Children’s Dental Health—2003

Message from the Medical Officer of Health

Dental health is more than just a nice smile. Dental pain, bleeding and infection can interfere with learning in school and lead to tooth loss. Good dental health is also essential for healthy nutrition, especially for seniors.

Poor dental health often begins in childhood, as shown in this first report on the state of children’s dental health in the Region of Peel. The information summarized here was gathered by examining the teeth of thousands of Peel children—and it reveals that too many of them have dental health problems.

Peel Health monitors children’s dental health and works to improve it through public education, screening for serious dental problems, and free treatment for children in need. Beginning in 2003, Peel Health will also offer preventive clinical services to reduce the incidence of dental disease.

Fluoride added to most of Peel’s public drinking water supply plays a key role in preventing dental caries. This report shows that children in communities not served by fluoridated water fare less well.

Peel Health will continue to work to improve dental health in the Region. All of Peel’s children deserve a chance for a lifetime of healthy teeth and gums—and a nice smile, too.

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Medical Officer of Health
Acknowledgements

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Executive Summary

Oral health plays an important role in general health and quality of life. The Region of Peel Health department monitors the oral health of the community as part of its mandate and core activities. A survey of school-aged children was conducted in 2001/2002 to assess the oral health status of children in the Region. The survey identified significant dental disease among Peel children.

Dental Disease in Children

The prevalence of dental caries increases with age. Overall, 38% of Peel children had experienced dental caries, with a mean of 1.1 teeth affected. The prevalence of dental caries was highest among children aged seven and nine years.

Among the three Peel municipalities, the overall prevalence of dental caries was significantly higher in Caledon as compared to Brampton and Mississauga.

Gingivitis (gum infections) is the most common type of periodontal disease. Overall, 15% of Peel children had gingivitis. The prevalence of gingivitis increased with age and occurred in similar proportions in the three municipalities in Peel.

Risk Factors for Dental Disease

The most common dental diseases are infections resulting from plaque—soft bacterial accumulations—on tooth surfaces and gums. If these bacterial accumulations harden into tartar or calculus, they will require the assistance of dental professionals to remove them. Overall, more than half of the children (59%) surveyed in Peel had soft deposits on their teeth while 7% had hard deposits. There were no significant differences in plaque and tartar accumulation among children by municipality.

Overall, children born outside Canada exhibited higher levels of dental disease than their Canadian-born equivalents. This trend was observed for all indicators of oral health status assessed except for fluorosis.
**Fluorides in Caries Prevention**

Fluorides have been identified as being effective in the prevention of dental caries. The lake-based community water supply in Brampton and Mississauga is fluoridated within the recommended fluoride concentration levels. This lake-based source also supplies Bolton in the Town of Caledon. The remainder of Caledon is supplied by a non-fluoridated well-based municipal water supply and private wells. The widespread use of fluorides has been associated with increased prevalence of fluorosis. Dental fluorosis is a patchy enamel discolouration which results from the ingestion of large amounts of fluoride during tooth formation. In Peel in 2001/2002, the prevalence of fluorosis among children was 13%. Fluorosis was more prevalent in Brampton and Mississauga as compared with Caledon. Children identified with fluorosis had a lower prevalence of dental caries. The prevalence and severity of fluorosis in Peel does not constitute a public health threat.

**Access to Dental Care**

The use of fissure sealants—plastic coatings placed on the tooth surfaces—is effective in preventing dental caries. It is also a good indicator of access to dental care services. Use of pit and fissure sealants is not widespread in Peel as only 14% of children had sealants placed on their teeth. Sealant use was significantly higher in Caledon than in Brampton and Mississauga.

Dental diseases are not self-limiting and may progress to urgent conditions without appropriate treatment. Regular visits to dental care providers allow early identification and intervention to prevent diseases and complications from untreated conditions. It is less likely that dental diseases will progress to urgent conditions where access to oral health care is available. Therefore, the presence of urgent conditions indicates a delay in seeking treatment. Overall, 12% of Peel children had urgent dental conditions. Although not statistically different, the prevalence of urgent conditions was higher in Brampton and Mississauga than in Caledon. The prevalence of urgent conditions was higher among younger children.

Dental caries may be observed in its treated form as fillings or extractions, and in its untreated form as cavities. The proportion of children who have had all their teeth with dental caries restored (filled) without losing any can be used to assess relative access to caries treatment. Among Peel children who have had dental caries, 55% had all the cavities filled. Although not statistically significant, the proportion of children having all cavities filled was higher in Caledon than in Brampton or Mississauga.
Introduction

Children’s Dental Health 2003 is one of an ongoing series of health status reports published by the Region of Peel Health department to describe the health of the Region’s population.

Oral health plays an important role in general health and quality of life. While they are seldom life threatening, oral diseases cause undue pain and suffering that can impact on the psychological and social well-being of the individual affected. There is increasing evidence of a link between oral conditions and systemic diseases. Periodontal diseases (also referred to as gum infections) have been associated with diabetes, low birth weight, premature births, heart disease and stroke.

Among children, dental diseases can lead to abscesses in the mouth and undue pain, which can affect eating, sleeping and general growth and development. The impact of childhood dental diseases includes lost school days and work hours. In the United States, it has been estimated that 51 million school hours per year are lost because of dental illnesses.¹ This would be equivalent to five million or more lost school hours for Canadian children. Treatment of these conditions, especially among the very young, can be costly and often requires hospitalization. It is estimated that in 1993, Canadians spent nearly $4.7 billion on dental care.² The most current Canadian estimate is in excess of $6 billion.³
While most Canadians enjoy good oral health, the burden of oral disease is unevenly distributed in the population. One of the principal roles of Public Health is to monitor the health status of the community. This is accomplished in several ways: periodic surveys, reviews of existing information and screening for specified conditions. Unfortunately, monitoring of oral health in the community by public health has been traditionally limited in its scope by focusing on children. Data are usually collected from school-aged children in elementary schools.

This report describes results from the *Peel Dental Health Indices* survey which collected data during 2001 and 2002 from a sample of over 4,000 children in senior kindergarten and grades 2, 4, 6 and 8 in each of the Region’s municipalities. This sample included 1,622 children from Brampton, 602 from Caledon and 1,803 from Mississauga.

*Children’s Dental Health 2003* covers information on the following topics:

- Dental disease in children
- Risk factors for dental disease
- Fluorides in caries prevention
- Access to dental care

Confidence intervals were calculated to determine whether estimates by municipality were statistically similar or different. When estimates were “statistically different”, terms such as “statistically lower” or “statistically higher” are used.

For more details about the methodology underlying this survey, please refer to Data Sources and Methods on page 23.
Dental Disease in Children

Introduction

Dental caries, also referred to as tooth decay or cavities, is an infectious disease in which bacterial by-products, mainly acids, dissolve the hard tooth surfaces. Dental caries may occur in the pits and fissures, and on smooth surfaces in the hard-to-reach areas between the teeth. The bacteria causing the disease are transmissible, which makes dental caries a communicable disease. If the bacterial activities are not stopped, these bacteria may travel into the tooth structure through the cavitations and reach the dentine and pulp causing pain and abscesses. On average, it takes between one-and-a-half to three years for caries to progress from the outer enamel surface to dentine.4

Dental caries is traditionally described using the cumulative history of the disease. The index used is the sum of teeth decayed, missing and filled due to decay (DMFT) in an individual. This index summarizes the total experience of dental caries up to the time of assessment. Summary measures used in this report include the proportion of children who have had caries, and the mean number of teeth affected by caries.

Dental Caries

Dental caries is assessed as the proportion of the population who have ever experienced caries. Dental caries is defined as having ever experienced tooth decay in any form (DMFT > 0). Generally, caries start early in life and increase with age; however, this observation is obscured among 11 and 13 year old children due to the loss of the primary teeth as part of the natural tooth shedding process. Irrespective of past caries experience, a decayed primary tooth lost as part of the natural shedding process or lost as a result of injury is not included in the total caries experience.
Overall, 38% of Peel children surveyed in 2001/2002 had experienced dental caries. The proportion of children who had dental caries was highest among seven and nine year old children (see Figure 1.1).

**Figure 1.1: Proportion of Children with Dental Caries by Age, Region of Peel, 2001/2002**

The prevalence of dental caries increased from 30% among five year old children to 50% among nine year old children, and then decreased to 34% and 31% among 11 and 13 year old children respectively.

The prevalence of dental caries by age and municipality is described in Figure 1.2 on the following page. Although not shown, the overall proportion of children with dental caries was significantly higher in Caledon (50%) compared to Brampton (37%) and Mississauga (38%). With the exception of children aged five years, the proportion of children with dental caries across all ages was higher in Caledon than the other municipalities. This difference was significant among children aged nine years in Caledon when compared to Brampton and Mississauga. Current comparative provincial data are lacking.
A recent collaboration among some Ontario health departments included the compilation of data on dental caries in five year old children for the 2000 school year. The proportion of dental caries among children aged five years in this project ranged between 31% and 39%. The mean number of teeth affected ranged between 1.2 and 1.5. These findings were comparable to data for five year old children in Peel, where 30% had dental caries with a mean of 1.1 teeth affected.

**Prevalence of Dental Caries Among Children in Ontario**

There has been a general decline in the incidence of dental caries throughout the industrialized world.¹ Provincial data indicate the incidence of dental caries has declined for children of all ages. In Ontario in 1972, slightly more than half (58%) of children aged five years had experienced dental caries; by 1994, slightly less than one-third (31%) had experienced dental caries (see Figure 1.3 on the following page).
There was a similar decline in caries incidence among children aged 13 years. In 1972, more than 90% of 13 year old children in Ontario had experienced dental caries. This decreased steadily and by 1994, nearly half of 13 year old children, (51%) had experienced dental caries. Based on these observations, it is likely the same decline in dental caries incidence also occurred in Peel.

**Severity of Dental Caries**

In addition to the prevalence of dental disease, the mean number of teeth affected by caries provides a measure of the extent of disease. The severity of dental disease is defined as the mean number of decayed, missing and filled teeth (mean DMFT). In Peel in 2001/2002, children aged five years had an average of 1.1 teeth affected by decay. The mean DMFT increased to 1.5 teeth affected for children aged seven and nine years, but declined to an average of 0.7 for children aged 13 years. The decline in the mean DMFT for children aged 11 and 13 years was due to the replacement of decayed primary teeth with adult teeth.

The average number of teeth affected by decay for all ages (except children aged five) was higher among children in Caledon than those in Brampton and Mississauga (see Table 1.1 on the following page). In Caledon, children aged 11 years had significantly more teeth affected by decay than those of the same age in Brampton and Mississauga. This finding mirrors the pattern of prevalence of dental decay.
**Table 1.1—Mean DMFT* by Age and Municipality, Region of Peel, 2001/2002**

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Age (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>Mississauga</td>
<td>1.1</td>
</tr>
<tr>
<td>Brampton</td>
<td>1.0</td>
</tr>
<tr>
<td>Caledon</td>
<td>1.6</td>
</tr>
<tr>
<td>Peel</td>
<td>1.1</td>
</tr>
</tbody>
</table>

* DMFT is defined as decayed, missing or filled teeth.

**Gingivitis**

The health of the teeth is complimented by the health of the gums and periodontal ligaments. These structures support the teeth in the jaw bones. Severe periodontal diseases are uncommon among children, although a minority may suffer bleeding gums. Gingivitis, or bleeding gums, is the most common type of periodontal disease. If not controlled, bleeding gums could progress to more severe periodontal disease and early tooth loss. In its most common form, gingivitis is associated with plaque which causes inflammation. Gingivitis may be reversed if proper oral cleaning actions are taken to remove the plaque which contains the bacteria responsible for the inflammation. Overall, 15% of Peel children surveyed had gingivitis in 2001/2002. The prevalence of gingivitis was lowest among children aged five years and increased with age (see Figure 1.4).

**Figure 1.4: Proportion of Children with Gingivitis by Age, Region of Peel, 2001/2002**

Source: Dental Indices Survey, Region of Peel Health Department, 2001/2002.
Although there are no geographic differences in the age of onset of gingivitis, a significantly greater proportion of children aged seven years in Caledon had gingivitis compared with Brampton and Mississauga (see Figure 1.5). All three communities had a similar prevalence of gingivitis among children aged 11 and 13 years. Although the overall proportion of children with gingivitis in Caledon was higher (22%) than Brampton (13%) and Mississauga (16%), the difference was not statistically significant.

**Figure 1.5: Proportion of Children with Gingivitis by Age and Municipality, Region of Peel, 2001/2002**

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Mississauga</th>
<th>Brampton</th>
<th>Caledon</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>8</td>
<td>2</td>
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<tr>
<td>9</td>
<td>19</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>22</td>
<td>22</td>
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</tr>
<tr>
<td>13</td>
<td>23</td>
<td>26</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>27</td>
<td>26</td>
</tr>
</tbody>
</table>

Source: Dental Indices Survey, Region of Peel Health Department, 2001/2002.

**Summary**

Dental diseases, notably dental caries and gingivitis (or gum infections), affect over a third of children in Peel. The prevalence of dental caries increases with age. Overall, 38% of Peel children had experienced dental caries with a mean of 1.1 teeth affected. The prevalence of dental caries was highest among children aged seven and nine years. The overall prevalence and severity of caries were higher in Caledon than in Brampton and Mississauga.

Gingivitis (gum infections) is the most common type of periodontal disease. Overall, 15% of Peel children had gingivitis. The prevalence of gingivitis increased with age and occurred in similar proportions overall in the three municipalities in the Region.
Risk Factors for Dental Disease

Introduction

The most common dental diseases—dental caries and periodontal diseases—are infectious processes. Bacteria collect and grow in the deposits on the teeth and gums and in the supporting structures of the tooth in its socket. The deposits are in the form of soft plaque which can harden into calculus. While dental caries are caused by the acid produced by bacterial fermentation of carbohydrates, periodontal diseases are inflammatory responses to bacterial invasion of the gums and supporting periodontal structures. Periodontal diseases start as gingivitis.

Soft Deposits—Plaque

Dental plaque is a soft, slimy deposit which builds up in the mouth in the absence of good oral hygiene practices. It is primarily made of bacteria and gelatinous materials including food debris. In its early stages of formation, it is unorganized and the deposit is easily removed by tooth brushing alone. In later stages when it is fully formed, plaque is well organized and requires the services of a dental professional to perform proper tooth cleaning using specialized instruments. The presence of plaque is seen as a predisposing factor to dental caries and gingivitis. The presence of plaque is also an indicator of the daily oral cleaning practices of children.

Overall, more than half of the children surveyed in Peel (59%) had plaque deposits on their teeth. Forty-one per cent of children aged five years had soft deposits. The presence of soft deposits increased to 67% among children aged seven and nine years, and then decreased to 61% and 56% among children aged 11 and 13 years, respectively (data not shown). This pattern was consistent across each municipality (see Figure 2.1 on the following page).

Across all ages, children in Caledon had lower levels of plaque compared to Brampton and Mississauga. Children aged five years in Caledon had particularly low levels of plaque; however, there is no clear explanation for this difference and future surveys will monitor this observation.
Although the presence of plaque does not itself constitute dental disease, it is an indicator of risk for dental disease. Good oral hygiene practices, including daily tooth brushing and flossing, are effective measures in controlling plaque accumulation. Plaque allowed to accumulate for 10 to 21 days without removal may lead to gingivitis.

**Hard Deposits—Calculus**

Dental calculus, also referred to as tartar, is a hard deposit on the tooth that may lie above and/or below the gum margin. This deposit results from calcification (hardening) of plaque. It is removable by professional scaling only. Whereas calculus deposits do not cause disease, their presence offers further surface for growth of plaque which also acts as mechanical interference in daily tooth cleaning activities. When it forms below gum margins, calculus may increase the risk of developing periodontal disease.

Overall, 7% of Peel children had evidence of calculus in 2001/2002. A higher percentage of Caledon children had calculus (10%) compared to Brampton (6%) and Mississauga (7%); however, this difference was not statistically significant. Calculus was more prevalent among children of older ages in Peel overall and by municipality (see Figure 2.2 on the following page). Although the data are not shown, the proportion of Peel children with calculus was less than 1% for those aged five years, 4% for those aged seven years, 8% for those aged nine years, 7% for those aged 11 years and 13% for children aged 13 years. Since these deposits are not removable by daily personal tooth cleaning, it is important to seek professional dental service for treatment.
Oral Health of Canadian-born and Foreign-born Children

Children’s oral health is generally good in Canada. High levels of education and standards of living, coupled with the availability of professional dental services, contribute in good measure to the oral health of Canadian children.

Table 2.1 describes the differences in oral health status between Canadian-born and foreign-born children. Thirty-five per cent of children born in Canada had experienced dental caries compared to 44% of children born outside of Canada. Nine per cent of children born in Canada had urgent conditions compared to 17% of children born outside Canada. This trend was observed for all indicators of oral health status assessed except for fluorosis. The prevalence of fluorosis among Canadian-born children was nearly twice that of children born outside Canada.

Table 2.1—Dental Health Indicators by Place of Birth, Region of Peel, 2001/2002

<table>
<thead>
<tr>
<th>Health Indicator</th>
<th>Canadian-born</th>
<th>Foreign-born</th>
<th>Birth Place Not Known</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean caries experience</td>
<td>1.1</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>% with dental caries</td>
<td>35</td>
<td>44</td>
<td>31</td>
</tr>
<tr>
<td>% with fluorosis</td>
<td>17</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>% with urgent conditions</td>
<td>9</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>% with all caries restored*</td>
<td>59</td>
<td>49</td>
<td>41</td>
</tr>
<tr>
<td>% with all caries active* (untreated)</td>
<td>23</td>
<td>32</td>
<td>37</td>
</tr>
<tr>
<td>% with gingivitis</td>
<td>14</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>% with calculus</td>
<td>5</td>
<td>13</td>
<td>4</td>
</tr>
</tbody>
</table>

* Applies only to children who have experienced caries.

Source: Dental Indices Survey, Region of Peel Health Department, 2001/2002.
Summary

The most common dental diseases are infections resulting from plaque—soft bacterial accumulations—on tooth surfaces and gums. These bacterial accumulations may eventually become calcified and require removal by dental professionals. Overall, more than half of Peel children (59%) had soft deposits on their teeth while 7% had calculus or tartar. There were slight but non-significant differences in plaque and tartar accumulation among children in the three municipalities.

Overall, foreign-born children exhibited higher levels of dental disease than their Canadian-born equivalents. This trend was observed for all indicators of oral health status assessed except for fluorosis.
Fluorides in Caries Prevention

Introduction

Fluoride compounds are chemical substances found in various forms in nature, including air, fresh water, sea water, plants and fish. Fluorides have been used to prevent dental caries through use in community water fluoridation, fluoride-containing toothpastes, professionally-applied topical fluorides and several food and drink sources. The incidence of dental caries has been declining steadily in the industrialized world due to the widespread availability and use of fluorides. The protective effects of fluorides are greatest when the teeth have erupted into the mouth.

Community Water Fluoridation

Community water fluoridation has been identified as one of the ten most effective public health achievements in the past century.\(^7\) It is an effective, equitable and efficient means of preventing dental caries.\(^8\)

Fluoride was added to the municipal drinking water supply in Brampton and Mississauga in the early 1960s and is monitored continuously. The Town of Bolton in Caledon was connected to the municipal water system from Brampton in early 2002 and has been receiving fluoridated drinking water since that time. The remaining areas of Caledon are served by 13 municipal communal wells, which provide drinking water to approximately 10,800 people, and private wells (which are not fluoridated), which provide water to approximately 19,000 people.

Recent provincial and federal reviews of drinking water fluoridation levels resulted in new recommendations for optimal levels of fluoride in municipal water supplies. The current recommended optimal levels of 0.5 to 0.8 parts per million (0.5–0.8 mg/L) were implemented in mid-2000 at the municipal water treatment plants in Peel.
Fluorosis

Excessive exposure to fluorides, especially during the early years of tooth formation, may result in enamel fluorosis. Fluorosis is tooth discoloration which may range from patchy white staining of the tooth enamel in its mildest form to pitted brown staining in its severe form. Mild fluorosis is the most common presentation in Canada. Mild fluorosis is not easily visible to non-professionals but indicates the ingestion of a greater than optimal amount of fluoride. Fluorosis is assessed using various indices that describe the severity of the condition. The 2001/2002 Peel Dental Indices Survey used the Tooth Surface Index of Fluorosis (TSIF).*

In Peel, fluorosis most commonly presents in the mild form. The prevalence and the severity of fluorosis does not constitute a public health threat.

Among the Peel children surveyed, 13% overall were identified as having some form of fluorosis. Nine per cent had mild fluorosis, 3% had moderate fluorosis and 1% had severe fluorosis. Fluorosis could not be scored in 8% of students surveyed because the indicator teeth were not present. The proportion of Peel children with any or mild fluorosis by age is shown in Figure 3.1.

Figure 3.1: Proportion of Children with Any or Mild* Fluorosis by Age, Region of Peel, 2001/2002

* TSIF = Tooth Surface Index of Fluorosis
* *Mild* is a subset of “Any”.
NA= Data not available
Source: Dental Indices Survey, Region of Peel Health Department, 2001/2002.
The proportion of children with any type of fluorosis was higher in the fluoridated communities of Brampton and Mississauga than in Caledon which has not universally received fluoridated water (see Table 3.1). The prevalence and forms of fluorosis observed in Brampton and Mississauga were similar to dental survey results from Toronto which also has the recommended levels of fluoride in the drinking water supply.

<table>
<thead>
<tr>
<th>Table 3.1—Proportion of Children with Any or Mild* Fluorosis by Age and Municipality, Region of Peel, 2001/2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Municipality</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Brampton</td>
</tr>
<tr>
<td>Caledon</td>
</tr>
<tr>
<td>Mississauga</td>
</tr>
<tr>
<td>Peel</td>
</tr>
</tbody>
</table>

*Mild* is a subset of *Any*.

Source: Dental Indices Survey, Region of Peel Health Department, 2001/2002.

### Fluorosis and Dental Caries

The prevalence of dental caries is usually lower among children with fluorosis due to the protective effect of fluoride exposure. This effect was observed among the children surveyed in Peel. The prevalence and severity of dental caries was highest among children with no evidence of fluorosis. Figure 3.2 (see the following page) shows the relationship between fluorosis and the prevalence of dental caries. Among those children with no fluorosis, 40% had experienced dental caries. In comparison 30% of children with mild fluorosis and 21% of children with severe fluorosis had experienced dental caries.

The mean number of teeth affected by dental caries follows a similar relationship with fluorosis. Children with no fluorosis had more teeth affected by decay than children with fluorosis. The mean number of teeth affected by decay was 1.3 among children with no fluorosis compared with 0.7 and 0.3 teeth affected among children with mild and severe fluorosis, respectively. Similar results were reported in Toronto. Lack of current data does not permit comparison with provincial averages.
Fluorides are effective in preventing dental caries. The lake-based community water supply in Brampton and Mississauga is fluoridated within the recommended fluoride concentration levels. This lake-based source also supplies Bolton in the Town of Caledon. The remainder of Caledon is supplied by a non-fluoridated, well-based municipal water supply and private wells. The availability and widespread use of fluorides have been associated with increased prevalence of fluorosis. Dental fluorosis is a patchy enamel discoloration which results from ingestion of fluoride during tooth formation. In 2001/2002, the prevalence of fluorosis among children was 13% overall in Peel and was higher in Brampton and Mississauga compared with Caledon. Children identified with fluorosis had a lower prevalence of dental caries compared with children who had no fluorosis. The prevalence and the severity of fluorosis in Peel does not constitute a public health threat.

**Figure 3.2: Proportion of Children Aged 5, 7, 9, 11 and 13 with Dental Caries by Fluorosis Score, Region of Peel, 2001/2002**

<table>
<thead>
<tr>
<th>Fluorosis Score</th>
<th>Percentage</th>
<th>Mean DMFT†</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0) None</td>
<td>40</td>
<td>1.27</td>
</tr>
<tr>
<td>(1) Mild</td>
<td>30</td>
<td>0.74</td>
</tr>
<tr>
<td>(2) Moderate</td>
<td>32</td>
<td>0.72</td>
</tr>
<tr>
<td>(3 and 4) Severe</td>
<td>21</td>
<td>0.26</td>
</tr>
<tr>
<td>Not Scored*</td>
<td>30</td>
<td>0.98</td>
</tr>
</tbody>
</table>

† DMFT is defined as decayed, missing or filled teeth.

* For a small proportion of children, fluorosis was not scored because the indicator teeth were absent. Their results are presented separately rather than excluding them completely.

**SUMMARY**

Fluorides are effective in preventing dental caries. The lake-based community water supply in Brampton and Mississauga is fluoridated within the recommended fluoride concentration levels. This lake-based source also supplies Bolton in the Town of Caledon. The remainder of Caledon is supplied by a non-fluoridated, well-based municipal water supply and private wells. The availability and widespread use of fluorides have been associated with increased prevalence of fluorosis. Dental fluorosis is a patchy enamel discoloration which results from ingestion of fluoride during tooth formation. In 2001/2002, the prevalence of fluorosis among children was 13% overall in Peel and was higher in Brampton and Mississauga compared with Caledon. Children identified with fluorosis had a lower prevalence of dental caries compared with children who had no fluorosis. The prevalence and the severity of fluorosis in Peel does not constitute a public health threat.
Access to Dental Care

Introduction
Regular visits to dental care providers allow early identification and intervention to prevent deterioration and consequences of untreated conditions. Dental diseases are progressive and when left untreated may lead to severe pain, dental abscesses and facial swelling. These conditions could result in various limitations including problems with eating, sleeping, learning and social interactions. Some of the conditions may be considered as urgent depending on the extent of disease. The tendency for dental diseases to progress to urgent conditions is lower in areas where access to oral health care is good.

Pit and Fissure Sealants
Sealants, appropriately placed soon after the molar teeth erupt, are almost 100% effective in the prevention of dental caries. Despite their effectiveness, fissure sealants are not used in a widespread manner.

Prevalence of Pit and Fissure Sealants
The placement of dental sealants demonstrates access to preventive dental services. The use of dental sealants among children in Peel is consistent with patterns of tooth eruption. In 2001/2002, 14% of Peel children overall had one or more sealants placed on their teeth. The proportion of children with pit and fissure sealants increases with age. In 2001/2002, 2% of Peel children aged five years and 8% of children aged seven years had sealants. By age seven years, the first permanent molars have fully erupted into the mouth. It is important that sealants are placed on the molars soon after they erupt. Twenty per cent, 18% and 21% of children aged nine, 11 and 13 years respectively have had sealants placed.

Although not shown in Figure 4.1, a significantly higher proportion of children in Caledon (32%) had sealants placed for prevention of dental caries compared to children in Brampton (13%) and Mississauga (14%).
The use of dental sealants was also significantly higher among children aged seven years and older in Caledon than in Brampton and Mississauga (see Figure 4.1).

**Figure 4.1: Proportion of Children who had One or More Pit and Fissure Sealants by Age and Municipality, Region of Peel, 2001/2002**

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Mississauga</th>
<th>Brampton</th>
<th>Caledon</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>9</td>
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</tr>
<tr>
<td>11</td>
<td>19</td>
<td>15</td>
<td>40</td>
</tr>
<tr>
<td>13</td>
<td>20</td>
<td>22</td>
<td>47</td>
</tr>
</tbody>
</table>

Source: Dental Indices Survey, Region of Peel Health Department, 2001/2002.

**Urgent Dental Conditions**

The presence of urgent dental conditions indicates a delay in seeking necessary dental care. It may also act as an indicator for barriers to accessing dental treatment. The Ontario Ministry of Health and Long-Term Care has recognized certain oral conditions as urgent and has a set of criteria to identify these conditions. Any child identified as having any of these conditions should be monitored to ensure treatment is completed. Failure to treat the child is reportable to the child welfare authorities.

In 2001/2002, 12% of Peel children were identified as being in need of urgent dental treatment. The proportion of children in need of urgent treatment in Peel was higher among children of younger ages (see Figure 4.2 on the following page). Eighteen and 20% of children aged five and seven years were identified with urgent conditions. The prevalence of urgent conditions among children aged nine, 11 and 13 years was 13%, 6% and 6%, respectively.

The proportion of children in need of urgent treatment is an indication of delay in seeking oral care services. Among the very young, the process of providing the necessary dental treatment for these conditions may include hospitalization and the cost of treatment could be upwards of $2,000.00 per child.
Figure 4.2: Proportion of Children with Urgent Dental Conditions by Age, Region of Peel, 2001/2002

Source: Dental Indices Survey, Region of Peel Health Department, 2001/2002.

Figure 4.3: Proportion of Children with Urgent Dental Conditions by Age and Municipality, Region of Peel, 2001/2002

Source: Dental Indices Survey, Region of Peel Health Department, 2001/2002.
Although not significantly different, the prevalence of urgent conditions was higher in Brampton and Mississauga than in Caledon (see Figure 4.3 on the previous page). The prevalence of urgent conditions among children aged five and seven years in Caledon was less than half that of children of the same ages in Brampton and Mississauga. While there was a higher prevalence of dental disease, there was a lower prevalence of urgent conditions among children in Caledon.

**INCIDENCE OF URGENT DENTAL CONDITIONS IN ONTARIO**

Urgent dental conditions in children have declined in Ontario in a pattern similar to that of dental caries. After the initial decline from 1972 to 1974, there was a slight upswing in 1976 and again in 1980. These observations may be the result of changes in methodologies of data collection. However, there was a steady decline beginning in 1980 and continuing through that decade. In 1994, there seemed to be an increase in the prevalence of urgent conditions. Since no comparable data are available after the 1994 survey, it is uncertain whether this upswing is any indication of a reversal of the decline in urgent conditions. Furthermore, there are no data for Peel, making it impossible to conclude whether the prevalence of urgent conditions is declining or increasing in the Region.

**Figure 4.4: Proportion of Children Aged 5, 7 and 13 Years with Urgent Dental Conditions, Ontario, 1972–1994**

![Graph showing the proportion of children with urgent dental conditions from 1972 to 1994](image)

*Note:* Data from 1992 are not available.

**Dental Caries Treatment**

Dental caries are not self-limiting and once the process is initiated, the evidence—either active or treated disease—remains for life. One measure of identifying the community and professional response to the disease is the extent to which the disease has been treated. This may be assessed by the proportion of children with the disease who have had all teeth with dental caries restored (filled) without premature loss of teeth.

In Peel in 2001/2002, 55% of children who have ever had dental caries had all their cavities restored (see Figure 4.5). In Brampton and Mississauga, a lower proportion of children (51% and 54%, respectively) had all cavities restored. In contrast a higher proportion of children in Caledon who have had dental caries, (62%) had all caries restored. These difference between municipalities were not statistically significant.

![Figure 4.5: Dental Care Access Indicators by Municipality, Region of Peel, 2001/2002](chart)

This suggests children in Caledon may have better access to early intervention for treating dental caries. This is further supported by comparing the proportions of children with the disease who had not had any intervention. In Brampton, 29% of children with dental caries had not had any treatment compared to only 11% in Caledon.

Only 27% of children aged five years had all caries treated with fillings (see Figure 4.6 on the following page). This proportion increased with age to 77% among children aged 13 years. In contrast, more than half (54%) of children aged five years who had dental caries had not had any treatment for the disease. This proportion decreased to 11% at age 13 years. While there was a smaller proportion of children aged five years who had had dental caries, there was a delay in seeking care among this age group.
Dental diseases may progress to become urgent conditions unless adequate treatment is provided. Regular visits to dental care providers allow early intervention to prevent diseases and complications from untreated conditions. It is less likely that dental diseases will progress to urgent conditions where access to oral health care is available.

Fissure sealants—plastic coatings placed on the tooth surfaces—are effective in preventing dental caries and are also a good indicator of access to dental care services. In Peel, 14% of children had one or more sealants placed on their teeth. The use of sealants was significantly higher in Caledon than in Brampton or Mississauga.

The presence of urgent conditions clearly indicates a delay in seeking dental treatment. In Peel, 12% of children were identified with urgent dental conditions. Although not statistically different, the prevalence of urgent conditions was higher in Brampton and Mississauga than in Caledon. The prevalence of urgent conditions was higher among younger children.

Dental caries may present in the form of active and or treated disease. Access to caries treatment may be assessed as the proportion of children with the disease who have had all their teeth with dental caries restored (filled) without premature loss of teeth. Fifty-five per cent of Peel children who have ever had dental caries had all cavities filled. The proportion of children having all cavities filled was higher in Caledon than in Brampton or Mississauga.

**Summary**

Dental diseases may progress to become urgent conditions unless adequate treatment is provided. Regular visits to dental care providers allow early intervention to prevent diseases and complications from untreated conditions. It is less likely that dental diseases will progress to urgent conditions where access to oral health care is available.

Fissure sealants—plastic coatings placed on the tooth surfaces—are effective in preventing dental caries and are also a good indicator of access to dental care services. In Peel, 14% of children had one or more sealants placed on their teeth. The use of sealants was significantly higher in Caledon than in Brampton or Mississauga.

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Dental caries may present in the form of active and or treated disease. Access to caries treatment may be assessed as the proportion of children with the disease who have had all their teeth with dental caries restored (filled) without premature loss of teeth. Fifty-five per cent of Peel children who have ever had dental caries had all cavities filled. The proportion of children having all cavities filled was higher in Caledon than in Brampton or Mississauga.
Data Sources and Methods

Between October 2001 and January 2002, oral health assessments were carried out with Peel children in senior kindergarten and grades 2, 4, 6 and 8 in accordance with the Ontario Ministry of Health and Long-Term Care guidelines.

The number of children to be surveyed was calculated using Epi Info 6.04b. The prevalence estimates of caries among children in Ontario from the 1994 Dental Indices Survey were used as the best estimate for Peel for the sample size calculation. The estimated sample size requirements for each municipality for the 2001/2002 survey were 2,002 for Mississauga, 1,720 for Brampton and 1,297 for Caledon. Caledon was over-sampled to account for the smaller school population.

Schools in each of the municipalities were numbered consecutively. A random number table was then used to select schools from the list until the school population within each reflected the sample size requirement.

Parents were informed of the school-based dental survey through letters sent home with children at the beginning of the school year and prior to the screening. Parents had the option to exclude their children from participating in the dental screening or any of the dental services provided. A child could also refuse to participate in the survey.

During the survey period, every child in the selected school in senior kindergarten and grades 2, 4, 6 and 8 who had given consent had an oral assessment by dental hygienists from the Region of Peel Health department. The oral health assessments followed the 1997 Ontario Ministry of Health and Long-Term Care protocol. In this survey, examiners were calibrated for all the oral health indicators. Only cases of health conditions which were obvious were recorded. When in doubt of the presence of disease, the disease was not scored.

Data were entered into Epi Info 6.04b and analyzed using SPSS (Statistical Package for the Social Sciences) Version 11.0.0. To adjust for over-sampling in Caledon and other population discrepancies of the sample by municipality, a weight was applied to data for the final analysis. Confidence intervals for the statistical comparisons between municipalities were calculated using Epi Info 6.04b in order to adjust for clustering of the sample.

A total of 4,027 children in senior kindergarten and grades 2, 4, 6 and 8 were surveyed for this study: 1,622 from Brampton, 602 from Caledon and 1,803 from Mississauga. However, for this report, only children aged five, seven, nine, 11 and 13 were included in the analysis. All other ages were excluded.
References


