An Update on Pediatric Dental Surgery Rates for Early Childhood Caries (Tooth Decay) in Manitoba (2007/08 to 2014/15):
Sharing Evidence with Manitoba Communities, Decision-Makers and Stakeholders

March 2017

Prepared by the Healthy Smile Happy Child Initiative
Objectives

The objective of this report is to inform and update Manitoba communities, decision-makers, service providers and other interested stakeholders of the rates and volumes of pediatric dental surgery to treat early childhood caries (ECC or tooth decay) in children < 72 months of age in all Manitoba Regional Health Authorities and their smaller geographic areas. This report is intended to support knowledge exchange and increase engagement of all stakeholders regarding the promotion of early childhood oral health (ECOH) and prevention of ECC.

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The results and conclusions are those of the authors and no official endorsement by the Manitoba Health, Seniors and Active Living or other data providers is intended or should be inferred.

This work is also supported by the Canadian Institutes of Health Research (CIHR). Dr. Schroth is a CIHR Embedded Clinician Researcher in Improving Access to Oral Health Care and Oral Health Care Delivery for Vulnerable Young Children in Manitoba.
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Pre-Amble

This update report focuses on pediatric dental surgery to treat severe Early Childhood Caries (ECC) in preschool children (< 72 months of age) in Manitoba. It is intended for communities, decision-makers, service providers and stakeholders to provide valuable information on the rates and volumes of dental surgery in all Manitoba Regional Health Authorities (RHAs) and their smaller geographic areas.

Why is this important?

Rates of dental surgery under general anesthesia (GA) to treat caries can serve as a population health indicator for planning, monitoring and benchmarking purposes. Reviewing dental surgery data is important and can provide information on the volume, socioeconomic distribution, and regional trends of dental surgeries. Few Canadian data exist to support the allocation of resources to address the burden of severe ECC. Providing stakeholders with such information can increase community knowledge, thereby building community capacity and informing resource planning and oral health promotional activities.

ECC continues to be the most common chronic disease of childhood, with recent prevalence estimates in Canada ranging from 28% to 98%. Severe ECC (and aggressive form of ECC) can negatively affect childhood health and well-being, including growth, development, nutritional status, and quality of life. The tendency to rely on dental surgery under GA is understandable, as this is an efficient and convenient method to minimize discomfort and diminish physical and mental stress for young children. Unfortunately, dental surgery does not offer a permanent solution, as it does not address underlying causative factors. Studies have suggested that more than half of children who undergo comprehensive treatment develop additional caries within 2 years.
A promising method to improve early childhood oral health (ECOH) is the promotion of a ‘dental home’ and the first dental visit by the child’s first birthday. Children benefitting from early dental care are reported to require less restorative and emergency dental care, are more likely to receive preventive dental care, and have lower ongoing treatment costs. Early dental visits are still not common practice in Canada. Fortunately, the Manitoba Dental Association established its Free First Visit program in 2010 in order to promote early dental visits in Manitoba. The Free First Visit program is ongoing and there are now ongoing efforts to increase participation in rural regions of the province.

Other prevention strategies include dietary counselling and the promotion of breastfeeding. Breastfeeding is reported to offer protection against caries. There is ample evidence implicating bottle misuse (e.g. bedtime bottle, bottle propping) in the development of ECC. Bottles should be limited to feeding time and if a child must go to bed with a bottle it should only contain water. Children should be weaned from the bottle by 12-14 months of age. Snacks containing sugar should also be limited to meal times. Some dental friendly snacks include cheese, fruits, and vegetables.

Establishing a good oral hygiene routine is also important for oral health. Parents should be counseled to begin cleaning their child’s mouth with a soft cloth before teeth arrive. Once teeth are present, parents should be instructed to brush the teeth twice daily. For children less than 3 years of age it is recommended to use a rice grain size amount of fluoridated toothpaste. For children older than 3 years of age it is recommended to use a green pea size amount of fluoridated toothpaste. Children should have help with brushing until they are 8 years old.

Given the role that cavity-causing bacteria play in tooth decay, antimicrobials may hold
promise in preventing and controlling caries in young children. Xylitol is a sugar substitute with antimicrobial characteristics that can reduce levels of Mutans Streptococci (bacteria that play a role in the development of caries) in both plaque and saliva. Some have recommended the addition of xylitol into a preventive regimen for children at moderate to high risk for caries. Wipes and toothpastes containing xylitol are available, but may not contain the needed concentrations of xylitol for them to have therapeutic effects. Xylitol gum is also available, as well as xylitol syrup for children under four years of age.

Oral health recommendations should be practical and sensitive to parents’ real life circumstances and social context. It is important to customize prevention strategies and messages for each family. Every child is different and so is their risk for decay. This is why undertaking a caries-risk assessment for each child is so important. Maintaining a positive and encouraging attitude is essential when sharing early childhood oral health messages with parents.

Health educators and community facilitators/health promoters in RHAs have the unique opportunity to share key early childhood oral health messages with the children’s families and caregivers in a variety of community settings. Opportunities exist for health educators and community facilitators/health promoters to aid in early childhood oral health education and awareness when participating in activities such as workshops, “Healthy Baby” groups, school committees, family counselling sessions, and other community activities.

Providing the rates and volumes of dental surgery under GA for smaller geographic regions to existing programs and services/providers can empower communities to move forward with ECOH promotion & ECC prevention activities directly related to the needs of their communities.
Executive Summary

Eighteen years of pediatric dental surgery data for children < 72 months of age from Manitoba Health shows that the rate of dental surgeries in Manitoba increased from 1997/98 to 2009/10, peaking at 44.9 per 1,000 children (Figure 1). However, since then the rates have begun to decline. In 2014/15, the average rate of dental surgery under GA to treat ECC was 34.2 per 1,000 children. These high rates of dental surgery mirror the increase in the prevalence of ECC in North America, but may also reflect easier access to dental surgery under GA and increasing parental preference for GA.
A recent publication of data from the Canadian Institute for Health Information (CIHI) revealed that surgery for ECC is the most common reason for pediatric day surgery in Canada\(^1\). Surgery for ECC constitutes 31% of all day surgeries for children ages 1-5\(^1\). Rates of dental surgery in Manitoba appear to have increased over time, as shown in Figure 1; this suggests that either more children are experiencing ECC or more children have easier access to surgery. Other factors that may be influencing variability need to be considered and explored, such as inconsistent data collection, dental surgery being conducted in private offices/facilities, and operating room availability.

In Manitoba alone, $2.7 million in hospital costs is spent on pediatric dental surgery every year\(^1\). This amount does not include the dental fees or transportation costs. The average hospital cost for pediatric dental surgery in Canada is $21.2 million per year (excluding Quebec)\(^1\).

CIHI data reveals that the Northern Health Region has higher rates of pediatric dental surgeries than other RHAs (Figure 2). A high Indigenous population who experience caries, high poverty rates, and less access to care may influence this.

**Figure 2:** Manitoba pediatric dental surgery rates by RHA for 2013-2014. [Data available from CIHI]
The Healthy Smile Happy Child (HSHC) initiative is an intersectoral, collaborative partnership that is informed by community development approaches to engage communities in ECC prevention strategies and promotion of early childhood oral health in Manitoba. HSHC’s logic model is guided by three fundamental principles, namely; community engagement and development, knowledge exchange related to oral health promotion, and research, evaluation and quality improvement. Key objectives of the HSHC project have been to: 1) gain community awareness and acceptance of the importance of the issue of ECC; 2) build on existing programs and services which target young children; 3) increase parental knowledge of ECC prevention; 4) increase knowledge of existing services and health providers of the importance of prevention; and 5) encourage existing service and health providers to incorporate ECC prevention activities into their practice. More information on HSHC can be found online: http://www.wrha.mb.ca/healthinfo/preventill/oral_child.php
An Update on Pediatric Dental Surgery Rates for ECC in Manitoba for the Years 2007/08 – 2014/15

This update report focuses on data for pediatric dental surgery in the province of Manitoba for the years 2007/08 to 2014/15. We relied on data provided by Manitoba Health, Seniors and Active Living, and worked with the WRHA’s Research and Evaluation Unit to calculate rates for Manitoba, RHAs and their smaller geographic areas.

The following information in this update report pertains to all children less than 6 years of age residing in Manitoba who underwent pediatric dental surgery to treat early childhood caries (ECC).

Figure 3 reveals that over the nine years of available data the rates of pediatric dental surgery in Manitoba have remained high over time with the highest rate being in 2009/10 (44.9 per 1,000). However, the rate of dental surgery to treat ECC appears to have slightly decreased to 34.2 per 1,000 in 2014/15.

**Figure 3:** Total number of children receiving dental surgery under general anesthesia per fiscal year in Manitoba.
Figure 4: Map of geographic areas in Manitoba.

Figure 4 illustrates the smaller geographic areas in Manitoba considered in this report.

Figure 5 reveals that the geographic area with the highest rates of pediatric dental surgery throughout the years 2007/08 to 2014/15 was the Burntwood area, within the Northern Health Region, with its highest rate (151.8 per 1,000) being in the year 2008/09. The South Eastman and Brandon areas have the lowest rates of pediatric dental surgery.

Figure 5: Age adjusted rates by geographic areas in Manitoba.
Figure 6 illustrates that pediatric dental surgeries are widespread throughout Manitoba. These maps are useful in helping to locate communities with high numbers of children undergoing dental surgery.

**Figure 6a:** Map of pediatric dental surgeries in Manitoba geographic areas for 2007/08.

**Figure 6b:** Map of pediatric dental surgeries in Manitoba geographic areas for 2008/09.

**Figure 6c:** Map of pediatric dental surgeries in Manitoba geographic areas for 2009/10.

**Figure 6d:** Map of pediatric dental surgeries in Manitoba geographic areas 2010/11.
Figure 6e: Map of pediatric dental surgeries in Manitoba geographic areas for 2011/12.

Figure 6f: Map of pediatric dental surgeries in Manitoba geographic areas for 2012/13.

Figure 6g: Map of pediatric dental surgeries in Manitoba geographic areas for 2013/14.

Figure 6h: Map of pediatric dental surgeries in Manitoba geographic areas for 2014/15.
In this report, we recognize the new Manitoba Regional Health Authorities (Figure 7); however, we have chosen to report data for smaller geographic areas in order to assist regions in understanding the burden of dental surgery for ECC at the population level.

Figure 7: Map of Manitoba RHAs.
The following updated information is for all children less than 6 years of age residing in the Interlake-Eastern Regional Health Authority who underwent pediatric dental surgery to treat ECC for the years 2007/08 to 2014/15.

**Interlake**

Figure 8 reveals that the rates for pediatric dental surgery in the Interlake geographic area have remained relatively stable over the years 2007/08 to 2014/15, ranging from 40.4 to 52.9 per 1,000 children.

**Figure 8:** Age adjusted rate for the Interlake geographic area.
North Eastman

Figure 9 reveals the rates for pediatric dental surgery in the North Eastman geographic area were variable over the years 2007/08 to 2011/12, but appear to be on the decline from 2011/12 to 2014/15, ranging from 86.7 to 56.2 per 1,000 children.

Figure 9: Age adjusted rate for the North Eastman geographic area.
Northern Health Region

The following updated information is for all children less than 6 years of age residing in the Northern Health Region who underwent pediatric dental surgery to treat ECC for the years 2007/08 to 2014/15.

Burntwood

Figure 10 reveals the rates for pediatric dental surgery in the Burntwood geographic area continue to be high. The highest rate was observed for the year 2008/09 (151.8 per 1,000 children). A slight decline occurred in 2014/15 (119.1 per 1,000 children). Rates for Burntwood are the highest in all of Manitoba.

Figure 10: Age adjusted rate for the Burntwood geographic area
Figure 11 reveals the rates for pediatric dental surgery in the Nor-Man geographic area have been variable over time. While rates have been relatively stable over the years 2007/08 to 2011/12, they declined markedly to 27.7 per 1,000 children in 2013/14, but then increased to 64 per 1,000 children in 2014/15.

*Figure 11*: Age adjusted rate for the Nor-Man geographic area.
The following updated information is for all children less than 6 years of age residing in Prairie Mountain Health who underwent pediatric dental surgery to treat ECC for the years 2007/08 to 2014/15.

Assiniboine

Figure 12 reveals the rates for pediatric dental surgery in the Assiniboine geographic area have been generally stable over the years 2007/08 to 2014/15, ranging from 22.9 to 35.9 per 1,000 children.

Figure 12: Age adjusted rate for the Assiniboine geographic area.
Brandon

Figure 13 reveals that the rates for pediatric dental surgery in the Brandon geographic area have remained stable over the years 2007/08 to 2014/15, at an average rate of 20.2 per 1,000 children.

**Figure 13**: Age adjusted rate for the Brandon geographic area.
Figure 14 reveals the rates for pediatric dental surgery in the Parkland geographic area have remained relatively stable with a slight increase from 40.2 per 1,000 children in 2010/11 to 45.8 per 1,000 children in 2014/15.

Figure 14: Age adjusted rate for the Parkland geographic area.
The following updated information is for all children less than 6 years of age residing in Southern Health – Santé Sud who underwent pediatric dental surgery to treat ECC for the years 2007/08 to 2014/15.

**Central**

Figure 15 reveals the rates for pediatric dental surgery in the Central geographic area have remained relatively stable over the years 2007/08 to 2014/15, at an average rate of 32.0 per 1,000 children.

**Figure 15**: Age adjusted rate for the Central geographic area.
Figure 16 reveals the rates for pediatric dental surgery in the South Eastman geographic area have remained stable over the years 2007/08 to 2014/15, being lowest in 2007/08 at 15.4 per 1,000 children and then stabilizing at an average rate of 19.8 per 1,000 children.

**Figure 16**: Age adjusted rate for the South Eastman geographic area.
**Winnipeg Regional Health Authority**

The following updated information is for all children less than 6 years of age residing in the Winnipeg Regional Health Authority (WRHA) who underwent pediatric dental surgery to treat ECC for the years 2007/08 to 2014/15. The WRHA also includes Churchill, Manitoba.

Figure 17 reveals that over the eight available years of data the rate of pediatric dental surgery in Winnipeg was at its highest in 2009/10 (35.6 per 1,000), but had declined since then to 23.2 per 1,000 in 2014/15.

![Average Rate for Winnipeg](image)

**Figure 17**: Total number of children receiving dental surgery under general anesthesia per fiscal year in Winnipeg.
Figure 18 illustrates the community areas and neighbourhood clusters of Winnipeg.

Figure 19: Map of Winnipeg community areas and neighbourhood clusters.

Figure 19 reveals that the Winnipeg community area with the highest rates of pediatric dental surgery over the years 2007/08 to 2014/15 was Point Douglas.

Figure 19: Age adjusted rates by Winnipeg community areas.
This figure has not been standardized to 160/1000 children so separate communities can be visually distinguished.
Figure 20 reveals that the rates for pediatric dental surgery in the Churchill geographic area have been variable over the years 2007/08 to 2014/15. Fluctuations in rates look more pronounced due to the small number in Churchill.

![Figure 20: Age adjusted rate for the Churchill geographic area](image-url)
Figure 21 illustrates that pediatric dental surgeries are widespread throughout Winnipeg with a greater proportion of children coming from the downtown and Point Douglas areas of Winnipeg for all recorded years.

**Figure 21a:** Map of pediatric dental surgeries in Winnipeg for 2007/08.

**Figure 21b:** Map of pediatric dental surgeries in Winnipeg for 2008/09.
Figure 21c: Map of pediatric dental surgeries in Winnipeg for 2009/10.

Figure 21d: Map of pediatric dental surgeries in Winnipeg for 2010/11.

Figure 21e: Map of pediatric dental surgeries in Winnipeg for 2011/12.

Figure 21f: Map of pediatric dental surgeries in Winnipeg for 2012/13.
Figure 21g: Map of pediatric dental surgeries in Winnipeg for 2013/14.

Figure 21h: Map of pediatric dental surgeries in Winnipeg for 2014/15.
Winnipeg Community Areas and Neighbourhood Clusters

**Assiniboine South**

Figure 22 reveals the rate for pediatric dental surgery in the Assiniboine South community area have remained relatively stable over the years 2007/08 to 2014/15, ranging from 8.5 to 19.9 per 1,000 children.

**Figure 22**: Age adjusted rate for Assiniboine South community area.
**Downtown**

Figure 23a reveals the rate for pediatric dental surgery in the Downtown community area have remained relatively stable over the years 2007/08 to 2011/12, but have slightly decreased in 2013/14 and 2014/15 to 36.6 per 1,000 children.

Figure 23b reveals the rates for pediatric dental surgery in Downtown East and Downtown West somewhat declined over the past five years.

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**Figure 23a**: Age adjusted rate for Downtown community area.

**Figure 23b**: Age adjusted rates for Downtown neighbourhood clusters, Downtown East and Downtown West.
**Fort Garry**

Figure 24a reveals the rates for pediatric dental surgery in the Fort Garry community area have remained relatively stable over the years 2007/08 to 2014/15, ranging from 13.8 to 25.1 per 1,000 children.

![Graph showing rates of dental surgery per 1000 children for Fort Garry and Canadian average](image)

**Figure 24a**: Age adjusted rate for Fort Garry community area.

Figure 24b reveals the rates for pediatric dental surgery in Fort Garry North and Fort Garry South have remained stable over the years 2007/08 to 2014/15.

![Graph showing rates of dental surgery per 1000 children for Fort Garry North and Fort Garry South](image)

**Figure 24b**: Age adjusted rates for Fort Garry neighbourhood clusters, Fort Garry North and Fort Garry South.
Inkster

Figure 25a reveals the rates for dental surgery in the Inkster area have been variable from 2007/08 to 2014/15. Dental surgery rates jumped from 33.5 per 1,000 children in 2007/08 to 67.8 per 1,000 children in 2009/2010, but declined to 33.3 per 1,000 children in 2014/15.

Figure 25a: Age adjusted rate for Inkster community area.

Figure 25b reveals the rates for pediatric dental surgery in Inkster East and Inkster West have been variable over the years 2007/08 to 2014/15.

Figure 25b: Age adjusted rates for Inkster neighbourhood clusters, Inkster East and Inkster West.
Point Douglas

Figure 26a reveals the rates for pediatric dental surgery in the Point Douglas community area have been variable over the years 2007/08 to 2014/15, ranging from 40 to 67.7 per 1,000 children. The rate was the lowest in 2014/15 at 40.0 per 1,000 children.

Figure 26b reveals the rates for dental surgery in Point Douglas North and Point Douglas South have been variable over the years, but appear to have declined over the last 3 years.

Figure 26a: Age adjusted rate for Point Douglas community area.

Figure 26b: Age adjusted rates for Point Douglas neighbourhood clusters, Point Douglas North and Point Douglas South.
River East

Figure 27a reveals the rates for pediatric dental surgery in the River East area have remained stable from 2007/08 to 2014/15 at an average rate of 25.6 per 1,000 children.

Figure 27b reveals the rates for pediatric dental surgery in River East East, River East North, River East South, and River East West were stable over the years 2007/08 to 2014/15.
River Heights

Figure 28a reveals the rates for pediatric dental surgery in the River Heights community area have remained stable from 2007/08 to 2014/15 at an average of 18.2 per 1,000 children.

**Figure 28a:** Age adjusted rate for River Heights community area.

Figure 28b reveals the rates for pediatric dental surgery in River Heights East and River Heights West have remained stable over the years 2007/08 to 2014/15.

**Figure 28b:** Age adjusted rates for River Heights neighbourhood clusters, River Heights East and River Heights West.
**Seven Oaks**

Figure 29a reveals the rates for pediatric dental surgery in the Seven Oaks community area have remained stable over the years 2007/08 to 2014/15, with an average rate of 28.8 per 1,000 children.

![Figure 29a](image)

**Figure 29a**: Age adjusted rate for Seven Oaks community area.

Figure 29b reveals the rates for pediatric dental surgery in Seven Oaks East, Seven Oaks North, and Seven Oaks West have remained stable over the years 2007/08 to 2014/15.

![Figure 29b](image)

**Figure 29b**: Age adjusted rates for Seven Oaks neighbourhood clusters Seven Oaks East, Seven Oaks North, and Seven Oaks West.
Figure 30a reveals the rates for pediatric dental surgery in the St. Boniface community area have remained stable over the years 2007/08 to 2014/15, ranging from 13.3 to 22.4 per 1,000 children.

Figure 30b reveals the rates for pediatric dental surgery in St. Boniface East and St. Boniface West have remained stable over the years 2007/08 to 2014/15.
Figure 31a reveals the rates for pediatric dental surgery in the St. James-Assiniboia community area have remained stable over the years 2007/08 to 2014/15, ranging from 15.7 to 25.6 per 1,000 children.

Figure 31b reveals the rates for pediatric dental surgery in St. James-Assiniboia East and St. James-Assiniboia West have remained stable over the years 2007/08 to 2014/15.
**St. Vital**

Figure 32a reveals the rates for pediatric dental surgery in the St. Vital community area have remained stable from 2007/08 to 2014/15, ranging from 13.5 to 21.5 per 1,000 children.

**Figure 32a**: Age adjusted rate for St. Vital community area.

Figure 32b reveals the rates for pediatric dental surgery in St. Vital North and St. Vital South have remained stable over the years 2007/08 to 2014/15.

**Figure 32b**: Age adjusted rates for St. Vital neighbourhood clusters, St. Vital North and St. Vital South.
Figure 33 reveals the rates for pediatric dental surgery in the Transcona community area have remained stable over the years 2007/08 to 2014/15, ranging from 9.4 to 26.8 per 1,000 children.

Figure 33: Age adjusted rate for Transcona community area.
Concluding Remarks

These updated data on rates of pediatric dental surgery can and should be used to focus oral health promotion efforts and resources to populations most at risk. This information can inform programs and service providers as they promote Early Childhood Oral Health (ECOH) and work to support Early Childhood Caries (ECC) prevention activities that are directly related to the needs of their communities. It can facilitate stakeholders to work upstream, focusing on creating an environment that fosters good oral health in young children.

Data from this updated report can be used:

- As a quick reference guide for “decision makers” to assist them in making evidence informed decision for service allocation in respective regions of Manitoba.
- To inform stakeholders and communities of the significant oral health challenges faced by many children in Manitoba.
- To build awareness of the burden that dental surgery to treat ECC has on the health care system. Considerable health care dollars are spent annually to treat ECC in operating rooms.
- To guide targeted ECOH promotion and ECC prevention activities in Manitoba.

References