Oral Health Report 2018 Update

WINDSOR-ESSEX COUNTY
HEALTH UNIT

WINDSOR-ESSEX COUNTY HEALTH unit
Bureau de santé de Windsor-comté d'Essex

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Acknowledgements: This report was adapted from the Windsor-Essex County Health Unit "Oral Health 2016 Report" (2016).

Citation: Windsor-Essex County Health Unit. (2018). Oral Health Report, 2018 Update. Windsor, Ontario.

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April 2018

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Abbreviations & Glossary

APHEO – Association of Public Health Epidemiologists in Ontario

BOHP – Baby Oral Health Program

CI – Refers to the 95% confidence interval - the range within which we can be 95% certain that the true population estimate falls

CINOT – Children in Need of Treatment Program

deft – Decayed/extracted/filled primary teeth

DMFT – Decayed/missing/filled permanent teeth

ECC – Early childhood caries

ED – Emergency department

EESS – Emergency and Essential Services Stream of the Healthy Smiles Ontario Program

Epidemiology – the study of the causes and patterns of health related events in populations

HSO – Healthy Smiles Ontario Program

JK/SK – Junior/Senior Kindergarten

LHIN – Local Health Integration Network

MOHLTC – Ontario Ministry of Health and Long-term Care

NACRS – National Ambulatory Care Reporting System

ODSP - Ontario Disability Support Program

OHISS – Oral Health Information Support System

OPHS - Ontario Public Health Standards

PATF - Professionally applied topical fluoride

Periodontal disease – Disease of the gums with symptoms that range from inflammation to tissue damage

PFS – Pit and fissure sealant

PHO – Public Health Ontario

RRFSS – Rapid Risk Factor Surveillance System

SES – Socioeconomic status

WEC – Windsor-Essex County; includes the municipalities of Amherstburg, Essex, Kingsville, Lakeshore, LaSalle, Leamington, Pelee, Tecumseh, and Windsor

WECHU – Windsor-Essex County Health Unit

Executive Summary

Oral health is vital to general health and overall well-being at every stage of life. Most oral health conditions are largely preventable and share common risk factors with other chronic disease, as well as their underlying social determinants of health, such as income, employment, education, or other social factors that can impact health.

Public health units are well-situated to take a leading role in improving oral health in the communities they serve. The ***Oral Health Report 2018 Update*** was prepared by the Windsor-Essex County Health Unit to provide current information about the oral health status of residents in the City of Windsor and the County of Essex. The key findings are summarized below.

Oral health profile of Windsor-Essex County:

- Nearly 1 in 4 residents report having no dental insurance coverage.
- Just over 1 in 10 households with a child between 1 and 6 years, saw a dental professional for their child for the first time before their child's first birthday
- There is an average of 921 emergency department visits each year for problems related to oral health.
- The estimated average total cost for emergency dental visits is $508,259 per year in Windsor-Essex County.
- Over 9 in 10 visits to the emergency departments were by adults (18+) with the highest rates observed in young adults between 20 to 29 years of age.
- Each year, there is an average of 1,323 day surgeries for oral health (caries-related) reasons with the rates of day surgeries consistently higher in children (1 to 17 years) between 2010 and 2016.
- Approximately 4 in 5 residents in Windsor-Essex County support community water fluoridation.
- None of the nine municipalities in Windsor-Essex County fluoridate their water supplies.

Oral health assessment in schools and preventative services in Windsor-Essex County:

- In the 2016/2017 school year, 18,179 children from 119 schools were screened for oral health issues. Between 2011/2012 to 2016/2017, the percentage of children with decay and/or requiring urgent care has increased by 51%.
- A three-fold increase in the proportion of children eligible for topical fluoride was observed between the 2011/2012 and 2016/2017 school years.

- When compared to Ontario, the percentage of children with urgent dental needs in 2016/2017 was two-times greater in Windsor-Essex County. A similar trend was observed for all other school years.
- There is a decreasing trend in the proportion of caries-free children observed in JK, SK and Grade 2, from 7 in 10 (70%) children being caries-free in JK to 5 in 10 (50%) in Grade 2.
- The measure of decayed, missing, extracted, and filled teeth (deft/DMFT index) was highest in 2016/2017 and lowest in 2011/2012 school year indicating a trend in more oral health concerns among children at the time of school entry over time. Similar observations were found across the different grades.
- From 2011/2012 to 2016/2017, communities that recently ceased fluoridation observed a greater decrease in the percentage (13%) of students without caries compared to an 8% decrease in the communities that were never fluoridated.
- Between 2011/2012 and the 2016/2017 school year, there were no instances of moderate or severe fluorosis in children screened.
- With the new Healthy Smiles Ontario program, a total of 7,973 preventative oral health services were offered by the Windsor-Essex County Health Unit in the 2016/2017 school year.

Introduction

What is oral health?

Oral health is a key part of overall well-being and can directly impact a person's quality of life. The Canadian Dental Association outlines oral health as a state that is linked to a person's physical and emotional well-being (Canadian Dental Association, 2010). Good oral health means being free of mouth and facial pain, cavities, periodontal disease, and any other negative issues that impact the oral cavity (Petersen, 2003).

Two of the most common oral health concerns are tooth decay (cavities) and periodontal disease (gum disease) (Ministry of Health and Long-Term Care, 2012). In fact, cavities are one of the most prevalent chronic infectious diseases among Ontarians; yet these same oral health issues are largely preventable (Ministry of Health and Long-Term Care, 2012).

To prevent oral health issues, it is recommended to brush twice a day, floss once a day, visit the dentist regularly, and eat a healthy diet (Canadian Dental Association, 2010). Regular professional oral health care is an important part in maintaining good oral health, as it involves prevention, diagnosis, and treatment of issues such as cavities and gum disease, in a timely manner (College of Dental Hygienists of Ontario, 2014).

Why does oral health matter?

Oral health issues can also impact a person's quality of life. Missing teeth and oral pain can impact a person's speech, what they eat, and how they socialize (College of Dental Hygienists of Ontario, 2014). In fact, some studies have shown that people who report chronic mouth pain are more likely to take a sick day (Quinonez, Figueiroedo, & Locker, 2011).

In recent years an increasing amount of research has shown the important link between oral health and overall health. Oral health issues have been linked to respiratory infections, cardiovascular disease, diabetes, and poor nutrition. More recently, evidence has emerged that shows a link between maternal periodontal disease and babies with low birth weights (Ministry of Health and Long-Term Care, 2012).

Why is oral health important to children?

Oral health is a key part of a child's overall health and well-being. It is important to many aspects of a child's development, as poor oral health can lead to issues with eating, speech development, and self-esteem (Rowan-Legg, 2013). Dental issues and oral pain can also result in missed school days and negatively impact learning and behaviour. In Canada, it is

estimated that 2.3 million school days are lost each year due to dental visits or dental sick days (Health Canada, 2010).

In Canada, cavities are the most common chronic childhood disease, with more than 50% of children between the ages of 6 to 11 having had a cavity, while toddlers 2 to 4 years of age are also demonstrating increasing rates of cavities as well (Rowan-Legg, 2013). Another oral health concern that children may experience is early childhood caries (ECC); a condition where one or more missing, decayed or filled teeth are present in a child. When serious cases of ECC occur, surgery may be required. This type of surgery is the most common surgery among children in Canada, with the highest prevalence among Aboriginal children (Canadian Institute for Health Information, 2013) (Seto, Ha Thanh, & Quinonez, 2014). In Ontario, the Erie St Clair Local Health Integration Network (LHIN) – which includes Windsor-Essex, Chatham-Kent, and Sarnia-Lambton – has the third highest rate of this type of surgery (21 per 1,000 children between 1-5 years of age), following the highest rates in the North East and North West LHINs (Canadian Institute for Health Information, 2013).

Preventative dental care for children can benefit oral health and reduce costs later on (Rowan-Legg, 2013). Health promotion and prevention at an early age can help develop a solid foundation for life-long oral health. The Canadian Dental Association recommends a dental assessment for babies within six months of their first tooth or by the child's first birthday. This allows for identifying any concerns at an early stage, and allows for the opportunity to provide caregivers with information on proper oral hygiene and nutrition.

What are the barriers to good oral health?

There are direct links between poor oral health and poor overall health, so it is not surprising that oral diseases have many of the same social and economic determinants (e.g., income, employment, education, access to health services, social support and other factors that impact the health of people and communities) as other chronic diseases (College of Dental Hygienists of Ontario, 2014). Oral health and general health should not be thought of separately; oral health is one important component of overall health (Seto, Ha Thanh, & Quinonez, 2014). This becomes clear when oral health is looked at in relation to chronic disease risk factors. Diabetes, heart disease, and cancer all share common risk factors such as poor diet, alcohol use, and smoking and these are also possible risk factors for poor oral health, along with several others (Federal, Provincial and Territorial Dental Working Group, 2012).

In Ontario, the majority of oral health care services are not publicly funded, which means that Ontarians are responsible for the costs of their own dental care. In Ontario, public dental coverage is the lowest of all the provinces, as only 1% of the dental services are publically funded (Canadian Centre for Policy Alternatives, 2011). Ontario provides public dental

coverage to children of low income families, but there are very few options for adults with low income, including seniors (Wellesley Institute, 2015).

There are four ways people pay for their dental care: out of their own pocket, through government subsided programs (e.g., Ontario Works, and Healthy Smiles Ontario), third-party insurance (often through employer insurance benefits), or private dental insurance.

The lack of coverage and access to oral health care is a key barrier for good oral health. There are several other indicators that can act as barriers to good oral health, including, education level, income, age, where you live (urban or rural), and immigrant status. Compared to the rest of the population, immigrants receive less preventative services and more treatment, and experience more negative oral health outcomes (Canadian Academy of Health Sciences, 2014). This is important for Windsor-Essex County given the large immigrant population in the region. Furthermore, a recent systematic review found that newcomer families (refugees and immigrants) have poor oral health and face several barriers to using dental care services (Reza, et al., 2016), including language, navigating a new health care system, and lack of financial resources.

One outcome of poor access to oral health care can be seen through the burden it has created on other parts of the health care system. People are going to hospital emergency departments for dental problems because they are in pain and cannot afford dental treatment in the regular oral health care setting (Quiñonez, Gibson, Jokovic, & Locker, 2009). This access problem can also impact how frequently people use physician offices for dental pain.

What is public health's role in oral health care?

The Windsor-Essex County Health Unit, along with all other Public Health Units in Ontario, offers oral health programs in accordance with the Ontario Public Health Standards (OPHS, 2018). The Ontario Public Health Standards revised effective January 2018 outline the minimum requirements and expectations for programs and services offered by local boards of health and identify the role of public health within oral health. Under the Ontario Public Health Standards (2018) oral health is identified under the School Health standard, the Chronic Disease Prevention and Wellbeing standard, and the Healthy Growth and Development standard. Requirements under the Healthy Growth and Development standard and the Chronic Disease Prevention and Wellbeing standard include the collection, analysis of oral health data to monitor trends over time, identify emerging trends and identify priority populations and health inequities. Boards of health are further required to share this information with local partners including municipalities. The aim of these two standards are to decrease the burden of chronic diseases of public health importance and improve wellbeing as well as ensuring children and families achieve optimal health.

The School Health Standard includes requirements for the delivery of the Healthy Smiles Ontario (HSO) program as well as the assessment and surveillance of oral health within the school setting as outlined in the Oral Health Protocol (2018; OPHS, 2018, page 53). Expected outcomes identified by the Ministry of Health and Long Term Care (MOHLTC) via the school health standard include (OPHS, 2018, page 52):

- The board of health achieves timely and effective detection and identification of children and youth at risk of poor oral health outcomes, their associated risk factors, and emerging trends
- Children and youth from low-income families have improved access to oral health care
- The oral health of children and youth is improved

Objectives

The purpose of the 2018 update of the Oral Health Report is to provide an overview of the oral health status in Windsor-Essex County. This report is a refresh of the 2016 Oral Health Report, in which the population health data and information relevant to the new Ontario Public Health Standards have both been updated. Specifically, this report is intended to:

1. Address a request for information on oral health status in correlation with a 5-year moratorium on community water fluoridation in the City of Windsor.
2. Provide an oral health profile of the Windsor-Essex County population using available assessment and surveillance data for the period of 2011 to 2017.
3. Provide recommendations based on local data for the improvement of oral health within Windsor-Essex.

Methods

To fulfill the objectives of this report, data were collected from various sources. The specific data sources for each section of the report are listed below:

- The oral health profile was constructed by using data from the Rapid Risk Factor Surveillance System, Community Needs Assessment and the National Ambulatory Care Reporting System.
- Data for oral health programs were sourced from the Oral Health Information Support System, and the Windsor-Essex County Health Unit records.

The data were analyzed by the Epidemiology & Evaluation Department at the Windsor-Essex County Health Unit. The specific analytical methodology for each data source is described in the next section. Data presented represent a snapshot of the information at the time of extraction and may differ from previous or subsequent reports.

Data Sources

Rapid Risk Factor Surveillance System (RRFSS): RRFSS is a telephone survey conducted across various public health units across Ontario. The survey selects a random sample of adults 18 years and older from the health unit area. Individuals who don't have landline telephones and those not living in households (e.g. in correctional institutions) are excluded from the RRFSS sampling frame. A module in RRFSS is generally a group of questions related to a specific topic. RRFSS modules regarding dental insurance coverage, early childhood dental visits, early childhood tooth decay, and support for community water fluoridation were analyzed. RRFSS data reporting requirements allow estimates with a coefficient of variation (a measure of an estimate's variability) between 0 and 16.5 to be released without qualification. However, estimates with a coefficient of variation between 16.6 and 33.3 can only be released with caution (denoted with a superscript 'E'), while those estimates with a coefficient of variation greater than 33.3 cannot be released (denoted with a superscript 'F').

National Ambulatory Care Reporting System (NACRS): This database captures client visits for ambulatory care in facilities and the community. It is administered by the Canadian Institute for Health Information and contains ambulatory care data for outpatient and community-based clinics, emergency department (ED) visits, and day surgeries. In addition to service-specific information, it also collects demographic information. Data for oral health-related ED visits and day surgeries in Windsor-Essex County (2010-2016) were extracted from intelliHEALTH Ontario and presented in this report. The NACRS data was extracted in March 2018. Counts and rates of ED visits and day surgeries may be higher from previous reports, due to the availability of more up-to-date data at the time of data extraction.

For ED visits, only unscheduled ED visits for one of the following 'all problem' diagnosis codes (International Classification of Disease – 10th revision - CA) were included: K011, K020-K025, K028-K029, K044-K047, K050-K052, K0769, K0887, K119, or K122. For day surgeries, only surgeries for 'main problem' diagnosis codes of K020-K024, K028-K029, or K047; and a treatment code (Canadian Classification of Health Interventions) of 1FD52, 1FE29, 1FE53JARV, 1FE57JA, 1FE87JAH1, 1FE89, 1FF53, 1FF56, 1FF59JA, 1FF80, 1FF87, or 1FF89 were included. The diagnosis codes selected do not include oral health diagnoses related to injuries. When oral health related issues are mentioned, they refer only to the mentioned conditions, not all oral health related conditions.

Population Data: Public health unit and Ontario population estimates (2010-2016) were extracted from intelliHEALTH Ontario. The 2011 Canadian population estimates (standard population) were extracted from Statistics Canada. Rates presented by year were standardized by age and sex according to the standard population.

Oral Health Information Support System (OHISS): The Oral Health Information Support System (OHISS) is a database used for oral health screening and surveillance activities by public health units as mandated by Ontario Public Health Standards (2008). OHISS captures data on all children and youth under 18 who partake in publicly funded dental services (e.g., screening). Data extracted from OHISS for the 2011/2012 to 2016/2017 school years was used to generate the core indicators described in **Supplementary Table 1 (Appendix A)**.

Core Indicators

The Association of Public Health Epidemiologists in Ontario (APHEO) has developed a suite of standardized indicators that align with the Ontario Public Health Standards and allow for consistent reporting of population health data by public health agencies in Ontario (APHEO and Public Health Ontario, 2012). Included in these are oral health indicators which primarily focus on the oral health status of school-age children and youth (see **Supplementary Table 1, Appendix A**). This report provides these prescribed oral health indicators for the previous six school years (2011-2017) as well as additional indicators that were deemed relevant to oral health.

Oral Health Profile of Windsor-Essex County

This oral health profile of the Windsor-Essex County population presents the most recent and complete information collected through the Rapid Risk Factor Surveillance System (2015-2017), Windsor-Essex County Health Unit Community Needs Assessment (2016), and the National Ambulatory Care Reporting System (2010-2016). The specific oral health information presented in this section includes:

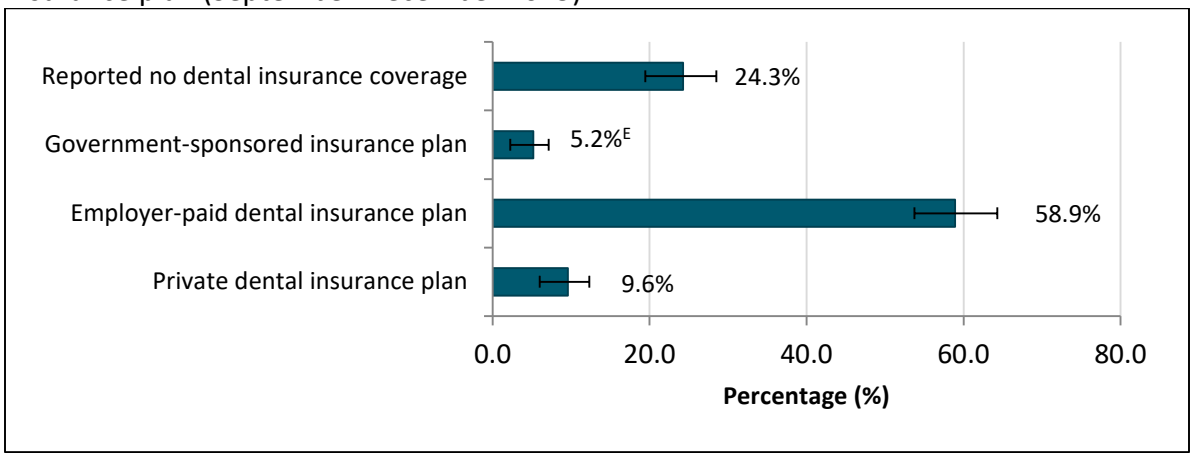
- Dental insurance coverage
- Early childhood dental habits
- Support for community water fluoridation
- Emergency department visits for oral health issues
- Day surgeries for oral health (caries-related) issues

Dental Insurance

The type of dental insurance coverage for Windsor-Essex County residents (≥ 18 years old) is reported in **Figure 1**. Almost one-quarter of adults in Windsor-Essex County do not have dental insurance coverage. For those with some form of coverage, an employer-paid dental insurance plan was the most commonly reported form of coverage - nearly 60% of adults. Almost ten percent of adults have some private dental insurance plan and only five percent of adults have some government-sponsored dental insurance plan.

Additionally, approximately four percent of adult residents refused or turned down treatment, because they did not have any insurance coverage (4.4%^{E} of adults, 95% CI: 2.6 to 7.4%).

Figure 1. The percentage of Windsor-Essex County residents (18 years old) with a dental insurance plan (September-December 2015)



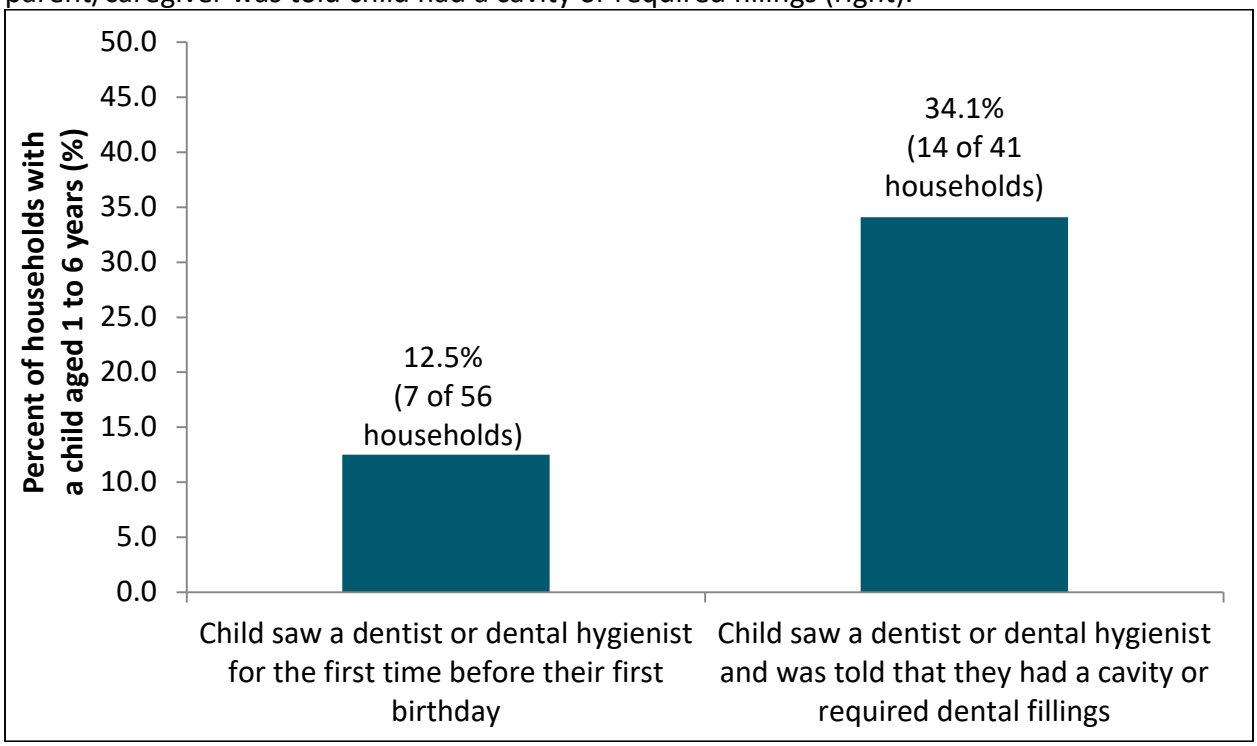
Source: Rapid Risk Factor Surveillance System (RRFSS), Sep-Dec 2015, Windsor-Essex County Health Unit

Note: Sample size of 401 respondents. Respondents who did not know the type of insurance plan they had are not depicted in this figure (< 10 respondents).
[E]Interpret estimate with caution due to high variability of the estimates.

Early Childhood Dental Habits

Only 13% of households with a child between the age of one and six years reported that the child saw a dentist or dental hygienist for the first time before their first birthday (**Figure 2**). Moreover, in 34% of households where the child saw a dental professional, the parent/caregiver was told that the child had a cavity or required dental fillings.

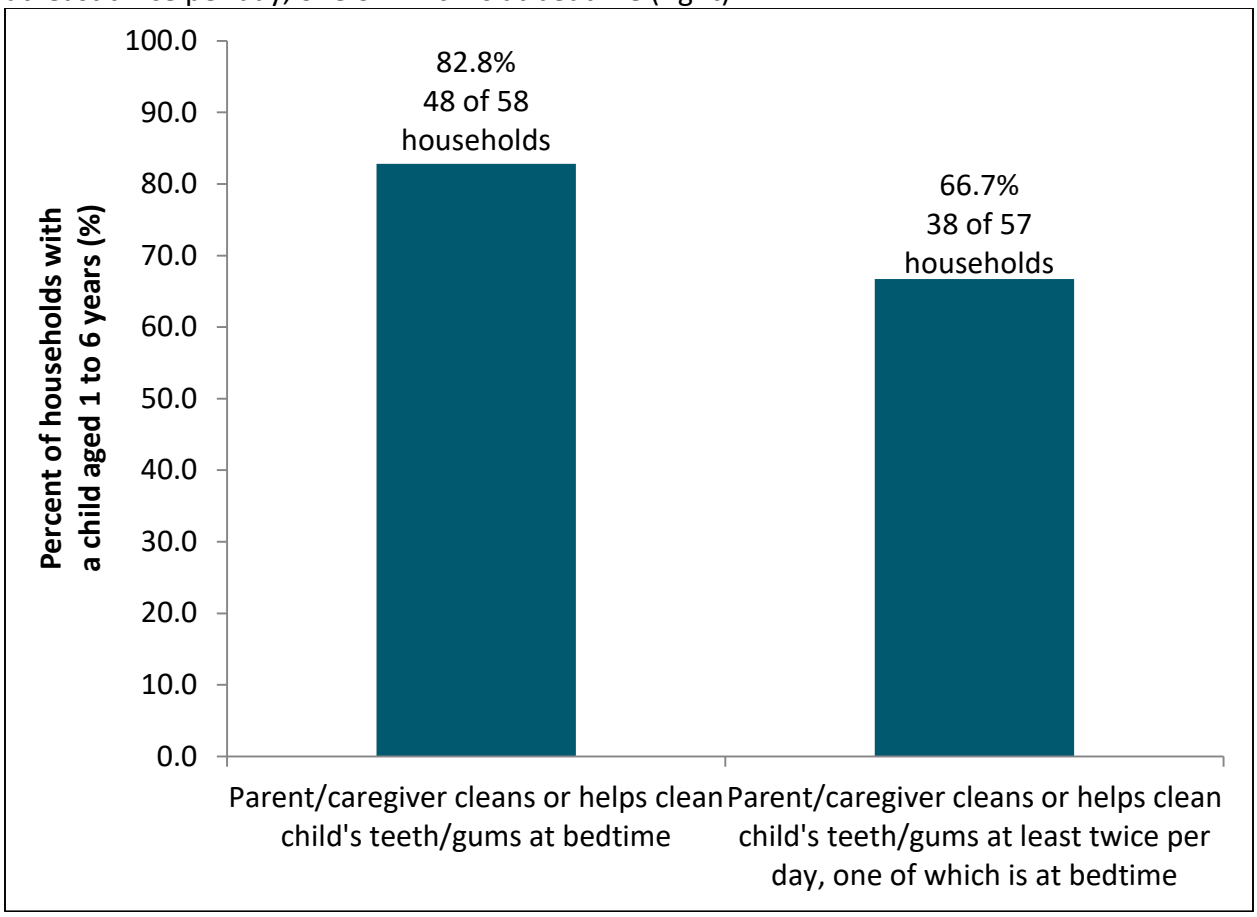
Figure 2. The percentage of households in Windsor-Essex County with a child between 1 and 6 years that saw a dental professional: for the first time before their first birthday (left); parent/caregiver was told child had a cavity or required fillings (right).



Source: Rapid Risk Factor Surveillance System (RRFSS), Jan-Apr 2016 and Jan-Apr 2017, Windsor-Essex County Health Unit

Protective behavioural factors like teeth are gum cleaning are associated with the prevention of early childhood tooth decay in children aged <1 to 6 years. **Figure 3** shows the teeth and gum cleaning habits as reported by the parent/caregiver. When parents/caregivers with a child 1-6 years old were asked whether they clean or help to clean the child's teeth or gums, almost 83% said they do so. Almost 67% of households stated that they clean or help to clean the teeth or gums twice daily, one of which is at bedtime.

Figure 3. The percentage of households in Windsor-Essex County with a child between 1 and 6 years where the parent/caregiver cleans or helps to clean child's teeth/gums: at bedtime (left); at least twice per day, one of which is at bedtime (right).



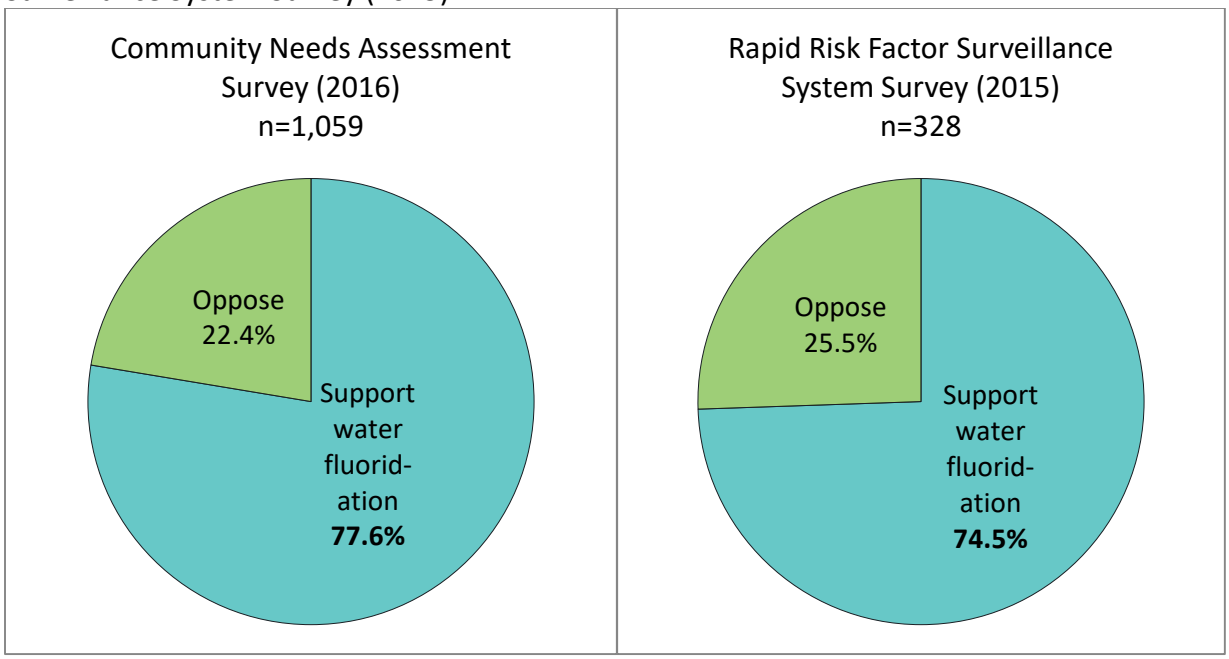
Source: Rapid Risk Factor Surveillance System (RRFSS), Jan-Apr 2016 and Jan-Apr 2017, Windsor-Essex County Health Unit

Community Support for Community Water Fluoridation

Support for community water fluoridation was assessed as part of the RRFSS survey in 2015, and Windsor-Essex County Health Unit's Community Needs Assessment survey in 2016 (see **Figure 4**). Both surveys showed similar results regarding support for community water fluoridation.

According to the survey results, the vast majority of adult residents in Windsor-Essex County support community water fluoridation (75% according to RRRFS, and 78% according to the Community Needs Assessment Survey).

Figure 4. Support for community water fluoridation by adults (≥ 18 years old) in Windsor-Essex County according to the Community Needs Assessment Survey (2016) and Rapid Risk Factor Surveillance System Survey (2015)



Sources: Community Needs Assessment, 2016, Windsor-Essex County Health Unit; Rapid Risk Factor Surveillance System (RRFSS), Sep-Dec 2015, Windsor-Essex County Health Unit.
Note: Don't Know/Unsure responses were excluded.

Emergency Department Visits for Oral Health issues

An outcome of poor access to oral health care can be seen through the impact it has on the health care system. People are using hospital emergency departments for dental problems because they are in pain and cannot afford dental treatment in the regular oral health care setting (Quiñonez, Gibson, Jokovic, & Locker, 2009).

This is an expensive and ineffective alternative to preventative oral health care. Individuals who access emergency departments (ED) for oral health issues tend to receive pain medication (e.g., opioids), and not treatment to resolve the oral health problem, which means that many will return to the ED. In an Ontario study, it was found that the majority (78%) of these types of visits were triaged as non-urgent, and most (93%) were simply discharged (Quiñonez, Gibson, Jokovic, & Locker, 2009).

In 2013, there were almost 59,000 visits to the ED for oral health problems. At a minimum cost of $513 per visit (2012 Canadian Dollars), the total estimated cost for dental visits to EDs in Ontario was at least $30 million in 2013 (Maund, 2014a). Visits to Ontario physicians' offices for oral health problems in 2012 totalled 217,728 visits at a cost of $7.3 million for that year (Maund, 2014b).

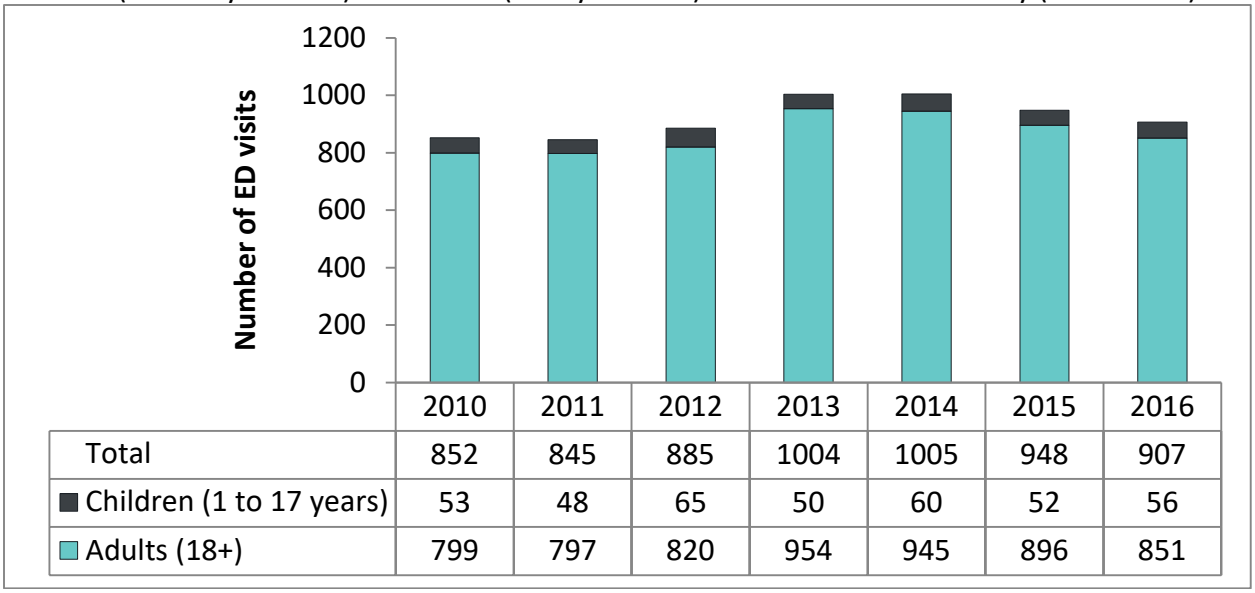
The number of EDs visits in Windsor-Essex County for oral health issues is reported by year in **Figure 5**. On average there were 921 ED visits annually for problems related to oral health (between 2010 and 2016), corresponding to an average annual rate of 240 oral health-related ED visits per 100,000 population. Based on a minimum of $513 per visit (Maund, 2014a), it is estimated that the average total cost for ED dental visits is $472,400 per year in Windsor-Essex County (2012 Canadian Dollars). Adjusted for inflation, this amount rises to $508,259 (2017 Canadian Dollars).

Children (1-17 years old) represented only six percent of oral health-related ED visits in Windsor-Essex County (see **Figure 5**); this makes sense given that there are a number of publicly funded programs for children in Ontario (e.g., Healthy Smiles Ontario).

The age distribution of ED visits by age groups is shown in **Figure 6**. Annually, adults 20-49 account for the majority of ED visits (66%) for oral health related problems. Those in their mid-to-late twenties had the highest rate of ED visits for oral health related issues (25-29 year olds: 537 ED visits per 100,000 population). After this age period, the rates subsequently decreased.

The oral health conditions of children and adults who visited the ED in Windsor-Essex County (2010-2016) are reported in **Table 1** and **Table 2**, respectively. The bulk of these oral health problems are diseases of the pulp and other disorders of teeth and supporting structures (e.g. 23% and 30% of ED visits for oral-health related conditions in children and adults, respectively, were for toothache not otherwise specified). In some cases the oral health problem was unspecified; this diagnosis may reflect emergency physicians' inability to assuredly diagnose many oral health conditions (Sun & Chi, 2014).

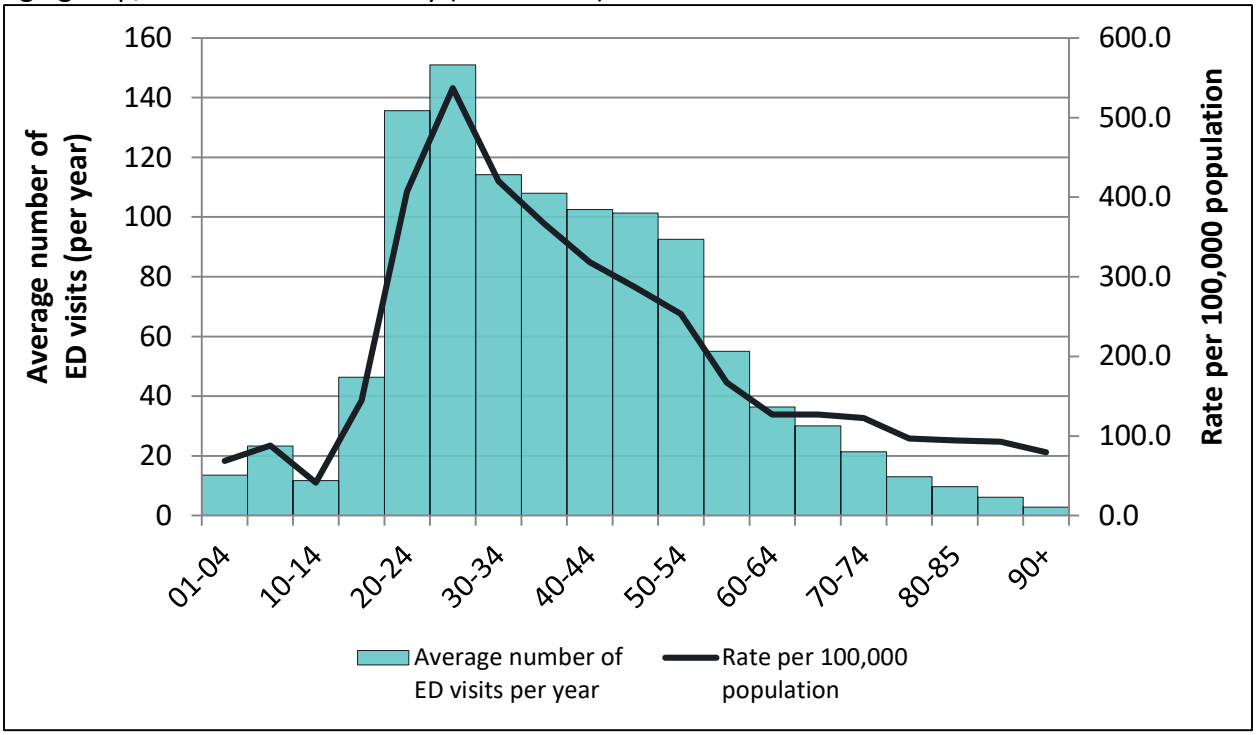
Figure 5. The annual number of oral health-related emergency department (ED) visits by children (1 to 17 years old) and adults (≥ 18 years old) in Windsor-Essex County (2010-2016)



	2010	2011	2012	2013	2014	2015	2016
Total	852	845	885	1004	1005	948	907
Children (1 to 17 years)	53	48	65	50	60	52	56
Adults (18+)	799	797	820	954	945	896	851

Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Figure 6. Average number of oral health-related emergency department (ED) visits and rate by age group, Windsor-Essex County (2010-2016).



Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Table 1. Oral health conditions of children (1-17 years old) visiting the emergency department in Windsor-Essex County (2010-2016).

Diagnosis (ICD-10-CA Code)	Number of ED visits (2010-2016)	Percent of all ED Visits for OH Conditions (%)
Periapical abscess without sinus (K047)	194	50.5%
Toothache, not otherwise specified (K0887)	90	23.4%
Chronic gingivitis (K051)	39	10.2%
Dental caries, unspecified (K029)	19	4.9%
Cellulitis and abscess of mouth (K122)	14	3.6%
Temporomandibular joint disorder, unspecified (K0769)	10	2.6%
Acute gingivitis (K050)	8	2.1%
Acute periodontitis (K052)	6	1.6%
Impacted teeth (K011)	< 5	1.0%

Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Table 2. Oral health conditions of adults (≥18 years old) visiting the emergency department in Windsor-Essex County (2010-2016).

Diagnosis (ICD-10-CA Code)	Number of ED visits (2010-2016)	Percent of all ED Visits for OH Conditions (%)
Periapical abscess without sinus (K047)	3016	49.8%
Toothache, not otherwise specified (K0887)	1801	29.7%
Dental caries, unspecified (K029)	464	7.7%
Cellulitis and abscess of mouth (K122)	255	4.2%
Chronic gingivitis (K051)	194	3.2%
Temporomandibular joint disorder, unspecified (K0769)	203	3.3%
Acute periodontitis (K052)	50	0.8%
Impacted teeth (K011)	48	0.8%
Diseases of salivary gland, unspecified (K119)	10	0.2%
Acute gingivitis (K050)	9	0.1%
Other dental caries (K028)	8	0.1%
Periapical abscess with sinus (K046)	6	0.1%

Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Day Surgeries for Oral Health (Caries-Related) Issues

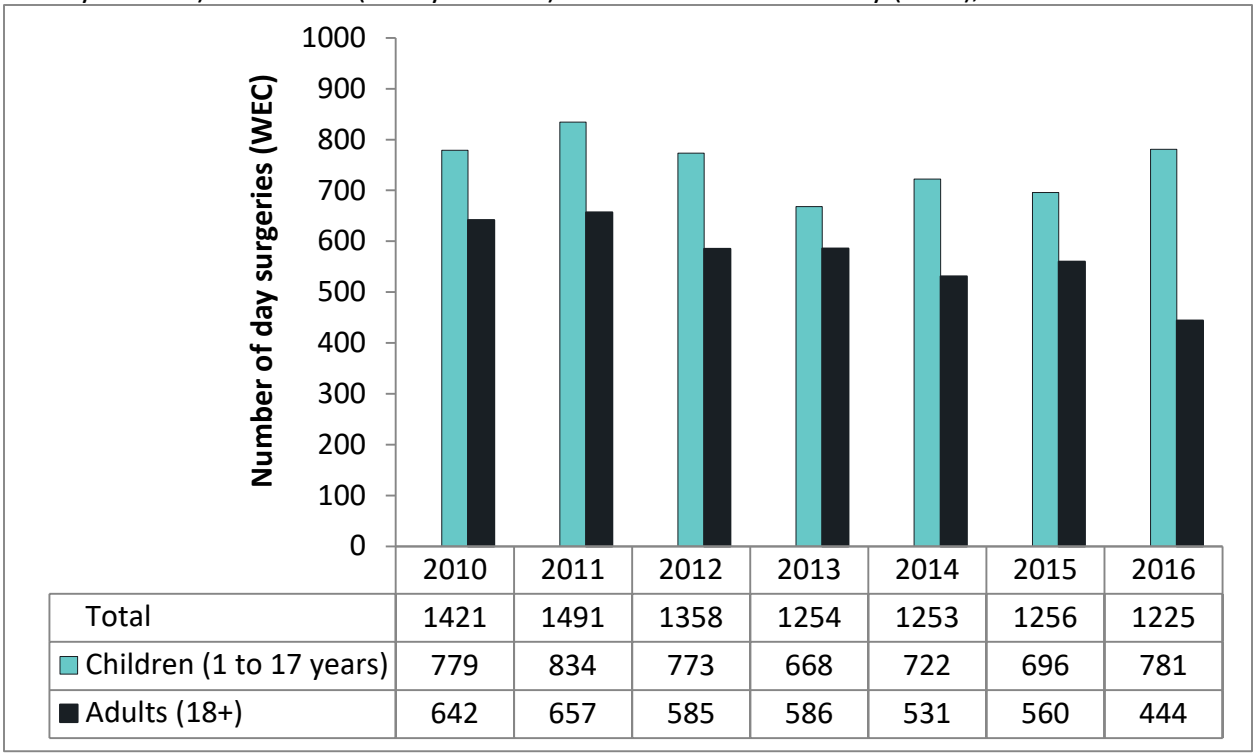
The most common type of day surgery for children in Canada is for oral health issues primarily caused by early childhood cavities. In fact, nearly 1 in 3 day surgeries among children are for oral health issues (Canadian Institute for Health Information, 2013). Despite the commonness of this problem, the majority of these cases are preventable. Children with the highest risk of developing oral health issues that require day surgery include Indigenous, those from low-income households, and those from rural communities (Canadian Institute for Health Information, 2013).

The number of day surgeries in Windsor-Essex County (2010-2016) is reported in **Figure 7**, and the rates locally and in Ontario are reported in **Figure 8**. In Windsor-Essex County, annually, there are 1,323 day surgeries on average for caries-related related issues, corresponding to an average annual rate of 326 day surgeries per 100,000 population. In 2016, the rate of oral day surgeries for caries-related issues was almost 3-times greater in Windsor-Essex County compared to Ontario.

The annual average number of day surgeries and rate were higher in children than adults. There were 750 surgeries per year on average in children (annual average rate of 186 day surgeries per 100,000 population) compared to 572 surgeries per year on average in adults (annual average rate of 140 day surgeries per 100,000 population); see **Figure 7** and **Figure 9**. The age distribution of day surgeries by age groups is shown in **Figure 10**. Children 1 to 10 years had the highest rate of day surgeries. Although children had higher rates overall than adults, an increase in the rate of day surgeries was once again observed from 65 years and onwards.

Table 3 and **Table 4** show the oral-health (caries-related) conditions for which children and adults had day surgeries, respectively. Over 95% of day surgeries in children and adults were for unspecified caries related concerns. In Ontario, the healthcare costs for these procedures are, on average, $1,408 per surgery (2012 Canadian Dollars) (Canadian Institute for Health Information, 2013). Based on this average cost and using a local average of 1,323 oral day surgeries per year, it is estimated that oral day surgeries among children and youth in Windsor-Essex County costs $1.86 million each year (2012 Canadian Dollars). Adjusted for inflation, this amount rises to $2.00 million (2017 Canadian Dollars). The cost and burden of oral surgeries that is placed on the healthcare system could be reduced through health promotion and prevention strategies.

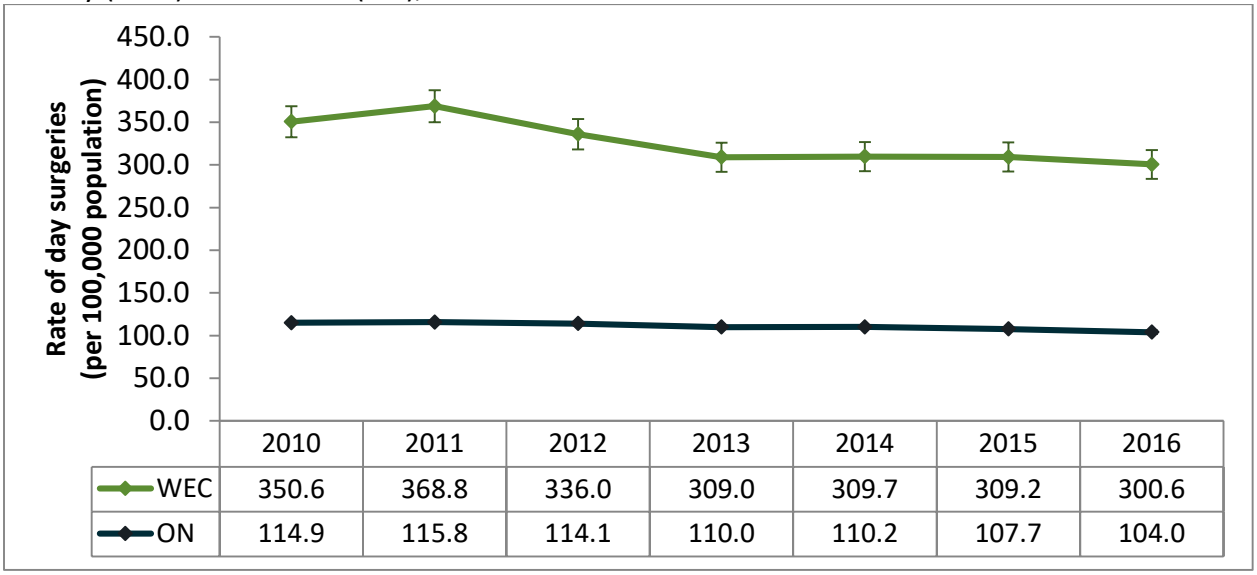
Figure 7. The number of day surgeries for oral health (caries-related) issues among children (1 to 17 years old) and adults (≥ 18 years old) in Windsor-Essex County (WEC), 2010-2016.



	2010	2011	2012	2013	2014	2015	2016
Total	1421	1491	1358	1254	1253	1256	1225
Children (1 to 17 years)	779	834	773	668	722	696	781
Adults (18+)	642	657	585	586	531	560	444

Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

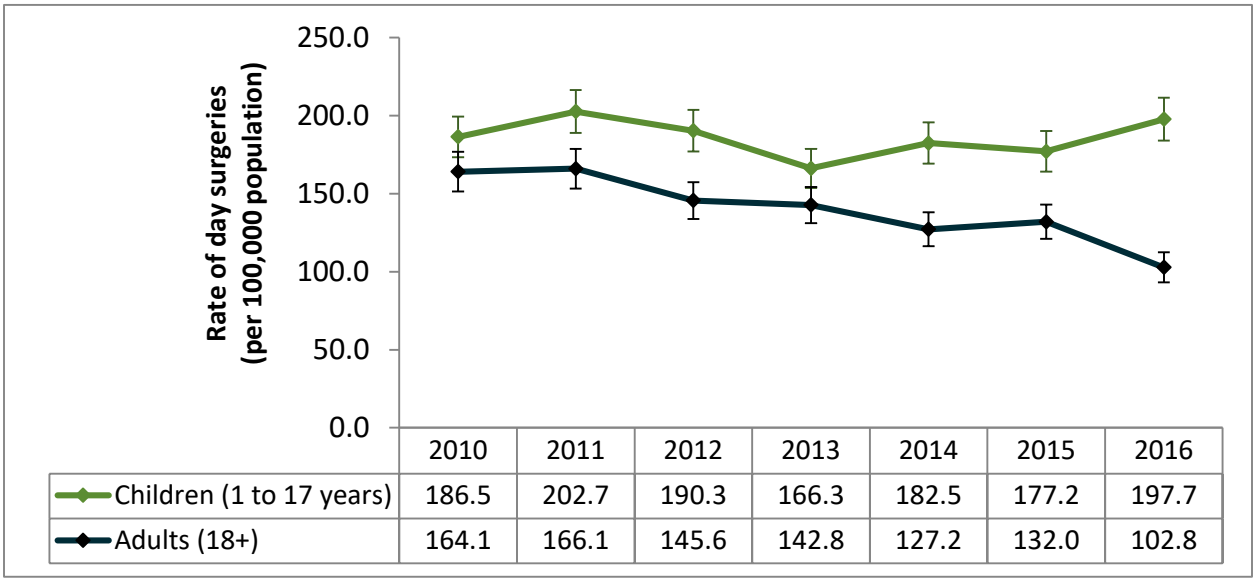
Figure 8. The rate of day surgeries for oral health (caries-related) issues in Windsor-Essex County (WEC) and Ontario (ON), 2010-2016.



	2010	2011	2012	2013	2014	2015	2016
WEC	350.6	368.8	336.0	309.0	309.7	309.2	300.6
ON	114.9	115.8	114.1	110.0	110.2	107.7	104.0

Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

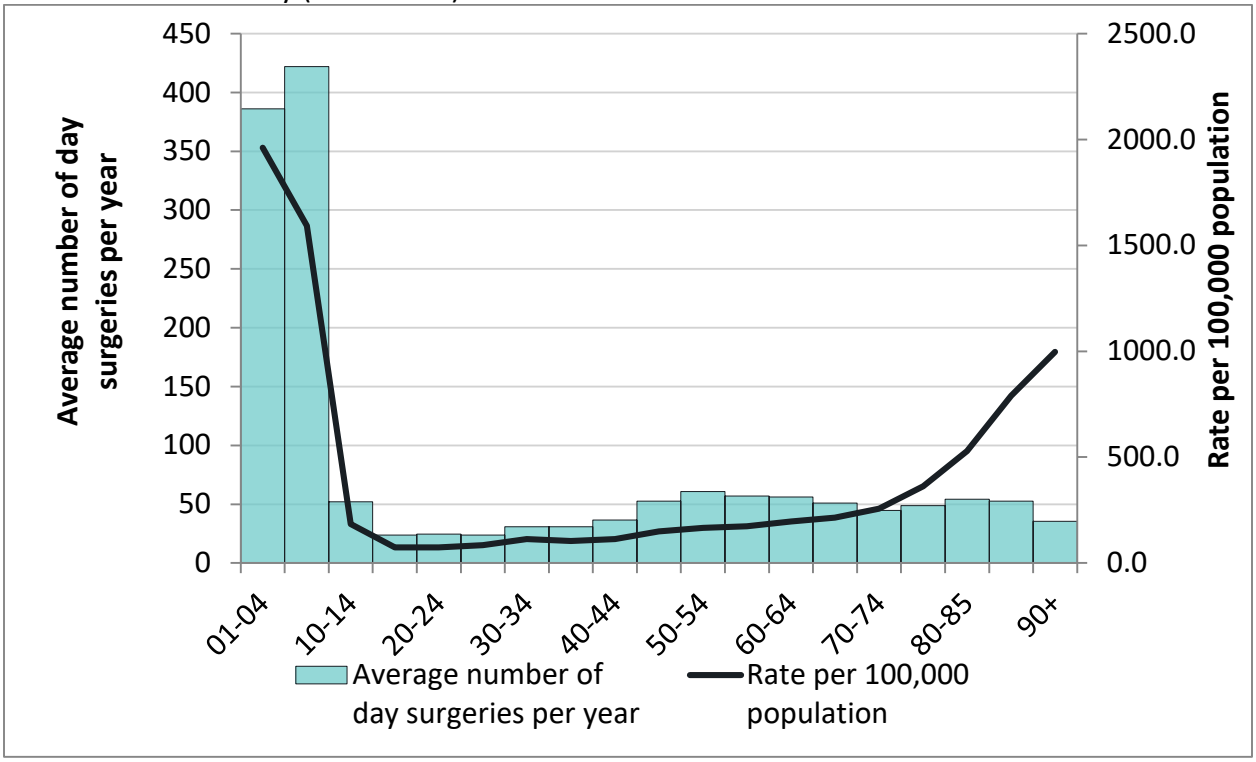
Figure 9. The rate of day surgeries for oral health (caries-related) issues among children (1 to 17 years) and adults (≥ 18 years old) in Windsor-Essex County (WEC), 2010-2016.



	2010	2011	2012	2013	2014	2015	2016
Children (1 to 17 years)	186.5	202.7	190.3	166.3	182.5	177.2	197.7
Adults (18+)	164.1	166.1	145.6	142.8	127.2	132.0	102.8

Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Figure 10. Average number of oral health (caries-related) day surgeries and rate by age group, Windsor-Essex County (2010-2016).



Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Table 3. Oral health (caries-related) conditions of children (1-17 years old) in Windsor-Essex County who had day surgeries (2010-2016).

Diagnosis (ICD-10 Code)	Number of ED visits (2010-2016)	Percent of all day surgeries for OH Conditions (%)
Dental caries, unspecified (K029)	5065	96.4%
Periapical abscess without sinus (K047)	115	2.2%
Other dental caries (K028)	72	1.4%
Caries of dentine (K021)	< 5	< 0.1%

Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Table 4. Oral health (caries-related) conditions of adults (≥18 years old) in Windsor-Essex County who had day surgeries (2010-2016).

Diagnosis (ICD-10 Code)	Number of ED visits (2010-2016)	Percent of all ED Visits for OH Conditions (%)
Dental caries, unspecified (K029)	3712	92.7%
Periapical abscess without sinus (K047)	252	6.3%
Other dental caries (K028)	36	0.9%
Caries of dentine (K021)	4	0.1%
Caries limited to enamel (K020)	< 5	< 0.1%

Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Oral Health Programs in Windsor-Essex County

There are several oral health programs that operate in Windsor-Essex County with the aim of improving oral health, primarily among children. Some programs are a collaboration of public health, community partners, school boards, and government agencies. The oral health programs in Windsor-Essex County are described in the following sections: (i) School Screenings and (ii) Preventive Services.

School Screenings

School dental screenings are conducted each year in all publicly funded elementary schools and some privately funded elementary schools. The Ontario Public Health Standards (OPHS) outline the requirement of providing annual oral health screenings to students in JK, SK, and Grade 2 at all publicly funded schools as per the Oral Health Assessment and Surveillance Protocol (Ontario Ministry of Health and Long-Term Care, 2018). Based on the Grade 2 screening results, a calculation is done to determine the school's screening intensity level. Schools that are calculated to have a higher intensity level are required to have additional grades screened.

The "no touch" screening is done by a Registered Dental Hygienist. A ten to thirty second visual inspection of the child's mouth is conducted with the aid of a sterilized mouth mirror and a light source. Data is collected and recorded in the Oral Health Information Support System (OHISS) for interpretation, analysis and statistical purposes.

Caregivers are notified prior to the screening date and may exclude their child from screening by notifying the school administration in writing prior to the date of the screening. A letter of no consent will be honoured for that school year only.

Through these screenings and other screening that are conducted in the community, children are identified that are in need of preventive services or urgent dental care. If the child does not have a dental provider and is in need of further care they may be referred to one of the health unit's two clinics or to a local oral health provider.

The following school screening results for Windsor-Essex County uses information extracted from OHISS (2011/2012 to 2016/2017 school years) to describe the oral health status of children in JK to Grade 8 who participated in the school screening program. This program is not able to screen all children but, of the children (in JK to Grade 8) living in Windsor-Essex County, an average of 35% of all children in this age group are screened each year through the school screening program. Of the JK, SK, and Grade 2 children in publicly funded schools in Windsor-Essex County, approximately 91% are screened each year through school screening

program. The other nine percent were either absent or were excluded during the day of the screening.

The total number of students screened in all grades across all schools in Windsor-Essex County is reported in **Table 5**.

Table 5. Oral health screening of children at schools in Windsor-Essex County (2011-2017).

School Year	Students Screened	Students Absent	Students Excluded/Refused
2011-2012	14,764	1,200 (7.4%)	333 (2.0%)
2012-2013	20,373	1,494 (6.7%)	572 (2.5%)
2013-2014	21,104	1,319 (5.7%)	696 (3.0%)
2014-2015	14,649	873 (5.5%)	458 (2.9%)
2015-2016	17,005	1,052 (5.6%)	692 (3.7%)
2016-2017	18,179	1,195 (6.0%)	606 (3.0%)

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 12, 2018).

For the 2016-2017 school year, this program conducted screenings at 119 school facilities. Nineteen (16%) of these schools had high intensities of tooth decay among grade 2 students. Compared to Ontario data (from 28 Public Health Units) for 2015-2016 (the latest school-year for which provincial data was available), 3477 school facilities were screened and 518 (15%) were considered to have high screening intensities (Ontario Ministry of Health and Long-Term Care, 2016). The number of school facilities where dental screening was conducted and the intensity of tooth decay among Grade 2 students are reported in **Table 6** for the Windsor-Essex County population.

Table 6. The number of school facilities screened in Windsor-Essex County (2011-2017) and the intensity of tooth decay among Grade 2 students at those facilities.

School Year	Facilities Screened	High Intensity Facilities	Medium Intensity Facilities	Low Intensity Facilities
2011-2012	120	13 (10.8%)	12 (10.0%)	95 (79.2%)
2012-2013	116	10 (8.6%)	13 (11.2%)	93 (80.2%)
2013-2014	114	16 (14.0%)	13 (11.4%)	85 (74.6%)
2014-2015	116	11 (9.5%)	18 (15.5%)	87 (75.0%)
2015-2016	115	24 (20.9%)	14 (12.2%)	77 (67.0%)
2016-2017	119	19 (16.0%)	11 (9.2%)	89 (74.8%)

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 12, 2018).

The screening outcomes for Windsor-Essex County children are reported in **Table 7**. From 2011/2012 to 2016/2017, the percentage of children that did not require any care

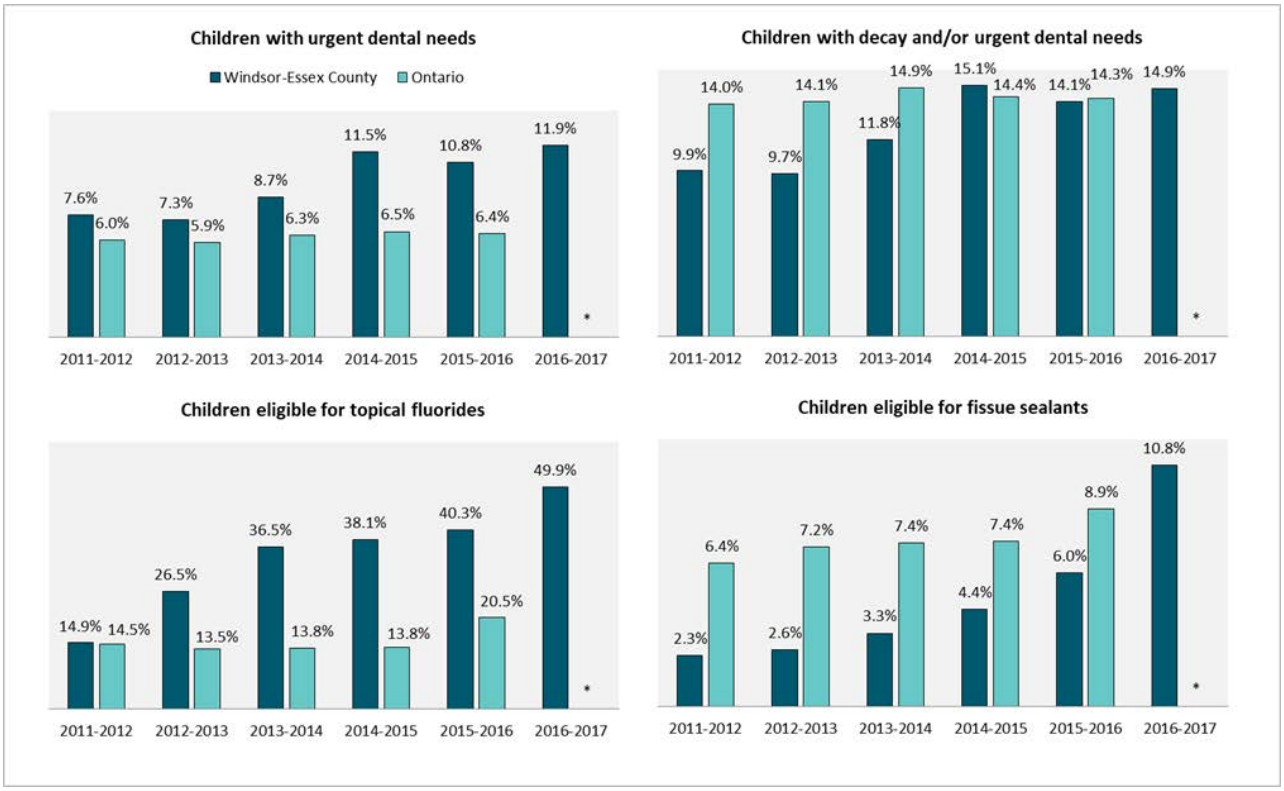
decreased substantially by 43% and the percentage of children with decay and/or requiring urgent care has increased by 51% over this period of time. The most alarming trend was the 3-fold increase in the proportion of children eligible for topical fluorides (a change of 236%) over this time period. Eligibility for topical fluoride occurs when children meet at least two of the following criteria: (i) community water fluoride concentration is less than 0.3 ppm, (ii) a past history of smooth surface decay, (iii) a presence of smooth surface decay (OMHLTC, 2008b). Hence, the cessation of community water fluoridation in 2013 in Windsor may explain the increase in children eligible for topical fluoride. There were also an increasing proportion of children eligible for fissure sealant and scaling, but incidences of fluorosis remain relatively rare.

Table 7. Screening outcomes for children at schools in Windsor-Essex County (2011-2017).

Indicator	Measure	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Children screened	n	14,764	20,373	21,104	14,649	17,005	18,179
No care required	n	11,798	13,804	12,152	8,478	9,189	8,239
	%	79.9	67.8	57.6	57.9	54.0	45.3
Non-urgent care required	n	348	507	663	525	558	544
	%	2.4	2.5	3.1	3.6	3.3	3.0
Urgent care required	n	1,119	1,479	1,829	1,682	1,838	2,158
	%	7.6	7.3	8.7	11.5	10.8	11.9
Decay and/or urgent care required	n	1,467	1,986	2,492	2,207	2,396	2,702
	%	9.9	9.7	11.8	15.1	14.1	14.9
Children eligible for topical fluorides	n	2,193	5,393	7,694	5,576	6,847	9,068
	%	14.9	26.5	36.5	38.1	40.3	49.9
Children eligible for fissure sealants	n	338	521	695	641	1,023	1,972
	%	2.3	2.6	3.3	4.4	6.0	10.8
Children eligible for scaling	n	603	1,327	2,009	1,146	1,635	1,977
	%	4.1	6.5	9.5	7.8	9.6	10.9
Children eligible for preventative services but did not require urgent care	n	1,750	4,589	6,499	3,985	5,498	7,319
	%	11.9	22.5	30.8	27.2	32.3	40.3
Moderate or severe fluorosis at time of school entry	n	0	0	0	0	0	0
	%	0	0	0	0	0	0

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 12, 2018).
n – Number of children
% – Percentage of children screened

Figure 11. Comparison of school screening outcomes between Windsor-Essex County and Ontario (2011-2017).



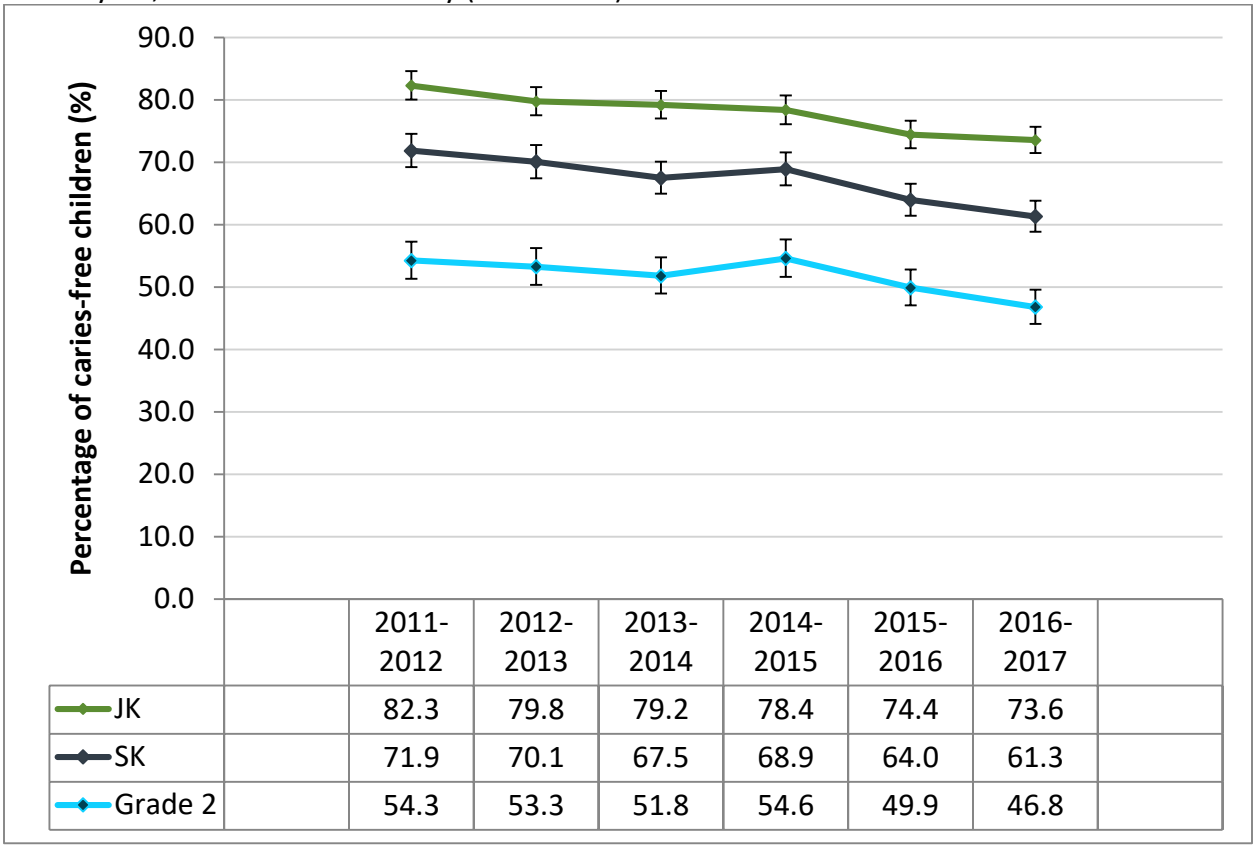
Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 12, 2018).
*Comparison data for Ontario (2016/2017) was not available at the time of data extraction. Denoted by an asterisk in the figure.

School screening outcomes were compared between Windsor-Essex County and Ontario, and these findings are reported in **Figure 11**. The percentage of children with urgent dental needs in 2016-2017 was 2-times greater in Windsor-Essex County compared to Ontario (2015-2016 Ontario data used for comparison). A similar trend was observed for all other school years. In Windsor-Essex County children with decay and/or urgent dental needs was either similar to or greater than the Ontario equivalent measure for all school years. The percentage of children eligible for topical fluorides has increased dramatically in Windsor-Essex County since 2011-2012 but has remained relatively stable in Ontario. In 2016-2017, 2-times more children in Windsor-Essex County were eligible for topical fluorides compared than Ontario (2015-2016 Ontario data used for comparison). The percentage of children eligible for fissure sealants is greater in Ontario than Windsor-Essex County for all previous school years (2016-2017 WEC data compared to 2015-2016 Ontario data). In general, children in Windsor-Essex County appear to have greater oral health needs when compared to children in Ontario.

The percentage of children who did not have any dental caries at the time of screening is reported in **Figure 12** by grade and school year. There is a common trend observed for all school years: at school entry (JK), 7 out of 10 children are caries-free but by second grade only 5

out of 10 children (50%) are caries-free. There was a decreasing trend in the proportion of caries-free children in JK and SK for the reported time period. For example, in 2011-2012, 82% of children were caries free, but by 2016-2017 this number decreased to 74%. This data indicates that more tooth decay is being observed among children at the time of school entry.

Figure 12. The percentage of caries-free children in the screening program by school grade and school year, Windsor-Essex County (2011-2017).

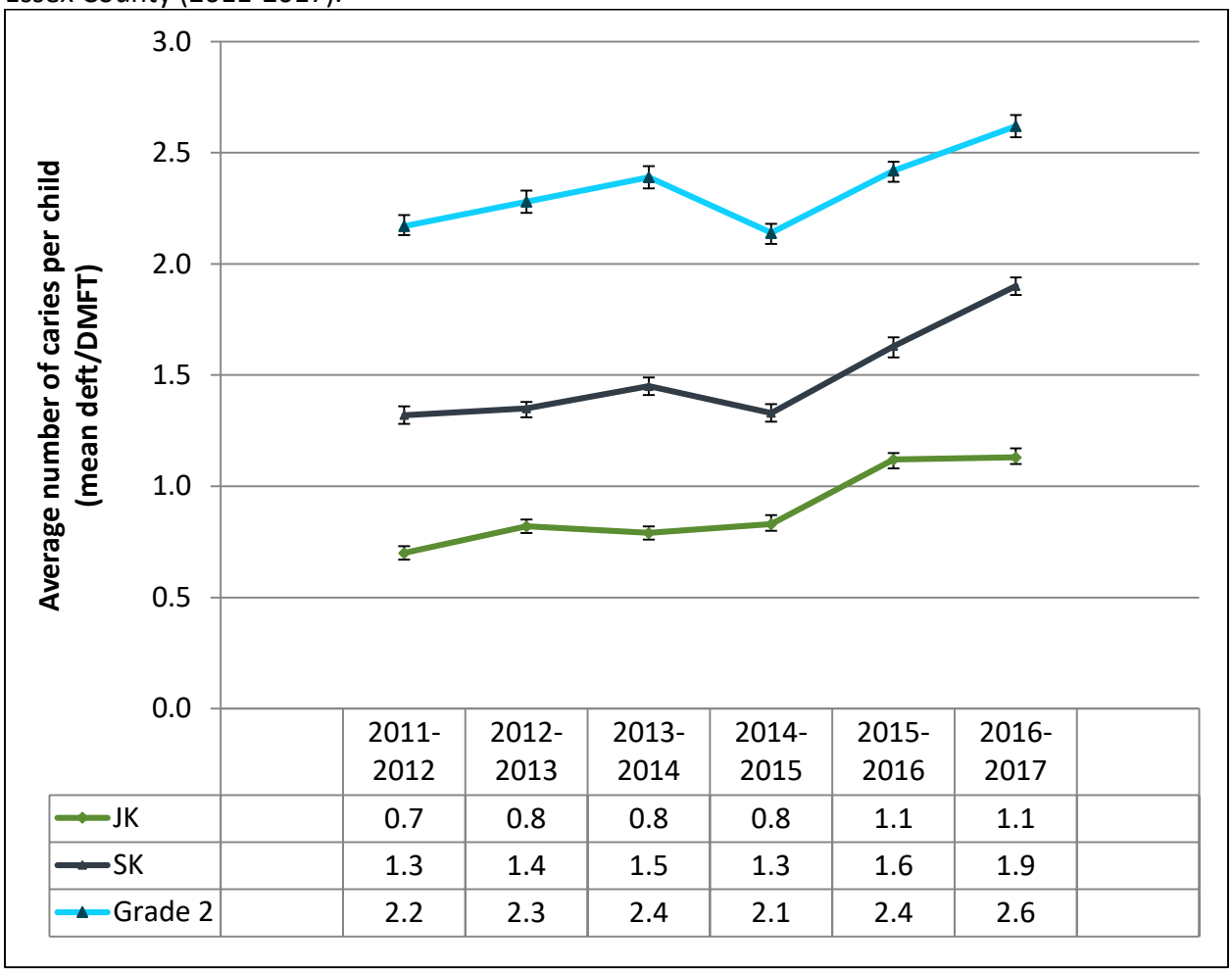


	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
JK	82.3	79.8	79.2	78.4	74.4	73.6
SK	71.9	70.1	67.5	68.9	64.0	61.3
Grade 2	54.3	53.3	51.8	54.6	49.9	46.8

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 12, 2018).

The mean deft/DMFT index is a measure of decayed, missing, extracted, and filled teeth (a greater value indicates more decayed/missing/extracted/filled teeth). The deft/DMFT index for children (JK to Grade 2) in Windsor-Essex County is reported in **Figure 13**. For JK students, the deft/DMFT index was greatest in 2016-2017 and lowest in 2011-2012. This indicates a trend in more decayed, extracted/missing, or filled primary and permanent teeth among children at the time of school entry. There was also an overall trend by grade level - the deft/DMFT index increased for students in higher grade levels.

Figure 13. The deft/DMFT index of screened children by school grade and school year, Windsor-Essex County (2011-2017).



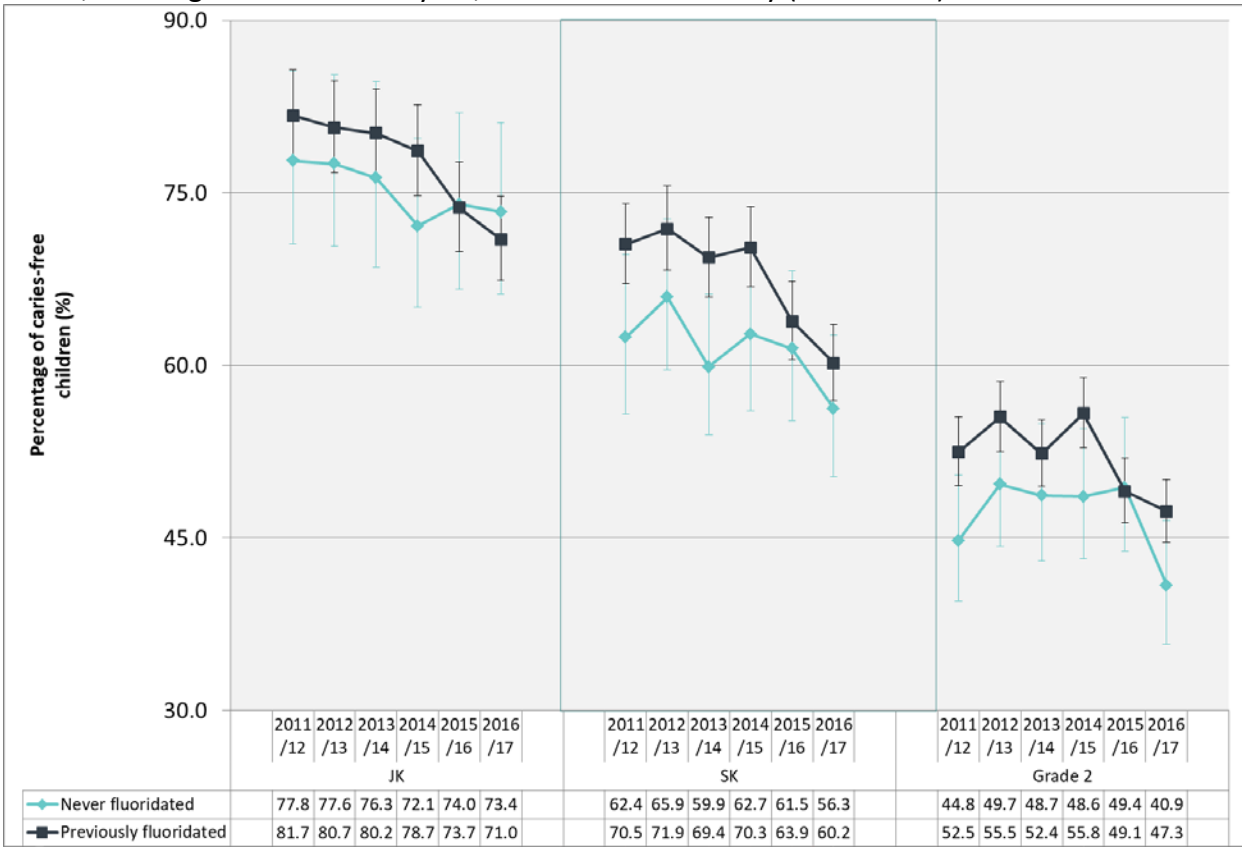
	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
JK	0.7	0.8	0.8	0.8	1.1	1.1
SK	1.3	1.4	1.5	1.3	1.6	1.9
Grade 2	2.2	2.3	2.4	2.1	2.4	2.6

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 12, 2018).

The percentage of children in publicly funded schools across three grades and two groups of communities (Kingsville, Essex, and Leamington – never fluoridated; Windsor, LaSalle, and Tecumseh – previously fluoridated) are shown in **Figure 14** and **Figure 15**. As described previously, oral health outcomes worsen with increasing age. There is also a gradual decrease in the percentage of children without any caries across time. From 2011-2012 to 2016-2017,

overall, there was an 8% decrease in the percentage of JK, SK, and Grade 2 students who are caries-free in the never fluoridated communities (Kingsville, Essex, and Leamington – 61% to 57%). For the same time period, in previously fluoridated communities (Windsor, LaSalle, and Tecumseh), there was a 13% decrease in the percentage of students without caries (68% to 59%).

Figure 14. The percentage of caries-free children in public schools by community fluoridation status, school grade and school year, Windsor-Essex County (2011-2017).

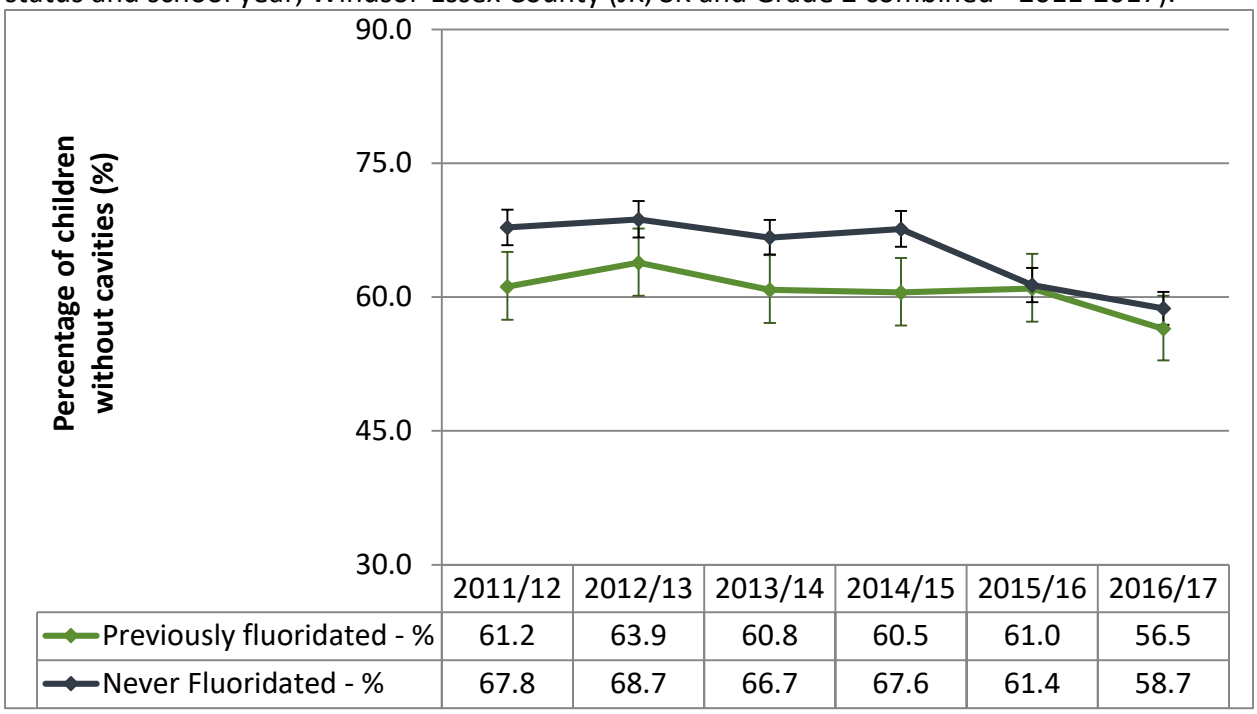


	JK						SK						Grade 2					
	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Never fluoridated	77.8	77.6	76.3	72.1	74.0	73.4	62.4	65.9	59.9	62.7	61.5	56.3	44.8	49.7	48.7	48.6	49.4	40.9
Previously fluoridated	81.7	80.7	80.2	78.7	73.7	71.0	70.5	71.9	69.4	70.3	63.9	60.2	52.5	55.5	52.4	55.8	49.1	47.3

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 12, 2018).

Note: Never fluoridated refers to Kingsville, Essex, and Leamington; Previously fluoridated refers to Windsor, LaSalle, and Tecumseh. Pelee was excluded to low sample size.

Figure 15. The percentage of caries-free children in public schools by community fluoridation status and school year, Windsor-Essex County (JK, SK and Grade 2 combined - 2011-2017).



	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Previously fluoridated - %	61.2	63.9	60.8	60.5	61.0	56.5
Never Fluoridated - %	67.8	68.7	66.7	67.6	61.4	58.7

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 12, 2018).

Note: Never fluoridated refers to Kingsville, Essex, and Leamington; Previously fluoridated refers to Windsor, LaSalle, and Tecumseh. Pelee was excluded to low sample size.

A summary of the core indicators for oral health prescribed by APHEO are reported in **Table 8** along with the observed trend of these measures from 2011/2012 to 2016/2017. Every trend indicated a worsening in oral health status for children in Windsor-Essex County with the exception of moderate or severe fluorosis which remained unchanged.

Table 8. Trends of the core indicators for oral health as identified by the Association of Public Health Epidemiologists in Ontario, Windsor-Essex County (2011-2017).

Indicator	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	Overall Trend
deft/DMFT index*	1.02	1.09	1.13	1.10	1.38	1.52	49% ↑
Caries-free children* (%)	77%	75%	73%	73%	69%	67%	13% ↓
Children with urgent dental needs (%)	7.6%	7.3%	8.7%	11.5%	10.8%	11.9%	57% ↑
Children with decay and/or urgent dental needs (%)	9.9%	9.7%	11.8%	15.1%	14.1%	14.9%	51% ↑
Children eligible for topical fluorides (%)	14.9%	26.5%	36.5%	38.1%	40.3%	49.9%	235% ↑
Children eligible for fissure sealants (%)	2.3%	2.6%	3.3%	4.4%	6.0%	10.8%	370% ↑
Fluorosis Index – moderate or severe fluorosis *+ (%)	0	0	0	0	0	0	**0% -**

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 17, 2018).
*At school entry (kindergarten).
+This indicator refers to children with a score of 3 (moderate) or 4 (severe) on the 0-4 score (Dean's) fluorosis index. It's a modified version of the APHEO indicator.

Overall, the school screening results demonstrate that children in Windsor-Essex County have greater oral health needs compared to the province and that the oral health of children in Windsor-Essex County has worsened over the time period examined by this report. These trends warrant concern and increased efforts to prevent poor oral health among children and youth in our region.

Preventive Services

The Oral Health Department at the Windsor-Essex County Health Unit also offers preventive services. The health unit has dental clinics located in Windsor, Essex, and Leamington. These services are available to children 17 years and under, and include scaling, professionally applied topical fluoride (PATF), pit and fissure sealants (PFS), and oral health education. The number of preventative oral health services offered by the health unit is summarized in **Table 9**.

Table 9. The number of preventative oral health services offered by the Windsor-Essex County Health Unit at its various locations throughout the region (2011-2017).

Year	Windsor	Essex	Leamington	Total
2011	767	266	898	1,931
2012	846	336	1,601	2,783
2013	1,118	233	1,165	2,516
2014	1,001	213	928	2,142
2015	779	194	1,259	2,232
2016	2,880	13	1,879	4,772
2017	4,530	-	3,443	7,973

Source: Internal records, Windsor-Essex County Health Unit.

Baby Oral Health Program (BOHP)

The Oral Health Team at the WECHU provides free dental screening for all children, 4 years and younger in Windsor-Essex County through the Baby Oral Health Program. This program began in 2014. Early dental screening helps make sure that a child's teeth are growing well and are not at risk for cavities or tooth decay. If left untreated, tooth decay in a child can cause pain, affect how adult teeth come in, or even affect speech.

A screening by a public health dental hygienist includes a check for cavities, a discussion about a healthy mouth and teeth, including information on healthy eating, and fluoride treatment at no cost, if needed. Need is determined by a caries "risk assessment" that is performed to see whether a child would benefit from a fluoride varnish application. Each child is provided a BOHP kit (see **Figure 16**), which consists of a bag that looks like a bunny rabbit and contains:

- Oral Health education resource
- Pamphlets on brushing and flossing
- Tooth eruption magnet that tells parent when to expect baby teeth and when they fall out

- Toothbrush
- Infant finger brush

Information about the program has been shared with parents and a variety of other service providers and primary care professionals, including all dentists, most doctors/walk-in-clinics, nurse practitioners, recreation centres, Ontario EarlyON Child and Family Centres, child care centres, children's consignment stores, and the midwives of Windsor. This information has been disseminated through flyers, posters, news releases, and social media. In fact, during Oral Health Month in April 2015 and 2016, social media was used as part of a larger promotional strategy for the Baby Oral Health Program.

When the BOHP launched in 2014 there were 12 children (0-4 years old) screened through this program. In 2017, there were 336 children (0-4 years old) screened through the BOHP in Windsor-Essex County.

Additionally, starting in late 2016, the BOHP program expanded to include new mothers to promote the importance of infant oral health and the one-year dental visit. This expansion of the BOHP was in collaboration with the oral health advisory committee with includes the Essex Dental Society and the City of Windsor.

Figure 16. The kit distributed to children in the Baby Oral Health Program.

Financial Assistance Programs

In Ontario, there are relatively few oral health programs that are available to those who cannot afford them. The majority of these programs are for children 17 years old and under. In Windsor-Essex County, like most communities across the province, there are an exceptionally limited number of programs for adults. The available programs and their eligibility requirements are listed below.

Children in Need of Treatment Program (CINOT)

CINOT was a provincially and municipally funded program for children in need of treatment. It has since been amalgamated into the new Healthy Smiles Ontario program.

Healthy Smiles Ontario Program (HSO)

On January 1st, 2016 six publically funded dental programs for children were combined into the new Healthy Smiles Ontario (HSO) program. The programs amalgamated included Ontario Works (OW), Ontario Disability Support Program (ODSP), and Children in Need of Treatment Program (CINOT). HSO is a government-funded dental program that provides free preventative, routine emergency, and essential dental services for children and youth 17 years old and under from low income households. There are three program streams within the HSO program.

1. **HSO-Core** – children are automatically enrolled in this stream if they receive assistance under: i) Temporary Care Assistance ii) Assistance for Children with Severe Disabilities or iii) their family receives OW or ODSP. Families may also apply if they have children 17 years of age and under, live in Ontario, AND come from a household that meets the income eligibility requirements.
2. **HSO-EESS** (formerly CINOT) – to qualify for the Emergency and Essential Services Stream (EESS) a child must have a clinical need and be able to show financial hardship. They are covered for 12 months from the date of their enrolment. If their family has private dental insurance coverage they are still eligible for this program.
3. **HSO-PSO** – a child can qualify for the Preventative Services Only (PSO) stream from the results of an oral health assessment or dental screening. Once enrolled, a child will be covered up to 12 months for professionally applied topical fluoride, pit and fissure sealant, scaling, and interim stabilization therapy services.

The number of HSO-EESS (formally CINOT) eligible children in Windsor-Essex County is reported in **Table 10** by calendar year. The average annual number of HSO-EESS eligible children presenting to the oral health clinics in the City of Windsor and the County of Essex were 966 and 403, respectively. Although fewer children are being screened and there are less

HSO-EESS eligible children, the total proportion of HSO-EESS eligible children has increased from 41% in 2012 to 55% in 2017.

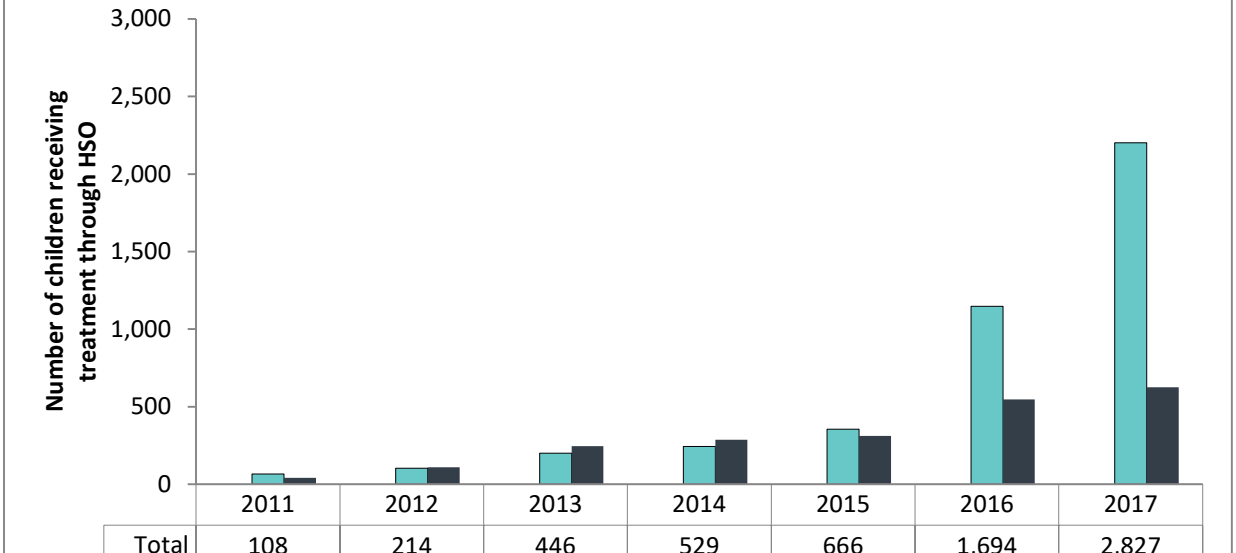
From 2011 to 2015, there was six-fold increase in the number of children receiving HSO treatments (see **Figure 17**). The large increases in treatment in 2016 and 2017 are due to the changes to HSO program in January 2016. Since the changes in 2016, there was a 67% increase in the number of children receiving HSO treatments.

Table 10. The number of children eligible for the Healthy Smiles Ontario-Emergency and Essential Services Stream (HSO-EESS) program presenting to the Windsor, Essex, and Leamington oral health clinics (2011-2017).

Year	Number of Children Screened			Number of HSO-EESS Eligible Children (%)			Total HSO-EESS Eligible Children
	Windsor	Essex	Leamington	Windsor	Essex	Leamington	
2011	2122	297	1106	935 (44%)	91 (31%)	435 (39%)	1461 (41%)
2012	1338	140	671	685 (51%)	55 (39%)	359 (54%)	1099 (51%)
2013	1348	65	593	706 (52%)	32 (49%)	265 (45%)	1003 (50%)
2014	1205	55	564	608 (50%)	20 (36%)	269 (48%)	897 (49%)
2015	1082	117	543	547 (51%)	38 (32%)	280 (52%)	865 (50%)
2016	1319	12	753	731 (55%)	2* (17%)	427 (57%)	1160 (56%)
2017	1082	0	1024	617 (57%)	-	545 (53%)	1162 (55%)

Source: Internal records, Windsor-Essex County Health Unit.
*Essex clinic closed in February 2017

Figure 17. Number of children receiving treatment by either a dental hygienist (RDH) or dentist (DDS) through the Health Smiles Ontario (HSO) program in Windsor-Essex County (2011-2017).



	2011	2012	2013	2014	2015	2016	2017
Total	108	214	446	529	666	1,694	2,827
RDH	67	104	201	243	354	1,147	2,201
DDS	41	110	245	286	312	547	626

Source: Internal records, Windsor-Essex County Health Unit.

Recommendations and Conclusions

The majority of oral health issues are preventable. Good oral health and prevention of oral health concerns can be achieved through a comprehensive approach to prevention addressing risk factors for poor oral health. Prevention approaches are multi-faceted and should address individual (brushing, healthy eating), environmental (community water fluoridation, access) and social factors (access to oral health services, social determinants of health) as well as policy (publically funded and accessible services).

Based on the data and analysis, the Windsor-Essex County Health Unit proposes the following recommendations to improve the oral health status in Windsor-Essex:

1. Windsor-Essex municipalities should consider continue to or introduce community water fluoridation as a key prevention strategy for dental caries.
2. Continue and increase support for oral health education and awareness in the community.
3. Improve access to oral health services within Windsor-Essex.
4. Advocate for improved funding for oral health services and expansion of public dental programs such as Healthy Smiles Ontario to priority populations.

The results of this report allow us to draw several conclusions about the oral health status of residents in Windsor-Essex County. In general, children in Windsor and Essex County appear to have greater oral health needs when compared to children in Ontario, and the oral health status of this population is worsening over time, as examined in this report. Additionally, many residents lack access to any form of dental services.

These critical findings demonstrate the significant need to expand programming and advocacy efforts to prevent poor oral health in our region. The results and recommendation provide a direction on addressing the needs of our community. The WECHU, its community partners, and the community can play a key role to move these recommendations forward.

Appendix A: Oral Health Core Indicators

Supplementary Table 1. Core indicators for the oral health of children and youth as identified by the Association of Public Health Epidemiologists in Ontario.

Name	Definition	Method	OHISS[1]
deft/DMFT index	The proportion of the number of teeth decayed, missing/extracted or filled to the total number of teeth examined in kindergarten children.	**Numerator**: number of decayed, missing, extracted, or filled teeth in kindergarten children.	DMF Total (DMF Details Report, JK)
		Denominator: total number of teeth examined in kindergarten children.	Total screened (DMF Report, JK)
Caries-free children	The proportion of the children at school entry who have never had any cavities.	**Numerator**: total number of children at school entry who have never had a cavity.	DMF=0 (DMF Report, JK)
		Denominator: total number of kindergarten children surveyed.	Total screened (DMF Report, JK)
Children with urgent dental needs	The proportion of children with urgent dental needs.	**Numerator**: number of children with urgent dental treatment needs.	CUC (SSR, all grades)
		Denominator: total number of children examined.	Screened (SSR, all grades)
Children with decay and/or urgent dental needs	The proportion of children with decay and/or urgent dental needs.	**Numerator**: number of children with decay and/or urgent dental treatment needs.	CUC+N-Urg[2] (SSR, all grades)
		Denominator: total number of children examined.	Screened (SSR, all grades)
Children eligible for CINOT[3]	The proportion of children eligible for children in need of treatment (CINOT) program.	**Numerator**: number of children eligible for CINOT.	N/A
		Denominator: total number of children examined (from birth to grade 8).	N/A
Children eligible for topical fluorides	The proportion of children eligible for topical fluorides.	**Numerator**: number of children eligible for topical fluorides.	PATF (SSR, all grades)
		Denominator: total number of children examined.	Screened (SSR, all grades)
Children eligible for fissure sealants	The proportion of children eligible for fissure sealants.	**Numerator**: number of children eligible for fissure sealants.	PFS (SSR, all grades)
		Denominator: total number of children examined.	Screened (SSR, all grades)

Name	Definition	Method	OHISS[1]
Fluorosis Index – Moderate or severe[4]	The proportion of the children at school entry who have moderate or severe dental fluorosis.	**Numerator**: number of children at school entry who have moderate or severe fluorosis (score of 3 or 4 on the 0-4 score Dean's index).	FL_3, FL_4 (SSR, JK)
		Denominator: total number of kindergarten children surveyed.	Screened (SSR, JK)

Source: Core Indicators, Association of Public Health Epidemiologists in Ontario (Updated August 2014), Accessed April 2018 (http://core.apheo.ca/index.php?pid=55).
SSR – Screening Summary Report
[1]Field name on report (name of report).
[2]Assumption: non-urgent decay.
[3]Available through internal records only.
[4]This indicator is a modified version of the APHEO core indicator, which reports on the proportion of children with fluorosis of any level of severity (score ≥ 1 on a 0-4 score Dean's index).

Appendix B: Community Water Fluoridation Statement

The Windsor-Essex County Health Unit's Board of Directors recommends that the Province of Ontario amend the regulations of the Safe Drinking Water Act to require community water fluoridation for all municipal water systems (when source-water levels are below the Health Canada recommended level of 0.7 mg/L) to prevent dental caries (tooth decay) and provide the funding and support to municipalities required.

- Community water fluoridation promotes good (oral) health and the relationship between poor oral health and poor physical and mental health is clear.
- Community water fluoridation is essential to minimize tooth decay, and help to restore and strengthen tooth enamel.
- Community water fluoridation is recognized as the single most effective public health measure to prevent tooth decay.
- Those in lower socio-economic status (SES) are at higher risk for poor health and oral health.
- Community water fluoridation is about equity. It is the most economical way to benefits all residents in the community irrespective of their SES, education or employment status.
- Most oral health services in Ontario are at a cost to our residents and favour those who can afford to pay.
- Global Health experts (World Health Organization, Centers for Disease Control, Health Canada) and scientific evidences support community water fluoridation to prevent tooth decay.
- When fluoride is added to the water at the recommended levels, studies have shown there is no link to negative health outcomes.
- For every $1 of spending on community water fluoridation, $38 is saved in future dental treatment.
- Fluorosis (a cosmetic alteration of the appearance of the tooth enamel) is associated only with areas that have exceeded the recommended concentration of fluoride in the drinking water.
- Research has shown declines in tooth decay where community water fluoridation has been introduced.

Appendix C: Supporting Data for Report Figures

Figure 1 data

Indicator	Percentage	Coefficient of variation	Lower 95% CI	Upper 95% CI	Number of respondents
Private dental insurance plan	9.6	16.6	6.9	13.2	38
Employer-paid dental insurance plan	58.9	4.6	53.6	64.1	227
Government-sponsored insurance plan	5.2	23.3	3.3	8.2	23
Reported no dental insurance coverage	24.3	9.5	20.0	29.1	107

Figure 2 data

Indicator	Percentage	Number of households	Total households
Child saw a dentist or dental hygienist for the first time before their first birthday	12.5	7	56
Child saw a dentist or dental hygienist and was told that they had a cavity or required dental fillings	34.1	14	41

Figures 3 data.

Indicator	Percentage	Number of households	Total households
Parent/caregiver cleans or helps clean child's teeth/gums at bedtime	82.8	48	58
Parent/caregiver cleans or helps clean child's teeth/gums at least twice per day, one of which is at bedtime	66.7	38	57

Figure 5 data.

Number of ED visits	Children (1 to 17 years)	Adults (18+)	Total
2010	53	799	852
2011	48	797	845
2012	65	820	885
2013	50	954	1004
2014	60	945	1005
2015	52	896	948

Number of ED visits	Children (1 to 17 years)	Adults (18+)	Total
2016	56	851	907

Figure 6 data.

Age group	Rate per 100,000 population	Average number of ED visits (per year)
01-04	68.6	13.5
05-09	88.0	23.3
10-14	41.4	11.7
15-19	144.8	46.3
20-24	407.0	135.7
25-29	537.1	151.0
30-34	419.9	114.2
35-39	366.8	108.0
40-44	318.5	102.5
45-49	286.7	101.3
50-54	253.1	92.5
55-59	167.3	55.0
60-64	126.9	36.3
65-69	126.9	30.0
70-74	122.5	21.3
75-79	96.7	13.0
80-85	94.5	9.7
85-89	92.9	6.2
90+	79.6	2.8

Figure 7 data.

Number of day surgeries (WEC)	Children (1 to 17 years)	Adults (18+)	Total
2010	779	642	1421
2011	834	657	1491
2012	773	585	1358
2013	668	586	1254
2014	722	531	1253
2015	696	560	1256
2016	781	444	1225

Figure 8 data.

Year	Region	Rate per 100,000 population	95% Lower LCI	95% Upper CI
2010	WEC	350.6	332.43	368.78
2011	WEC	368.8	350.14	387.44
2012	WEC	336.0	318.14	353.76

Year	Region	Rate per 100,000 population	95% Lower LCI	95% Upper CI
2013	WEC	309.0	291.94	326.1
2014	WEC	309.7	292.55	326.8
2015	WEC	309.2	292.12	326.33
2016	WEC	300.6	283.73	317.37
2010	ON	114.9	113.1	116.78
2011	ON	115.8	113.97	117.64
2012	ON	114.1	112.25	115.89
2013	ON	110.0	108.2	111.75
2014	ON	110.2	108.4	111.95
2015	ON	107.7	105.98	109.48
2016	ON	104.0	102.26	105.67

Figure 9 data.

Year	Age group	Rate per 100,000 population	95% Lower CI	95% Upper CI
2010	Children (1 to 17 years)	186.5	173.5	199.5
2011	Children (1 to 17 years)	202.7	189.1	216.4
2012	Children (1 to 17 years)	190.3	177.0	203.7
2013	Children (1 to 17 years)	166.3	153.7	178.8
2014	Children (1 to 17 years)	182.5	169.3	195.7
2015	Children (1 to 17 years)	177.2	164.1	190.3
2016	Children (1 to 17 years)	197.7	184.0	211.5
2010	Adults (18+)	164.1	151.4	176.8
2011	Adults (18+)	166.1	153.4	178.8
2012	Adults (18+)	145.6	133.8	157.4
2013	Adults (18+)	142.8	131.2	154.4
2014	Adults (18+)	127.2	116.3	138.0
2015	Adults (18+)	132.0	121.0	143.1
2016	Adults (18+)	102.8	93.1	112.5

Figure 10 data.

Age group	Rate per 100,000 population	Average number of day surgeries per year
01-04	1961.2	386.2
05-09	1592.0	422.0
10-14	184.7	52.0
15-19	74.5	23.8
20-24	73.5	24.5
25-29	84.2	23.7
30-34	113.4	30.8

Age group	Rate per 100,000 population	Average number of day surgeries per year
35-39	104.7	30.8
40-44	113.4	36.5
45-49	149.0	52.7
50-54	166.5	60.8
55-59	172.9	56.8
60-64	195.6	56.0
65-69	215.0	50.8
70-74	256.4	44.7
75-79	362.1	48.7
80-85	529.4	54.2
85-89	790.5	52.5
90+	997.4	35.5

Figure 11 data.

Year	Indicator	Windsor-Essex County	Ontario
2011-2012	Children with urgent dental needs	7.6%	6.0%
2012-2013	Children with urgent dental needs	7.3%	5.9%
2013-2014	Children with urgent dental needs	8.7%	6.3%
2014-2015	Children with urgent dental needs	11.5%	6.5%
2015-2016	Children with urgent dental needs	10.8%	6.4%
2016-2017	Children with urgent dental needs	11.9%	N/A
2011-2012	Children with decay and/or urgent dental needs	9.9%	14.0%
2012-2013	Children with decay and/or urgent dental needs	9.7%	14.1%
2013-2014	Children with decay and/or urgent dental needs	11.8%	14.9%
2014-2015	Children with decay and/or urgent dental needs	15.1%	14.4%
2015-2016	Children with decay and/or urgent dental needs	14.1%	14.3%
2016-2017	Children with decay and/or urgent dental needs	14.9%	N/A
2011-2012	Children eligible for topical fluorides	14.9%	14.5%
2012-2013	Children eligible for topical fluorides	26.5%	13.5%
2013-2014	Children eligible for topical fluorides	36.5%	13.8%
2014-2015	Children eligible for topical fluorides	38.1%	13.8%
2015-2016	Children eligible for topical fluorides	40.3%	20.5%
2016-2017	Children eligible for topical fluorides	49.9%	N/A
2011-2012	Children eligible for fissure sealants	2.3%	6.4%
2012-2013	Children eligible for fissure sealants	2.6%	7.2%
2013-2014	Children eligible for fissure sealants	3.3%	7.4%
2014-2015	Children eligible for fissure sealants	4.4%	7.4%
2015-2016	Children eligible for fissure sealants	6.0%	8.9%
2016-2017	Children eligible for fissure sealants	10.8%	*

Figure 12 data.

Grade	Year	Percentage	95% Lower CI	95% Upper CI	Number of children
JK	2011-2012	82.3	79.3	85.3	3563
JK	2012-2013	79.8	76.9	82.7	3599
JK	2013-2014	79.2	76.3	82.2	3640
JK	2014-2015	78.4	75.4	81.4	3396
JK	2015-2016	74.4	71.6	77.4	3454
JK	2016-2017	73.6	70.9	76.3	3824
SK	2011-2012	71.9	69.2	74.6	3882
SK	2012-2013	70.1	67.5	72.8	3827
SK	2013-2014	67.5	65.0	70.1	3965
SK	2014-2015	68.9	66.3	71.6	3892
SK	2015-2016	64.0	61.4	66.6	3739
SK	2016-2017	61.3	58.9	63.8	3884
Grade 2	2011-2012	54.3	52.0	56.6	4037
Grade 2	2012-2013	53.3	51.1	55.6	4079
Grade 2	2013-2014	51.8	49.6	54.1	4146
Grade 2	2014-2015	54.6	52.3	56.9	4000
Grade 2	2015-2016	49.9	47.7	52.1	4032
Grade 2	2016-2017	46.8	44.8	48.9	4166

Figure 13 data.

Grade	Year	Average	95% Lower CI	95% Upper CI	Number of children
JK	2011-2012	0.70	0.67	0.73	3563
JK	2012-2013	0.82	0.79	0.85	3599
JK	2013-2014	0.79	0.76	0.82	3640
JK	2014-2015	0.83	0.80	0.87	3396
JK	2015-2016	1.12	1.08	1.15	3454
JK	2016-2017	1.13	1.10	1.17	3824
SK	2011-2012	1.32	1.28	1.36	3882
SK	2012-2013	1.35	1.31	1.38	3827
SK	2013-2014	1.45	1.41	1.49	3965
SK	2014-2015	1.33	1.29	1.37	3892
SK	2015-2016	1.63	1.58	1.67	3739
SK	2016-2017	1.90	1.86	1.94	3884
Grade 2	2011-2012	2.17	2.13	2.22	4037
Grade 2	2012-2013	2.28	2.23	2.33	4079
Grade 2	2013-2014	2.39	2.34	2.44	4146
Grade 2	2014-2015	2.14	2.09	2.18	4000

Grade	Year	Average	95% Lower CI	95% Upper CI	Number of children
Grade 2	2015-2016	2.42	2.37	2.46	4032
Grade 2	2016-2017	2.62	2.57	2.67	4166

Figure 14 data.

Grade	Year	Fluoridation status	Percentage	95% Lower CI	95% Upper CI	Number of children
JK	2011/12	Never fluoridated	77.8	70.6	85.6	545
JK	2011/12	Previously fluoridated	81.7	77.9	85.7	2078
JK	2012/13	Never fluoridated	77.6	70.4	85.3	548
JK	2012/13	Previously fluoridated	80.7	76.8	84.7	2004
JK	2013/14	Never fluoridated	76.3	68.6	84.7	464
JK	2013/14	Previously fluoridated	80.2	76.5	84.0	2175
JK	2014/15	Never fluoridated	72.1	65.1	79.7	531
JK	2014/15	Previously fluoridated	78.7	74.8	82.7	1972
JK	2015/16	Never fluoridated	74.0	66.6	82.0	496
JK	2015/16	Previously fluoridated	73.7	69.9	77.7	1925
JK	2016/17	Never fluoridated	73.4	66.2	81.1	522
JK	2016/17	Previously fluoridated	71.0	67.4	74.7	2066
SK	2011/12	Never fluoridated	62.4	55.8	69.7	511
SK	2011/12	Previously fluoridated	70.5	67.2	74.1	2308
SK	2012/13	Never fluoridated	65.9	59.6	72.8	596
SK	2012/13	Previously fluoridated	71.9	68.3	75.6	2080
SK	2013/14	Never fluoridated	59.9	54.0	66.2	628

Grade	Year	Fluoridation status	Percentage	95% Lower CI	95% Upper CI	Number of children
SK	2013/14	Previously fluoridated	69.4	66.0	72.9	2234
SK	2014/15	Never fluoridated	62.7	56.0	70.0	507
SK	2014/15	Previously fluoridated	70.3	66.9	73.8	2279
SK	2015/16	Never fluoridated	61.5	55.2	68.2	576
SK	2015/16	Previously fluoridated	63.9	60.5	67.3	2133
SK	2016/17	Never fluoridated	56.3	50.4	62.6	592
SK	2016/17	Previously fluoridated	60.2	57.0	63.6	2131
Grade 2	2011/12	Never fluoridated	44.8	39.5	50.5	592
Grade 2	2011/12	Previously fluoridated	52.5	49.6	55.5	2298
Grade 2	2012/13	Never fluoridated	49.7	44.3	55.6	618
Grade 2	2012/13	Previously fluoridated	55.5	52.5	58.6	2317
Grade 2	2013/14	Never fluoridated	48.7	43.0	54.9	546
Grade 2	2013/14	Previously fluoridated	52.4	49.5	55.3	2470
Grade 2	2014/15	Never fluoridated	48.6	43.2	54.5	611
Grade 2	2014/15	Previously fluoridated	55.8	52.8	58.9	2345
Grade 2	2015/16	Never fluoridated	49.4	43.9	55.5	583
Grade 2	2015/16	Previously fluoridated	49.1	46.3	52.0	2376
Grade 2	2016/17	Never fluoridated	40.9	35.8	46.6	560
Grade 2	2016/17	Previously fluoridated	47.3	44.7	50.1	2495

Figure 15 data.

Grade	Year	Fluoridation status	Percentage	95% Lower CI	95% Upper CI	Number of children
All grades	2011/12	Never fluoridated	61.2	57.5	65.1	1648
All grades	2011/12	Previously fluoridated	67.8	65.8	69.8	6684
All grades	2012/13	Never fluoridated	63.9	60.2	67.7	1762
All grades	2012/13	Previously fluoridated	68.7	66.7	70.8	6401
All grades	2013/14	Never fluoridated	60.8	57.1	64.7	1638
All grades	2013/14	Previously fluoridated	66.7	64.8	68.6	6879
All grades	2014/15	Never fluoridated	60.5	56.8	64.4	1649
All grades	2014/15	Previously fluoridated	67.6	65.7	69.7	6596
All grades	2015/16	Never fluoridated	61.0	57.3	64.9	1655
All grades	2015/16	Previously fluoridated	61.4	59.5	63.3	6434
All grades	2016/17	Never fluoridated	56.5	52.9	60.2	1674
All grades	2016/17	Previously fluoridated	58.7	56.9	60.6	6692

Figure 17 data.

Year	RDH	DDS	Total
2011	67	41	108
2012	104	110	214
2013	201	245	446
2014	243	286	529
2015	354	312	666
2016	1147	547	1694
2017	2201	626	2827

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April 2018.