



**Pediatric Dental Surgery Rates for Early Childhood Caries
(Tooth Decay) in Manitoba (2007/08 to 2012/13):
Sharing Evidence with Manitoba Communities, Decision-Makers and
Stakeholders**

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(revised)

Prepared by the Healthy Smile Happy Child Initiative

Objectives

The objective of this report is to inform 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, Healthy Living and Seniors or other data providers is intended or should be inferred.

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Pre-Amble

This 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 can negatively affect childhood health and well-being, including growth, development 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.

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 cariogenic 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. 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 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

Sixteen years of pediatric dental surgery data for children < 72 months of age from Manitoba Health shows that the rate of dental surgeries in Manitoba has been increasing over the years (Figure 1). In 1997/98, the mean rate for dental surgery was 19.4 per 1,000 children. However, in 2012/13, the average rate was 40.2 per 1,000 children. This steady increase mirrors the increase in the prevalence of ECC in North America, but may also reflect easier access to dental surgery under GA.

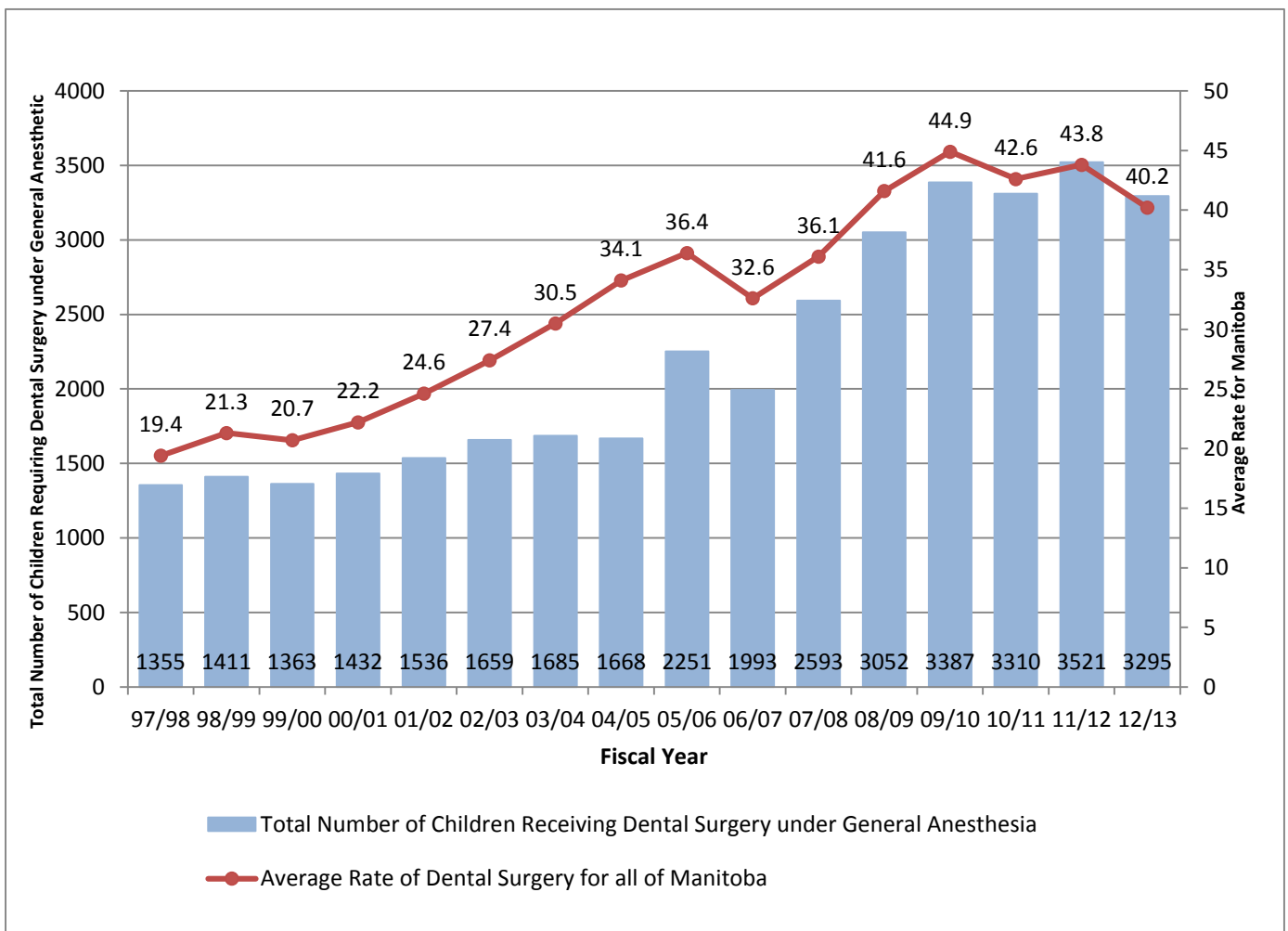


Figure 1: Rates of pediatric dental surgery in MB for 1997/98-2012/13. [Data available from MB Health]

A recent report from the Canadian Institute for Health Information (CIHI) revealed that surgery for ECC is the most common reason for pediatric day surgery in Canada. Surgery for ECC constitutes 31% of all day surgeries for children ages 1-5. Rates of dental surgery in Manitoba appear to be increasing over time, as shown in Figure 1, which 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, oral surgeries being conducted in private offices, and operating room availability.

In Manitoba alone, \$2.7 million in hospital costs is spent on pediatric dental surgery every year. 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).

Figure 2 shows the Northern Health Region has higher rates of pediatric dental surgeries than other RHAs. This may be impacted by a high Aboriginal population who experience caries, high poverty rates, and less access to care.

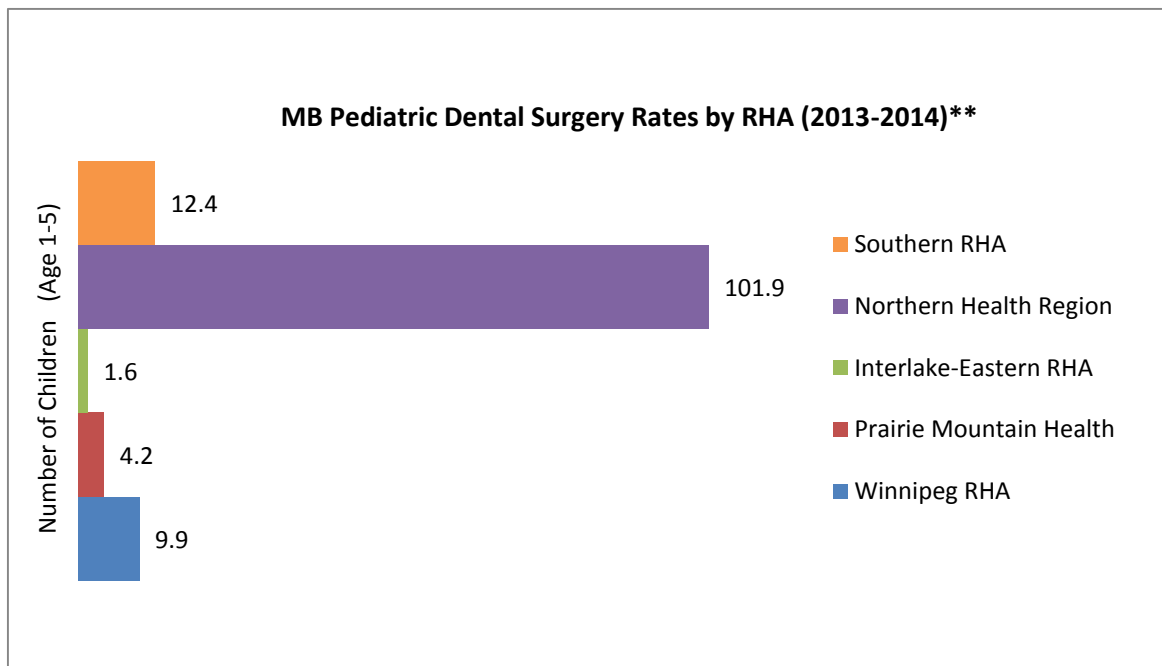


Figure 2: Manitoba pediatric dental surgery rates by RHA for 2013-2014. [Data available from CIHI]

Healthy Smile Happy Child (**HSHC**) 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.

Pediatric Dental Surgery Rates for ECC in Manitoba for the years 2007/08 – 2012/13

This report focuses on data for pediatric dental surgery in the province of Manitoba for the years 2007/08 to 2012/13. We relied on data provided by Manitoba Health, Healthy Living and Seniors 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 report pertains to all children less than 6 years of age residing in Manitoba who underwent pediatric dental surgery to treat ECC.

Figure 3 reveals that over the six years of available data the rate of pediatric dental surgery in Manitoba has increased over time with the highest rate being in 2009/10 (44.9 per 1,000). The rate of dental surgery to treat ECC appears to have decreased to 40.2 per 1,000 in 2012/13.

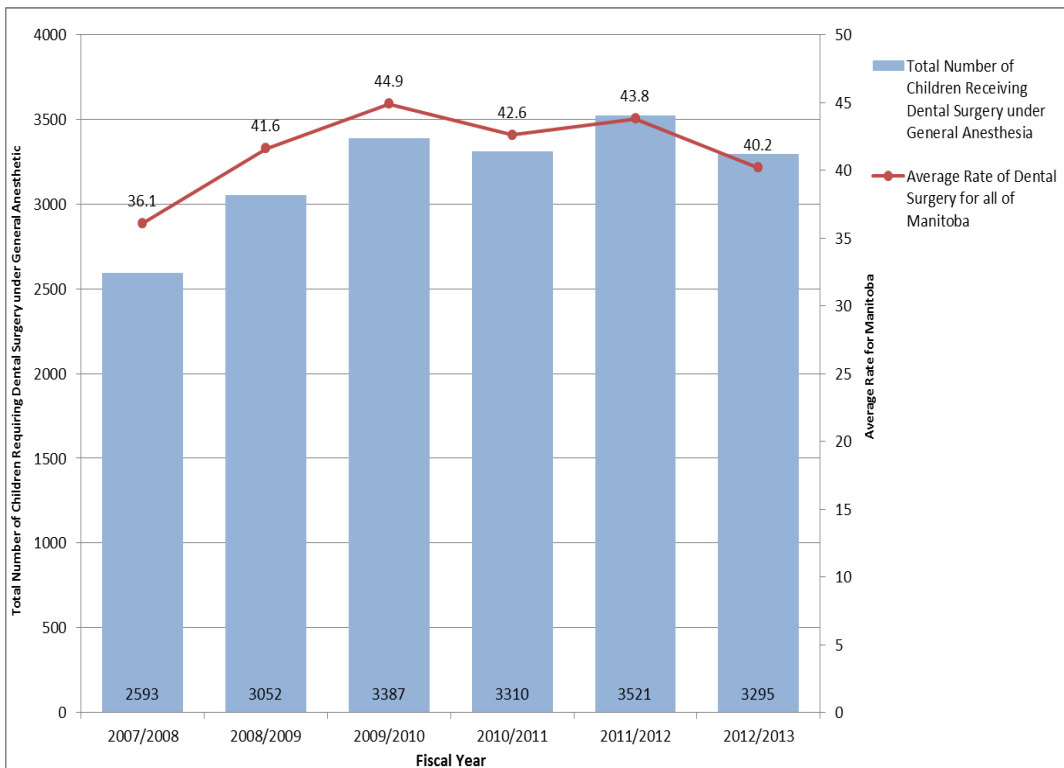


Figure 3: Total number of children receiving dental surgery under general anesthesia per fiscal year in Manitoba.

Figure 4 illustrates the smaller geographic areas in Manitoba.

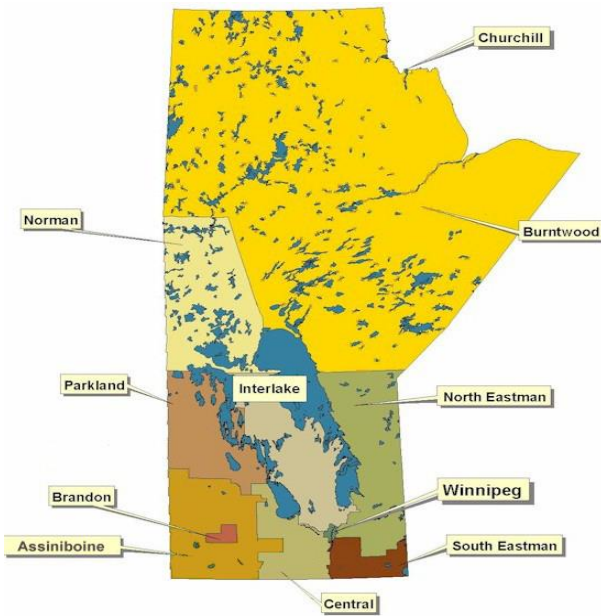


Figure 4: Map of geographic areas in Manitoba

Figure 5 reveals that the geographic area with the highest rates of pediatric dental surgery throughout the years 2007/08 to 2012/13 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.

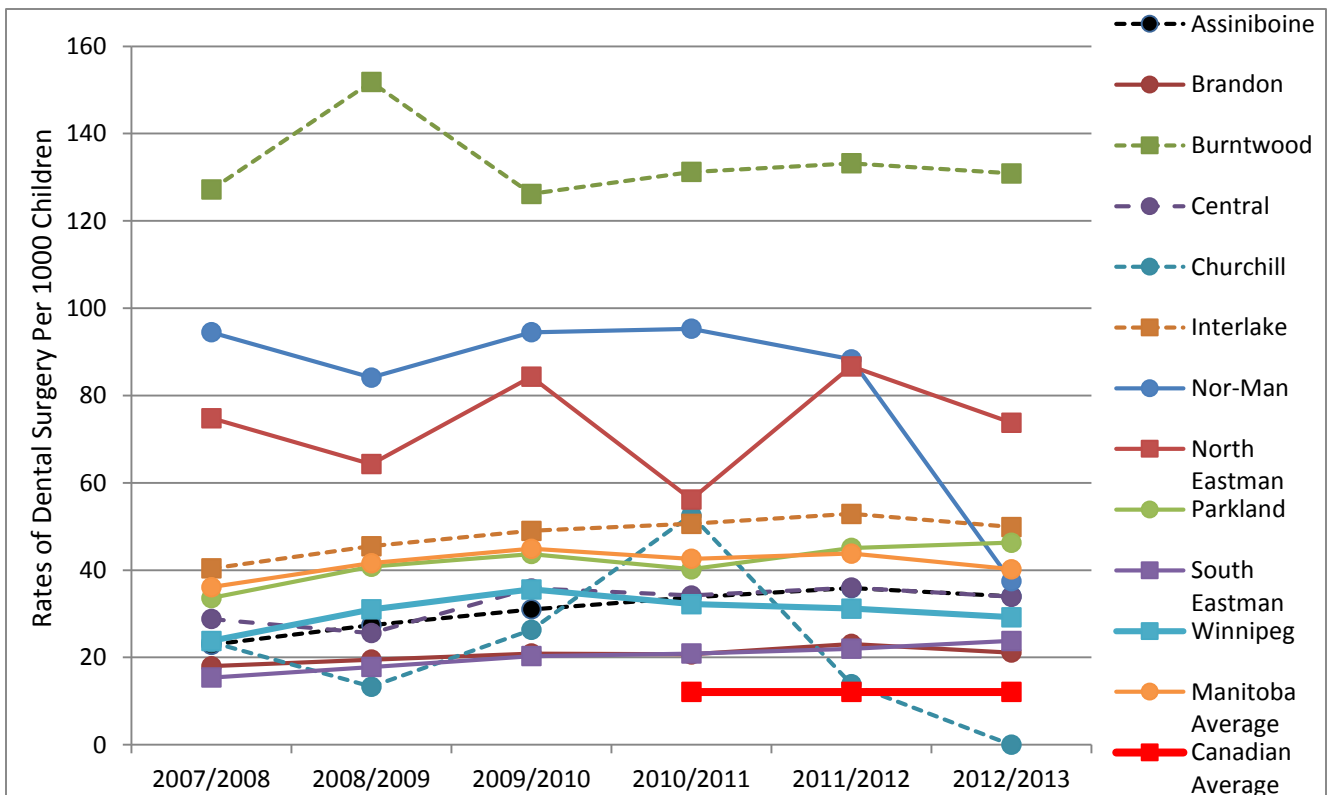


Figure 5: Age adjusted rates by geographic areas in Manitoba.

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.

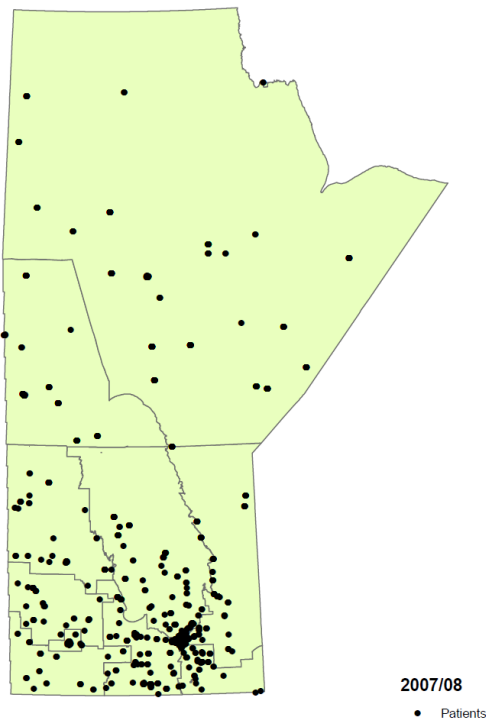


Figure 6a: Map of pediatric dental surgeries in Manitoba geographic areas for 2007/08

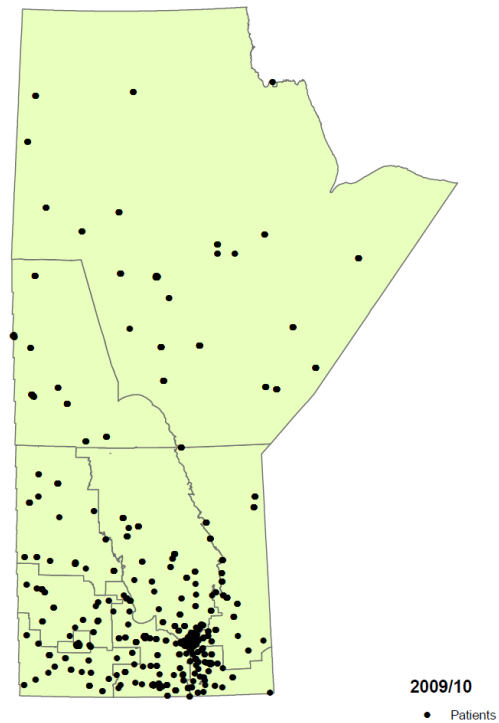


Figure 6b: Map of pediatric dental surgeries in Manitoba geographic areas for 2008/09.

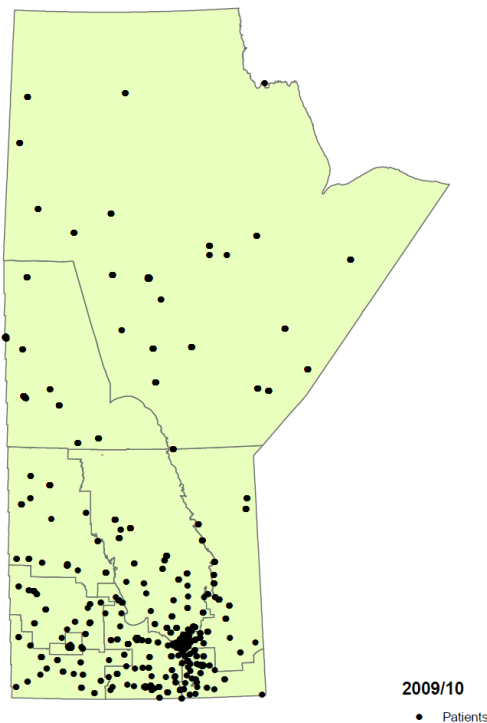


Figure 6c: Map of pediatric dental surgeries in Manitoba geographic areas for 2009/10

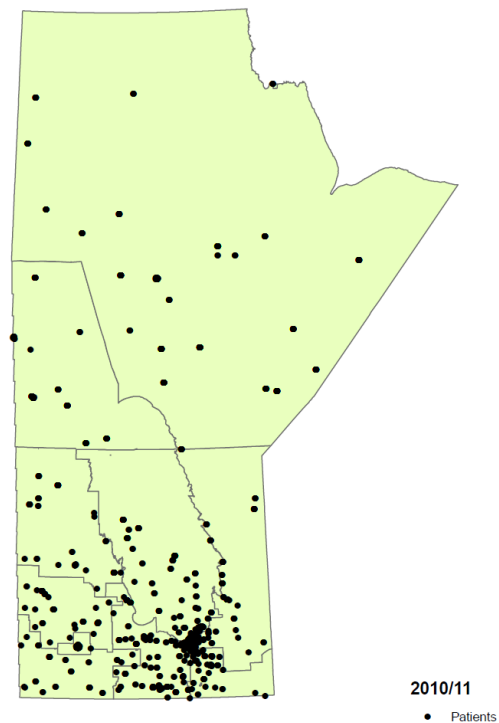


Figure 6d: Map of pediatric dental surgeries in Manitoba geographic areas 2010/11.

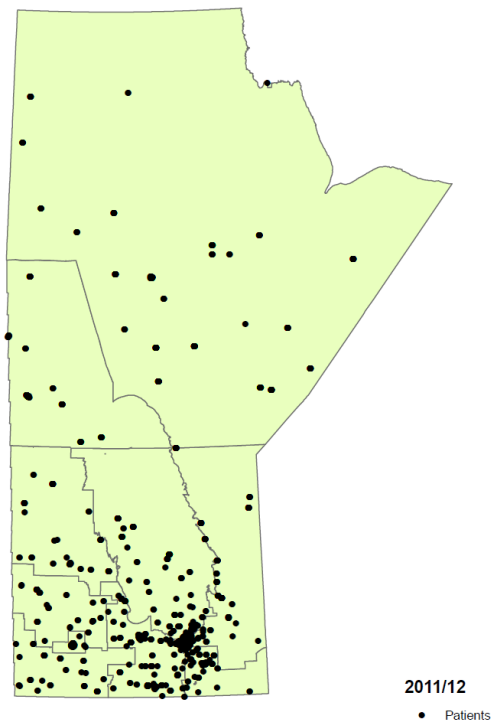


Figure 6e: Map of pediatric dental surgeries in Manitoba geographic areas for 2011/12.

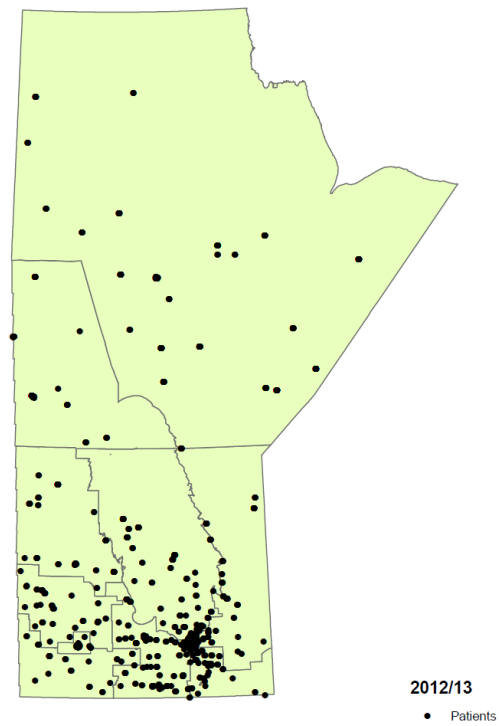


Figure 6f: Map of pediatric dental surgeries in Manitoba geographic areas for 2012/13

In this report we recognize the new Manitoba Regional Health Authorities (Figure 7); however, we chose to use data from smaller geographic areas. We chose to use data from 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.

Interlake-Eastern Regional Health Authority

The following 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 2012/13.

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 2012/13, ranging from 40.4 to 52.9 per 1,000 children.

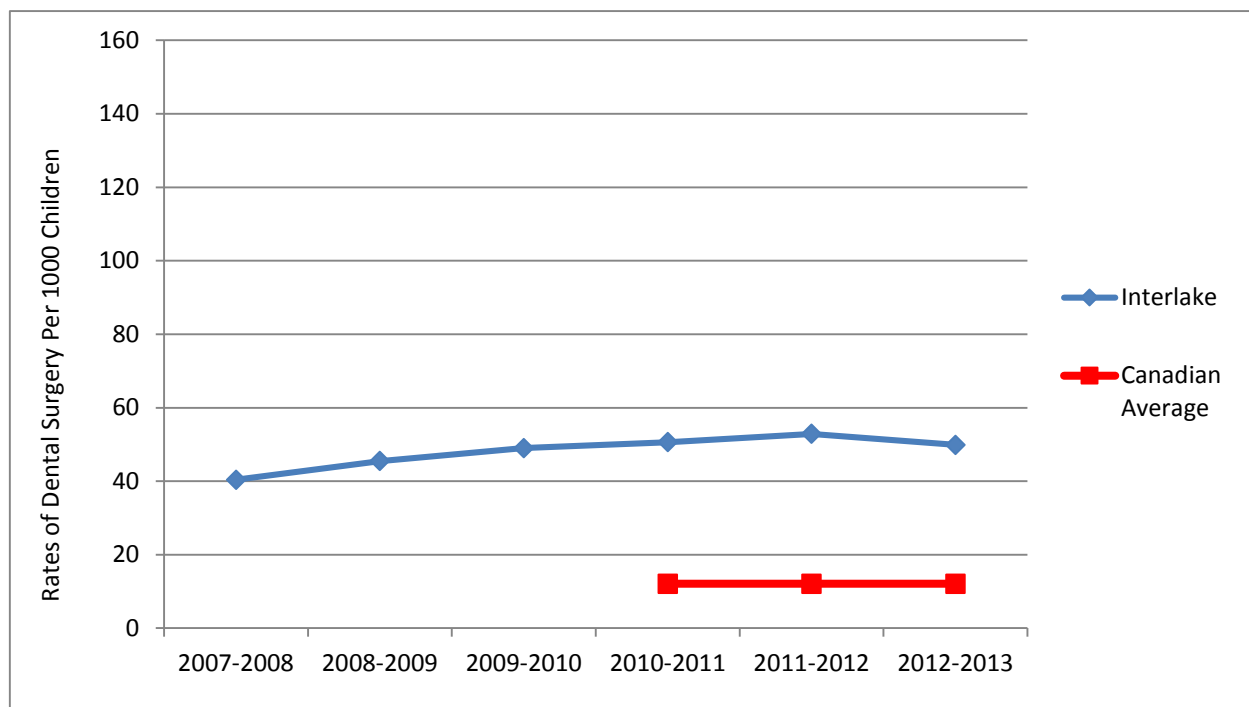


Figure 8: Age adjusted rate for the Interlake geographic area.

North Eastman

Figure 9 reveals that the rates for pediatric dental surgery in the North Eastman geographic area were variable over the years 2007/08 to 2012/13, ranging from 74.8 to 86.7 per 1,000 children.

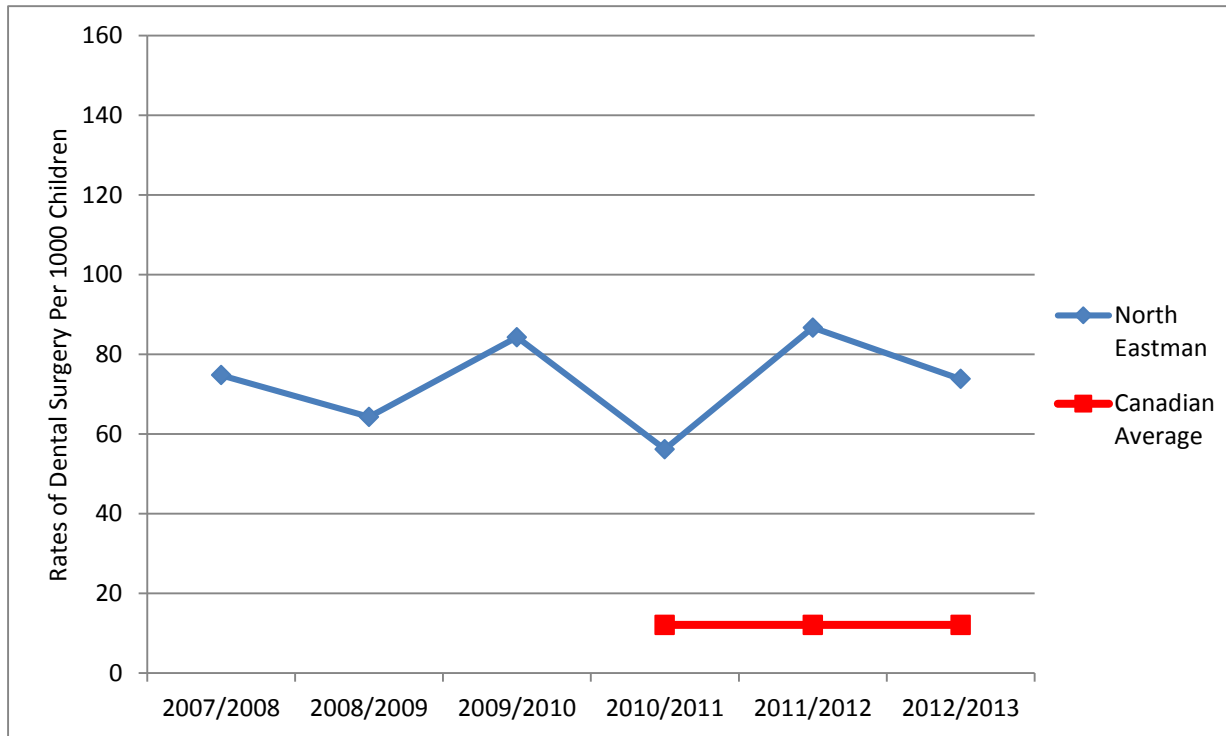


Figure 9: Age adjusted rate for the North Eastman geographic area.

Northern Health Region

The following 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.

Burntwood

Figure 10 reveals that the rates for pediatric dental surgery in the Burntwood geographic area were highest in the year 2008/09 (151.8 per 1,000 children), with a drop to 126.2 per 1,000 children in 2009/10, where they remained stable through to 2009/10. Rates for Burntwood are the highest in all of Manitoba.

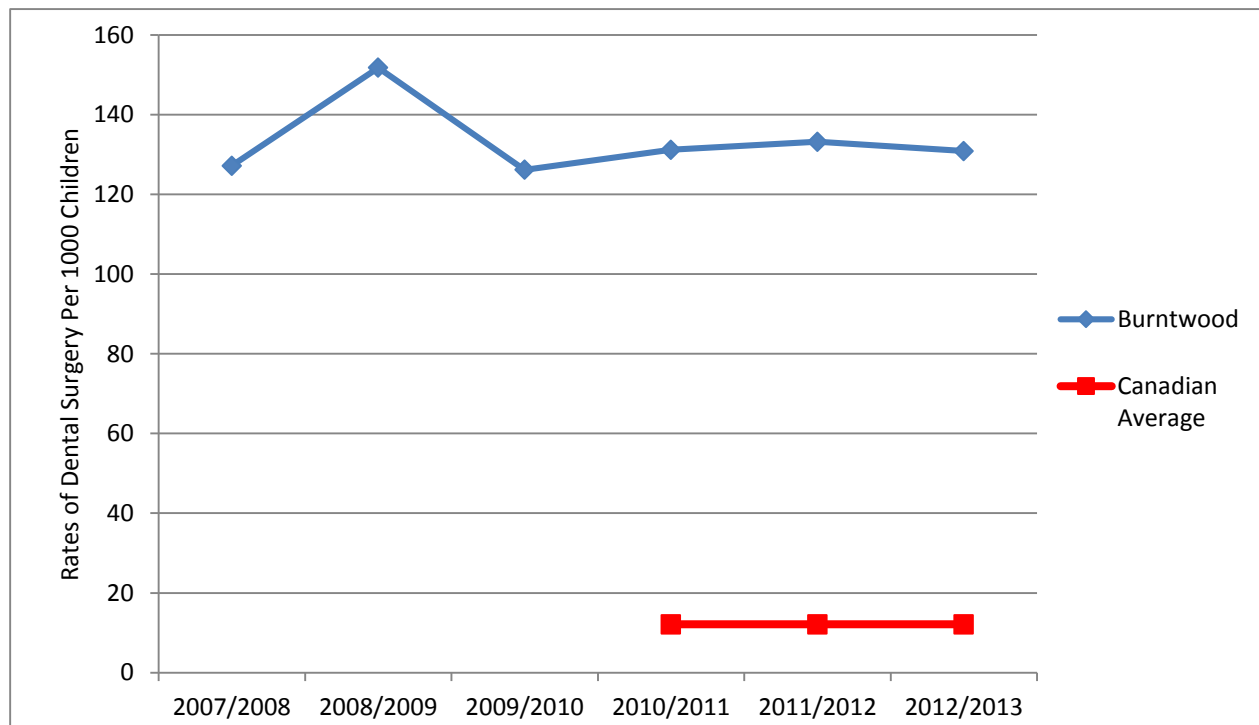


Figure 10: Age adjusted rate for the Burntwood geographic area

Nor-Man

Figure 11 reveals that the rates for pediatric dental surgery in the Nor-Man geographic area were fairly stable over the years 2007/08 to 2011/12, with an average rate of 91.3 per 1,000 children. Rates dropped markedly to 37.5 per 1,000 children in 2012/13.

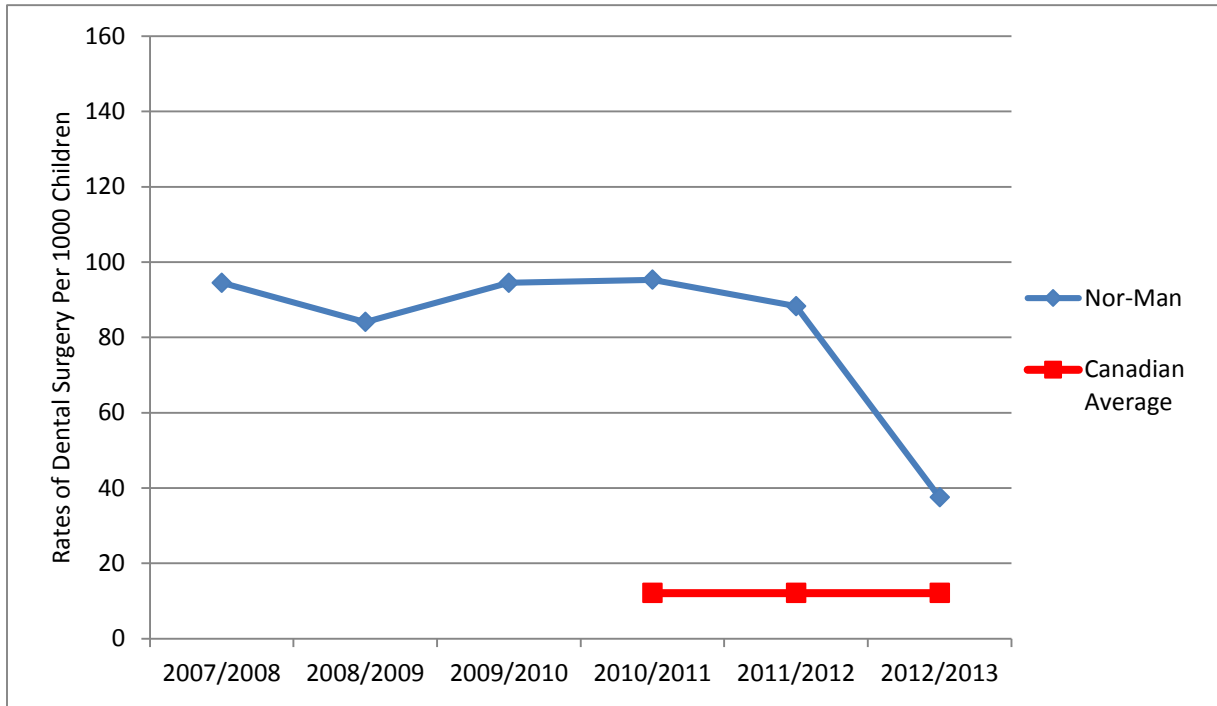


Figure 11: Age adjusted rate for the Nor-Man geographic area.

Prairie Mountain Health

The following information is for all children less than 6 years of age residing in Prairie Mountain Health who underwent pediatric dental surgery to treat ECC. We chose to use data from smaller geographic areas.

Assiniboine

Figure 12 reveals that the rates for pediatric dental surgery in the Assiniboine geographic area were generally stable over the years 2007/08 to 2012/13, ranging from 22.9 to 35.9 per 1,000 children.

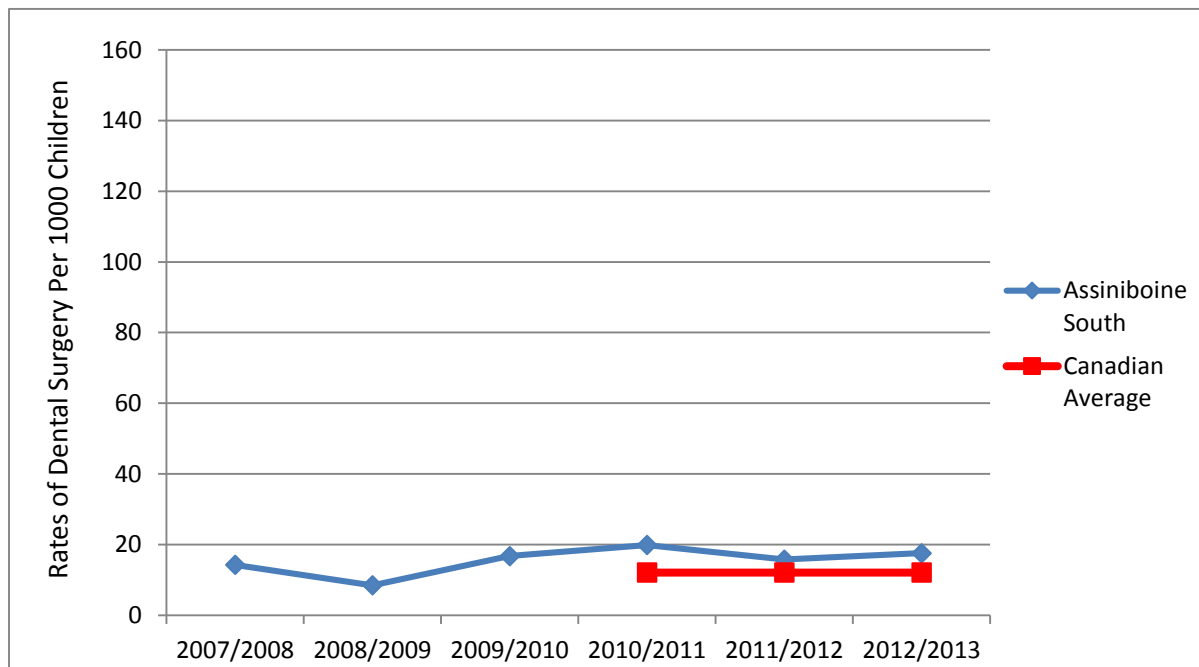


Figure 12: Age adjusted rate for the Assiniboine geographic area.

Brandon

Figure 13 reveals that the rates for pediatric dental surgery in the Brandon geographic area were stable over the years 2007/08 to 2012/13, at an average rate of 20.6 per 1,000 children.

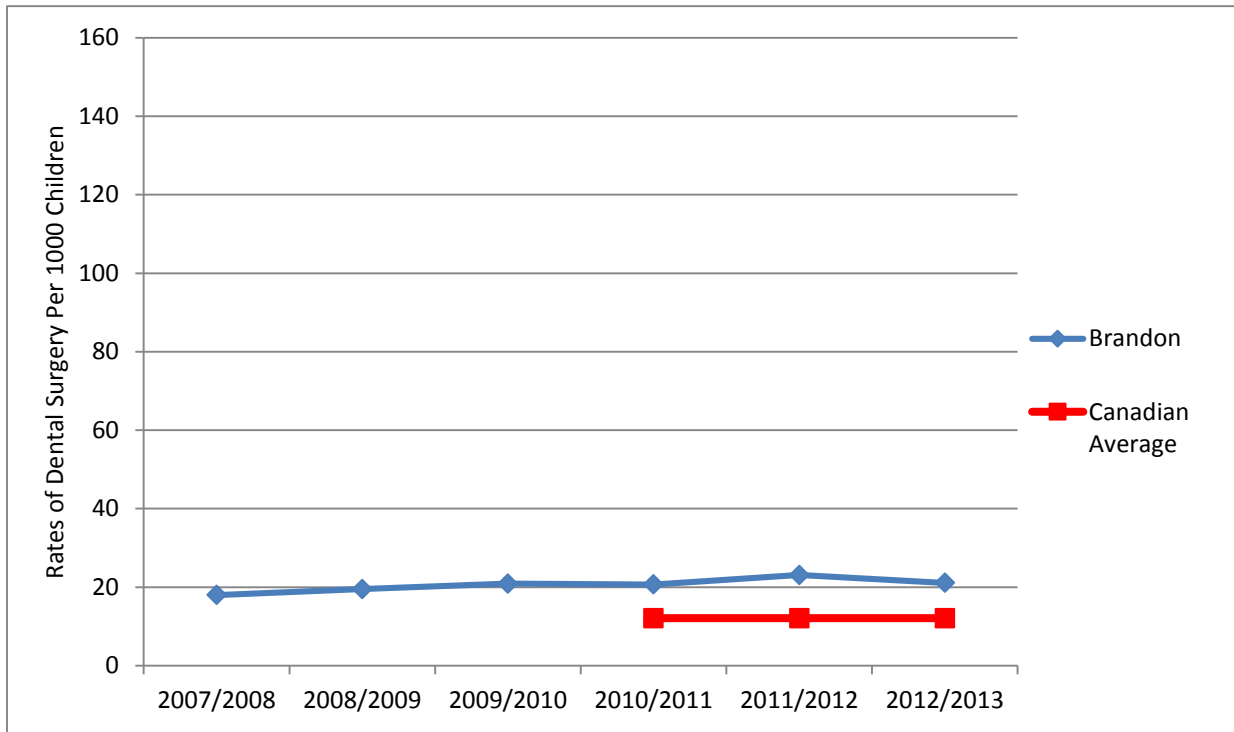


Figure 13: Age adjusted rate for the Brandon geographic area.

Parkland

Figure 14 reveals that the rates for pediatric dental surgery in the Parkland geographic have remained relatively stable with a slight increase from 33.6 per 1,000 children in 2007/08, to 43.7 per 1,000 children in 2009/10, followed by a small decline (40.2 per 1,000 children) in 2010/11 only to stabilize back at the 2009/10 rate.

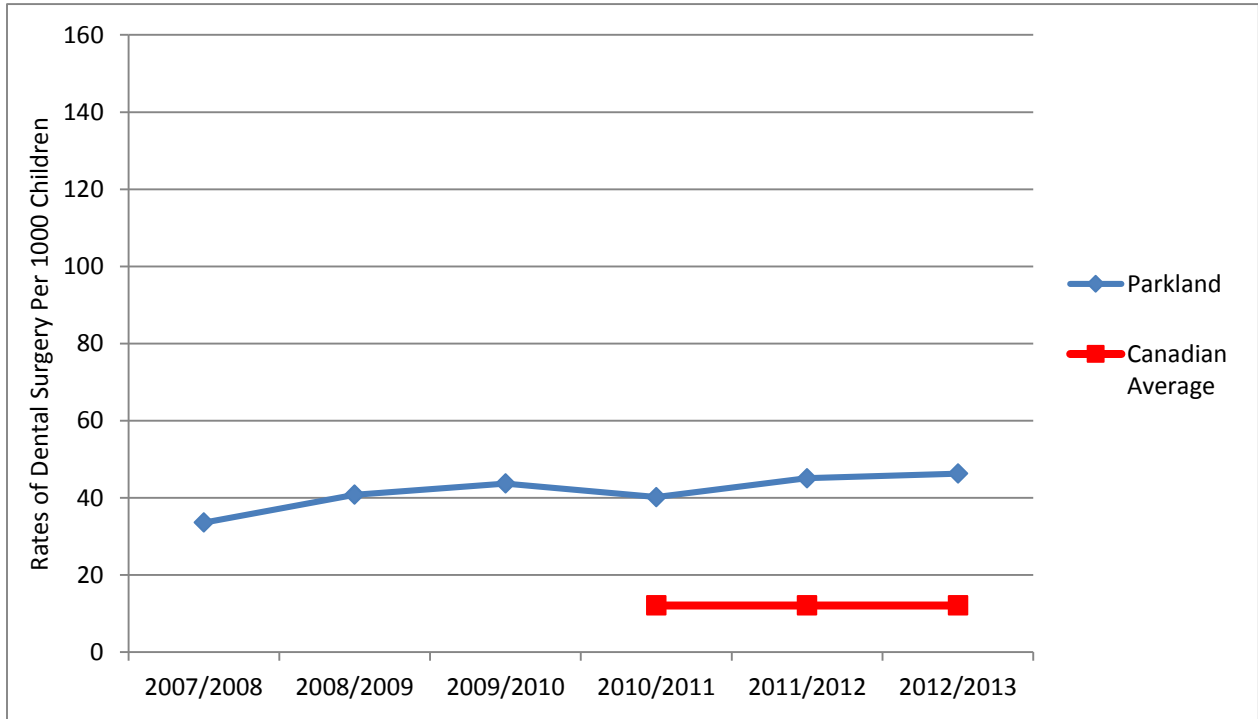


Figure 14: Age adjusted rate for the Parkland geographic area.

Southern Health – Santé Sud

The following 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. We chose to use data from smaller geographic areas.

Central

Figure 15 reveals that the rates for pediatric dental surgery in the Central geographic area were stable over the years 2007/08 to 2012/13, at an average rate of 32.4 per 1,000 children.

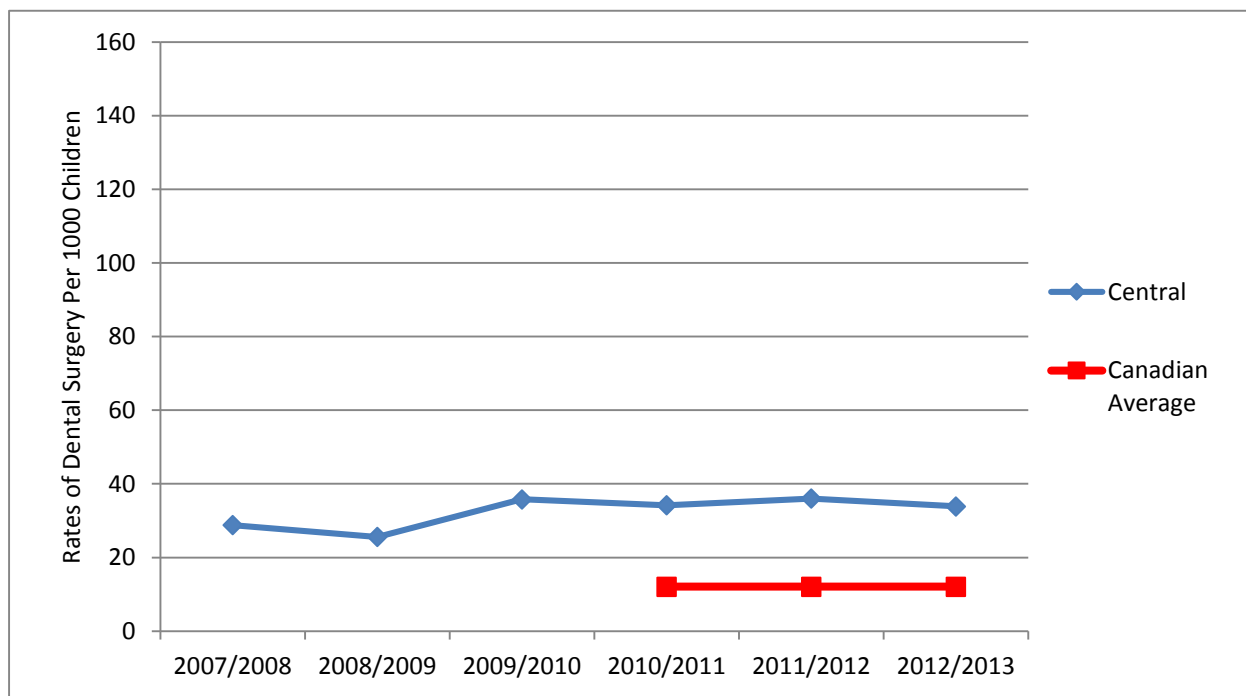


Figure 15: Age adjusted rate for the Central geographic area.

South Eastman

Figure 16 reveals that the rates for pediatric dental surgery in the South Eastman geographic area were stable over the years 2007/08 to 2012/13 being lowest in 2007/2008 at 15.4 per 1,000 children and then stabilizing at an average rate of 21 per 1,000 children.

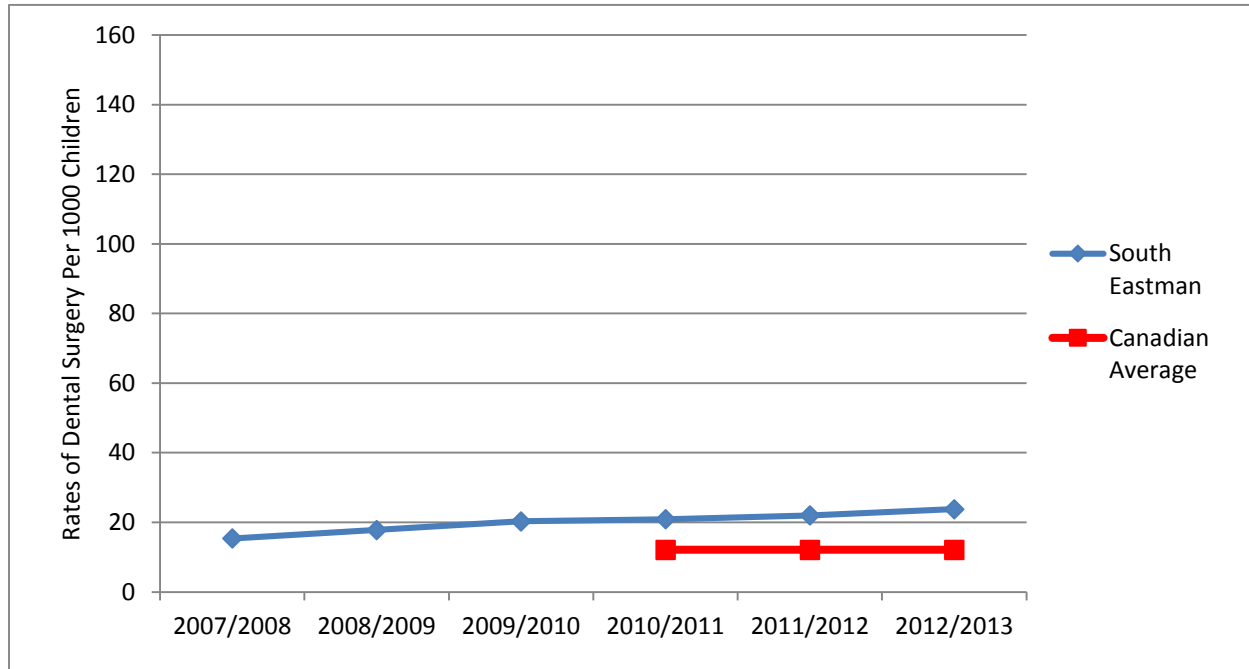


Figure 16: Age adjusted rate for the South Eastman geographic area.

Winnipeg Regional Health Authority

The following 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. The WRHA now also includes Churchill, Manitoba.

Figure 17 reveals that over the six 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 dropped to 29.2 per 1,000 in 2012/13.

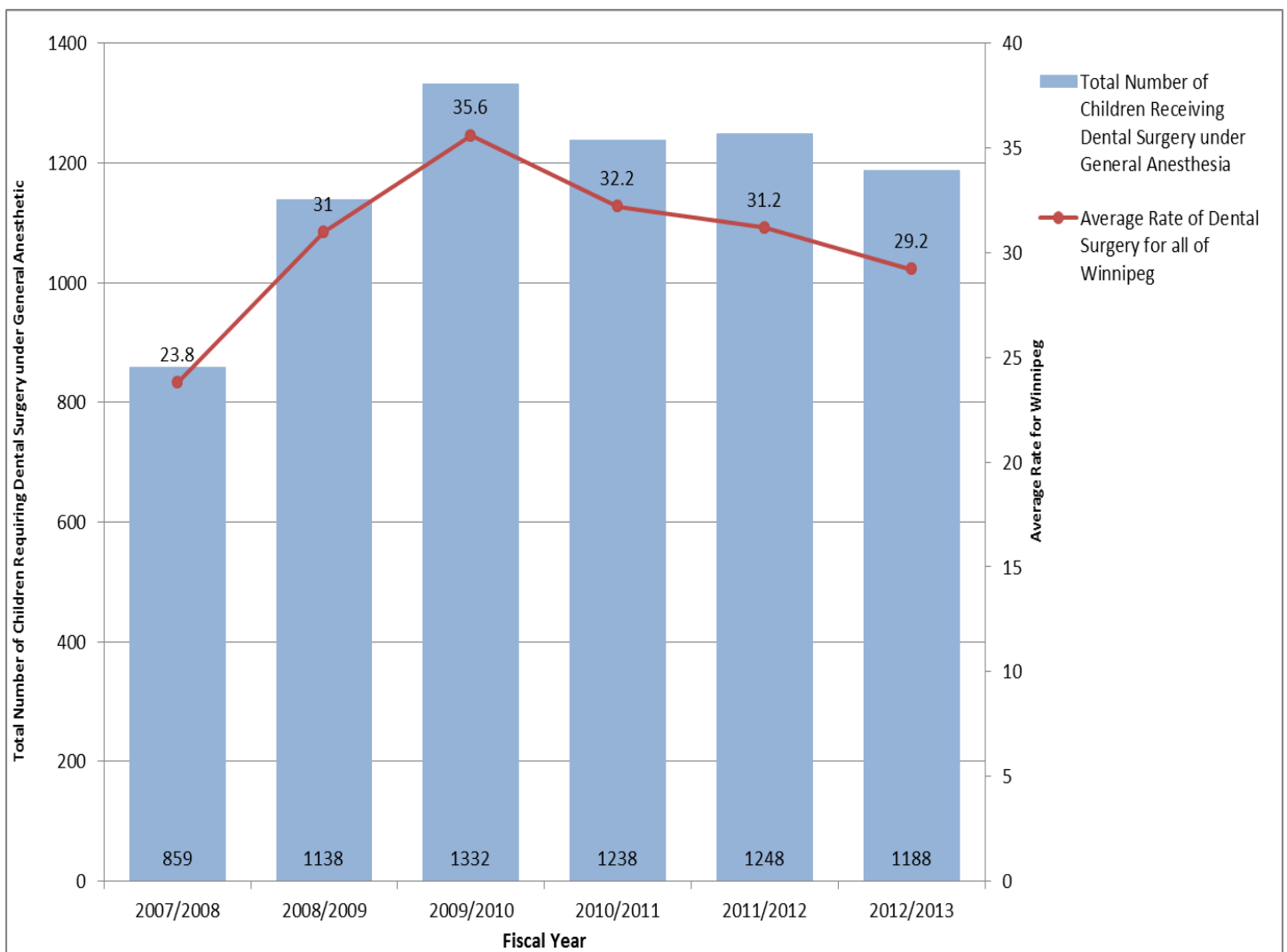


Figure 17: Total number of children receiving dental surgery under general anesthesia per fiscal year in Winnipeg.

Figure 18 illustrates the community areas and neighbourhood clusters of Winnipeg.

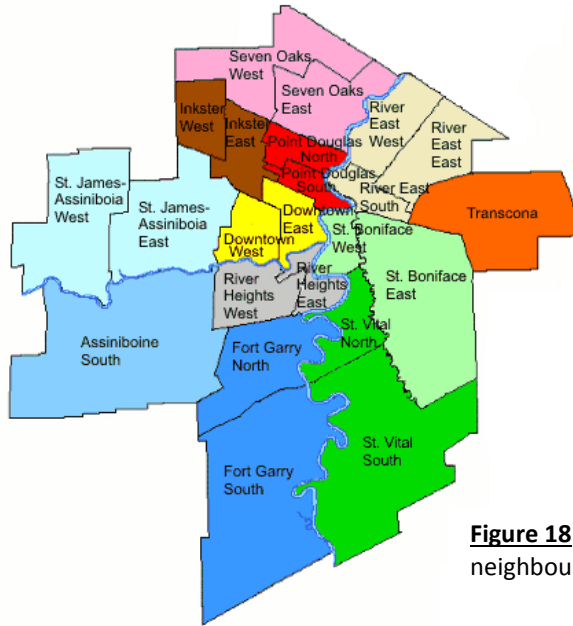


Figure 18: Map of Winnipeg community areas and neighbourhood clusters.

Figure 19 reveals that the Winnipeg community area with the highest rates of pediatric dental surgery over the years 2007/08 to 2012/13 was Point Douglas.

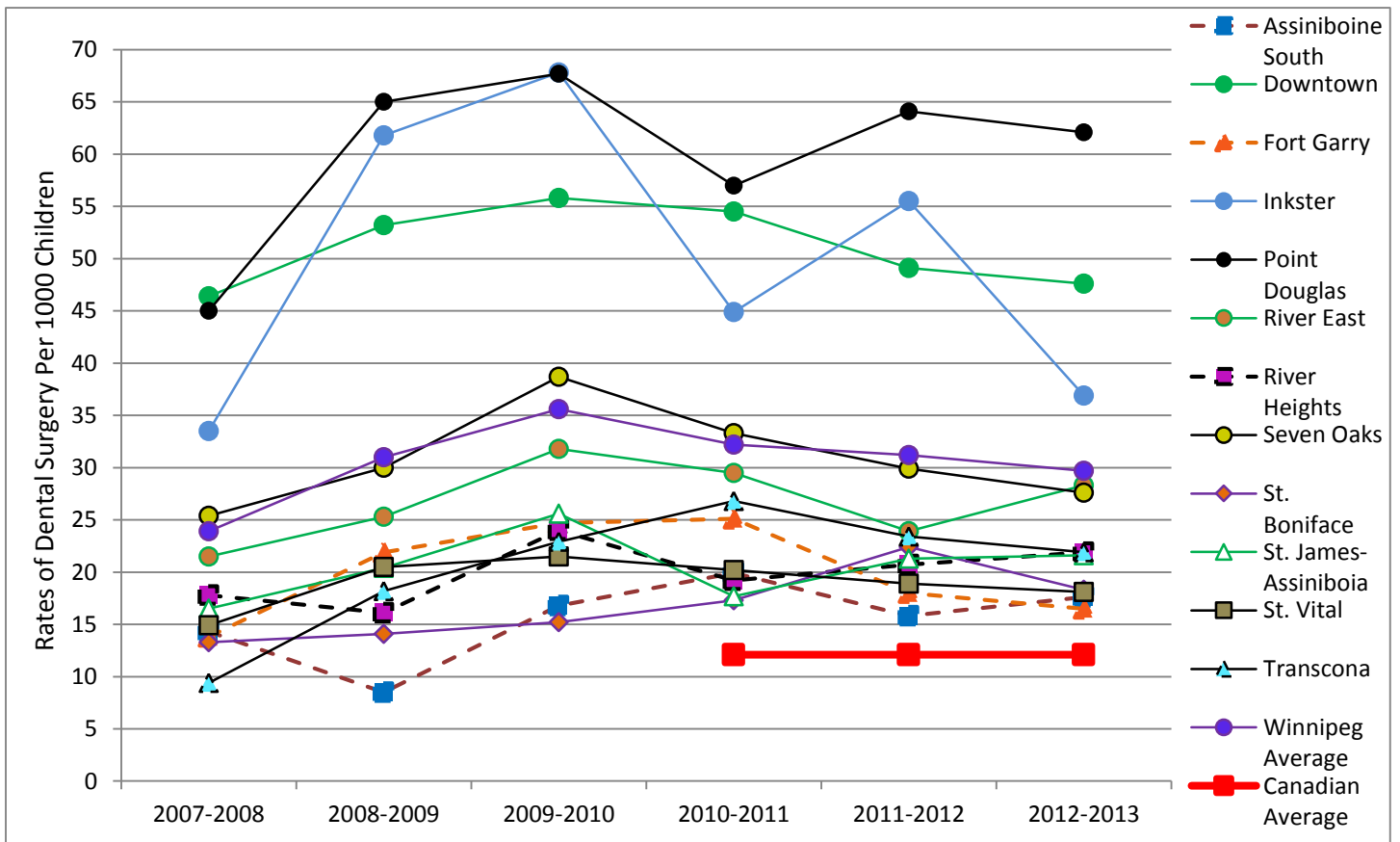


Figure 19: Age adjusted rates by Winnipeg community areas.

This figure has not been standardized to 160/1000 children so separate communities can be visually distinguished.

Churchill

Figure 20 reveals that the rates for pediatric dental surgery in the Churchill geographic area were variable over the years 2007/08 to 2012/13. Fluctuations in rates look more pronounced due to the small number in Churchill.

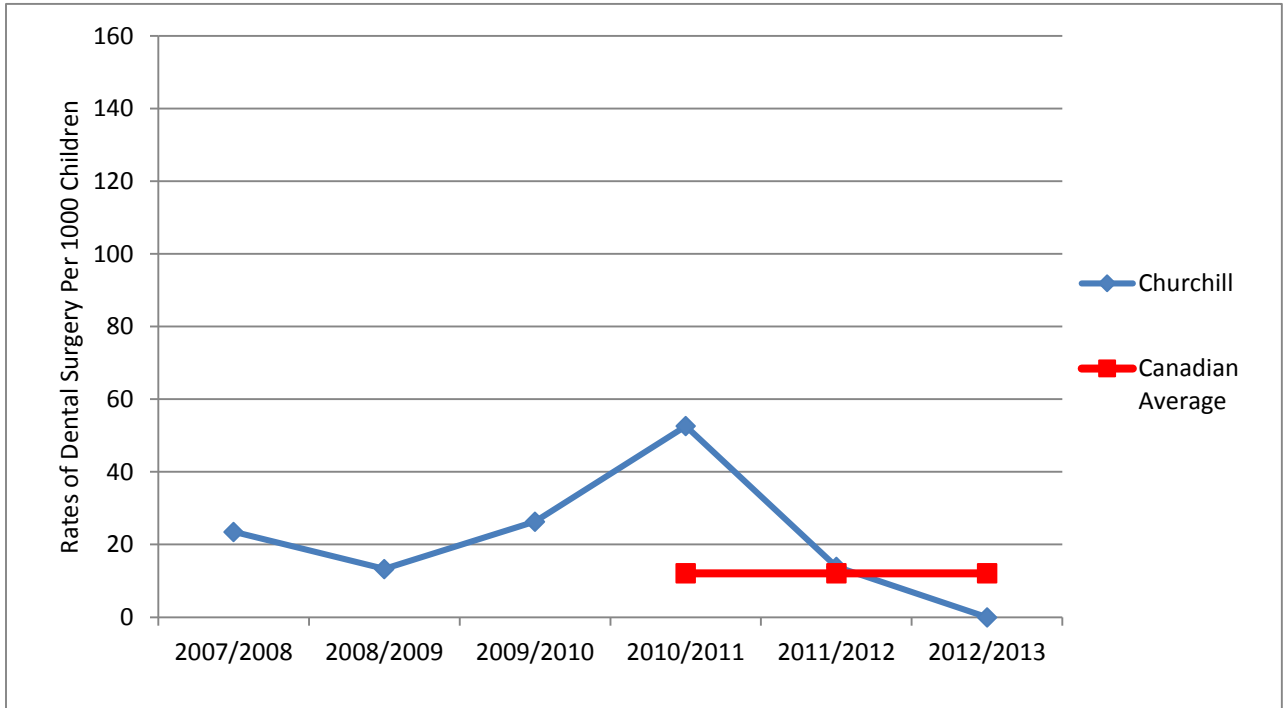


Figure 20: Age adjusted rate for the Churchill geographic area

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.

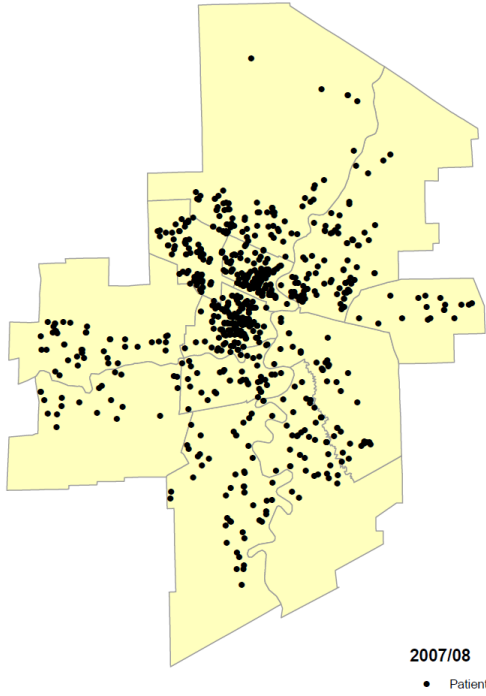


Figure 21a: Map of pediatric dental surgeries in Winnipeg for 2007/08.

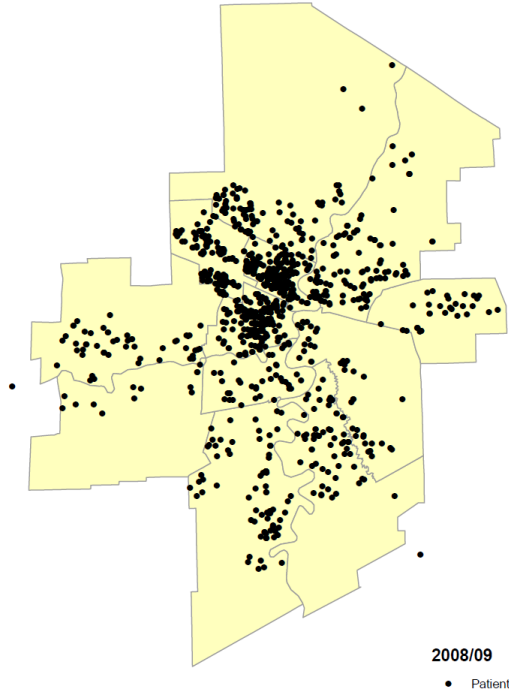


Figure 21b: Map of pediatric dental surgeries in Winnipeg for 2008/09.

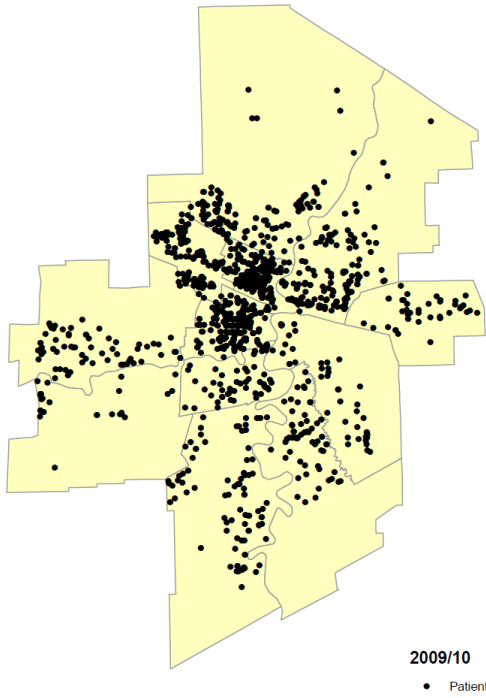


Figure 21c: Map of pediatric dental surgeries in Winnipeg for 2009/10.

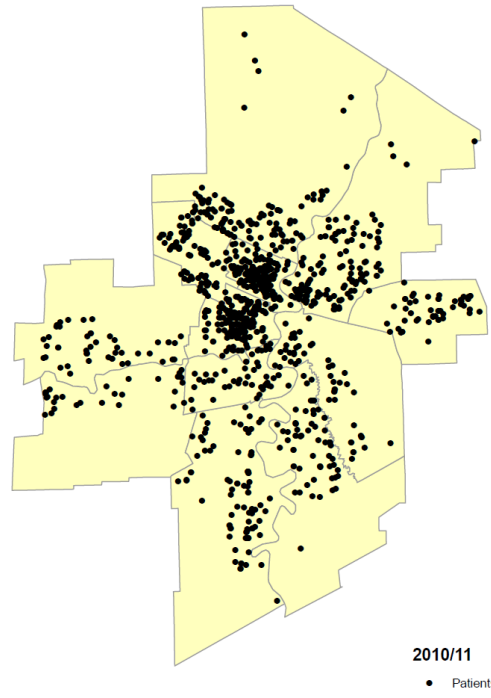


Figure 21d: Map of pediatric dental surgeries in Winnipeg for 2010/11.

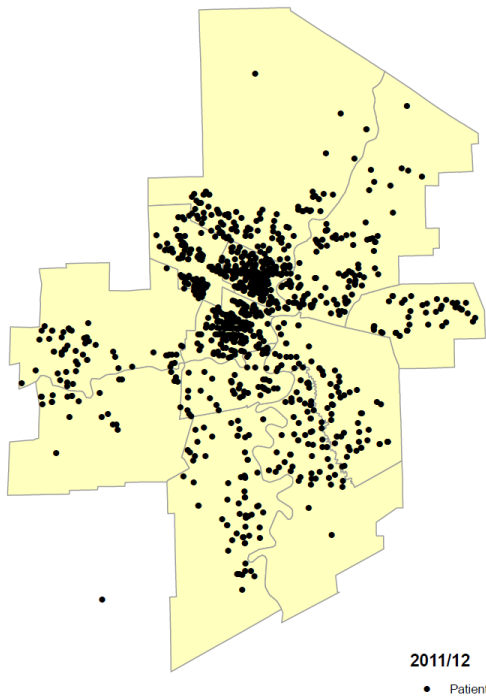


Figure 21e: Map of pediatric dental surgeries in Winnipeg for 2011/12.

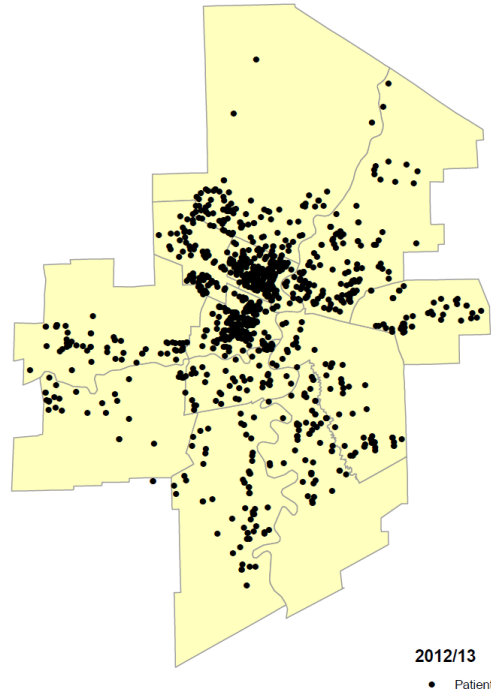


Figure 21f: Map of pediatric dental surgeries in Winnipeg for 2012/13.

Winnipeg Community Areas and Neighbourhood Clusters

Assiniboine South

Figure 22 reveals that the rate for pediatric dental surgery in the Assiniboine South community area was fairly stable over the years 2007/08 to 2012/13 at a range of 8.5 to 19.9 per 1,000 children.

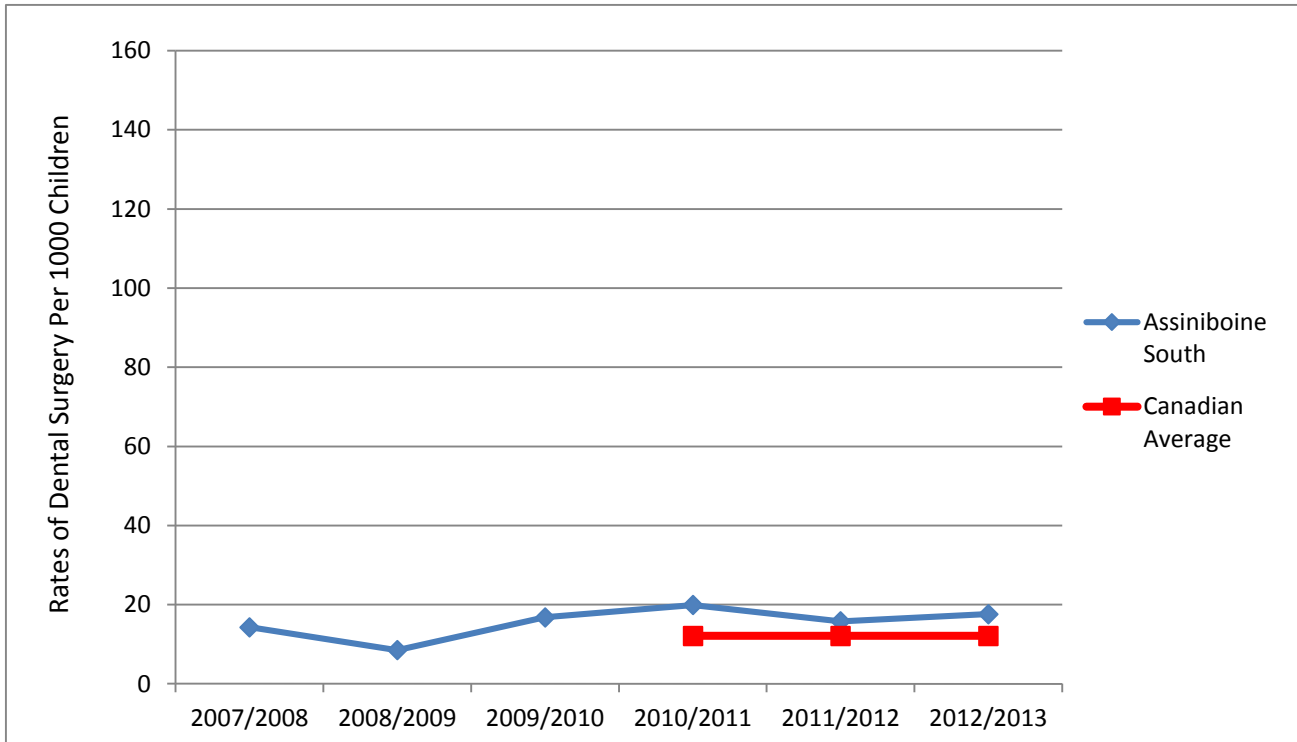


Figure 22: Age adjusted rate for Assiniboine South community area.

Downtown

Figure 23a reveals that the rate for pediatric dental surgery in the Downtown community area was stable over the years 2007/08 to 2012/13, ranging from 35.8 to 62.6 per 1,000 children.

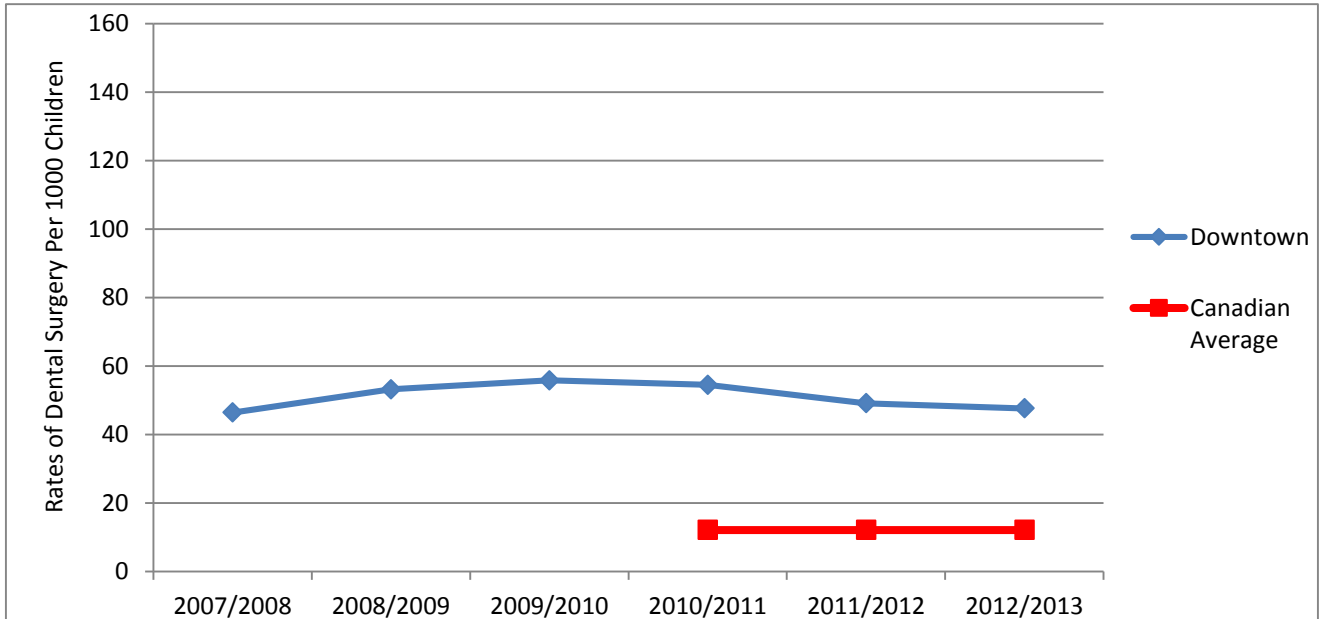


Figure 23a: Age adjusted rate for Downtown community area.

Figure 23b reveals that the rates for pediatric dental surgery in Downtown East and Downtown West were stable over the years 2007/08 to 2012/13.

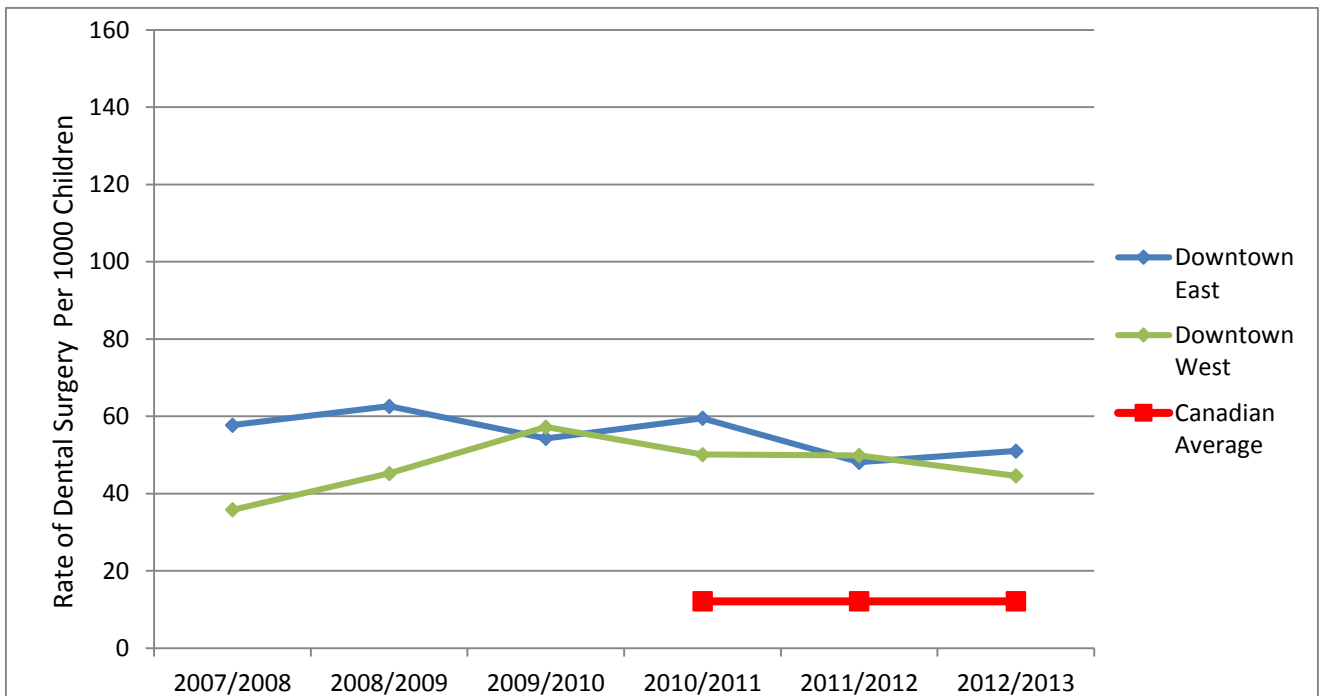


Figure 23b: Age adjusted rates for Downtown neighbourhood clusters, Downtown East and Downtown West.

Fort Garry

Figure 24a reveals that the rate for pediatric dental surgery in the Fort Garry community area was stable over the years 2007/08 to 2012/13, ranging from 13.8 to 25.1 per 1,000 children.

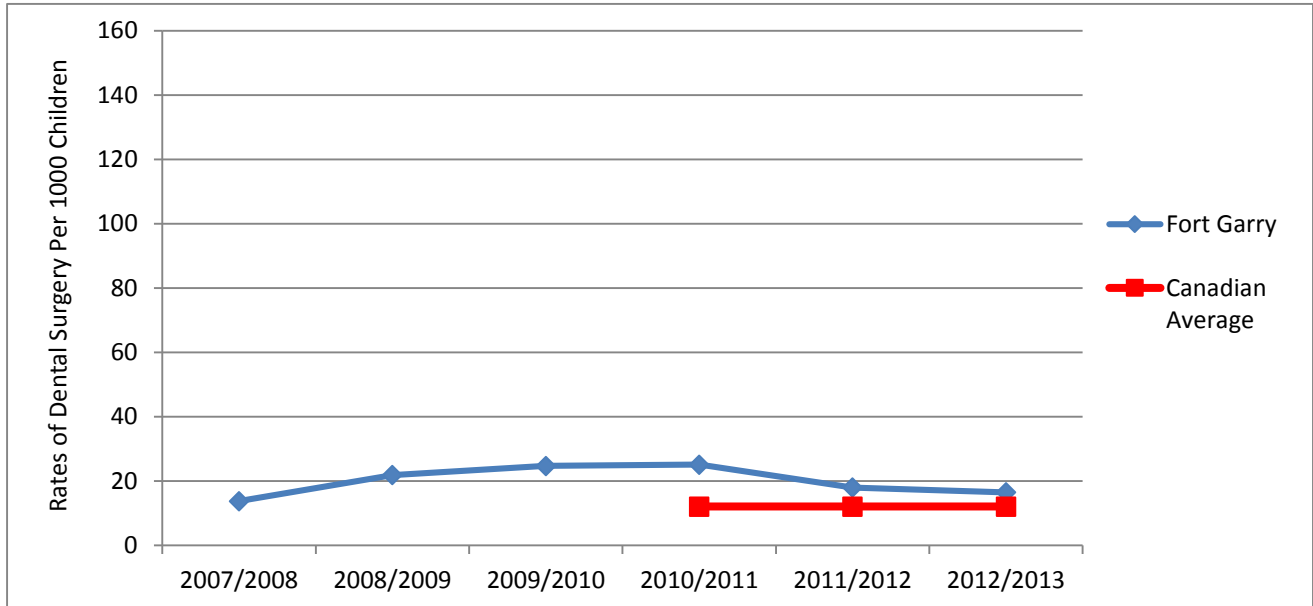


Figure 24a: Age adjusted rate for Fort Garry community area.

Figure 24b reveals that the rates for pediatric dental surgery in Fort Garry North and Fort Garry South were stable over the years 2007/08 to 2012/13.

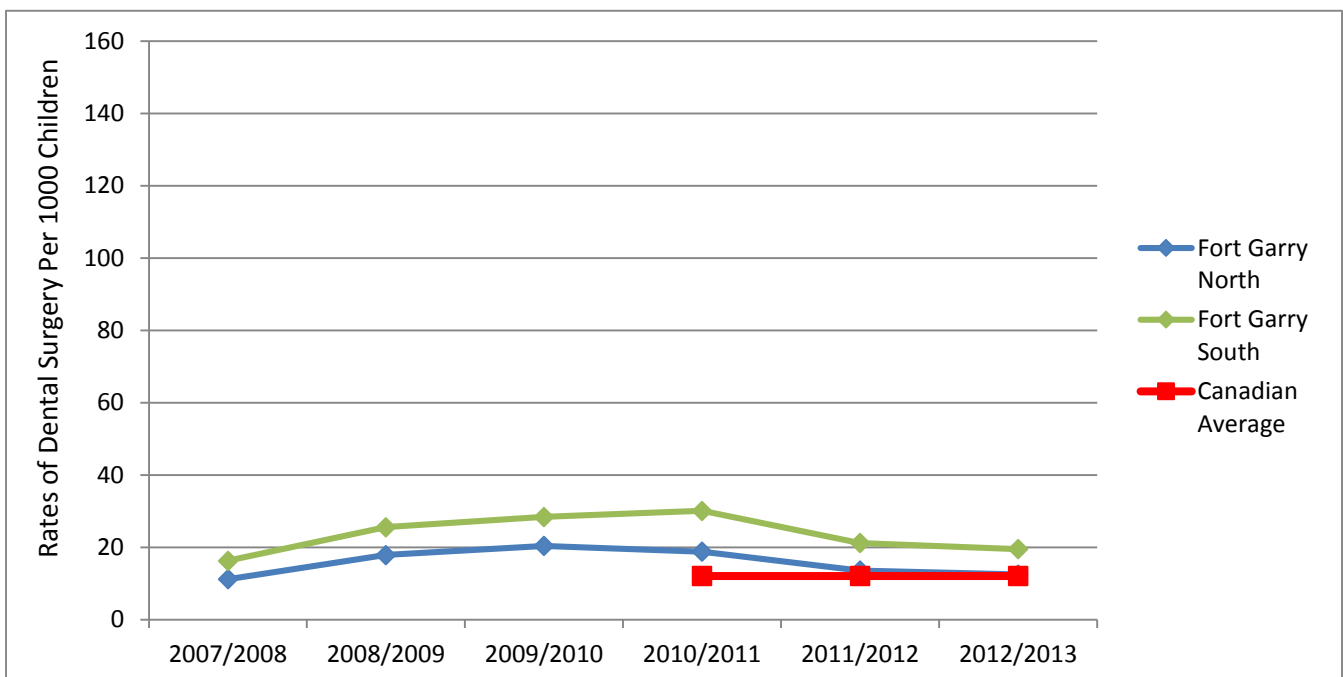


Figure 24b: Age adjusted rates for Fort Garry neighbourhood clusters, Fort Garry North and Fort Garry South.

Inkster

Figure 25a reveals that the rate for pediatric dental surgery in the Inkster community area was variable over the years 2007/08 to 2012/13. Dental surgery rates jumped from 33.5 in 2007/08 to 67.8 in 2009/2010 per 1,000 children and then back down to 36.9 per 1,000 children.

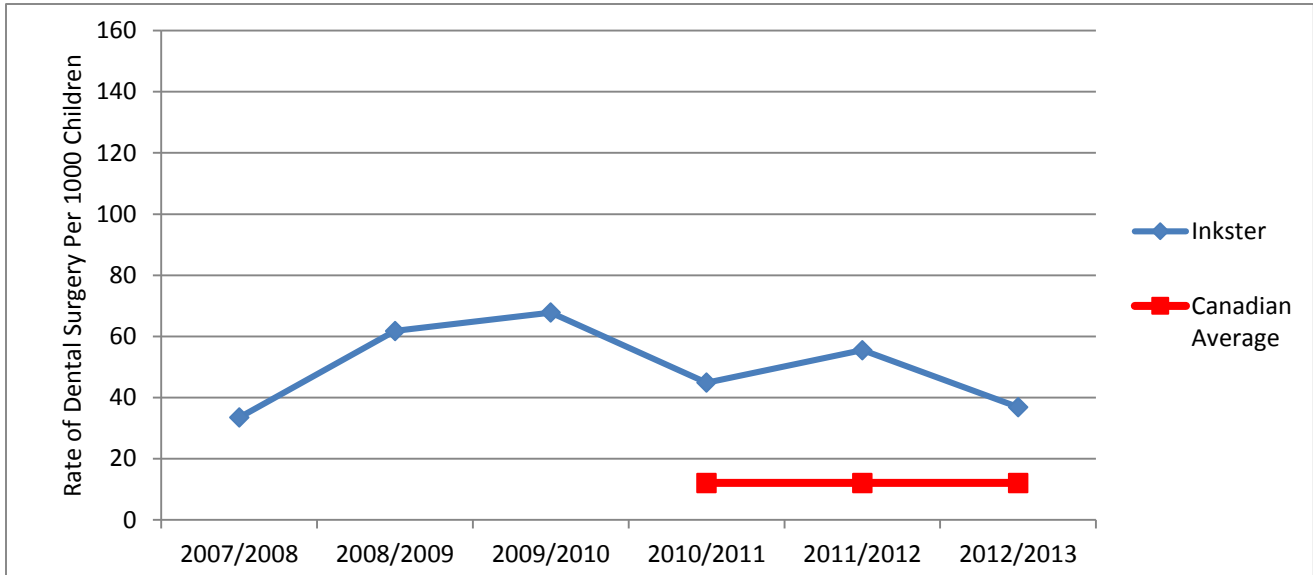


Figure 25a: Age adjusted rate for Inkster community area.

Figure 25b reveals that the rates for pediatric dental surgery in Inkster East and Inkster West were variable over the years 2007/08 to 2012/13.

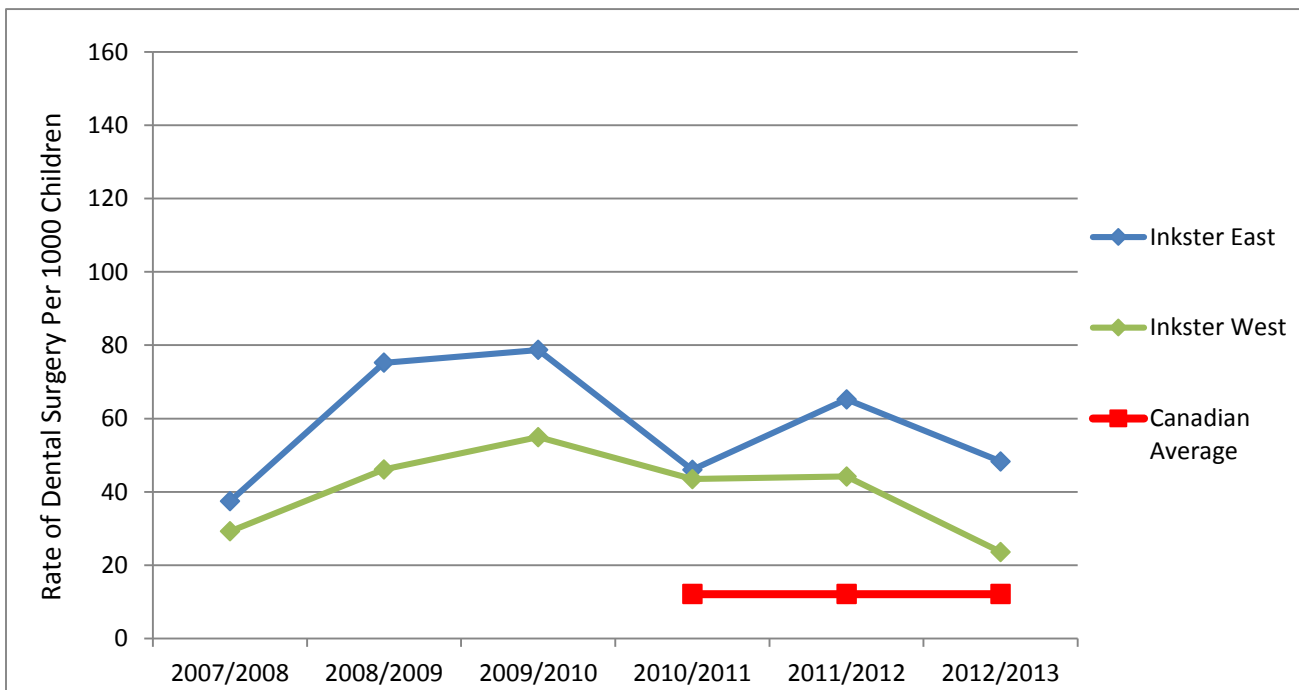


Figure 25b: Age adjusted rates for Inkster neighbourhood clusters, Inkster East and Inkster West.

Point Douglas

Figure 26a reveals that the rate for pediatric dental surgery in the Point Douglas community area was variable over the years 2007/08 to 2012/13, ranging from 45 to 67.7 per 1000 children.

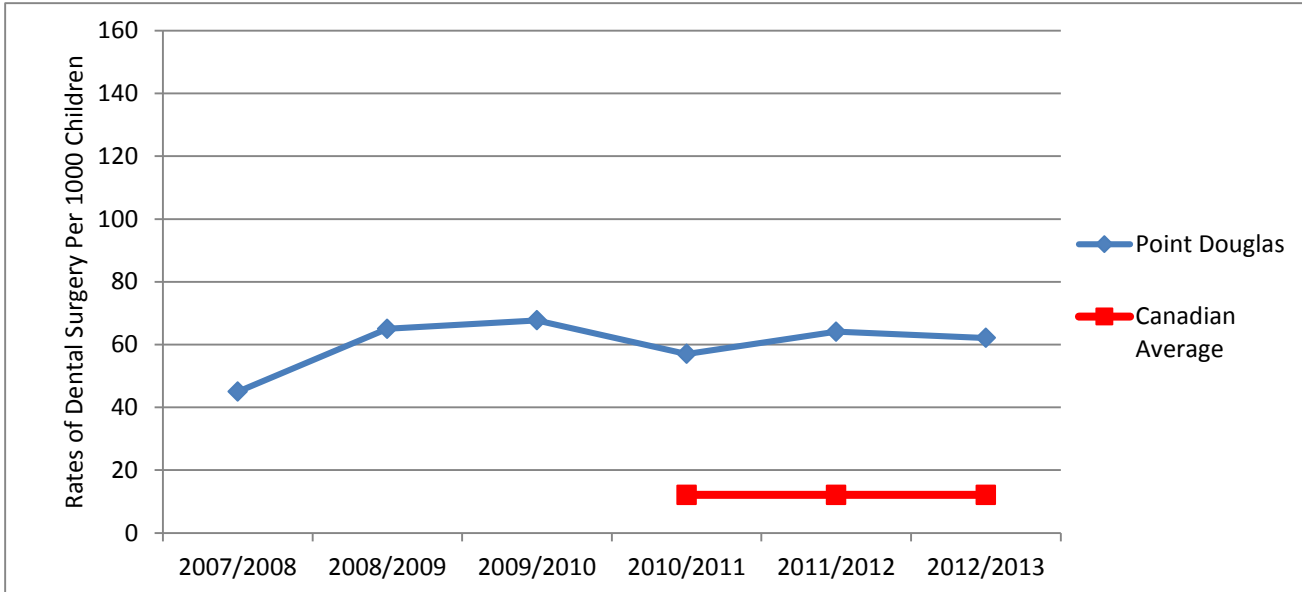


Figure 26a: Age adjusted rate for Point Douglas community area.

Figure 26b reveals that the rates for pediatric dental surgery in Point Douglas North and Point Douglas South were variable over the years 2007/08 to 2012/13.

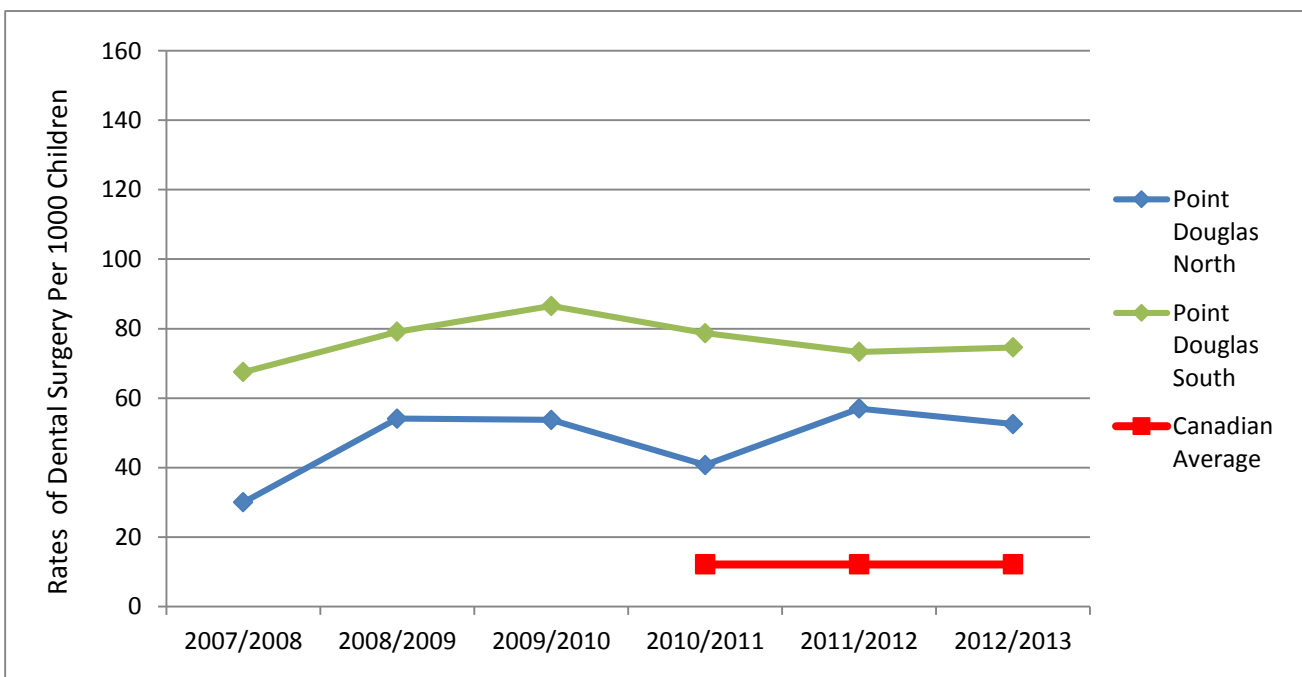


Figure 26b: Age adjusted rates for Point Douglas neighbourhood clusters, Point Douglas North and Point Douglas South.

River East

Figure 27a reveals that the rate for pediatric dental surgery in the River East community area was stable over the years 2007/08 to 2012/13 at an average rate of 27 per 1,000 children.

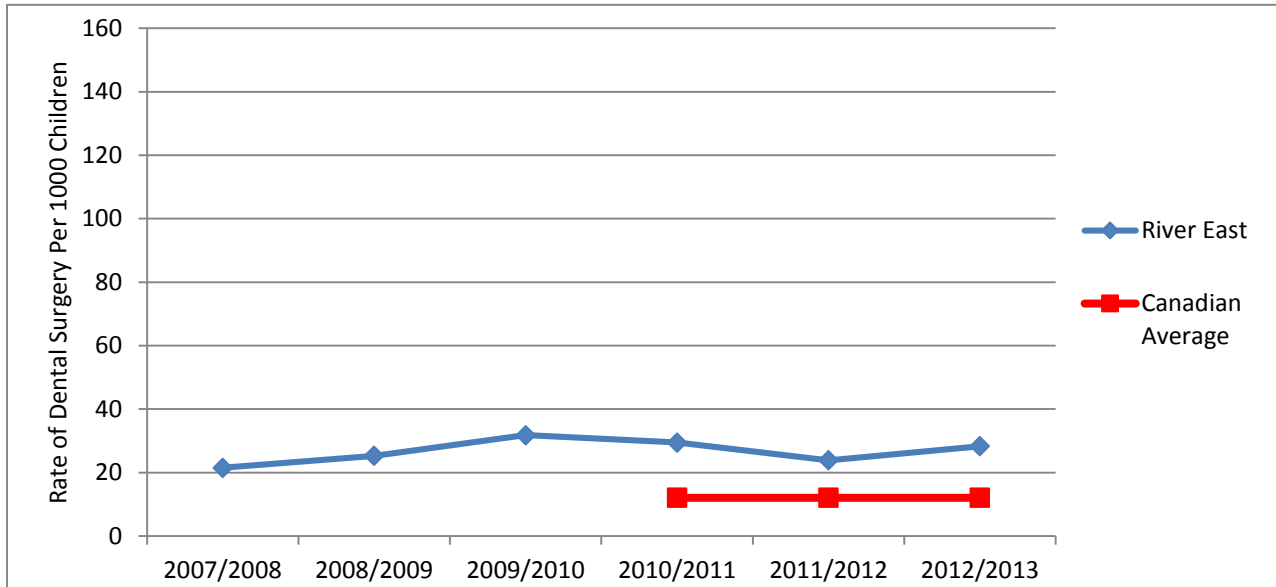


Figure 27a: Age adjusted rate for River East community area

Figure 27b reveals that 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 2012/13.

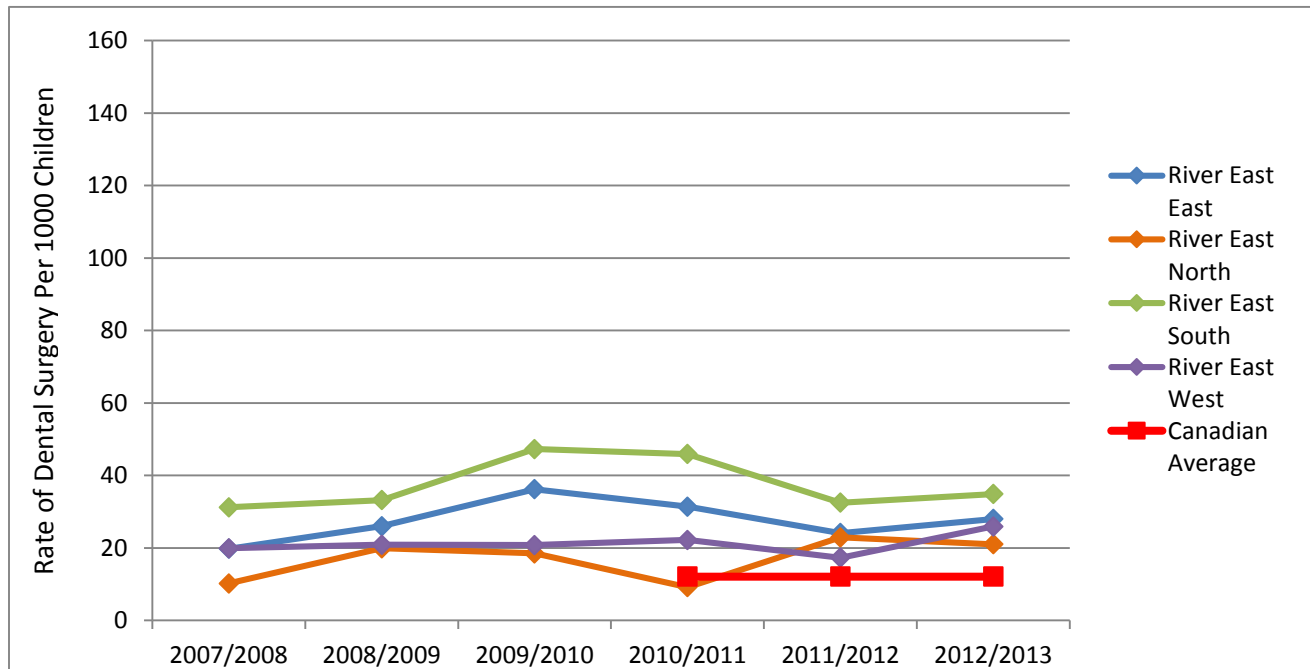


Figure 27b: Age adjusted rates for River East neighbourhood clusters, River East East, River East North, River East South, and River East West.

River Heights

Figure 28a reveals that the rate for pediatric dental surgery in the River Heights community area were stable over the years 2007/08 to 2012/13 at an average rate of 20 per 1,000 children.

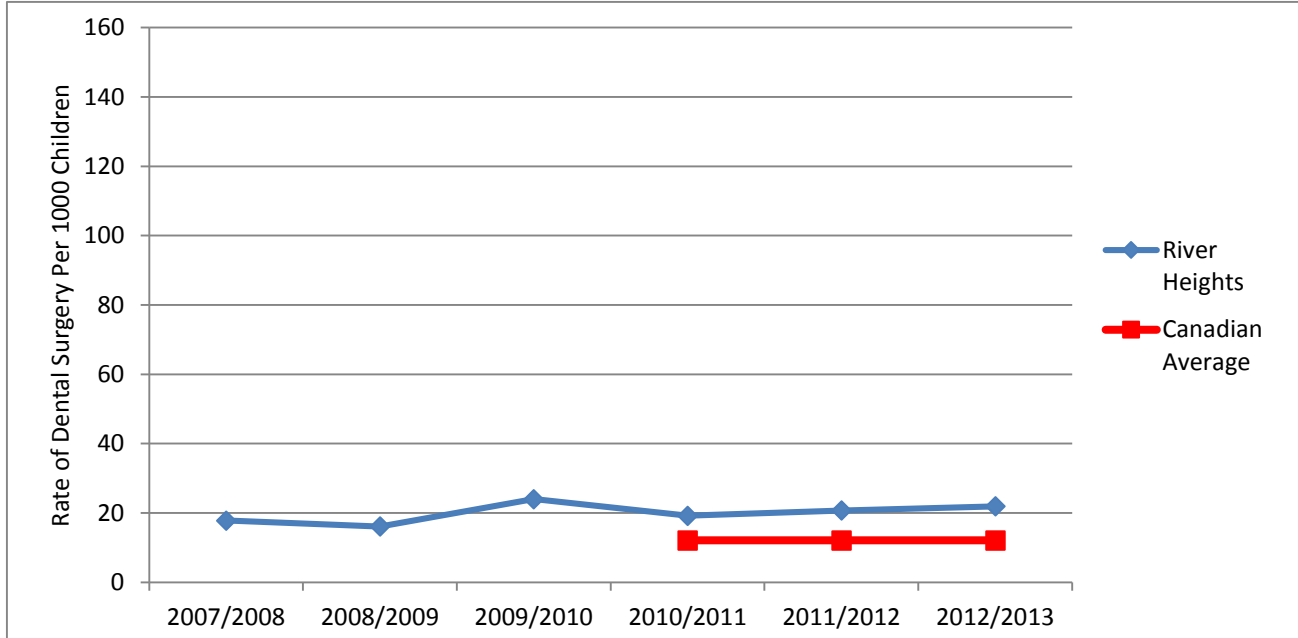


Figure 28a: Age adjusted rate for River Heights community area.

Figure 28b reveals that the rates for pediatric dental surgery in River Heights East and River Heights West were stable over the years 2007/08 to 2012/13.

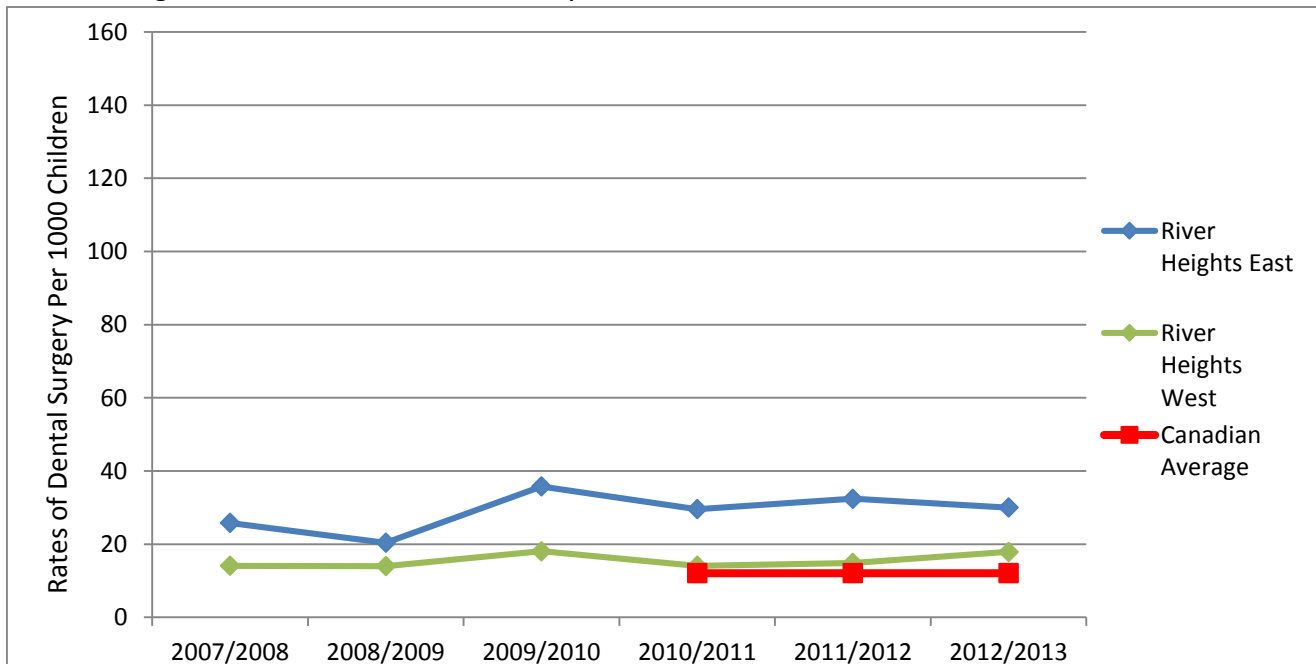


Figure 28b: Age adjusted rates for River Heights neighbourhood clusters, River Heights East and River Heights West.

Seven Oaks

Figure 29a reveals that the rate for pediatric dental surgery in the Seven Oaks community area was stable over the years 2007/08 to 2012/13, with an average rate of 31 per 1,000 children.

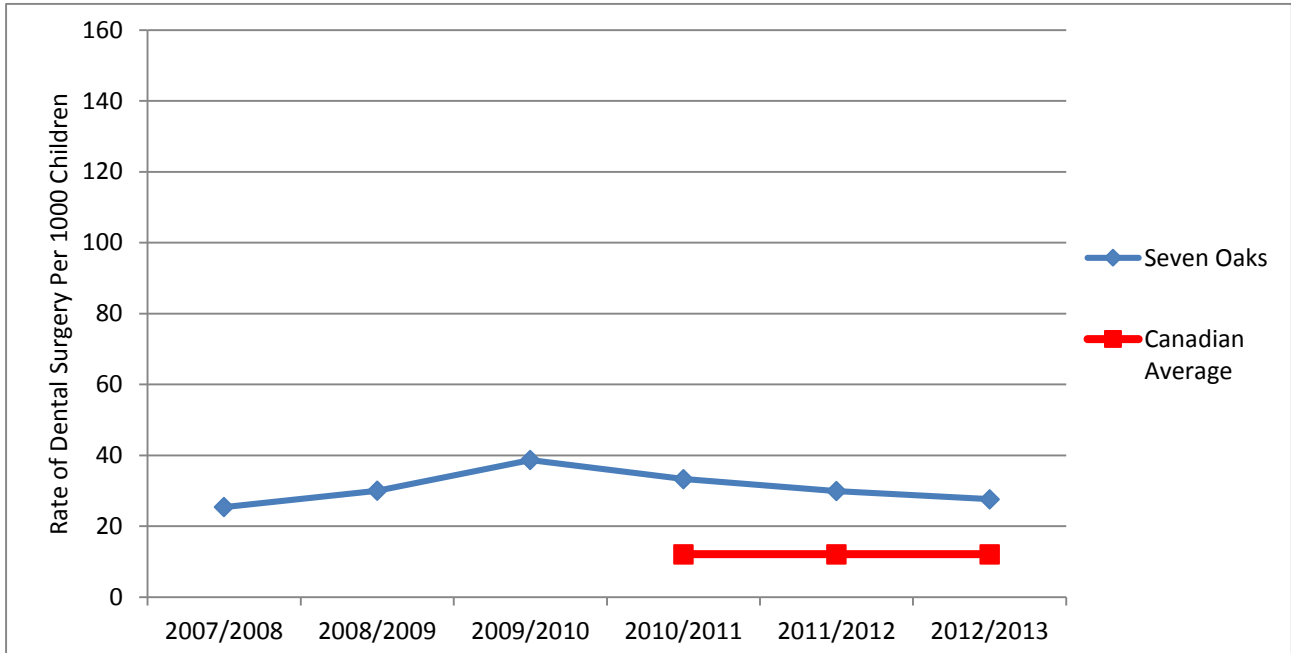


Figure 29a: Age adjusted rate for Seven Oaks community area.

Figure 29b reveals that the rates for pediatric dental surgery in Seven Oaks East, Seven Oaks North, and Seven Oaks West were stable over the years 2007/08 to 2012/13.

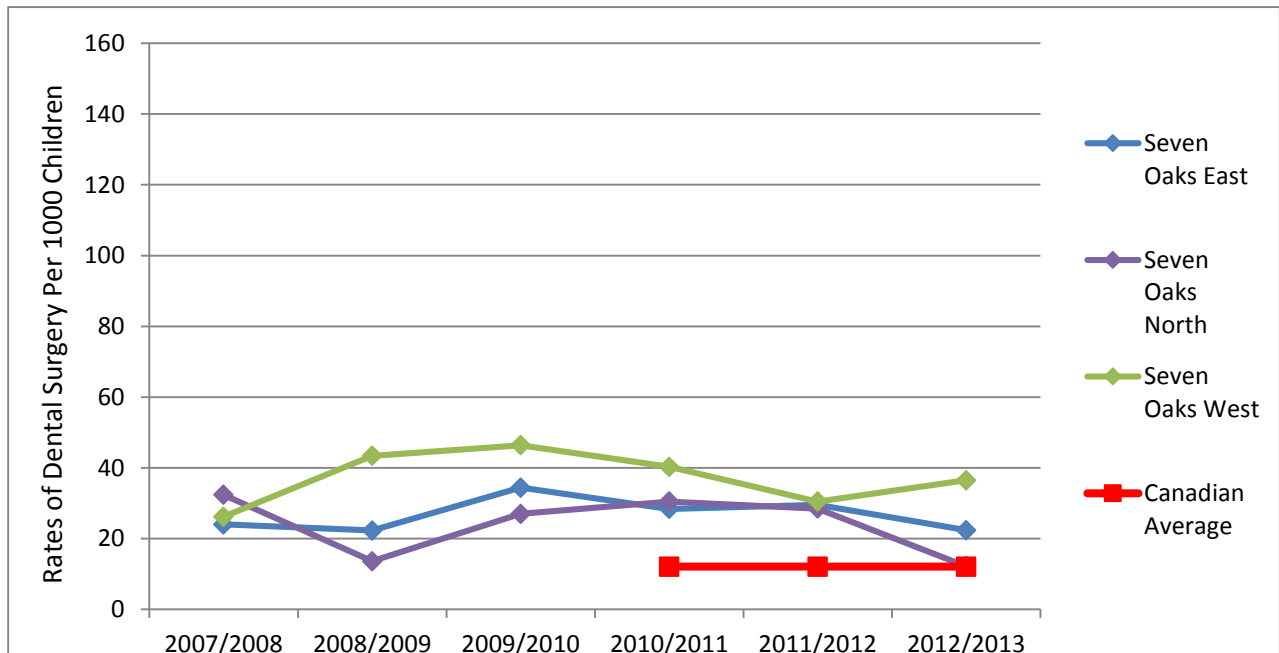


Figure 29b: Age adjusted rates for Seven Oaks neighbourhood clusters Seven Oaks East, Seven Oaks North, and Seven Oaks West.

St. Boniface

Figure 30a reveals that the rate for pediatric dental surgery in St. Boniface community area was stable over the years 2007/08 to 2012/13, ranging from 13.3 to 22.4 per 1,000 children.

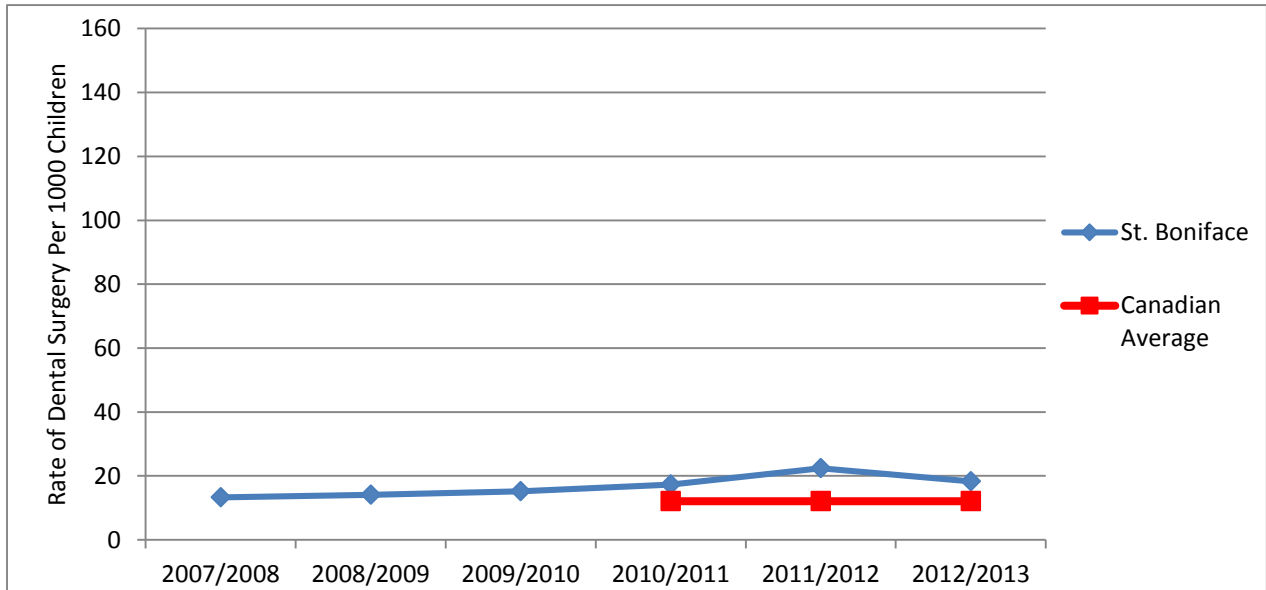


Figure 30a: Age adjusted rate for St. Boniface community area.

Figure 30b reveals that the rates for pediatric dental surgery in St. Boniface East and St. Boniface West were stable over the years 2007/08 to 2012/13.

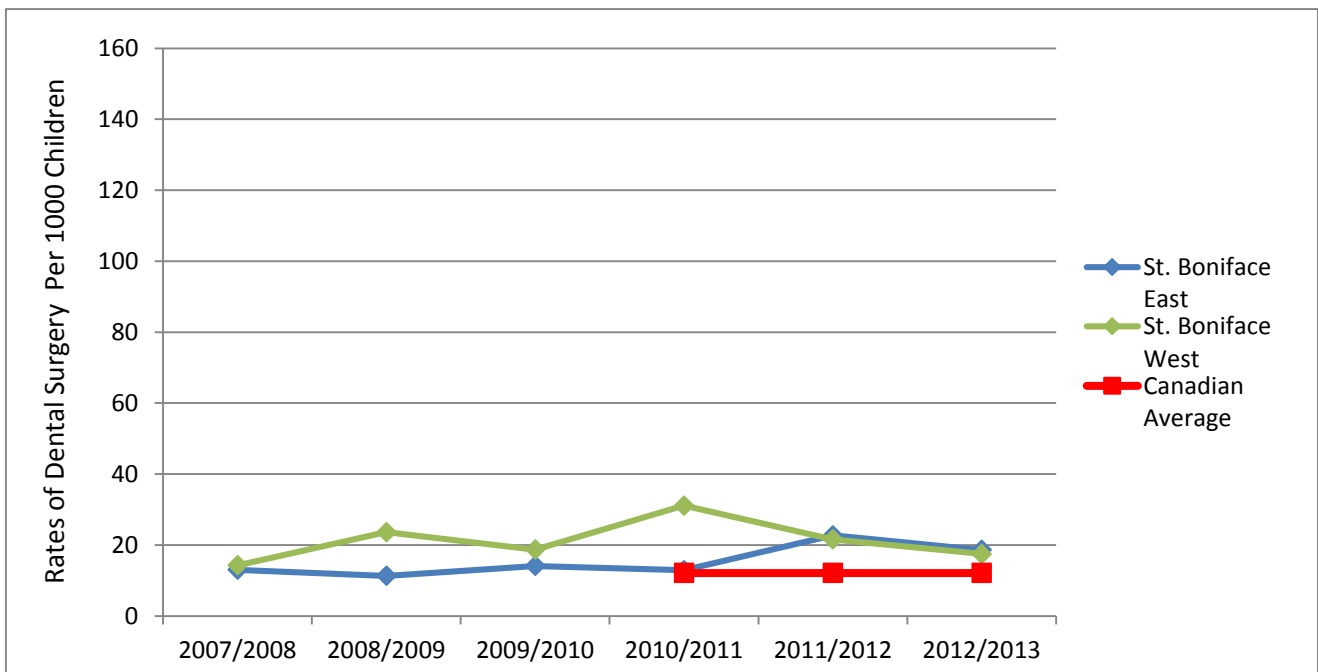


Figure 30b: Age adjusted rates for St. Boniface neighbourhood clusters, St. Boniface East and St. Boniface West.

St. James-Assiniboia

Figure 31a reveals that the rate for pediatric dental surgery in the St. James-Assiniboia community area was stable over the years 2007/08 to 2012/13, ranging from 16.5 to 25.6 per 1,000 children.

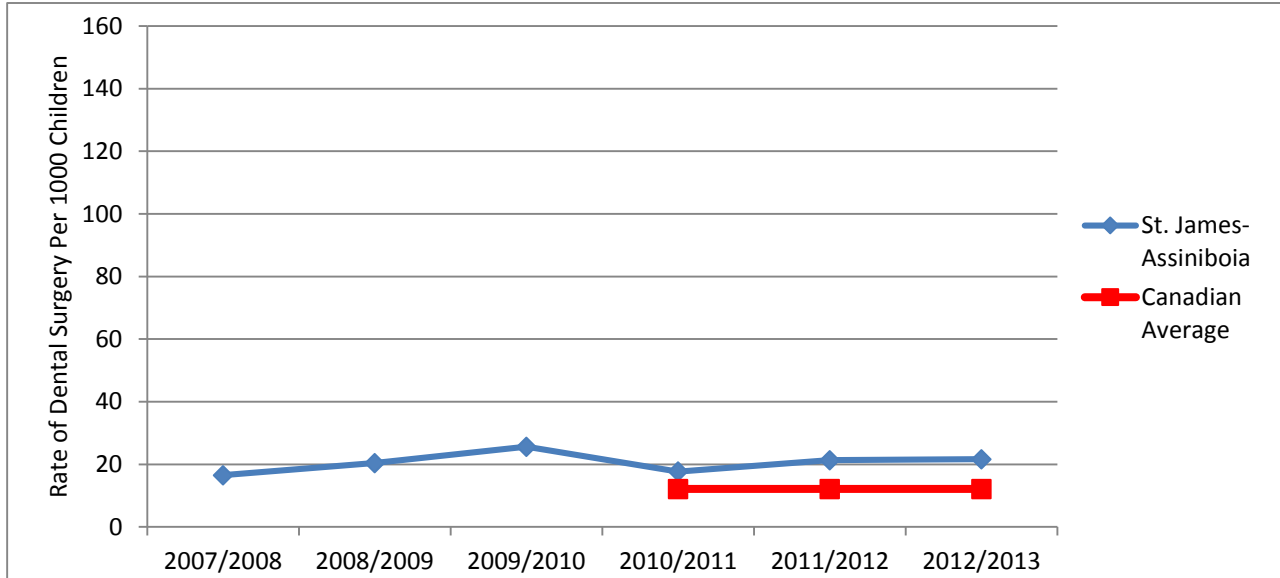


Figure 31a: Age adjusted rate for St. James-Assiniboia community area.

Figure 31b reveals that the rates for pediatric dental surgery in St. James-Assiniboia East and St. James-Assiniboia West were stable over the years 2007/08 to 2012/13.

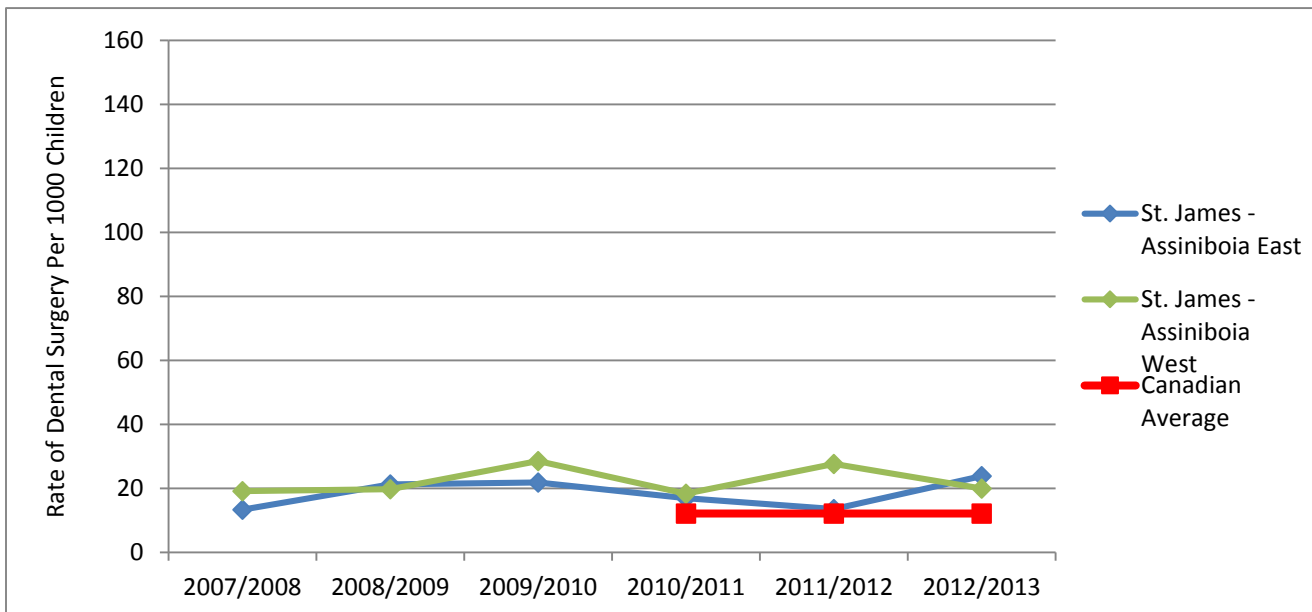


Figure 31b: Age adjusted rates for St. James-Assiniboia neighbourhood clusters, St. James-Assiniboia East and St. James-Assiniboia West.

St. Vital

Figure 32a reveals that the rate for pediatric dental surgery in the St. Vital community area was stable over the years 2007/08 to 2012/13, ranging from 14.9 to 21.5 per 1,000 children.

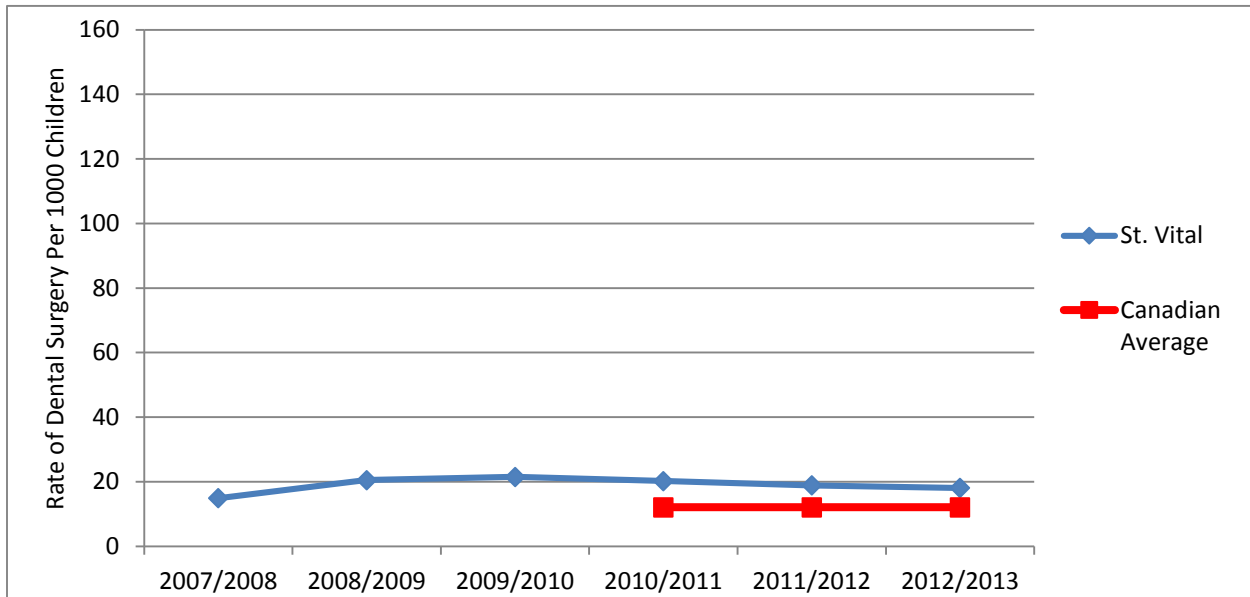


Figure 32a: Age adjusted rate for St. Vital community area.

Figure 32b reveals that the rates for pediatric dental surgery in St. Vital North and St. Vital South were stable over the years 2007/08 to 2012/13.

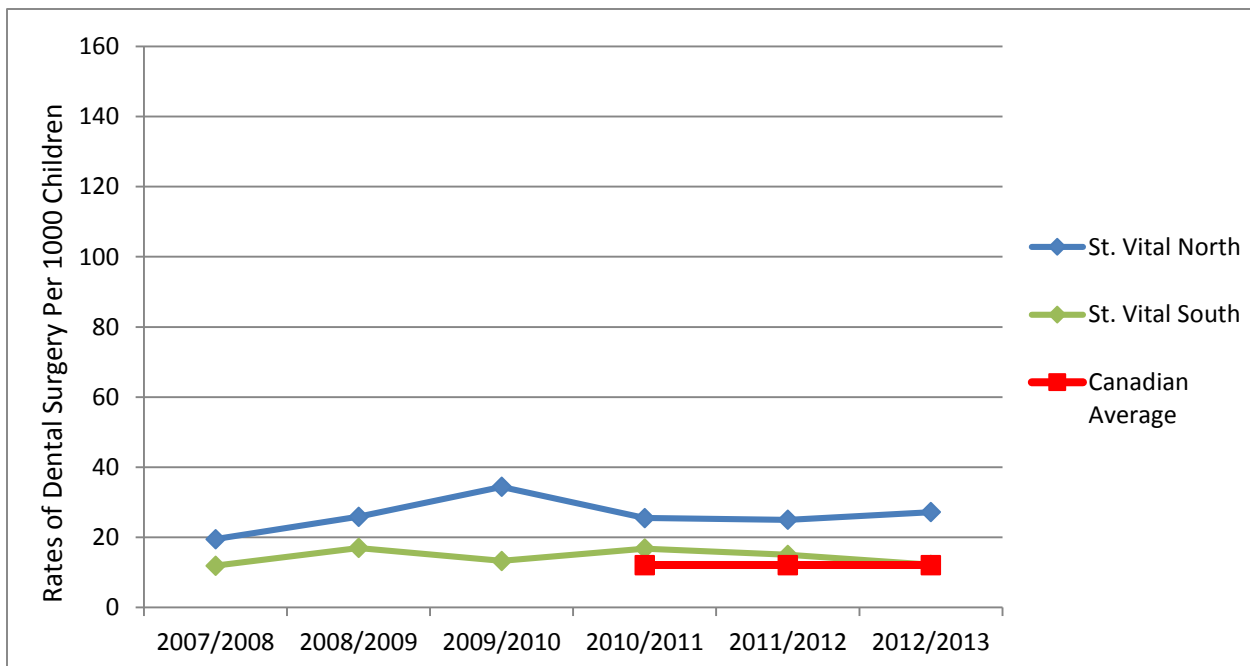


Figure 32b: Age adjusted rates for St. Vital neighbourhood clusters, St. Vital North and St. Vital South.

Transcona

Figure 33 reveals that the rate for pediatric dental surgery in the Transcona community area has remained stable over the years 2007/08 to 2012/13, ranging from 9.4 to 26.8 per 1,000 children.

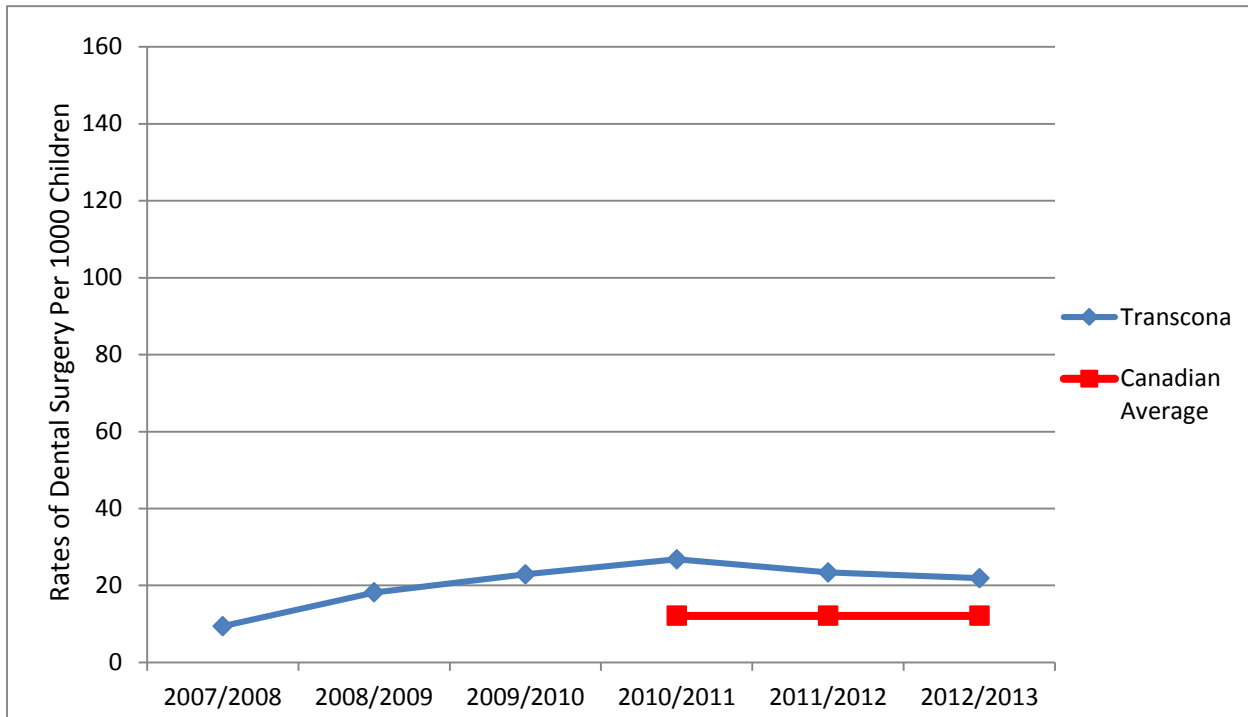


Figure 33: Age adjusted rate for Transcona community area.

Concluding Remarks

The data on rates of pediatric dental surgery can be used to focus oral health promotion efforts and resources to populations most at risk. This information can inform programs and services providers as they promote Early Childhood Oral Health and work to support Early Childhood Caries 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 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.