in their permanent teeth by up to 35 percent. Adults experience a 20 to 40 percent reduction in tooth decay from lifelong exposure to water fluoridation.

The City of Peterborough began fluoridation of municipal drinking water in 1973. As part of its health promotion, PCCHU is committed to the continuation and expansion of community water fluoridation. This is achieved by ongoing review and analysis of the highest quality studies and guidelines. Additionally, levels of fluoride in Peterborough's drinking water system are measured on a daily basis and reports are provided to the PCCHU's Medical Officer of Health and Oral Health department. This is to ensure that the levels of fluoride are within the recommended and safe range.

Key Points:

- PCCHU consistently provides more oral health services than required by the OPHS
- Approximately three-quarters of JK students are caries-free
- The Dental Consultant reviewed and approved treatment plans for 3,323 people between April 2012 and April 2013
- DTAF is the only local fund dedicated to providing funds for emergency dental treatment to people who have no form of dental insurance
- Nearly half of the services at the CDHC and MDHC were diagnostic and just over a quarter were restorative
- PCCHU supports and promotes CWF for the benefits of all residents in the City of Peterborough



Section 2: Utilization of Oral Health Services & Oral Health Status

As oral diseases are largely preventable, appropriate access and regular utilization of dental services are crucial in achieving optimum oral health. Large-scale studies have shown that regular dental visits can result in fewer decayed teeth and better oral health. Better access to preventive dental care may also result in cost-savings in future dental treatments.

Those who do not make regular visits to a dental professional demonstrate poor oral health. For instance, while not causal, the results of the Canadian Health Measure Survey 2007-09 (CHMS) illustrate that those who did not visit a dental professional in the last year were almost two times more likely to report their oral health as fair or poor compared to those who made dental visits in the last 12 months. These people also had significantly higher numbers of untreated decayed teeth at all ages. Canadian adults who did not visit a dentist in the past year were more also likely to show worse gingival and periodontal measure scores, report more soft tissue oral lesions and have more treatment needs.



2.1 Utilization of Oral Health Services

In 2009/10 three-quarters (74.4%) of Peterborough residents and 70.2% of Ontario residents had visited the dentist in the past 12 months; similar proportions of men and women had visited a dentist in the past 12 months (Figure 1). There were significant differences in the proportion of people who had visited a dentist in the past 12 months by age group: in Peterborough, 87.3% of youth aged 12 to 19 reported having seen a dentist in the past 12 months compared to only 64.6% of older adults aged 65 and older (Figure 2). Similarly, only 67.0% of adults aged 35 to 49 had reported visiting a dentist in the past 12 months.

In Ontario, a significantly greater proportion of youth aged 12 to 19 had seen a dentist in the past 12 months compared to any other age group at 81.5%; three-quarters of those aged 35 to 49 years of age and only 58.6% of older adults reported visiting a dentist in the past 12 months. A significantly greater proportion of young adults aged 20 to 34 in Peterborough reported visiting a dentist in the past 12 months compared to Ontario (77.9% and 64.2%, respectively).



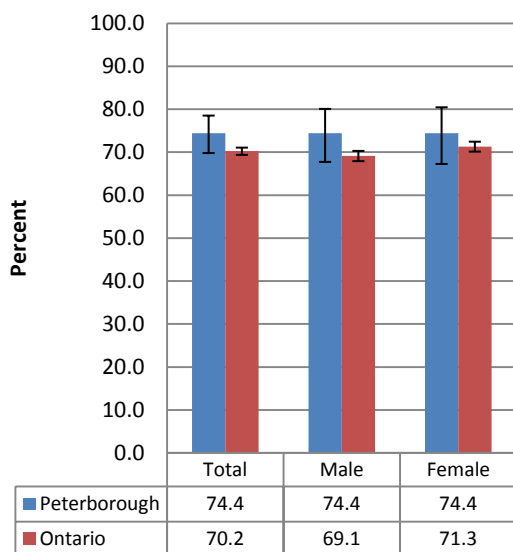


Figure 1. Proportion of Peterborough and Ontario residents who have visited the dentist in the past 12 months by gender; 2009/10

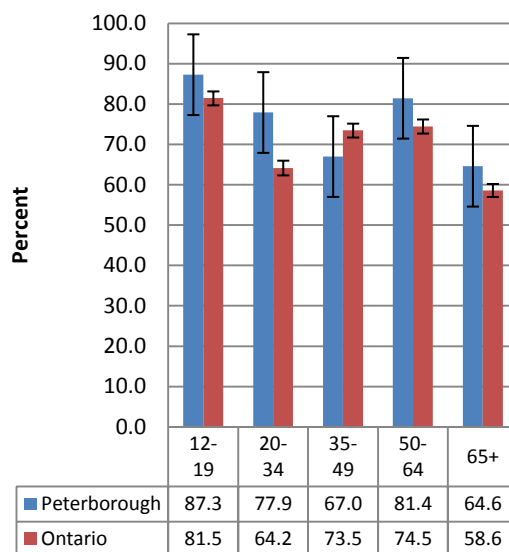


Figure 2. Proportion of Peterborough and Ontario residents who have visited the dentist in the past 12 months by age group; 2009/10

Among Peterborough residents *who had not* visited a dentist in the past three years, the most common reasons cited were: cost; not thinking it was necessary; fear; not yet having gotten around to it; and, while more prominent among older age groups, wearing dentures (Table 3). The distribution of reasons was similar in Ontario, though not significantly statistically different. Despite this, it is important to note cost is indicated by two out of five (43.0%) Peterborough residents who have not visited a dentist in the past three years. A greater proportion of Ontario men reported not visiting the dentist because they did not think it necessary compared to women (40.9% and 28.4%, respectively).

Table 3. Reasons for not visiting the dentist in the past three years, Peterborough and Ontario; 2009/10

Reason	Peterborough % (95%CI)	Ontario % (95%CI)
Cost	43.0 (26.3-61.3)	29.0 (26.8-31.2)
Did not think it necessary	33.0 (18.1-52.2)	34.8 (32.4-37.3)
Fear	‡	5.5 (4.4-6.7)
Had not gotten around to it	‡	9.6 (8.4-11.0)
Wears dentures	26.8 (17.5-38.9)	23.7 (22.1-25.5)

‡ these data do not meet Statistics Canada's quality standards; conclusions based on these data will be unreliable and most likely invalid and are therefore not included

Being insured for dental care is an important factor that can influence whether or not an individual visits a dentist. In 2009/10, 64.8% of Peterborough residents and 63.6% of Ontarians reported having insurance for dental expenses with males and females reporting similar dental insurance coverage rates (Figure 3). There were significantly different levels of dental insurance coverage based on age, however, with older adults aged 65 and older reporting the lowest rates in Peterborough at 48.1% (Figure 4). However, dental insurance coverage was significantly lower among older adults in Ontario at 34.8%.

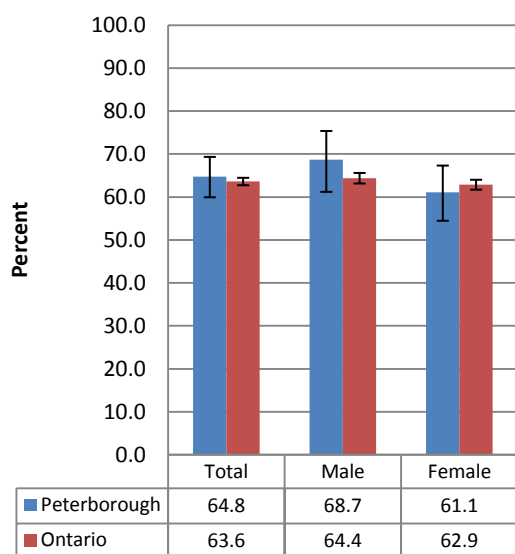


Figure 3. Proportion of Peterborough and Ontario residents who have dental insurance by gender; 2009/10

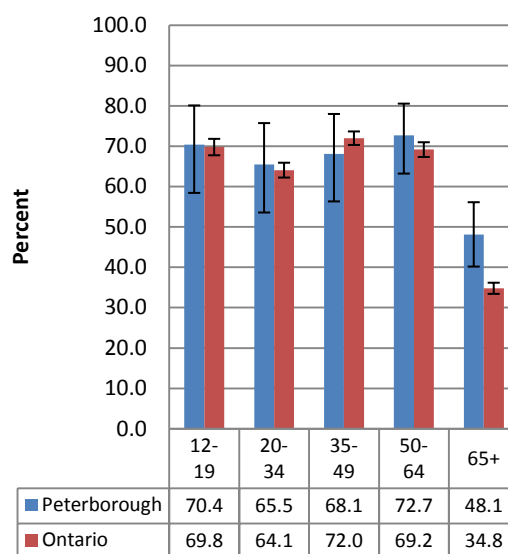


Figure 4. Proportion of Peterborough and Ontario residents who have dental insurance by age group; 2009/10

The majority of people who had insurance for dental care reported having an employee sponsored plan – 84.7% in Peterborough and 84.0% in Ontario – indicating employment as an important factor to having insurance for dental services (Table 5).

Table 4. Type of dental insurance plan, Peterborough and Ontario; 2009/10

Type of Dental Insurance Plan	Peterborough % (95%CI)	Ontario % (95%CI)
Employee sponsored	84.7 (79.8-88.7)	84.0 (83.2-84.7)
Government sponsored	8.7† (6.3-14.8)	8.5 (8.0-9.1)
Private plan	4.8† (3.1-7.5)	6.5 (6.0-7.1)

† estimates should be interpreted with caution due to large sampling variability

A number of sociodemographic indicators (SDI) such as income, education and geography can influence whether or not an individual has insurance for dental services. This is partly because they can affect, or are affected by, employment. In Peterborough, 70.6% of people with high income reported having dental insurance compared to 41.1% of those with lower incomes, a statistically significant difference (Figure 5). Similarly, a smaller proportion of people with lower education reported having insurance for dental services compared to those with higher education, though the difference was not significant (51.6% and 65.7%, respectively). There was little difference observed between urban and rural populations. Like Peterborough, significant differences were found between those in high and low income groups (72.8% and 38.3%, respectively) as well as a significant difference between high and low education groups (67.4% and 48.8%) in Ontario.

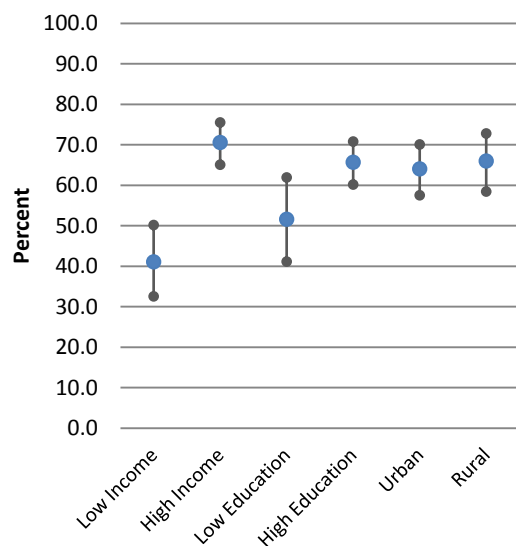


Figure 5. Proportion of Peterborough residents who have dental insurance by SDI; 2009/10

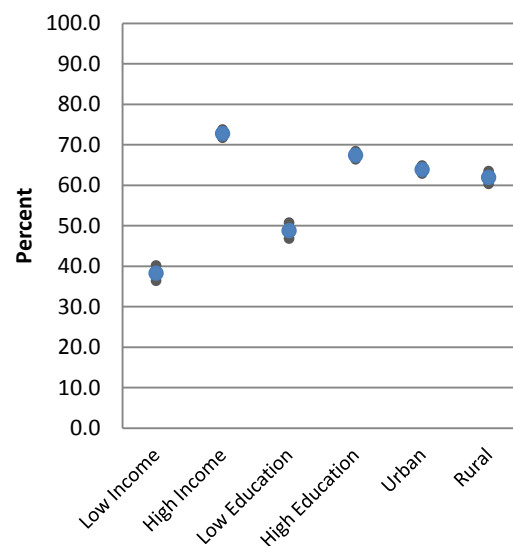


Figure 6. Proportion of Ontario residents who have dental insurance by SDI; 2009/10

Dental insurance and SDI can also play a role in accessing and affording dental care services. A smaller proportion of Peterborough residents in low income or with lower education report visiting a dentist in the past 12 months compared to those in high income and higher education, though the differences were not significant (Figure 7). The proportion of people who did not have insurance and report visiting a dentist in the past 12 months was significantly smaller than those who have insurance (63.5% and 82.2%, respectively). Differences among income, education and insured groups in Ontario are more apparent (Figure 8). Compared to Ontario, significantly larger proportions of Peterborough residents with low income, lower education, and those who were uninsured reported visiting a dentist in the past 12 months.

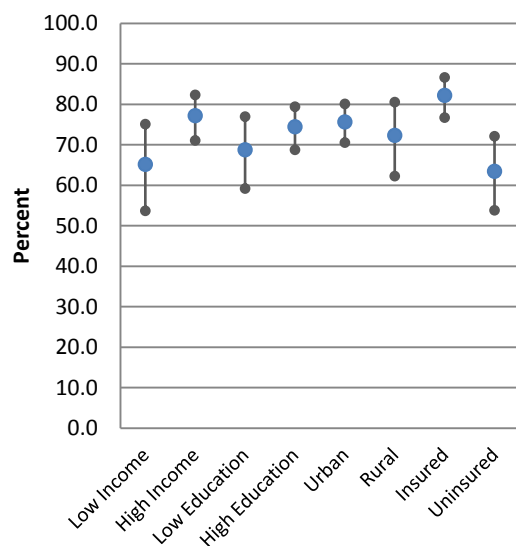


Figure 7. Proportion of Peterborough residents who have visited the dentist in the past 12 months by SDI and insurance coverage; 2009/10

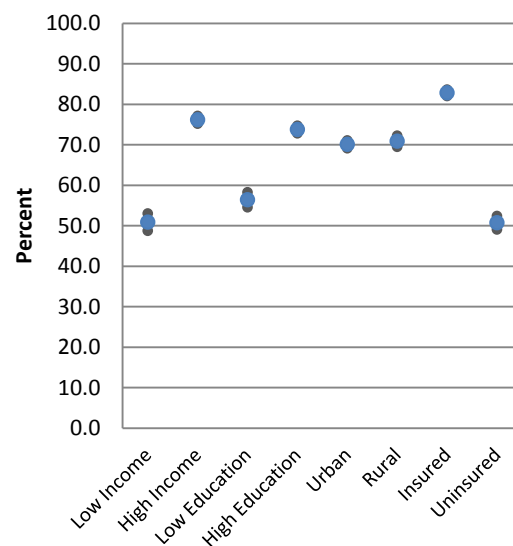


Figure 8. Proportion of Ontario residents who have visited the dentist in the past 12 months by SDI and insurance coverage; 2009/10

In 2009/10, nearly one in five Peterborough residents (18.1%) reported usually visiting a dentist only for emergency care, similar to the 18.4% in Ontario (Figure 9). There were no differences by gender in Peterborough; however, in Ontario a smaller proportion of women only visited the dentist only for emergency care compared to men (17.1% and 19.9%, respectively). The proportion of people visiting the dentist only for emergency care also varies by age group: over one quarter of older adults usually visit the dentist only for emergency care in Peterborough and Ontario (28.1% and 29.5%, respectively); in Ontario, this is significantly more than other age groups (Figure 10). By comparison, a significantly smaller proportion of youth in Ontario only visit the dentist for emergency care compare to other age groups. Among other age groups in Peterborough, the proportion of people who only visit the dentist for emergency care ranged from 13.2% for 50 to 64 year olds and 23.4% for those aged 35 to 49.

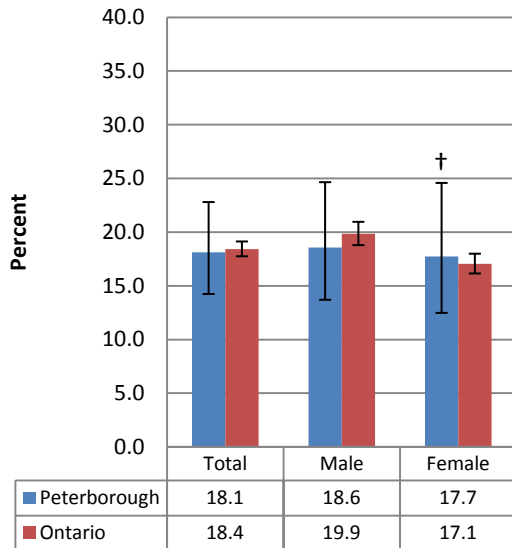


Figure 9. Proportion of Peterborough and Ontario residents who usually only visit the dentist for emergencies by gender; 2009/10

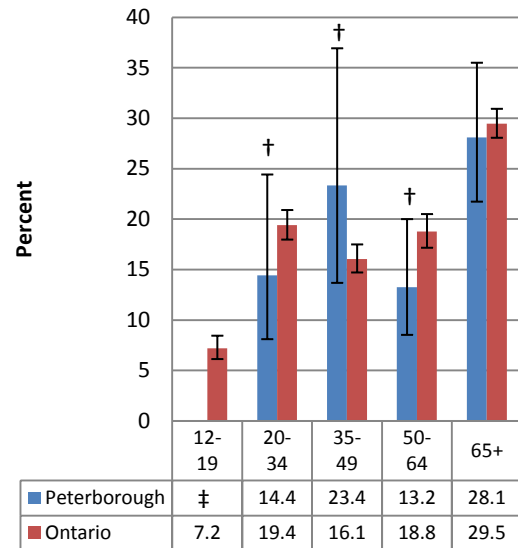


Figure 10. Proportion of Peterborough and Ontario residents who usually only visit the dentist for emergencies by age group; 2009/10

† estimates should be interpreted with caution due to large sampling variability

‡ these data do not meet Statistics Canada's quality standards; conclusions based on these data will be unreliable and most likely invalid and are therefore not included

In Peterborough, smaller proportions of people with higher education and incomes reported only visiting a dentist for emergencies compared to those with low education and incomes (Figure 11). A significantly greater proportion of uninsured individuals report only visiting the dentist for emergency care compared to those who had insurance for dental coverage (34.4% and 10.9%, respectively). In Ontario, the differences between most SDI groups were statistically significantly different: 13.6% of people with higher incomes, 15.3% of those with high education and 9.6% of insured persons visit the dentist only for emergency care compared to 34.8% of those with low income, 32.7% of those with lower education and 36.8% of uninsured people (Figure 12).

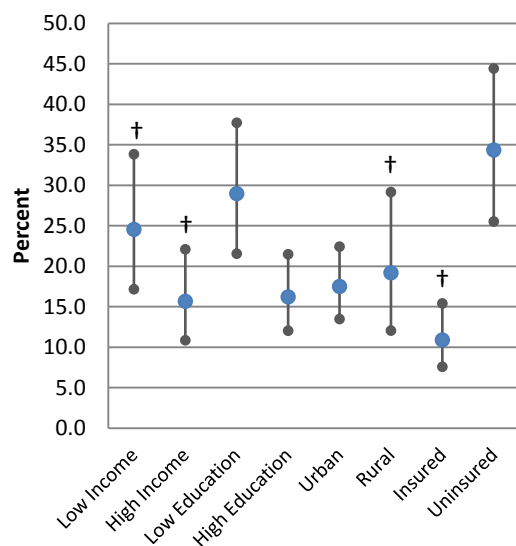


Figure 11. Proportion of Peterborough residents who usually only visit the dentist for emergencies by SDI and insurance coverage; 2009/10

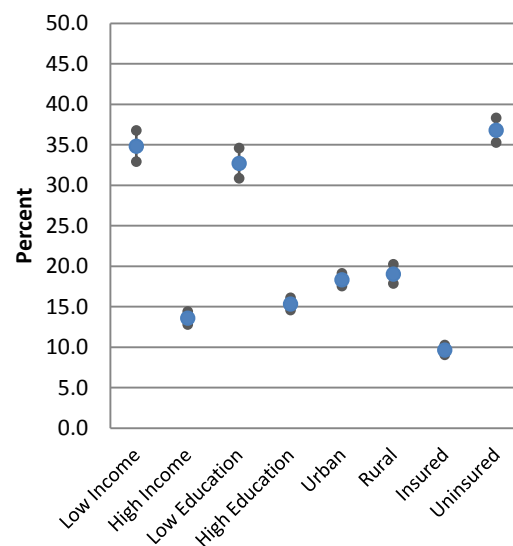


Figure 12. Proportion of Ontario residents who usually only visit the dentist for emergencies by SDI and insurance coverage; 2009/10

† estimates should be interpreted with caution due to large sampling variability

Key Points:

- In 2009/2010, three quarters of Peterborough residents visited the dentist in the past 12 months
 - A significantly greater proportion of Peterborough youth 12 to 19 visited a dentist in the past year compared to older adults aged 65 and older
- The most common reason for not visiting a dentist in the past three years was cost
- Two thirds of Peterborough residents have dental insurance
 - Less than half of older adults 65 years of age and older have dental insurance
 - Nearly nine in ten people report having their dental insurance through an employee sponsored plan
 - Seven out of ten people living in high income have dental insurance compared to four out of ten in low income
 - A greater proportion of people with dental insurance visited the dentist in the past 12 months compared to people without insurance
- Almost one in five Peterborough residents visit a dentist only for emergency care
 - A significantly great proportion of people who are uninsured visit a dentist only for emergency care compared to those who are insured

2.2 Oral Health Status

Some conditions of the mouth can provide an indication of poor oral health. For example toothaches may indicate dental caries while bleeding gums may suggest gum disease. When asked about the health of their teeth and mouth in the past month, just over half of Peterborough residents experienced oral/facial pain or discomfort, significantly more than 45.4% of Ontarians (Table 5). Some oral health issues were more prevalent, such as temperature sensitivity (31.0%) while others were not as common (i.e. pain in jaw joint [9.4%]).

In addition, in Peterborough, 14.0% of people had a tooth removed by a dentist in the past 12 months, with more than half (56.0%) reporting the tooth had been removed due to decay or gum disease. Similarly, 10.3% of Ontarians had a tooth removed by a dentist in the past 12 months with 44.8% reporting the teeth were removed due to decay or gum disease.

Table 5. Proportion of people reported oral or facial pain or other conditions in the past 12 months, Peterborough and Ontario; 2009/10

	Peterborough % (95%CI)	Ontario % (95%CI)
Oral/facial pain	51.9 (46.9-56.8)	45.4 (44.6-46.2)
Sensitivity to hot/cold	31.0 (27.1-35.2)	27.3 (26.5-28.0)
Bleeding gums	13.2 (10.0-17.3)	11.3 (10.7-11.8)
Bad breath	15.3 (11.7-19.7)	11.4 (10.9-11.9)
Dry mouth	11.4 (8.4-15.3)	11.0 (10.5-11.5)
Toothache	10.6 (7.7-14.3)	10.1 (9.6-10.7)
Pain in jaw joint	9.4 (6.4-13.5) [†]	8.6 (8.1-9.1)
Other pain of face/mouth	5.5 (3.6-8.3) [†]	5.5 (5.1-5.9)

[†] estimates should be interpreted with caution due to large sampling variability

In addition to the physical burden placed on an individual due to oral health issues, one's oral health status can also impact social functioning by avoiding conversation or contact with others, or by avoiding laughing or smiling. One in twenty (4.9%[†]) Peterborough residents experienced social limitation due to oral conditions compared to 3.4% in Ontario. Similarly, 4.9%[†] of Peterborough residents reported having a mouth condition which made speaking clearly difficult compared to 2.8% of Ontarians.

([†] estimates should be interpreted with caution due to large sampling variability)

Brushing the teeth twice a day has been shown to protect against dental caries and gum disease. Three-quarters (75.2%) of Peterborough residents brushed their teeth twice or more per day in 2009/10 and a significantly greater proportion of females reporting brushing their teeth twice or more per day than males (83.2% and 66.7%, respectively; Figure 13). Similar patterns for tooth brushing were found in Ontario. Frequent tooth brushing is more common among youth and younger adults in Peterborough: over 80% of people under the age of 50 report brushing their teeth twice or more per day compared to

only 57.5% of older adults. One of the reasons older adults in Peterborough brush their teeth less frequently may be due to the fact that a smaller proportion report having one or more of their own teeth (76.1%) compared to the general population (92.7%) and over half report wearing dentures (51.2%).

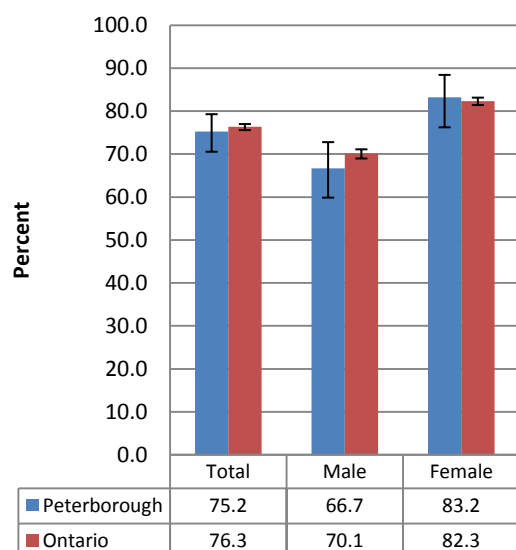


Figure 13. Proportion of Peterborough and Ontario residents who brush their teeth twice or more per day by gender; 2009/10

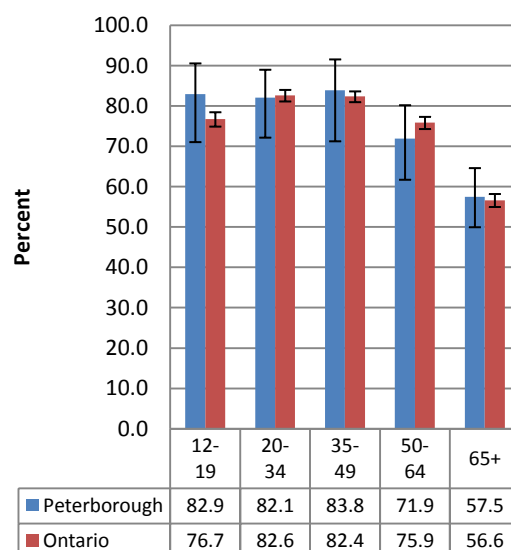


Figure 14. Proportion of Peterborough and Ontario residents who brush their teeth twice or more per day by age group; 2009/10

Key Points:

- A greater proportion of people in Peterborough had oral or facial pain in the past 12 months compared to Ontarians
- One in six Peterborough residents have had a tooth removed by a dentist in the past 12 months and more than half of those due to decay or gum disease
- One in twenty residents experience social limitations due to oral health issues
- One quarter of people in Peterborough do not brush their teeth twice or more daily

Section 3. Impact of Oral Health on the Medical System

In the event of an oral health emergency, if access or costs are barriers to regular dental services, it is likely that people will visit the emergency department (ED). This section provides a summary of data available on ED visits due to diseases of the oral cavity, salivary glands and jaws (DOC) including caries, impacted teeth and periodontal disease.

3.1 Emergency Department Visits

Between 2003 and 2012, there were 10,237 ED visits due to DOC among Peterborough residents with an average of 1,024 visits per year (543 among men and 481 among women). Males accounted for a slightly greater proportion of the visits during this time frame (5,427, or 53.0%) compared to women (4,810 or 47.0%). The number of ED visits due to DOC was generally stable between 2003 and 2012, ranging from a low of 963 visits in 2003 to a high of 1,064 visits in 2008 (Figure 15). Overall the crude rates among Peterborough males decreased between 2003 and 2012 while rates for women have remained relatively stable since 2006.

By comparison, the numbers of ED visits due to DOC have increased steadily in Ontario as have the crude rates among men and women (Figure 16). Despite this, crude rates among Peterborough men are approximately 70% greater than the province, and among Peterborough women, crude rates are approximately 60% greater than Ontario.

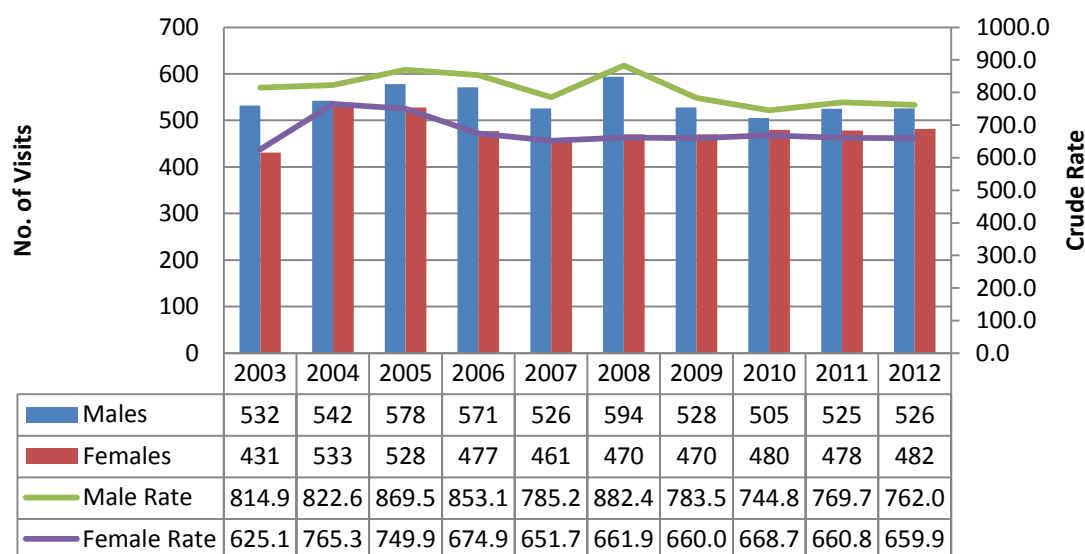


Figure 15. Number and crude rate of DOC ED visits by sex, Peterborough; 2003-2012

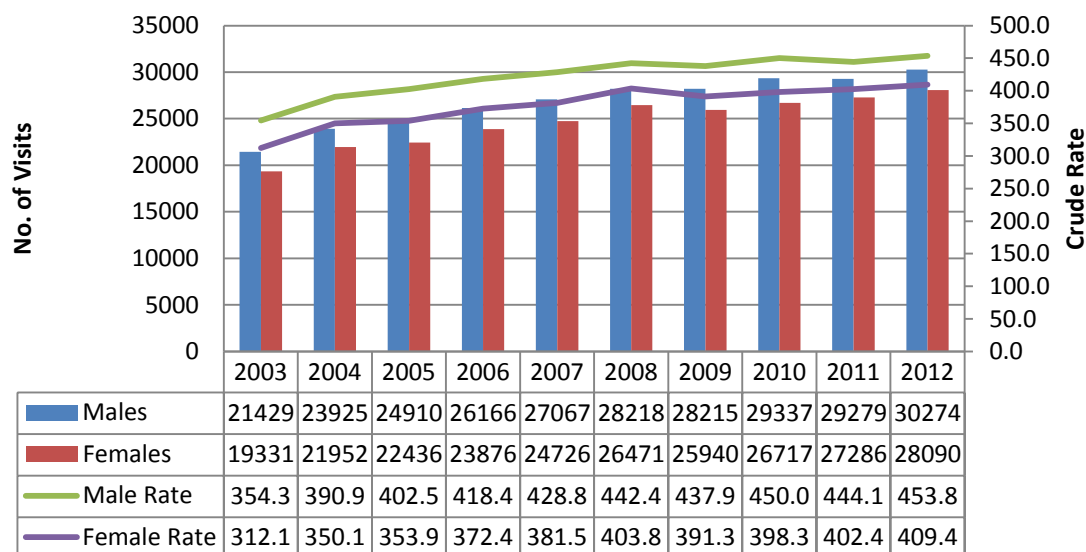


Figure 16. Number and crude rate of DOC ED visits by sex, Ontario; 2003-2012

Young adults in Peterborough aged 20 to 29 accounted for the largest proportion (30.3%) of ED visits due to DOC during the 2003 to 2012 period followed by persons between the ages of 30 and 39 at 20.4% (Table 6). By comparison, in Ontario, those aged 20 to 29 and 30 to 39 accounted for 25.9% and 18.9% of visits, respectively. In Peterborough, children under the age of ten only accounted for 4.8% of visits compared to 8.2% in Ontario.

Table 6. Number and relative frequency of DOC ED visits by gender and age group, Peterborough and Ontario; 2003-2012

Age Group	Peterborough n (%)			Ontario n (%)		
	M	F	Total	M	F	Total
0-9	279 (5.1)	216 (4.5)	495 (4.8)	23,222 (8.6)	18,921 (7.7)	42,143 (8.2)
10-19	357 (6.6)	453 (9.4)	810 (7.9)	18,156 (6.8)	22,022 (8.9)	40,178 (7.8)
20-29	1,718 (31.7)	1,385 (28.8)	3,103 (30.3)	66,747 (24.8)	61,753 (25.0)	128,500 (24.9)
30-39	1,160 (21.4)	929 (19.3)	2,089 (20.4)	53,341 (19.8)	44,324 (18.0)	97,665 (18.9)
40-49	936 (17.2)	816 (17.0)	1,752 (17.1)	49,743 (18.5)	49,945 (17.0)	91,688 (17.8)
50-59	522 (9.6)	535 (11.1)	1,057 (10.3)	30,833 (11.5)	28,671 (11.6)	59,504 (11.5)
60-69	272 (5.0)	230 (4.8)	502 (4.9)	14,779 (5.5)	14,736 (6.0)	29,515 (5.7)
70-79	123 (2.3)	137 (2.9)	260 (2.5)	8,315 (3.1)	8,905 (3.6)	17,220 (3.3)
80+	60 (1.1)	109 (2.3)	169 (1.7)	3,684 (1.4)	5,548 (2.2)	9,232 (1.8)
Total	5,427 (53.0)	4,810 (47.0)	10,237	268,820 (52.1)	246,825 (47.9)	515,645

Between 2003 and 2012, youth and young adults between the ages of 20 to 34 in Peterborough had the highest age-specific rates of ED visits due to DOC. Specifically, young adults aged 25 to 29 had the highest rate at 1,853.0 visits per 100,000 people during this time frame followed by those aged 30 to 34 at 1,759.8 visits per 100,000. Older adults 90 years of age and older had the lowest rate at 136.7 per 100,000 (Figure 17). A similar pattern of the distribution of ED visits also exists in Ontario with higher rates among young adults and smaller rates among older adults. However, age-specific rates in Peterborough were an average of 1.6 times greater than the province. The rate ratio (RR) was three times greater among 30 to 34 years old; rates among Peterborough youth and young adults aged 15 to 44 were on average 2.4 times greater than the province.

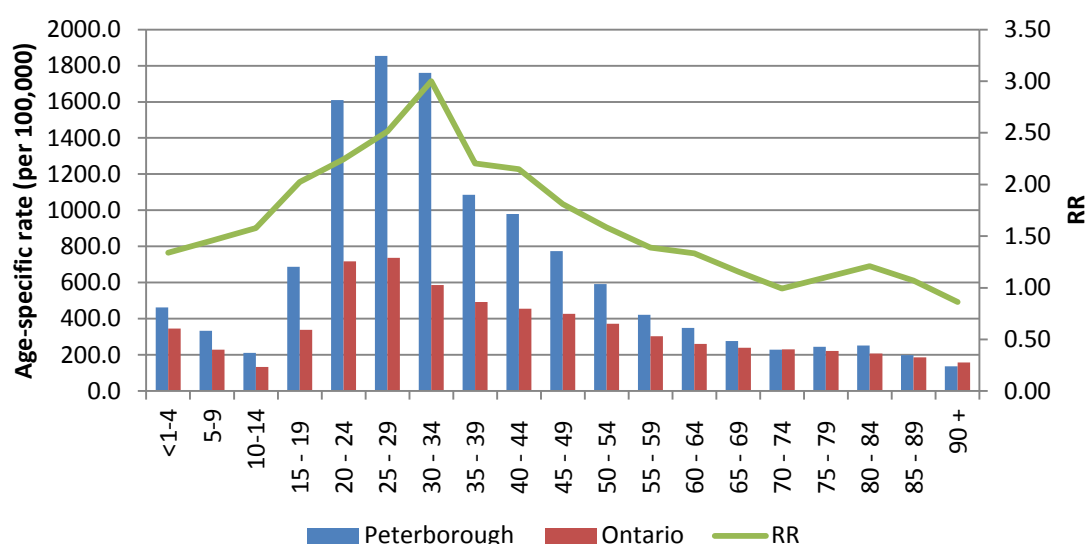


Figure 17. Age-specific rates of DOC ED visits by age group, Peterborough and Ontario; 2003-2012

Standardized rates of ED visits due to DOC have in general decreased since 2003 among Peterborough men, though were stable between 2009 and 2012 (Figure 18). Among Peterborough women, rates decreased between 2004 and 2007 and have since been stable. In Ontario, rates of ED visits due to DOC among men and women have increased steadily between 2003 and 2012 by approximately 35.8% and 30.6%, respectively. However, despite the increases provincially, rates of visits in Peterborough were nearly double that of the province in 2012: the rate among men in Peterborough was 1.9 times greater than Ontario; among women, rates were 1.8 times larger.

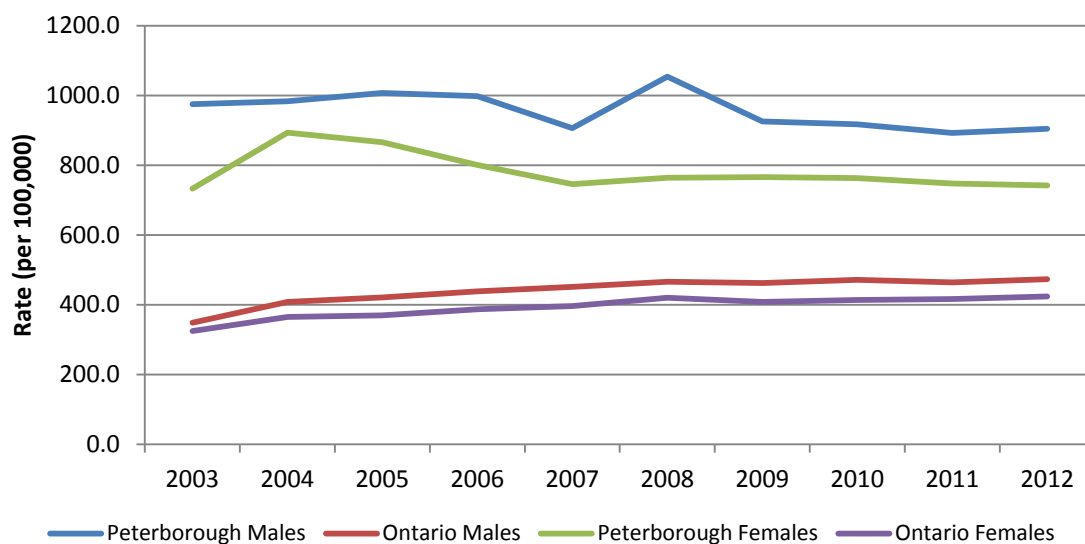


Figure 18. Standardized rates of ED visits due to Doc, Peterborough and Ontario; 2003-2012

Visits to the ED can be further sub-classified in order to better understand of the types of DOC diagnoses that are occurring. Diseases of the pulp and periapical tissues (K04) accounted for a third (34.4%) of ED visits in Peterborough between 2003 and 2012, similar to 33.9% in Ontario (Table 7). Visits of this type include localized infections at the tip of the root of a tooth. The next most common visit was “other disorders of teeth and supporting structures” (K08). The K08 code (“other disorders”) includes toothaches and accounts for just over one quarter of the ED visits in Peterborough and Ontario (29.7% and 27.4%, respectively). Dental caries (K02) accounted for 6.3% of the visits; stomatitis, or inflammation of the mouth (K12) at 6.2%; and diseases of the salivary glands (K11) at 5.7%. The frequency at which different visit types occur in Peterborough is similar to Ontario.

Table 7. Five most frequent DOC ED visit types by ICD-10 code, Peterborough and Ontario; 2003-2012

ICD-10 Code	Peterborough n (%)			Ontario n (%)		
	Males	Females	Total	Males	Females	Total
K04	2,034 (37.5)	1,485 (30.9)	3,519 (34.4)	96,294 (35.8)	78,405 (31.8)	174,699 (33.9)
K08	1,701 (31.3)	1,338 (27.8)	3,039 (29.7)	76,412 (28.4)	64,801 (26.3)	141,213 (27.4)
K02	396 (7.3)	245 (5.3)	650 (6.3)	16,487 (6.1)	11,230 (4.5)	27,717 (5.4)
K12	318 (5.9)	317 (6.6)	635 (6.2)	17,803 (6.6)	18,064 (7.3)	35,867 (7.0)
K11	232 (4.3)	351 (7.3)	583 (5.7)	11,449 (4.3)	13,888 (5.6)	25,337 (4.9)

Key Points:

- On average, there are over 1,000 visits per year to the ED due to DOC among Peterborough residents
- Crude ED rates in Peterborough were over 65% greater than those in Ontario
- Young adults between the ages of 20 and 39 make up over half the ED visits due to DOC
- Age-specific rates varied dramatically by age group
 - Young adults aged 20 to 34 had the highest rates of ED visits
 - The ED rate among 30 to 34 year olds in Peterborough were three times larger than Ontario
- Standardized rates of ED visits in Peterborough were nearly twice as high as those in Ontario
- Diseases of pulp and periapical tissues (e.g.: abscesses) and other disorders of teeth and supporting structures (e.g.: toothache) were the most common ED visit types in Peterborough accounting for over half of visits

3.2 Oral Cancers

Oral cancer is any abnormal growth and spread of cells occurring in the mouth cavity including the lips, tongue, roof of the mouth, under the tongue, gums, and inside the lips and cheeks. Tobacco and alcohol are the two most important risk factors for oral cancer and the risk is even higher when these two factors are combined. Other risk factors for developing oral cancer include human papillomavirus (HPV), sun exposure to the lips, and a diet low in fresh fruits and vegetables. The incidence of oral cancer is highest after the age of 40.

Between 1986 and 2007 there were 395 new cases of oral cancer diagnosed among Peterborough residents, the majority of which (265, or 67.1%) occurred in males (Table 8). The incidence rate of oral cancers between 1986 and 2007 was significantly higher among Peterborough males (15.9 cases per 100,000) compared to females (6.4 per 100,000). A slight majority of males (51.1%) and females (56.5%) diagnosed with oral cancer in Peterborough between 1986 and 2007 were 65 years of age or older. Peterborough women between the ages of 45 to 64, 65 to 74, and those aged 75 and older had significantly lower rates of oral cancer than men in those age groups. Peterborough women aged 45 to 64 had significantly higher incidence rates than their provincial counterparts.

Compared to some other common cancers, deaths due to oral cancer are not frequent in Peterborough: there were 140 deaths due to oral cancer between 1986 and 2007 and only 12 deaths in 2007. Males also account for the majority (98, or 70.0%) of oral cancer deaths. Mortality rates of oral cancers between 1986 and 2007 were significantly higher among Peterborough males (5.8 deaths per 100,000) compared to females (2.0 per 100,000). Approximately two-thirds of oral cancer deaths in Peterborough males (64.2%) and females (61.0%) between 1986 and 2007 occurred among those aged 65 and older. Peterborough women ages 45 to 64, 65 to 74, and those 75 and older had significantly lower oral cancer mortality rates than men. Peterborough women aged 45 to 64 had significantly higher rates than their provincial counterparts.

Table 8. New cases, deaths, and incidence and mortality rates per 100,000 of oral cancer by gender, Peterborough; 1986-2007

Time Period	Males events (rate)		Females events (rate)	
	New Cases	Deaths	New Cases	Deaths
1986-2007	265 (15.9)	98 (5.8)	130 (6.4*)	42 (2.0*)

* significantly different

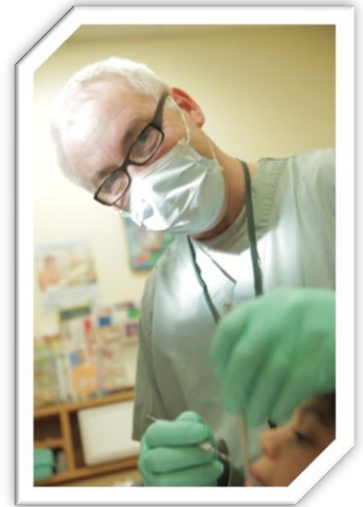
Key Points:

- Peterborough men have significantly higher incidence and mortality rates of oral cancer than women
- Peterborough women aged 45 to 64 had significantly higher rates of oral cancer incidence and mortality compared to Ontario women of the same age
- Deaths from oral cancer are rare in Peterborough

Section 4: Discussion & Recommendations

4.1 Discussion

In general, Peterborough residents have excellent oral health behaviours; most have visited the dentist in the past 12 months and brush their teeth twice or more per day. However, half of residents report oral or facial pain in the past month, which may be indicative of oral health issues. The data also suggests areas of concern in terms of affording oral care: over half of the people who had not visited a dentist in the past three years cited cost as the main reason. Also, only two thirds of Peterborough residents over the age of 12 are insured for dental care which was shown to be a significant factor in visiting a dentist. Most dental care insurance was employee sponsored implicating employment as a contributing factor to receiving oral care. In addition, a smaller proportion of people with lower income had dental insurance: seven out of ten people living in high income have dental insurance compared to four out of ten in low income. Higher incomes are likely related to gainful employment, which is in turn related to dental care insurance resulting in improved access and affordability of dental care; however, no analyses of the available data were conducted to verify this statement.



In addition to the affordability of dental care and the disparity of accessing care between the insured and the uninsured, other priority groups are made evident in this report. A smaller proportion of older adults over the age of 65 had visited the dentist in the past year compared to other age groups. In addition, smaller proportions of older adults had dental insurance or brushed their teeth regularly compared to other age groups. Finally, over one quarter of older adults only visited a dentist for emergency care. The inability to pay for dental care is a major barrier for adults, especially adults with low incomes.

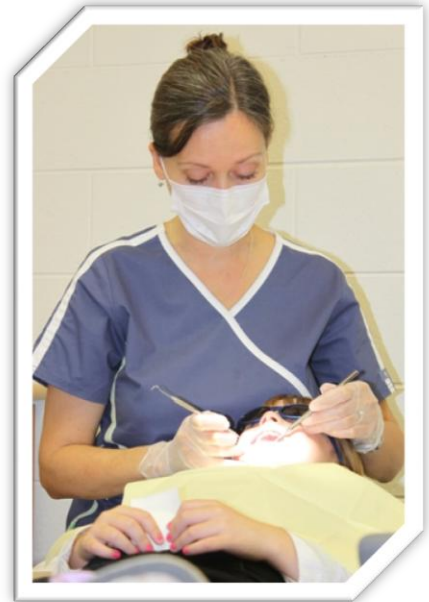
When people experience an oral health crisis or are unable to access or afford dental care they are likely to visit an ED for care. Based on the volume of visits to the ED due to diseases of the oral cavity, salivary glands, and jaws (an average of 1,000 per year) and the standardized rates of visits being nearly double those of the province, there is apparent need for improved access to timely, affordable dental care in this community. This is all the more evident among young adults between the ages of 20 and 39 who account for half of the ED visits and who age-specific rates of ED visits were as much as three times greater than Ontario. Approximately two-thirds of the ED visits between 2003 and 2012 were due to oral health issues that were likely preventable such as infections at the root of a tooth and toothaches. Improved access to affordable timely dental care and improved oral health behaviours may reduce the need for ED visits for diseases of the oral cavity.

4.2 Recommendations

Based on the data presented in this report, PCCHU has the following recommendations for action:

- Continue to promote and support policies and provision for residents of Peterborough City to have access to optimally fluoridated community drinking water, and advocate for provincial coordination and incentives to provide CWF.

- Maintain, and expand where possible, the current level of data collection concerning oral health including expanding use of the Ministry of Health and Long-term Care's Oral Health Information Support System (OHISS) to enable: analysis of trends and changes; business and program planning; dental health centre sustainability; engaging and working with new partners; and supporting provincial expansion of publically funded dental services.
- Continue to improve access to dental services for underserved populations by ensuring the sustainability and long-term viability of community dental health centre at its full capacity.
- Continue to remove barriers to accessing dental services by optimizing the utilization of the mobile dental health centre.
- Explore the feasibility of expanding the overall scope of services offered in the mobile and community dental health centre, including denture plans, by exploring opportunities available through other community partners.
- Work in partnership with community champions and advocates to maintain emergency dental funding for residents not able to afford dental care and expand eligibility criteria to current oral health programs and services.
- Develop health promotion activity to expand capacity building within community to improve oral health behaviours and knowledge.



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