

INFORMATION REPORT

TO: Mayor and Members Board of Health	WARD(S) AFFECTED: CITY WIDE
COMMITTEE DATE: April 22, 2013	
SUBJECT/REPORT NO: Oral Health Status Report (BOH13015) (City Wide) (Outstanding Business List Item)	
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Council Direction:

Board of Health at its meeting of April 4, 2012 approved the following: “That the Medical Office of Health and Public Health Services be directed to provide written “Oral Health” reports, beginning in 2013 and thereafter once per term of City Council or as required or requested by the Board of Health”.

Information:

This report reviews the status of oral health in Hamilton (Appendix A). It compares Hamilton’s oral health with that of Ontario and Canada and it outlines existing programs and services that address the oral health needs of Hamiltonians.

As the City of Hamilton works to address the Social Determinants of Health and improve the health and well-being of Hamiltonians, access to care is increasingly recognized as the main barrier to oral health. This report offers an in-depth review of the social determinants of health and how they affect oral health outcomes.

Most dental care is not covered by OHIP and so people must pay for care. Payment for dental care comes from a variety of sources. Many people have dental coverage as an employee benefit or purchase private policies. Others pay out-of-pocket for care and a small number qualify for publicly-funded care. Many of the various public programs have restrictive eligibility requirements and are difficult to navigate and Ontario's Chief Medical Officer, Dr. Arlene King, has described these as "a patchwork of services" that leave many in need without access to care.

There are clear differences in oral health status across income levels in Hamilton. People with lower incomes tend to have far worse oral health than those with middle or higher incomes. The greatest need for care is concentrated in priority neighbourhoods.

The mouth is the gateway to the body and oral health is integral to good overall health. Poor oral health can also have an impact on emotional health, social relationships and economic activities. These individual-level outcomes combine to create far-reaching effects on the very fabric of society. The economy is directly affected by lost work and school days, and in expensive emergency healthcare costs from untreated dental problems. The effects of poor oral health reinforce barriers and increase the inequities in accessing care.

This report presents an overview of Public Health Services dental programs. This outlines how the dental team delivers programs and services to support Hamiltonians to access and receive dental care. The report includes results from mandated programs that will provide baseline evidence for future program planning and delivery of services.



City of Hamilton Oral Health Report 2013



Hamilton

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List of Abbreviations

ACSD	Assistance for Children with Severe Disabilities
CINOT	Children in Need of Treatment
JK	Junior Kindergarten
LICO	Low Income Cut-off
MCSS	Ministry of Community and Social Services
MOHLTC	Ministry of Health and Long-Term Care
NIHB	Non-Insured Health Benefits
ODSP	Ontario Disabilities Support Program
OHISS	Oral Health Information Support System
OPHS	Ontario Public Health Standards
PHS	Public Health Services
SK	Senior Kindergarten
WHO	World Health Organization

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Executive Summary

This report reviews the status of oral health in Hamilton. It compares Hamilton's oral health with that of Ontario and Canada. It also outlines how the Public Health Services dental teams deliver programs and services to support Hamiltonians to access and receive dental care. The report includes results from mandated programs that will provide baseline evidence for future program planning and delivery of services.

As the City of Hamilton works to address the Social Determinants of Health and improve the health and wellbeing of Hamiltonians, access to care is increasingly recognized as the main barrier to oral health. This report offers an in-depth review of the social determinants of health and how they affect oral health outcomes.

Most dental care is not covered by OHIP and so people must pay for care. Payment for dental care comes from a variety of sources. Many people have dental coverage as an employee benefit or purchase private dental insurance policies. Others pay out-of-pocket for care and a small number qualify for publicly-funded care. Many of the various public programs have restrictive eligibility requirements and are difficult to navigate. Ontario's Chief Medical Officer, Dr. Arlene King, has described these as "a patchwork of services" that leave many in need without access to care(1).

There are clear differences in oral health status across income levels in Hamilton. People with lower incomes tend to have far worse oral health than those with middle or higher incomes. The greatest need for care is concentrated in Hamilton's priority neighbourhoods.

The mouth is the gateway to the body and oral health is integral to good overall health. Poor oral health can affect emotional health, social relationships, and economic activities. These individual-level outcomes combine to create far-reaching effects on the very fabric of society. The economy is directly affected by lost work and school days and in expensive emergency healthcare costs from untreated dental problems. The effects of poor oral health reinforce barriers and increase the inequities in accessing care.

Introduction

Oral Health is integral to good overall health and this report presents an overview of the oral health of residents of the City of Hamilton. National and provincial data have been used to compare results to measure how Hamiltonians are faring in comparison to Ontarians and Canadians. This report offers an in-depth review of the social determinants of health and how they affect oral health outcomes. An overview of Public Health Services Dental programs is presented and discusses how the dental team delivers programs and services to support City of Hamilton residents in accessing and receiving dental care. Finally, results from provincially mandated programs are provided as a baseline for future program planning and delivery of services.

Section 1

The important link between oral health and overall health

The mouth is connected to the body so what happens there affects the health of the entire body. Most dental care in Ontario is privately-funded and therefore separate from the publicly-funded healthcare system. Perhaps this is why oral health is often thought to be separate from overall health. But, oral health is about more than cavities and clean white teeth. Poor oral health has also been linked to other diseases and serious health conditions that are not usually thought of as having a connection to the mouth (1, 2).

Periodontal disease, also known as gum disease, affects the structures surrounding the teeth that keep them in place. Disease in these structures caused by oral bacteria, produce inflammation of the gum tissue (gingivitis) or inflammation of the bone (periodontitis). Over time, the attachment between the gum and the tooth breaks down. Gum disease on its own can be extremely serious, but there is a growing body of scientific evidence suggesting a relationship between periodontal disease and a number of serious health conditions. For example, diabetic patients are more likely to develop periodontal disease, which in turn can increase blood sugar and diabetic complications.

Several studies have shown that periodontal disease is associated with an increased risk of heart disease. Research has shown treating inflammation may not only help manage periodontal diseases, but may also help with the management of other chronic inflammatory conditions (3).

Oral cancer is any abnormal growth and spread of cells occurring in the mouth, including the lips, tongue, gums, inside of the lips and cheeks, floor of the mouth, salivary gland, tonsil, oropharynx, back of the throat, and roof of the mouth. The actual cause of oral cancer is not known but risk factors include: age, using tobacco products, Human Papilloma Virus (HPV), sex/genetics, poor diet, and sun exposure. Treatment depends on the severity and location of the disease, as well as the age and health of the patient. Oral cancer can be successfully treated if caught at an early stage. If not treated early, the cancer can spread to other parts of the body and becomes more difficult to treat (4).

Poor oral health can cause:

- Tooth loss
- Gum disease
- Cancers of the mouth, tongue, throat, soft palate
- Mouth & jaw pain
- Soft tissue injuries
- Mouth infections

Poor oral health is linked to:

- In the general population
 - Heart disease & stroke
 - Diabetes
 - Poor nutrition
- In seniors
 - Respiratory infections
 - Rheumatoid arthritis
 - Osteoporosis
 - Alzheimer's
- In pregnant women
 - Premature births
 - Babies born at a low birth weight

Poor oral health can also affect overall quality of life (5). This is more than just physical health, it also includes social and emotional health and work life. People with oral health problems may suffer from poor self-esteem and self-image because of how they view themselves or from the comments of others. This may leave people feeling isolated from the outside world. In children, serious cases of dental decay can damage a child's sense of self-esteem, and

affect school performance, ability to learn and potential to thrive (1). In adults, poor oral health may also lead to financial problems because of the cost of dental treatment or the wages lost due to missed time at work. Oral health problems have a large impact on the economy. For example, every year in Canada, over 4 million work days and 2 million school days are lost due to dental visits or dental sick days (6).

Promotion & Education

Tooth decay and gum disease are almost always easily preventable. Most people know they should see a dentist regularly and take care of their teeth, but they may not know why this helps both their oral and overall health.

It is important people know:

- The possible negative outcomes of oral health problems
- How their oral health affects their overall health
- How to access oral health care
- How to improve/maintain their own and their family's oral health

Oral health promotion and education may not seem to be important, but studies show that they are less costly to the community. This is because they help prevent costly oral health problems from developing by raising awareness of the importance of oral health care (1). Parents have often said, "If I had only known..." when faced with expensive dental treatment for their children and upon learning that the problem was preventable.

The benefits of prevention

There is a popular saying that an ounce of prevention is worth a pound of cure and this is true for oral health. Preventing oral health problems from developing saves a person from more serious, often painful and expensive problems later. There are many ways to help prevent oral health problems including:

- Drinking water treated with fluoride
- Using dental products with fluoride
- Brushing at least two times a day
- Flossing everyday
- Having an oral health check-up by a dental professional every 6-9 months

Treatment

Dental treatment is expensive and time consuming. Dental caries (decay) structurally weaken teeth and each treatment is specific to the client and the dental issue. Regular dental visits and good home care together, help to ensure continued good oral health. Regular check-ups allow for any oral problems to be detected and treated early, thus preventing the need for more extensive and costly procedures.

Most dental care in Ontario is carried out in private dental practices of regulated health care professionals (Dentist, Registered Dental Hygienist). The public healthcare system does not pay for oral health care, so individuals are responsible for paying for their treatment themselves. Many people have dental coverage either through their employment or by purchasing private insurance policies, while others pay out-of-pocket for dental treatment.

Insurance companies offer employers plans, with various covered services, co-payments, and limits. These plans may be purchased and offered as a benefit to employees. Often insurance plans do not cover all treatment options, and may require co-payments by the employee. Thus, even with dental insurance coverage, dental care may remain unaffordable.

Government-funded dental programs, geared mostly toward children, have been described as a “patchwork of services that are complex for clients to navigate” (1).

Fluoride

Fluoride was first added to Canadian drinking water 68 years ago in Brantford, Ontario (7). Due to its safety and success in reducing tooth decay in children, many other communities soon followed suit (7). In Hamilton, fluoridation of city water was approved in 1967 and council again upheld this important public health measure in 2008 (7).

Over 90 national and international professional health organizations endorse the use of fluoride to prevent dental cavities (8). These include the World Health Organization, Health Canada, the Canadian Public Health Association, the Canadian Dental Association, and the Canadian Medical Association (8). These organizations support fluoride in water and in dental care products (e.g. toothpaste, mouthwash) because numerous studies have found that fluoride is safe and effective in preventing cavities and strengthening teeth. Again, because oral health affects general health, strengthening teeth and reducing cavities improves the health of the entire body.

One of the greatest benefits and important reasons for adding fluoride to the public water supply is that the entire community benefits. Many people cannot afford to visit a dentist, or buy toothbrushes, toothpaste, or dental floss. These people are more likely to suffer from oral health issues than those who can afford oral home care items. However, anyone who drinks city water gets the benefit of fluoride and city water is readily available to all Hamilton residents. Adding fluoride to city water is one way to address this income-related health inequity while also helping to prevent tooth decay.

When fluoride is added to public drinking water it helps decrease cavities by:

- Up to 60% in children's 'baby' teeth
- Up to 35% in children's permanent teeth
- 20-40% in adults and seniors through lifelong exposure

(35)

Section 2

The Social Determinants of Health and Oral Health

Most Canadians enjoy good health and equitable access to health care services; however, there are still inequities that exist in Canada. The following conditions or factors are known as the broad determinants of health for Canadians (9):

- Income and social status
- Education and literacy
- Social and physical environments
- Healthy child development
- Health services
- Culture
- Social support networks
- Employment/working conditions
- Personal health practices and coping skills
- Individual biology and genetics
- Gender
- Language

The World Health Organization (WHO) defines the *social determinants of health* as...

“The conditions in which people are born, grow, live, work and age, including the health system. These circumstances are shaped by the distribution of money, power, and resources at global, national, and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries” (40).

This means the factors and conditions in which people live affect both their overall health and oral health. The City of Hamilton has implemented numerous strategies to reduce inequities in health by addressing these broader issues; a good example in the Neighbourhood Development Strategy.

A 2012 Public Health Ontario report on access to dental care and oral health reveals that income, insurance status, age, and education are strongly associated with access to dental care (10). In that report, about 4 in 5 Ontarians

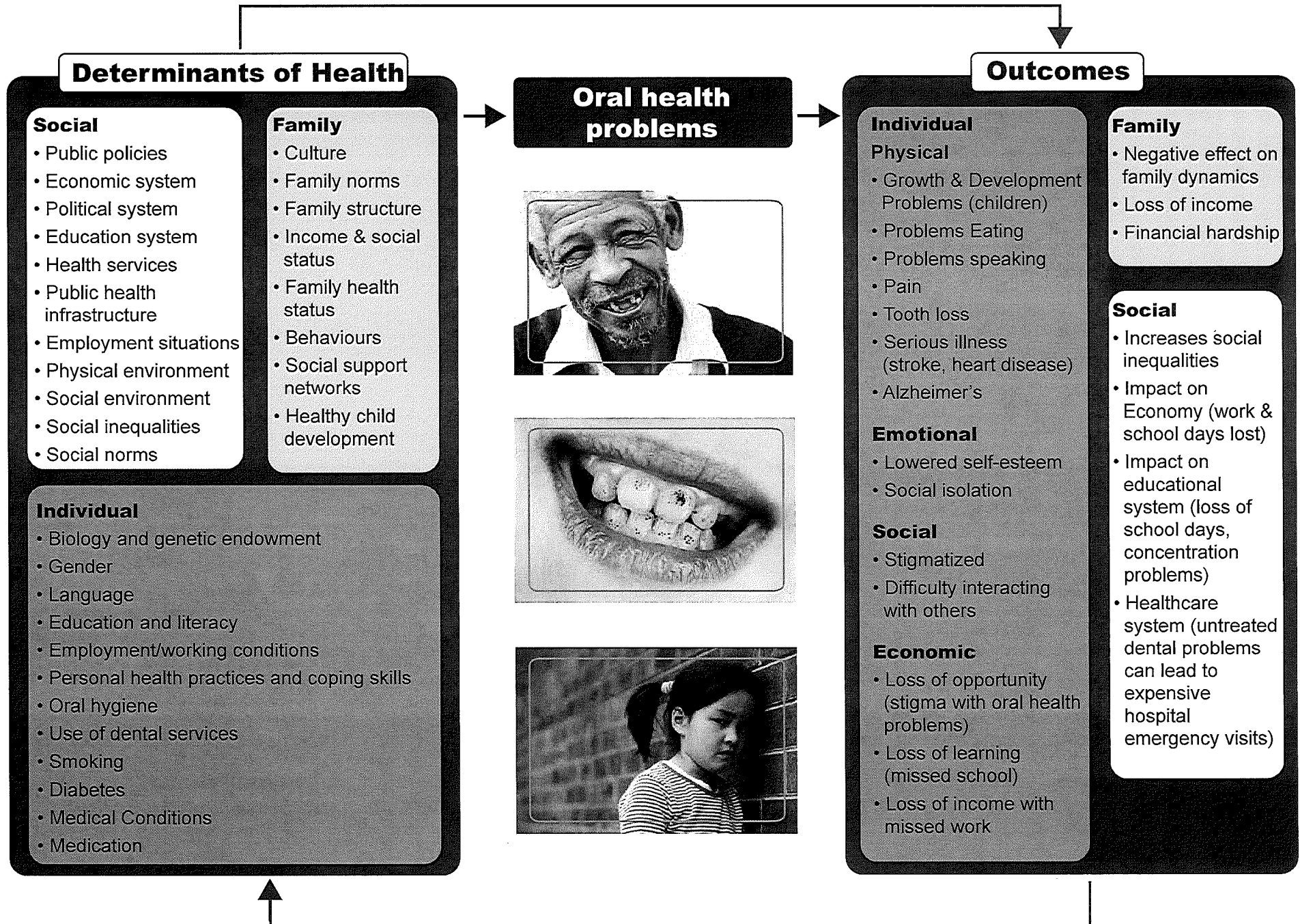
report the reason they usually visit a dentist is to prevent dental problems, but 1 in 5 report they visit a dentist only for emergency care (10). People who visit a dentist only for emergency care were more likely to have lower incomes, no dental insurance, less than secondary school graduation, and be 65 years of age and older (10). Quinonez & Figueiredo (2010) state “there is a strong social gradient to inequalities in oral health” (11).

Poor oral health is often affected by the social determinants of health, with the burden of dental diseases falling upon:

- Low-income families
- People without dental insurance coverage
- Certain age groups: Children & seniors
- New immigrant populations
- People with low levels of education

Since dental care is not publicly funded, multiple determinants of health from Figure 1 create barriers to accessing oral health care services. In fact because of access, the impact on oral health is greater than on general health (12). The inability to access dental services is reflected in the outcomes, with profound affects to the individual, the family and society. Furthermore, some of the outcomes themselves become future determinants of oral health (i.e. being unable to afford treatment may cause treatment delay, more serious complications, pain, time lost from work and lost wages). This leaves people who are the most likely to need dental care the least likely to get it (13).

Figure 1: Determinants & outcomes of poor oral health



How Dental Treatment is Paid

There are several ways to pay for dental care in Canada. About 60% of Canadians have dental insurance coverage through their employer, 5% are covered by government programs and 35% do not have any form of insurance and pay for all dental expenses out of pocket (13, 14).

In Canada, dental treatment is paid in one of three ways:

- Through an employee benefit package
- Through government programs
- Out of pocket

Not having dental insurance coverage and being low-income are the two most outstanding barriers to accessing dental care. Among Ontarians who did not visit the dentist within the past 3 years, 1 in every 5 adults refers to cost as a barrier (1, 15). Lack of dental insurance coverage is consistently associated with poorer oral health outcomes (11) and uninsured children receive fewer dental services than insured children (16). In comparison, people with dental insurance are more likely to report having a yearly dental visit, better oral health, fewer teeth removed, keeping their natural teeth and better oral health habits (10).

Table 1: Dental insurance coverage in Hamilton, by age & income

		Age Group (years)			
		12-19	20-44	45-64	65+
Income Group	Low	57.7%	49.3%	60.0%	28.4% ^E
	Mid	83.7%	79.3%	83.6%	47.0%
	High	82.0%	89.5%	76.5%	50.0% ^E

^E= Interpret with caution due to high sampling variability

Source: Canadian Community Health Survey (CCHS), 2009/10, Share File, Ontario
Ministry of Health and Long-term Care (17)

Less than half (48.4%) of Hamiltonians with low incomes have dental insurance, compared to 75.8% in the middle income group and 79.9% of the high income group (17). Ontario values are similar. When this data is broken down by age, it is clear that older adults have less coverage than others. Table 1 shows that Hamiltonians with low incomes of all ages reported lower levels of dental insurance than those with mid or high incomes, but that adults 65+ have the lowest levels of coverage.

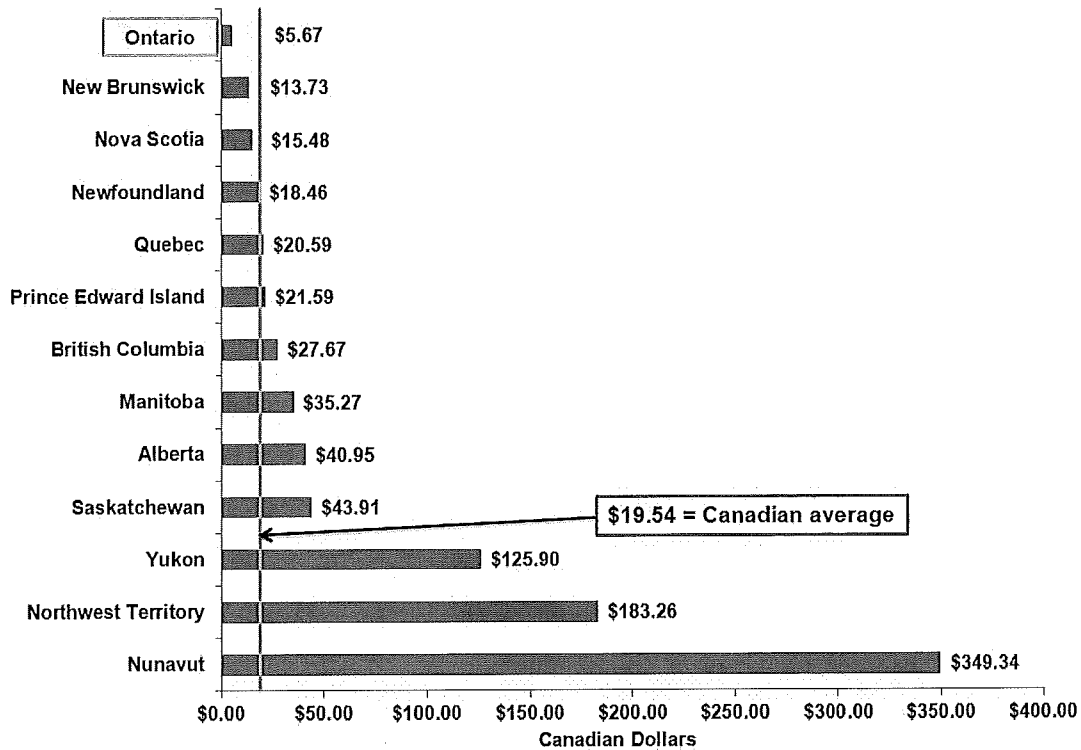
In Canada, government programs pay for approximately 5% of dental treatment, but this figure is much lower in Ontario at only 1.3% (1). Ontario pays the lowest amount for dental care at only \$5.67 per person (Figure 2). This amount is well below the national average of \$19.54 and startlingly different from the \$349.34 per person spent in Nunavut. Per person, spending in Ontario has been decreasing since 2001, even though the cost of dental care has been increasing (18). This leaves low-income families with more costs and fewer options (18).

Figure 3 shows that both Hamilton and Ontario residents in high and medium income groups were one and half times more likely to visit a dentist in the past 12 months than people in the low income group.

The same results are consistent with other Ontario reports. Furthermore, people with low and low-middle incomes (i.e. \$15,000- \$29,000) report poorer oral health, more tooth loss within the past year, experiencing more social limitations due to oral health conditions, as well as experiencing more pain and discomfort than those from higher income groups (10).

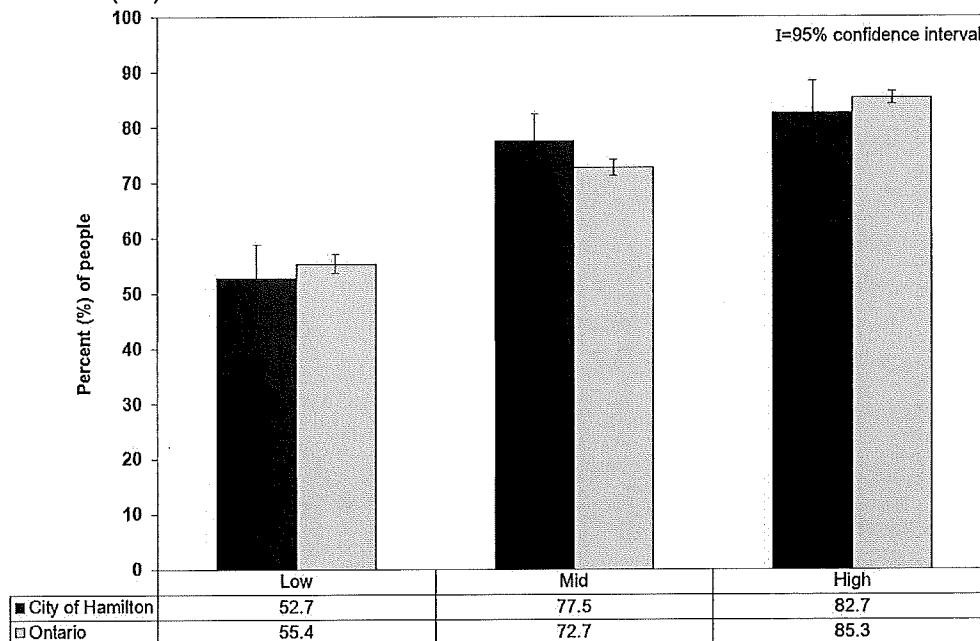
Figure 4 shows that 22.1% of Hamilton residents report having excellent oral health. However, this picture changes when income level is considered. Hamilton residents with low incomes reported fair/poor levels of oral health almost one and a half times more often than people with middle incomes (23.7 vs. 15.1%), and almost three times more often than those in high income group (23.7% vs. 8.1%^E). Hamilton residents with high incomes reported very good levels of oral health almost one and half times more often than those with low incomes (42.0% vs. 28.7%). Provincial values are similar (not shown).

Figure 2: Average per person public spending on dental care, by province/territory



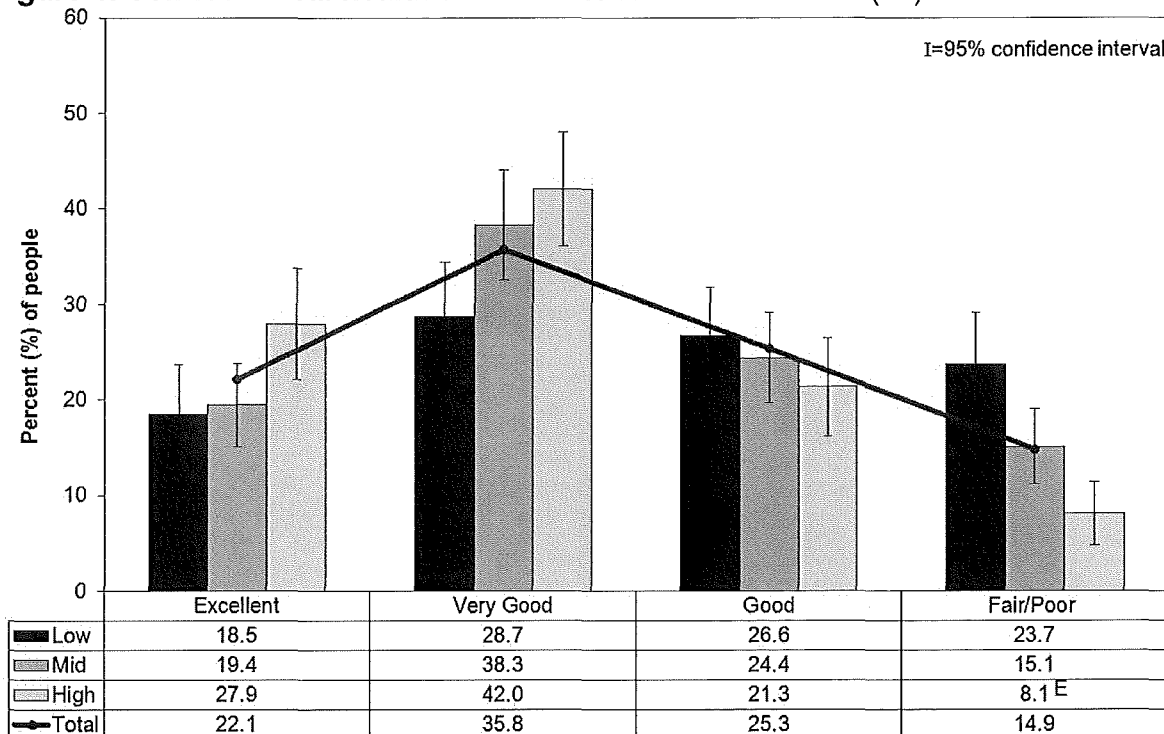
Source: Canadian Institute for Health Informatics, National Health Expenditure Database, 2010

Figure 3: Dental visits in the last year, by income level in Hamilton & Ontario (17)



Source: Community Health Survey 2009/10, Share File, Ontario Ministry of Health and Long-term Care

Figure 4: Self-rated oral health and income level in Hamilton (17)



Source: Community Health Survey 2007/08, Share File, Ontario Ministry of Health and Long-term Care
E=interpret with caution due to high sampling variability

Oral health problems can affect how people feel about themselves and how others treat them. Oral health problems can also cause a considerable amount of pain. This pain can affect other areas of their lives.

Table 2: People experiencing social isolation or pain or discomfort due to a dental health issue

	Social Isolation Past Year	Pain or Discomfort Past Month
City of Hamilton	3.5% ^E	51.7%
Ontario	3.5%	45.5%

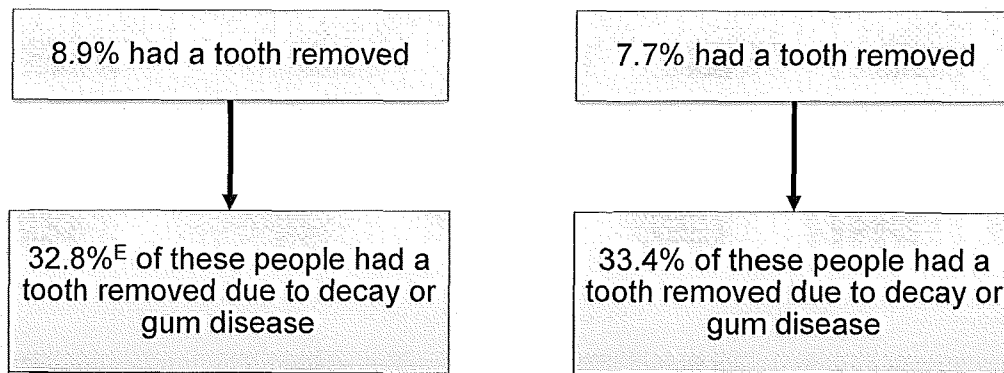
E= Interpret with caution due to high sampling variability

Source: Canadian Community Health Survey (CCHS), 2009/10, Share File, Ontario Ministry of Health and Long-term Care (17)

More than half of Hamilton residents experience pain due to dental health issues. Table 2 shows 3.5% of Hamilton residents experienced some type of social isolation because of an oral health problem in the past 12 months. More

than half (51.7%) of Hamilton and 45.5% of Ontario residents had pain or discomfort because of an oral health problem within the past month. There are differences between income groups. For example, in Ontario more low income residents (48.4%) reported experiencing pain than those in the high income group (42.9%) (not shown (17)).

Figure 5: People who had a tooth removed in the last 12 months
Hamilton **Ontario**



E=Use caution when interpreting due to high sampling variability.

Source: Canadian Community Health Survey (CCHS), 2009/10, Share File, Ontario Ministry of Health and Long-Term Care (17)

Figure 5 shows that almost 9 % of Hamilton residents who sought dental treatment in the previous 12 months had a tooth removed. Yet almost twice as many people in the low income group had a tooth removed as those in the high income group (12.2% vs. 6.3%) (not shown (17)). Of all people who had a tooth removed, almost one third of them (32.8%) were removed due to dental decay or gum disease (Figure 5). People with lower incomes are less likely to be able to pay for treatment, and are more likely to delay seeking care. Delaying care until a problem is painful can result in more serious complications and higher costs. This is an inequitable outcome that occurs most often for those with lower incomes.

Children

Children are most vulnerable to poor oral health for two reasons:

- Children rely on parents and caregivers to take care of their health
- As children grow and develop their oral health problems will have a greater impact on their overall health (36).

Children from low-income families have 2.5 times more decay than children from high-income families (18). Children from low-income families are less likely to receive comprehensive oral health care. These children are also more likely to have critical oral health problems that require emergency care than children from middle to high income families (19).

Since parents influence children's attitudes and behaviors, their influence can affect everything from developing good dental habits, eating choices, fear of the dentist, and views on the importance of oral health and baby teeth (20). Yet, poor dental habits and poor food choices are major contributors to developing dental decay. The results of poor oral health affect overall health, interfere with academic performance, and impede social development, good nutrition, growth and development. In the long run, poor oral health affects overall health and increases health care costs to society (16).



Parents with low incomes, from minority populations, and parents who are unemployed are all associated with low use of preventive dental services and having children with high rates of tooth decay (21). In Canada over 2 million school days are lost annually due to dental visits or dental sick days (1). Furthermore, children with early childhood cavities (caries) have more oral health problems as adults (22).

When trying to meet competing financial demands on a limited income, the working poor experience an even more uncertain situation. Because they are

employed, these families may not be eligible for government-sponsored programs. Yet, even if they do have dental coverage benefits through their employer, it may not cover the necessary dental treatments (23).

Beyond the economic burden families face, other factors create barriers and affect oral health and access to care including; transportation, geographic isolation, taking time off work, housing instability, fixed monthly costs, food insecurity, and affordable nutritious foods (27, 37-39). Other barriers people may experience when trying to access dental care include language or low literacy skills, excessive bureaucracy, and lack of information (41).

The good news is that early prevention is vital to positive oral health outcomes for children. Dr. King (2012) indicated that preschool aged children who received preventive dental care were more likely to receive follow up preventive care and experienced overall lower dental health costs (1).

Seniors

Seniors may also face barriers accessing dental services due to cost, limited physical and cognitive abilities, and transportation issues. Only 39% of Hamilton seniors (65+) have dental insurance coverage (17). Only 55% of Hamilton seniors had a dental visit in the previous 12 months, while 36% stated they usually only visit a dentist for emergencies (17). About 35% of seniors in Ontario (65+) have dental insurance coverage (17). Only 58% of Ontario seniors had a dental visit in the previous 12 months, and 30% stated they usually only visit a dentist for emergencies (17).

As seen previously in Table 1, fewer Hamilton seniors reported having dental insurance compared to residents in the youngest age group (12-19) at all income levels: low-income (28.4% vs. 57.7%) middle income (47.0% vs. 83.7%), and high income (50.0% vs. 82.0%). Many seniors may lose their dental coverage at retirement and/or age 65. A minority of seniors have dental benefits

extended past retirement by their employer/union, while others may have the funds to purchase dental insurance. However, these seniors are typically in the high or mid income groups. Special packages may also be offered to retiree groups for purchase (i.e. retired teachers). These packages are expensive to purchase and those seniors living on Old Age Pension and Old Age Security may not be able to afford to purchase private dental insurance.



As people age their oral health may be affected by factors including medication, medical conditions, and limited mobility that may affect oral hygiene habits (24). Accessing dental treatment for seniors in long-term care facilities is even more restrictive. As health declines, seniors must rely on others to take care of their teeth. In Ontario, there are no provincial programs to support seniors. However, some local municipalities offer dental coverage to assist this population.

Other Barriers to Oral Health Care

Education level is also associated with oral health status. For example, those with less than a secondary school education have the highest amount of tooth loss, and experience more social limitations due to oral health conditions (10, 25).

Ethnic, minority populations and new immigrants also experience poorer oral health outcomes and report dental treatment (versus dental prevention) as the main reason for dental visits (10, 26). Those born outside of Canada have fewer teeth and more untreated decay (27).

The inequities that exist with respect to oral health care are deep and have serious outcomes, but are addressed in the Ontario Public Health Standards (OPHS), which articulate expectations for Ontario's boards of health, as they fulfill their responsibilities to provide public health programs and services that contribute to the physical, mental and emotional health and well-being of all Ontarians. The OPHS Child Health Program, the goal of which is "to enable all

children to attain and sustain optimal health and developmental potential,” specifies a societal outcome related to oral health – “an increased proportion of children have optimal oral health” (28).

Section 3

Snapshot of Oral Health in Ontario

In February 2007 Moira Welsh, a Toronto Star reporter ran a story on Jason Jones, a young man who had his teeth removed due to painful dental problems, and was unable to afford to replace his teeth. He looked like an elderly man; his health was affected, he could not speak or eat properly and could not find employment.

When the story ran:

“He spoke for the thousands who spent a lifetime in poverty with little or no access to dental care, especially the preventive treatments that save teeth, health, and jobs” (34).

The inequities in oral health persist and these issues need to be addressed. Add to this the current economic climate and dental programs are again in the forefront. Politicians and professionals from many disciplines are trying to answer the question ‘how can we make this work better with what we have’. A number of reports have been written over the past 18 months that identify and address these issues.

- April 2011** **Putting Our Money where Our Mouth is: The Future of Dental Care in Canada.** *Canadian Center For Policy Alternatives* (13)
- April 2012** **Oral Health- More than Just Cavities,** *A report by Ontario's Chief Medical Officer of Health, Dr. A. King* (1)
- July 2012** **Report on Access to Dental Care and Oral Health Inequalities in Ontario.** *Public Health Ontario* (10)
- October 2012** **Staying ahead of the curve: A unified public oral health program for Ontario?** *Ontario Association of Public Health Dentistry, University of Toronto Faculty of Dentistry, Association of Local Public Health Agencies, Association of Ontario Health Centres* (39)
- January 2012** **Canadian Pediatric Society Position Statement- Oral health care for children-a call for action.** *Canadian Pediatric Society* (18)

In an effort to address gaps in oral health care for children and as part of the Ontario Poverty Reduction Strategy, the Ontario government initiated two publicly funded programs, Children in Need Of Treatment (CINOT) expansion program (2009) and Healthy Smiles Ontario (HSO) (2010). These programs provide services for children ages 0-17 but do not address the inequities that continue to exist for adult populations. They also have narrow eligibility criteria that leave many children who are in need unable to access treatment.

Politician Jim Bradley suggests that starting with children is the first step in the Poverty Reduction strategy for Ontario (29). Mr. Bradley's response was prompted by a postcard campaign initiated by the Ontario Oral Health Alliance (OOHA); an oral health advocacy group for adults and seniors. The post card campaign has delivered over 50,000 postcards to Queen's Park to raise awareness of oral health issues for adults and seniors. This group highlights the need for emergency dental care for low-income adults and seniors. They are

also requesting the government repair the current children's oral health programs so they are more efficient and accessible to children and families with low incomes (30).

Dr. Arlene King, Ontario's Chief Medical Officer of Health released a report in April 2012 that further prompted discussion about dental care on a provincial level (1). In her report "*Oral Health: More than Just Cavities*" she expresses serious concern about oral health and the connection to overall health and stresses the importance of both early intervention and preventive dental services for all age groups. She also stresses that early intervention and prevention lead to an overall cost savings for society. Dr. King has four recommendations to improve oral health outcomes for Ontarians, including:

1. Conduct a review of current policies and mechanisms to ensure that all Ontarians have access to optimally fluoridated drinking water
2. Conduct a review of how publicly funded oral health programs and services for Ontarians are monitored and evaluated. The review should include the quality, availability and appropriateness of current data and identification of missing data in order to improve programs and services.
3. Explore opportunities for better integration and/or alignment of low income oral health services in Ontario, including integration and/or alignment with the rest of the healthcare system. This relates predominantly to the client journey, including making it easier for the client to access the care that is needed when it is needed.
4. Explore opportunities to improve access to oral health services as well as awareness of oral health services available to First Nations people in Ontario, with a focus on better integration and/or alignment of the variety of available dental programs.

From the evidence and recent interest expressed by politicians and professionals, changes are needed. For positive changes to occur it is critical that the momentum and attention to oral health is sustained. This will ultimately improve oral health outcomes for all Ontario residents.

Dr. King has described Ontario's publicly-funded dental programs as a "patchwork of services"(2). These services are described in Table 3. The CINOT and HSO programs have the greatest potential to reach the largest number of children; however, their strict eligibility requirements mean that many children who need care cannot get it. The \$20,000 cutoff for HSO has been criticized for being much too low, excluding many children who need care but whose families cannot afford to provide it. Furthermore, if these children have any kind of dental insurance they are not eligible for these programs. However, not all dental coverage is created equal, so even having very poor quality insurance that cannot provide all necessary services makes a child ineligible for CINOT and HSO. This is an inequitable outcome that occurs most often for those with lower incomes.

Table 3: Ontario's dental programs & services for children & youth 17 years of age & younger

Program and Service	Dental Treatment Coverage	Client Group	Funding source
Children in Need of Treatment (CINOT)	Essential dental care, as defined in the CINOT Schedule of Dental Services and Fees; no ongoing care.	For children and youth with identified urgent dental conditions. Children are eligible if they have no dental insurance and the parent/guardian signs a written declaration that the cost of dental treatment would result in financial hardship	Administered by PHS. Funding; 75% MOHLTC 25% City of Hamilton
Healthy Smiles Ontario (HSO)	Regular visits to establish & maintain good oral health; preventive & early treatment services	Children and youth are eligible if their family's adjusted net income is \$20,000/year or less, and have no access to any form of dental coverage	Administered by PHS Funded 100% by PHO
Ontario Works (OW)	Basic dental care and preventive services as defined in the MCSS schedule of services and fees	Children and youth who have parents receiving OW benefits	Administered by Community Services & PHS. Funding: 75% MCSS 25% City of Hamilton
Ontario Disability Support Program (ODSP)	Basic dental services such as: oral examinations, x-rays, fillings and extractions.	Children and youth who have parents receiving ODSP benefits	Administered by Accerta. Funded 75% by MCSS 25% by City of Hamilton
Assistance for Children with Severe Disabilities (ACSD)	Coverage includes services such as oral exams, x-rays, fillings and extractions	Children whose parent receive ACSD	Funded by MCSS
Non-Insured Health Benefits (NIHB)	Covers dental treatment and preventive services and more	Eligible First Nations and Inuit	Administered & funded by Health Canada
Cleft Lip and Palate/Craniofacial Dental Program	Can cover up to 75% of the pre-approved dental specialist treatment costs (not routine dentistry), not covered by private dental insurance	Child has been diagnosed as having a cleft lip and/or palate, a craniofacial anomaly or other severe dental dysfunction	Administered & funded by MOHLTC

Source: Ontario Benefits Directory <http://www.gov.on.ca/en/residents/benefitsdirectory/index.htm>

Section 4

City of Hamilton Public Health Services that Support Oral Health

The City of Hamilton Public Health Services (PHS) dental programs administer services listed in Table 3 as well as those listed below. These include providing dental screenings and following children's progress to treatment, providing preventive and dental treatment services, paying claims for various government dental programs, and providing community outreach activities. Fluoridation of city water is monitored by the Public Health Dentist. PHS operates the dental health bus and dental clinics throughout the city. All dental information and services are listed on the City of Hamilton website:

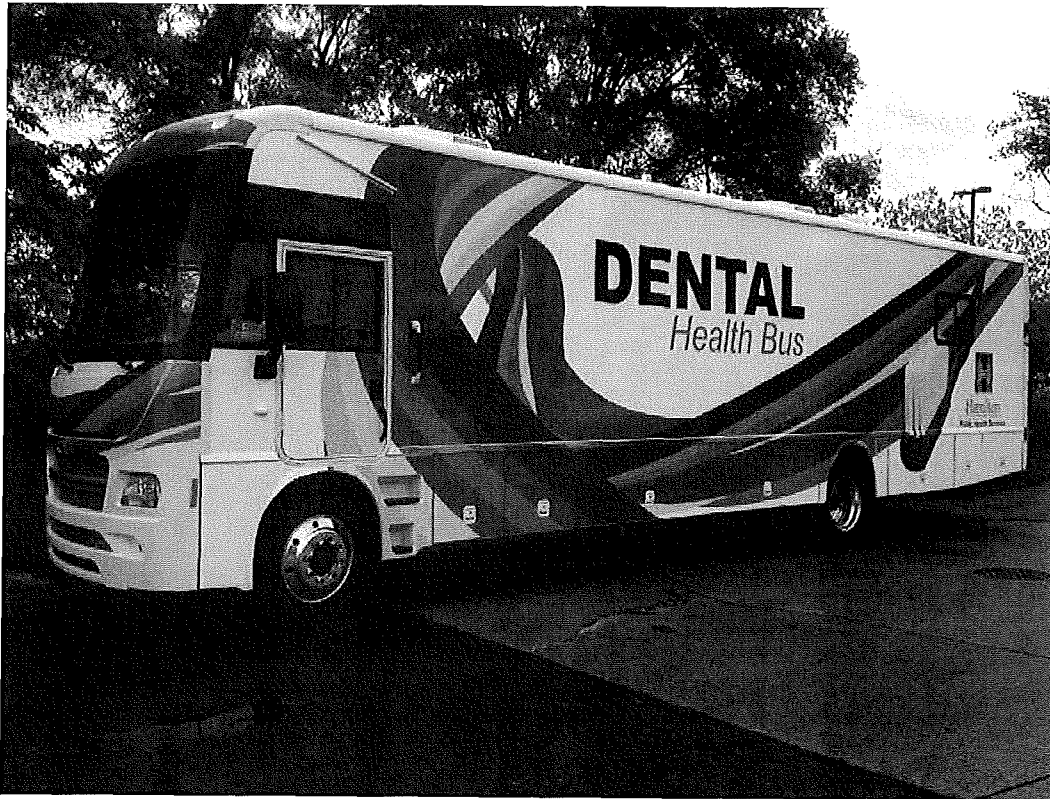
<http://www.hamilton.ca/HealthandSocialServices/PublicHealth/DentalServices/>

Special Supports Program

City of Hamilton residents, who are experiencing dental problems, can apply for Special Supports Program funding for their dental treatment. Residents may be eligible if they do not have dental insurance or dental coverage from any government program, and meet the low income criteria. Dental treatment can be done by dentists in the community. This program is 100% municipally funded.

Dental Health Bus

The dental health bus is a mobile outreach clinic that provides emergency dental services free of charge to residents of the City of Hamilton who have limited finances and no form of dental coverage. The bus is parked at six community locations on a weekly rotational basis. In 2012, the dental health bus provided dental treatment for 1,404 clients but turned away 276 because they were over capacity. The bus staff also provided outreach services including harm reduction services and items (e.g. needle exchange and condoms), personal hygiene supplies and hot and cold items (e.g. hats, scarves, mittens, and socks) to 1,060 clients. This program is 100% municipally funded.



The City of Hamilton received a new dental health bus that was launched in October 2012. The new bus has two dental chairs, which will increase the capacity to offer dental treatment.

Public Health Services Dental Clinic

Residents, who are not eligible for the Special Supports program, can apply to the dental clinic located at 1447 Upper Ottawa Street, unit #8. Applications are reviewed and accepted on an individual basis, with eligibility based on the following criteria:

- Resident of Hamilton
- Low income
- Not having any dental insurance or government dental program

In 2012, the Public Health Dental clinic dentists provided restorative, surgical and various other dental services to over 1,350 clients. Registered Dental Hygienists provided preventive treatment services to over 2,000 clients.

Ontario Works

The Mandatory Dental Program is provided through the Ministry of Community and Social Services (MCSS) for dependent children (0-17 years) whose parents are Ontario Works (OW) recipients and to Ontario Disability Support Program (ODSP) recipients, their spouses and dependent children (0-17 years). MCSS sets the Schedule of Dental Services and Fees for this program. Participants may contact a dentist of their choice, and can receive treatment from this dentist providing the dentist agrees to the fee schedule set by MCSS.

The City of Hamilton also provides discretionary emergency dental benefits to adults (18+) who are participants of Ontario Works (OW), Ontario Disability Support Plan (ODSP) dependent adults (18+) who are not covered on the ODSP dental card, and low-income adults and seniors not on any other social assistance programs. This program covers examinations, restorations, extractions, surgery and limited root canal treatment but does not cover preventive treatments such as scaling, cleaning, and other treatment services including crowns, bridges and orthodontics.

Ontario Public Health Standards

The Ontario Public Health Standards (OPHS) are expectations from the provincial government for Ontario's boards of health to provide public health programs and services that contribute to the physical, mental and emotional health and well-being of all Ontarians. The OPHS for the Child Health Program, state the goal is "to enable all children to attain and sustain optimal health and developmental potential," and specifies a societal outcome related to oral health: "an increased proportion of children have optimal oral health" (1)

City of Hamilton PHS is compliant with the minimum standards required by the OPHS. City of Hamilton, PHS Community Dental Program provides school dental screening for children in Hamilton's elementary schools in accordance with the Ontario Public Health Standards (OPHS) *Oral Health Assessment and Surveillance Protocol* (31).

Elements of this protocol range from detection and identification of oral health issues, to the collection of relevant oral health data. The protocol standardizes oral health assessment and surveillance practices, and the use of the Oral Health Information Support System (OHISS) to collect assessment and surveillance data across the province. The protocol mandates that at a minimum, every child in JK, SK and grade 2 receive an oral health assessment (dental screening). Some schools have additional grades screened. This is based on the school's risk rating, which may be low, medium or high. The school's risk rating is determined by the previous year's screening results of the grade 2 class. The Ministry of Health and Long Term Care (MOHLTC) protocol is used to calculate the risk rating for each school:

$$\frac{\text{\# of children with 2 or more decayed teeth}}{\text{Total \# of children screened}} \times 100 = \% \text{ of children with unmet treatment needs}$$

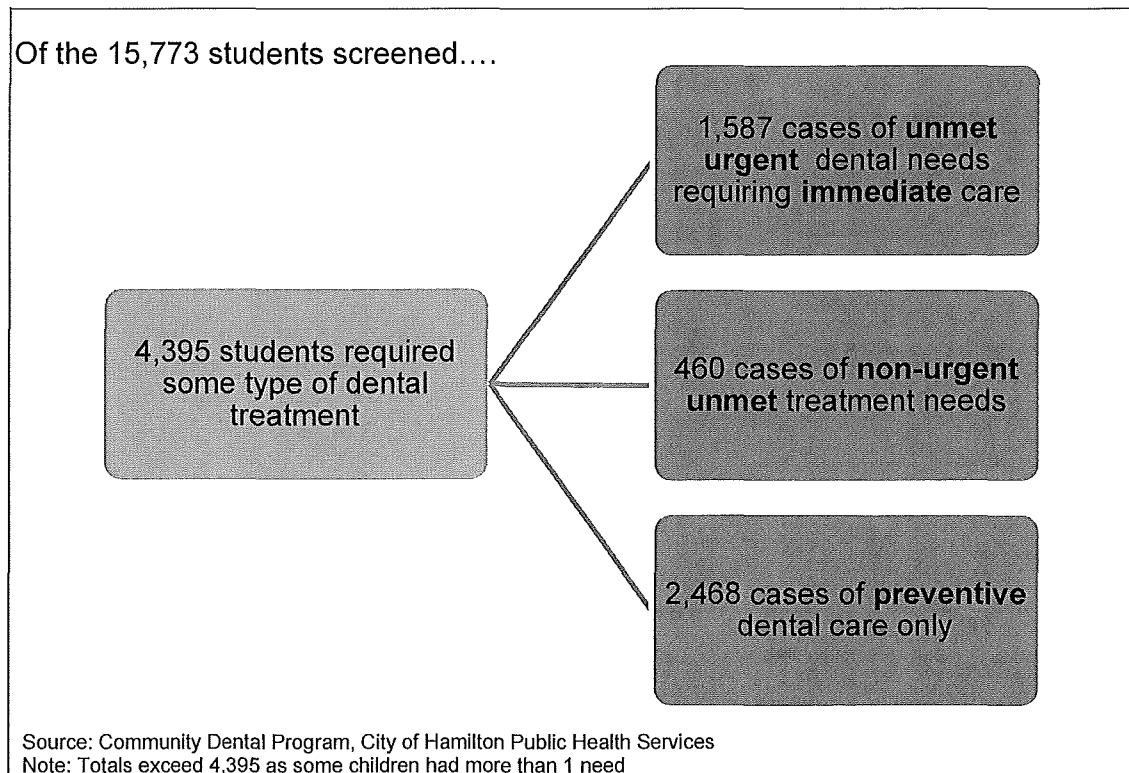
Risk rating		Grades screened
Low Risk	= 9.5% or less	JK/SK and grade 2
Medium Risk	= 9.51% - 13.99%	JK/SK, grades 2 and 8
High Risk	= 14.00% or more	JK/SK grades 2, 4, 6 and 8

During the 2011/12 school year, 15,773 children were screened in 142 Hamilton elementary schools. The screening serves a number of functions including:

- Identifying children with urgent dental problems, advising parents of the need for treatment and following up to ensure the child receives the care needed
- Identifying children who would benefit from one or more preventive dental services

The OPHS *Children in Need of Treatment (CINOT) Program Protocol* standardizes case management for all screened children identified with urgent dental treatment needs. The Registered Dental Hygienist who does the original screening is responsible for ensuring that the child/youth begins treatment with a dental care provider. The CINOT program is offered to families of identified children who have no dental insurance or other form of coverage, and payment for needed dental treatment would create a financial hardship. CINOT-eligible children are referred to the local dental community and their treatment is monitored. During the 2011/12 school year 1,587 Hamilton children were identified with urgent dental treatment needs (according to the protocol requirements) during school screening, and required case management.

Figure 6: 2011-2012 Oral Health Assessment (dental screening) results



Map 1 takes the information from Figure 6 and presents all unmet treatment needs of JK, SK and grade 2 students by ward. It is clear that most treatment needs are concentrated in wards 2 through 6.



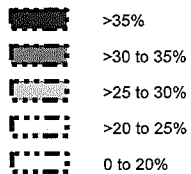
Hamilton

Map 1: Percentage of students in Hamilton with a need for dental treatment, by ward

School year 2011-2012 student dental data

LEGEND

Percentage of students from junior kindergarten, senior kindergarten and grade two students with a need for dental treatment (urgent, non-urgent and preventive services).



Escarpment

Percentage = number students with a need for dental treatment / total number of students screened.

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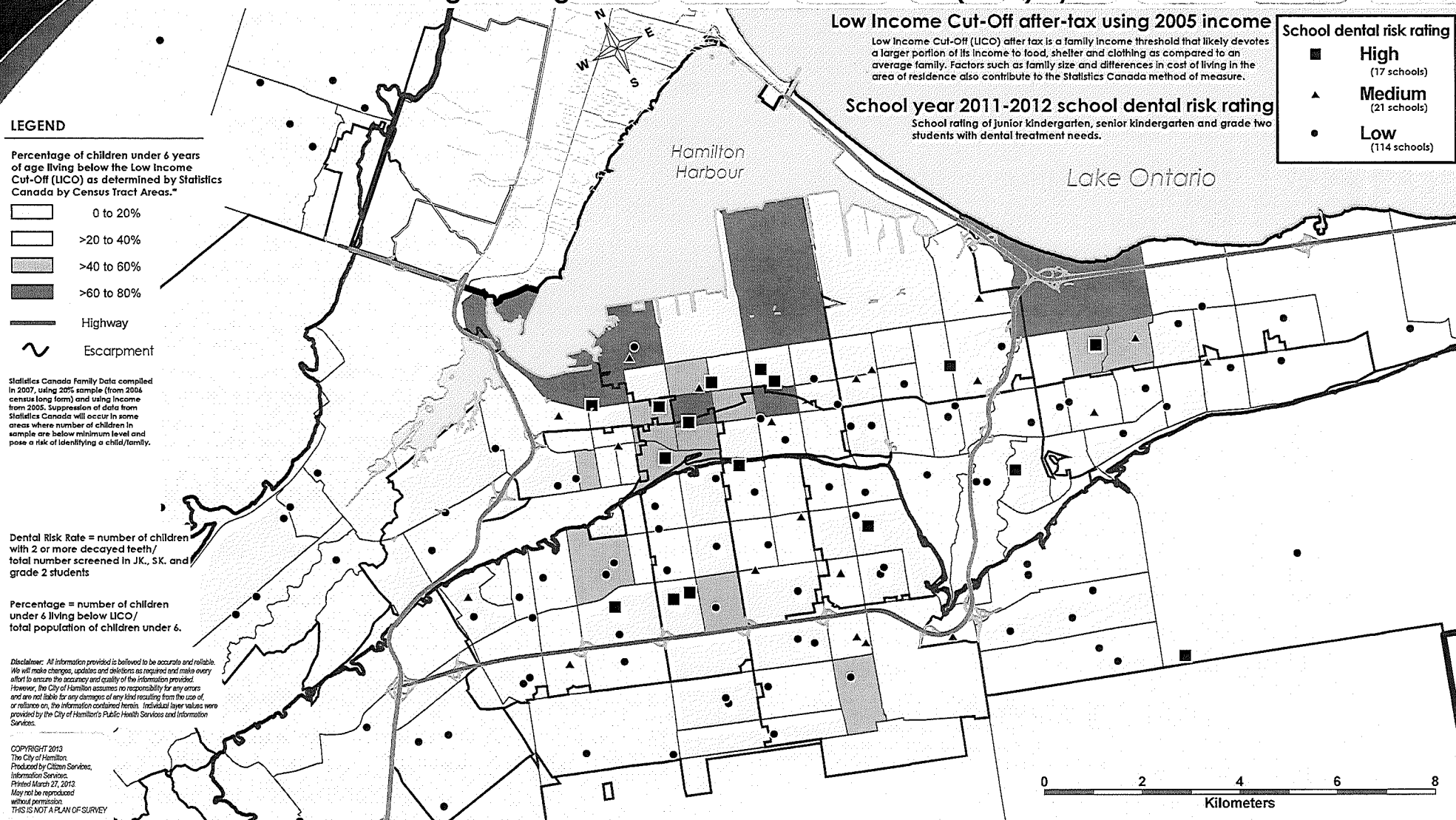
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Hamilton

Map 2: Schools by dental risk rating in Hamilton and percentage of children under age 6 living below the Low Income Cut-Off (LICO) by Census Tract Areas



Map 2 was prepared using the risk rating for each elementary school screened by PHS. Risk values for individual schools were calculated and plotted on the map. This map was generated using 2005 Census Tract data and shows how many children under 6 years of age are living below the Low Income Cut-Off (LICO) in Hamilton neighbourhoods. Neighbourhood socioeconomic factors are significantly associated with school oral health outcomes (32). This map clearly shows that the burden of dental disease falls on lower income families across all neighbourhoods.

Table 4:
Number of Hamilton elementary schools with high, medium, and low dental needs, by ward

Ward	High	Medium	Low
1	0	1	5
2	3	2	1
3	5	3	4
4	1	3	6
5	2	1	6
Wards 1 to 5	11	10	22
6	1	5	6
7	3	1	14
8	1	1	14
Wards 1 to 8	16	17	56
9	1	1	9
10	0	2	6
11	0	0	6
12	0	0	8
13	0	0	6
14	0	1	4
15	0	0	9
Wards 1 to 15	17	21	104

Source: Community Dental Program, City of Hamilton
Public Health Services (2011-2012 school year)

Table 4 uses mapping data to capture school needs by ward.

- 65% of the high needs schools are in wards 1-5 (11 of 17), which include neighbourhoods exhibiting higher rates of child poverty
- Almost 50% of the medium needs schools (10 of 21) are located in wards 1 to 5
- Most children were identified with urgent dental needs in school due to decay, or associated infection or pain.

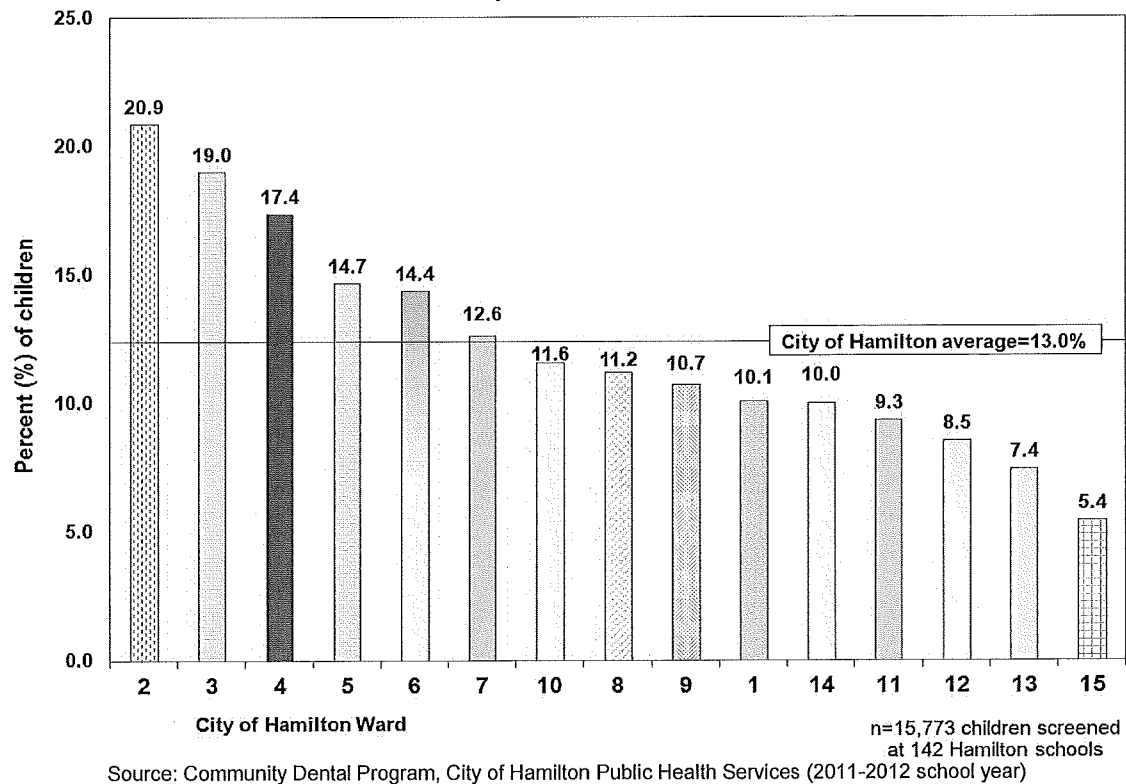
An urgent dental need is defined as:

- one or more large open cavities in permanent teeth well into the dentin or in crucial primary teeth, or
- evidence of pain, infection, trauma, or other pathology

Of the 1,587 children identified with urgent dental needs:

- 780 children or almost half (49.1%) lived in wards 1 to 5
- 1,216 children (over 75%) lived in wards 1 to 8
- Most high and medium needs schools are located in neighborhoods where the poverty rate is above the Hamilton average (26.4%)
- In 3 of the neediest schools, 1 in every 4 children were identified with an urgent dental need

Figure 7: Prevalence of JK, SK & Grade 2 students with non-urgent and urgent unmet dental needs in Hamilton, by ward



Children with only non-urgent dental needs are not eligible for the CINOT program, and their dental care provider makes the decisions concerning treatment needs. In the school-screening program, these teeth are recorded as decayed and constitute an unmet but not urgent dental need.

The prevalence for unmet dental treatment needs were calculated by

combining the number of children with urgent and non-urgent decay and expressing that value as a percentage of the children screened in each ward (Figure 7). The descending values are labeled by ward.

Overall, of the 15,773 children screened in 2011-2012:

- 2,047 or 13.0% of children seen had unmet dental treatment needs
- 1 in every 7 children screened had decayed teeth, evidence of pain, infection, trauma, or other pathology

In general, across all wards there is a direct relationship between school risk level, unmet dental needs, and neighborhood child poverty levels. The individual school data for the five wards with the highest level of unmet dental needs directly correlates with corresponding neighbourhood child poverty levels. Wards 2, 3, and 4 had the highest levels of unmet dental need:

In wards 2, 3 & 4:

- 3,743 children were screened in 2011-2012
 - 715 (19.1%) of these children had unmet dental treatment needs
 - Almost 1 in every 5 children screened had decayed teeth

CINOT expansion program

In 2009 the Ministry of Health and Long Term Care (MOHLTC) expanded the age of eligibility for the CINOT program, to include youth under 18 years of age. Public Health Services also offers screening services at various locations in the city for children and youth under 18 years of age (Dental Health Bus, Mountain Dental Clinic and later in 2012 at three Community Preventive Services Clinics).

Parent/guardians can request dental screening when the child/youth:

- will not be in school on the screening day
- was absent from school the day routine screening was conducted
- has an oral health complaint

The Ontario Public Health Standards state that a screening should be offered within five business days of the request (28). In Hamilton, children and youth with urgent requests are screened the day of the request. This helps PHS to best serve the needs of both the client and the community.

CINOT participation has been increasing since 2009. From September 1, 2011 to August 31, 2012: 1,556 children were enrolled in the CINOT program in order to receive needed treatment for urgent dental conditions, at an average cost of \$518.76 per child (Table 5).

Table 5: 2009-2012 CINOT and CINOT Expansion Program costs and participation for the City of Hamilton, under 18 years of age

School Year	# of Clients Participated 0-18	Average Cost per Client 0-18
2009-2010	1,145	\$431.58
2010-2011	1,515	\$485.18
2011-2012	1,556	\$518.76

Source: Dental Program, City of Hamilton Public Health Services

Children and youth must be screened to access the CINOT program. These children access the program from many locations throughout the City Of Hamilton including, but not limited to:

- School screening program
- Preventive Dental Clinics
- Outreach events
- Ontario Early Years Centres
- Dental Health Bus
- Public Health Dental Clinic
- Community locations/presentations
- Immigrant Women's Centre

Preventive Oral Health Services

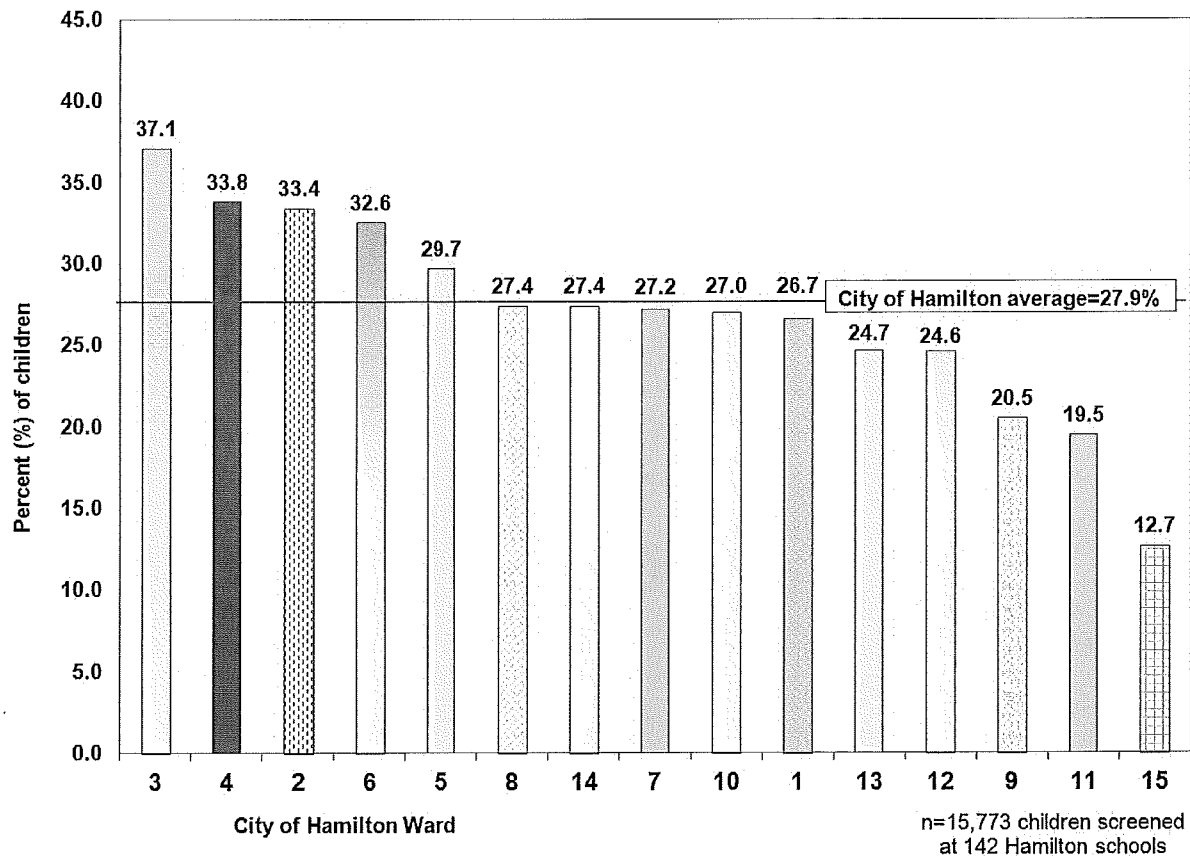
Children and youth with preventive needs are identified by dental screening. They are offered free preventive services if they meet the criteria found in the OPHS *Preventive Oral Health Services Protocol* (33). Preventive services include professionally applied topical fluoride, pit and fissure sealants and scaling, and may be provided by public health dental staff.

During the 2011-2012 school year, 4,395 children were identified as eligible for preventive dental services in all wards. Of these, some had:

- Open decay (1,486 urgent and 416 non urgent cases)
- Evidence of dental treatment in the past (fillings, extractions) or would benefit from a preventive service only (2,468)

An average of 27.9% of all children screened would benefit from some preventive service(s). Many children were also found to benefit from more than one preventive service (5,411 preventive services vs. 4,395 students). Once children have experienced dental decay, they are at greater risk for more decay than those who have never experienced it and these children benefit most from preventive services. In determining the need for preventive services, the dental hygienist carries out an individual risk assessment of the teeth and soft tissues, using the MOHLTC criteria, considering history and/or presence of decay, tooth structure, and the condition of the gums. For this reason, a greater number of children were identified with preventive dental needs than those identified with unmet dental needs across all wards. The gradient displayed in Figure 8 of children in need of preventive services by ward is not as steep as Figure 7 for unmet dental needs, yet the wards with the most unmet dental needs (i.e. decay) also had higher needs for preventive services.

Figure 8: JK, SK & Grade 2 students with preventive dental needs in Hamilton, by ward



Source: Community Dental Program, City of Hamilton Public Health Services (2011-2012 school year)

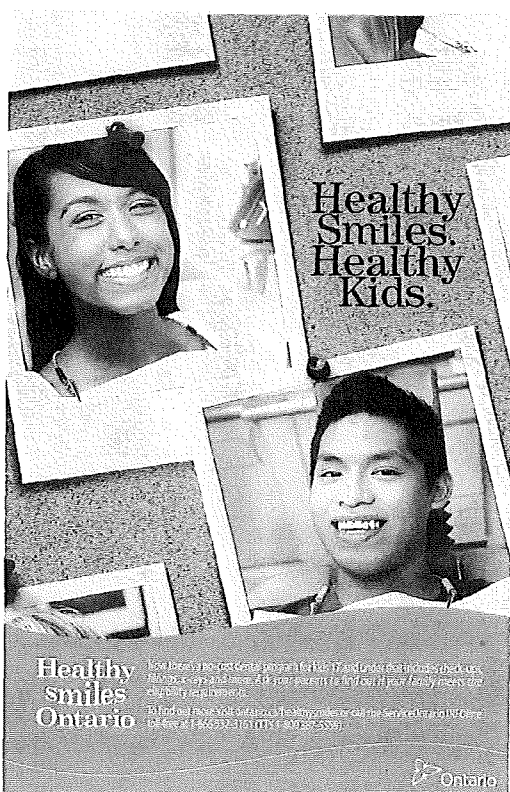
A total of 3,743 children were screened in Wards 2, 3 and 4. These wards had:

- The highest levels of need for preventive dental services (1,313 children)
- More than one third (35.0%) of the children seen in these wards would benefit from preventive services

Preventive dental clinics are funded by Healthy Smiles Ontario (HSO) and staffed by the PHS Community Dental Program. Dental screenings and preventive dental services (fluoride treatments, pit and fissure sealants, and scaling) are available in the community. In March 2012, three Public Health Preventive Dental Service Clinics opened in the lower city:

- 247 Centennial Parkway North (within an existing Public Health Clinic)
- 145 Wilson Street (Beasley Recreation Center/ Dr. J. Edgar Davey School)
- 30 Pearl St. North (Good Shepherd Center)

Eligible children identified through the screening process in school and community locations can have preventive services completed free of charge if parents/guardians meet the financial criteria (no dental insurance coverage, and either on OW, ODSP, CINOT, or HSO program, receiving Ontario Child Benefit or family income is below financial eligibility cut off) and have consented to treatment. Oral hygiene instruction tailored to individual child needs is also provided. The goal of this instruction is for children (and their caregivers) to adopt and maintain good oral care practices at home.



Healthy Smiles Ontario (HSO)

Dental screening and follow up communication with parents of participating children offers an opportunity to provide oral care information. Outside of the mandate of the OPHS, *Healthy Smiles Ontario*, targets low-income children 17 years of age and younger, and provides access to basic dental care including diagnostic, preventive and treatment services. Families without access to any form of dental coverage (including other government-funded programs) and an annual adjusted net

income of \$20,000 or less may be eligible for HSO. The one on one communication between staff and parents regarding the HSO program has provided the best results in recruiting families to the program in Hamilton.

Map 3 represents the location by postal code of children enrolled in the HSO dental program. The change in colour indicates an increased number of clients in the area registered on HSO. The intensification of registration (colour) displayed correlates with the Census data from Map 1. The preventive dental clinics, the Mountain dental clinic and the Dental Health Bus locations are also indicated on the map. They appear to be in proximity to those areas of lower income, higher dental need and higher HSO registration.

As with other municipalities in Ontario, the HSO program has had a slow uptake in the City of Hamilton. Currently PHS is putting the HSO program through the Hamilton Public Health services Equity Lens Tool to determine barriers to accessing the program and to develop strategies to mitigate these barriers.

Table 6: Healthy Smiles Ontario Enrolment in the City of Hamilton

Year	New Client Enrolment
October 2010-December 2011	509
January 2012-December 2012	475

Map 3: Healthy Smiles Ontario (HSO) participant locations in Hamilton, 2010-2012

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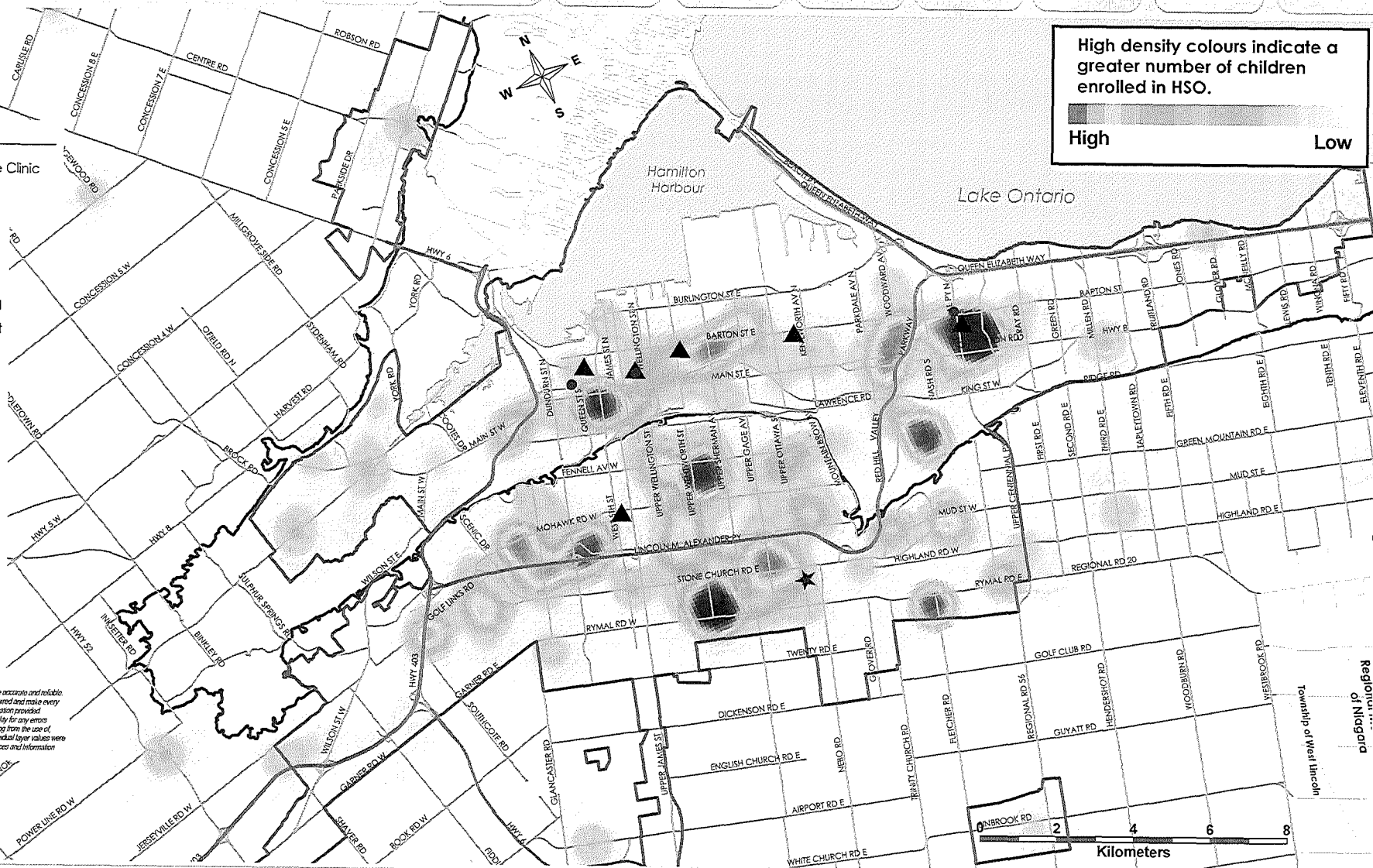
- ★ Main Office Clinic
- Clinic
- ▲ Bus
- ▭ Urban Boundary
- ▬ Highway
- ▬ Major Road
- ~ Escarpment

High density colours indicate a greater number of children enrolled in HSO.

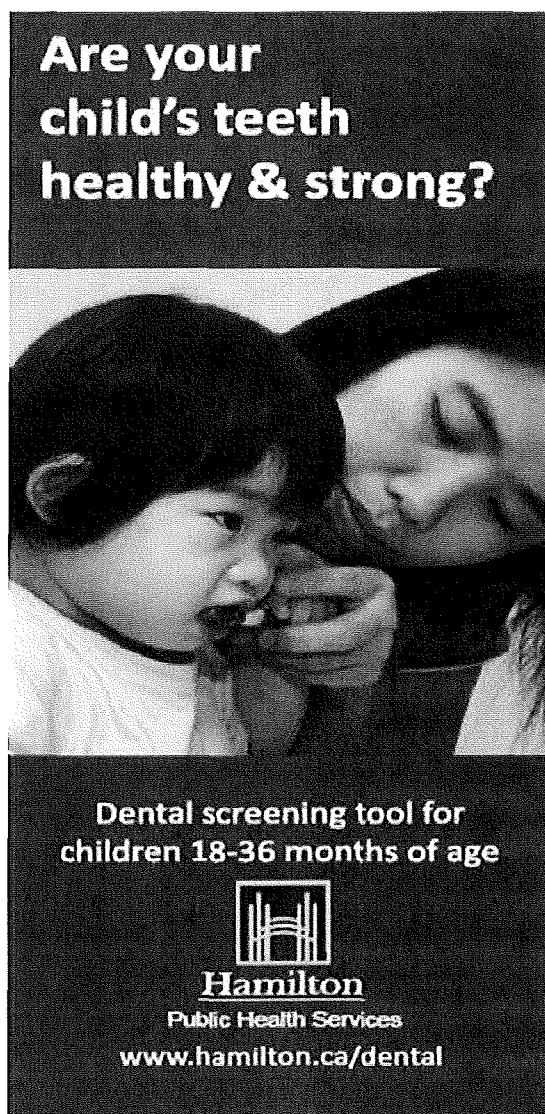
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Region of
Niagara
Township of West Lincoln



Oral Health Promotion and Education in Hamilton

Oral health promotion is a requirement of OPHS and HSO, of which raising the awareness of the importance of oral health is one component. PHS is implementing the Pediatric Dental Screening tool for children ages 18-36 months to raise awareness of oral health in young children. This tool was developed by the Community Dental Health Services Research Unit, University of Toronto as an adjunct to the Nipissing District Developmental Screen for early developmental guidelines for children. The tool is a questionnaire designed for parents to assess their child's dental health and explains appropriate actions based on results of the questionnaire.

As part of the funding proposal for HSO, public health units were encouraged to collaborate and build upon existing relationships with internal and external partners to raise awareness of the importance of oral health, improve oral health outcomes and increase access to dental services. PHS dental programs continually connect with community groups to achieve these goals.

Last year dental teams participated in health fairs, community events and provided over 100 presentations to various community groups in the City of Hamilton. With a provincial re-allocation of HSO funding, a high impact communication campaign was implemented in October 2011-January 2012. The

objective of the campaign was to inform the public and raise awareness of the HSO program and other dental services.

The dental teams continually use evidence to inform decision making whether in the clinic or out in the community. Learning resources are developed and maintained for children and their families. For example, the teacher resource kits are based on the Ontario curriculum to better support teachers in the classroom. The Re-Think your drink display was updated to reflect current beverage consumption by youth. For example, many youth consume energy drinks (e.g. Redbull) so the current display shows the sugar content of this drink.

Conclusion

This report provides an overview of the oral health of Hamilton residents in comparison with Canadian and Ontario data. The social determinants of health offer an explanation why people do not or cannot access dental care, the barriers they face, and the related oral health outcomes. Inequities in oral health persist and need to be addressed. It has been shown that access to care has the greatest impact on oral health outcomes, more so than oral health behaviours. Poor oral health and the inability to afford dental treatment affect more people of all ages with low incomes, and an increasing number of people are not getting the dental care they need.

Politicians and professionals have identified these barriers to care and are working to support those who need dental care. While efforts are made to meet the demands for service, the current system leaves many gaps. There is a need for collaboration and better integration of services across all levels of government and organizations to improve efficiency and health outcomes.

It is important to continue and possibly increase oral health promotion and health advocacy and put the mouth back in the body. Raising awareness about the importance of good oral health and its effects on overall health encourages people to take action so that costly, painful and extensive dental treatment can be minimized. It is also essential to understand and engage different populations

in order to shift attitudes and behaviours concerning the importance of good oral health, prevention and accessing treatment before it becomes an emergency.

Finally, this report provides baseline data so that trends can be identified and outcomes of interventions can be monitored in the future. Over time, data will be generated on how services are used in our preventive clinics. The equity lens tool will have been completed and changes will be implemented based on these results. Collectively, this will provide dental programs with the evidence needed for informed decision making and will increase accountability to the citizens of Hamilton.

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Data Notes

The following information relates to the Canadian Community Health Survey data analyzed by the Applied Research & Evaluation Team within Hamilton Public Health Services (17). This includes data presented in:

- Tables 1 & 2
- Figures 3, 4 & 5

Canadian Community Health Survey (CCHS)

The CCHS collects information on health status and determinants, and health care utilization from respondents 12 years of age and older living in private dwellings via a combination of telephone and face-to-face interviewing. Since the CCHS only collects information from community-dwelling residents, indicators do not represent the health status of all individuals living in the community (e.g. individuals living in institutions or those who are homeless). There may also be differences between individuals who choose to participate in the survey and those who do not.

In 2007, the CCHS moved to an annual data collection mode. Data presented in this report combine two data collection cycles so that sample size is comparable to data collected in previous implementations. Changes to sampling and weighting procedures introduced in 2007 as a result of the re-design may partially explain differences with previous cycles, so trends should be interpreted with caution.

CCHS data are self-report and, as a result, are subject to error. Individuals may have difficulty accurately recalling their past behaviours or may 'adjust' their responses to align with what is seen as socially desirable. CCHS estimates include 'don't know' and refusal responses in the denominator and so estimates should be interpreted as 'of all individuals from Hamilton surveyed' instead of 'of all those individuals from Hamilton who provided information'. Estimates will be conservative when the percentage of missing data is high.

95% Confidence Intervals ("±")

Confidence intervals (CIs) are presented for CCHS data. The prevalence of a trait in the actual population is likely to be somewhat different than the estimate derived from the CCHS sample. CIs provide a range where one can reasonably expect that the true population prevalence will be captured in 95 of 100 similarly executed samples. Estimates that have wider CIs are less reliable than estimates that have narrower CIs.

CIs also assist with identifying groups in the population that are 'different' from each other. If the CIs around two estimates do not overlap, then it can be assumed that they represent populations that actually differ from each other in

terms of a trait. If the CIs overlap, the populations are deemed to be the same (even though the actual estimate may be somewhat different).

95% CIs derived from the simple computation of the CI for a proportion (CI 95% = $p \pm 1.96 * SEp$) were used to compare the differences in outcomes for Hamilton residents between population groups and over time. Normal distribution was assumed. Differences were considered to be statistically significant if CIs did not overlap.

Indicator Notes

Household Income

The CCHS asks respondents about all sources of total household income before taxes and deductions in the past 12 months. This information is adjusted using Statistic Canada's low income cut-offs while accounting for household and community size. Household income data are separated into deciles which provide a relative measure of each household income to the household incomes of other respondents. For this report, these deciles were then grouped into 3 categories: the lowest 30% (low income), middle 40% (mid income) and highest 30% (high income) income groups. By using deciles rather than actual dollar amounts, it will be possible to make comparisons between different time periods. This is because, unlike actual dollar amounts, deciles are unaffected by changes due to inflation.

Social Isolation

The CCHS uses information on avoiding conversation or contact with others, avoiding laughing or smiling due to a condition of the teeth, mouth or dentures in the past 12 months to derive a variable that indicates whether a respondent's social functioning has been affected by his/her oral health status.

Pain or Discomfort

The CCHS asks respondents if they have experienced a variety of oral conditions within the past month (teeth sensitive to hot or cold food or drinks, bad breath, dry mouth, bleeding gums, toothache, pain in or around the jaw joints, and other pain in the mouth or face). This information is used to create a derived variable that indicates the presence of oral or facial pain in the past month.