

A Review of System-Level and Practitioner Relevant Factors That Improve Access to Primary Dental Care for Children Living in Vulnerable Contexts

By

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Abstract

The distribution of childhood caries and dental surgery in BC and Canada is inequitable and is a potential indicator of limited access to prevention and treatment through primary dental care. This paper focuses on different ways to improve access to primary dental care, specifically with an interest in better meeting the needs of children 0-18 years of age living in vulnerable contexts. Findings from this research indicate that policies and investment strategies that reduce the cost of primary dental care have significant impact on improving access, and that a combination of interventions that address economic, safety and health human resource related barriers to care can contribute. Innovative funding and staffing models, inter-disciplinary collaboration, the use of technology and transport, child centered and friendly care and targeted training, recruitment and retention strategies all contribute to increasing access. This paper recommends continued advocacy for policy changes to include primary dental care for children and youth as a part of the Canada Health Act as well as local planning that looks at innovative, creative, flexible and family-friendly ways of providing service, building staffing and maximizing the usage of existing infrastructure and resources.

Keywords: Access; Children; Primary Dental Care; Vulnerable Contexts

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Glossary

Preventative dental care	Interventions that prevent caries including cleaning, scaling fluoride varnish and dental sealants. These interventions, typically completed by dental practitioners, maintain the health of teeth and work to prevent the formation of caries.
Remote	Place with a population of 1 to 1,000 and without year-round road access, or which rely on a third party (e.g. train, airplane, ferry) for transportation to a larger centre
Restorative dental treatment	Dental work to restore the strength and cavity-free state of a tooth including minor fillings, crowns, bridges and root canals as examples.
Rural	Place with a population of 1,001 to 20,000 and requiring more than 30 minutes to drive to a larger centre
System-level	A mixture of high level infrastructure and mechanisms that drive and shape health care, including laws, values and principles, practice expectations, workforce training, organizational leadership and financial and reporting flows
Vulnerable Contexts	Vulnerable contexts can be understood as the social, economic, geographical and political environments and conditions that can negatively influence individual and group capacity and conditions by increasing risk, decreasing choice and ability to cope as examples. Vulnerable contexts reflect the process and distribution of power. When thinking about examples of vulnerable contexts and children, this can include children living in poverty, systemic racism or violent home settings. This can also include children living in rural and remote locations, where access to resources may, relatively, be more limited. This paper purposefully uses the term vulnerable contexts instead of vulnerable children to emphasize the relationship between environments and the human condition.

Introductory Reflection

The focus of this paper comes from a personal interest in equity and the wellness of children. Having worked as a teacher before transitioning into the health sector, I have seen how social systems and conditions impact child health status, learning and development. My work in public and population health currently focuses on First Nations and Aboriginal early childhood development – oral health promotion and caries prevention being an important area of focus. Concentrating this research on primary dental care is a new area of learning to help me think beyond the health promotion work that I have primarily been doing. It is my hope that building my knowledge in this area can help to inform my work with colleagues and partners in primary care and dentistry with regard to what innovative actions and models of care might be pursued in BC to work towards including a greater focus on access to early treatment, particularly with regard to Aboriginal children. With friends and family members who do not have extended health benefits and dental care coverage, I am aware of the burdensome cost of dental care and the access barriers that individuals and families face. I have had limited personal experience with this issue as I have had fairly continuous access to primary dental care. I, however, am committed to ensuring that others can enjoy the same opportunities that I have had to access dental care in a safe, appropriate and acceptable way. This paper seeks to combine a number of my professional and personal interests and it is a nice opportunity to be able to do this research after a few years of experience working in public and population health.

Introduction

The mouth is an integral part of the human body, making it possible for individuals to express themselves and interact with others verbally, physically and spiritually through speech, song, smiles and frowns. Oral health, the condition of the lips, palate, teeth, gums, tongue and throat, is crucial for the holistic health and wellness of individuals and populations. Disease that affects the mouth and throat can have substantial consequences, with the potential to impact food choices, self-confidence, physical comfort, and sleep (Askelson, 2013; CDA, 2010). Research has shown that young children with oral health conditions often suffer from “embarrassment, increased irritability, and fewer social interactions” all factors that can have an impact on early childhood development and emotional well-being (HELP, 2011, p. 1).

A particularly frequent disease of the mouth that poses a significant burden at a population health level is dental caries, or decay of the tooth. Dental caries is an infectious and shareable disease that is bacteria driven (a common bacteria being streptococcus mutans) (BC MOH, 2014b). Dental caries is commonly transmitted to children before the age of three either through guardians or siblings (BC MOH, 2014b). An infection can progressively eat through the layers of a tooth and spread across teeth if not identified and treated promptly. Dental caries is also commonly thought of as a chronic disease, given its widespread prevalence and long term impact if left untreated. Caries has also been shown to be related with other chronic conditions such as cardiovascular disease and diabetes (BC MOH, 2014b).

Purpose

Enabling good and consistent access¹ to primary dental care at an early age and across the life course is crucial for effective oral health promotion and caries prevention both at an individual and community level. Primary dental care can be understood as the first point of face to face contact between an individual and a practitioner in a community setting, where a cross section of care can be provided, such as dental hygiene education, oral health screenings, dental check-ups, preventative care² and restorative treatment³ (Morris et al, 2001). Primary dental care is typically provided by a team of generalists rather than specialists including dental assistants, hygienists, therapists and dentists. Appendix 1 provides an overview of these various professions and their summarized scopes of practice (CDA, 2015). Primary dental care can be understood within the frame of primary health care as defined in the Declaration of Alma-Ata, as “the first element of a continuing health care process” [which] “addresses the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly” (WHO, 1978, p.2). Although primary dental care has not been

¹ Access can be understood within a health context, as ease of entry into or use of the health care system or services. Ease of entry can be achieved without indirect or direct barriers or restrictions to receiving care. Factors such as age, race, health status, fees and patient financial means should not prevent or delay someone from getting the service that they need. In relation to primary dental care, a common indicator of good access to care is if one has seen a dentist within the past 12 months.

² Preventative care for the purposes of this paper includes interventions that prevent caries, including cleaning, scaling fluoride varnish and dental sealants. These are interventions typically completed by dental practitioners that maintain the health of teeth and work to prevent the formation of caries.

³ Restorative treatment for the purposes of this paper is to be understood as dental work to restore the strength and cavity-free state of a tooth including minor fillings, crowns, bridges and root canals as examples.

recognized as essential care in the Canadian context, given that its coverage largely sits outside of Canada's medicare system, the disease burden of dental caries and its potential to be largely prevented and controlled through community-based services, warrant its consideration as essential care. With regular access to primary dental care, the condition of the natural teeth can often be monitored and maintained in a timely proactive and cost effective way when compared to irregular or emergency access to care, where interventions may be more intrusive and financially costly.

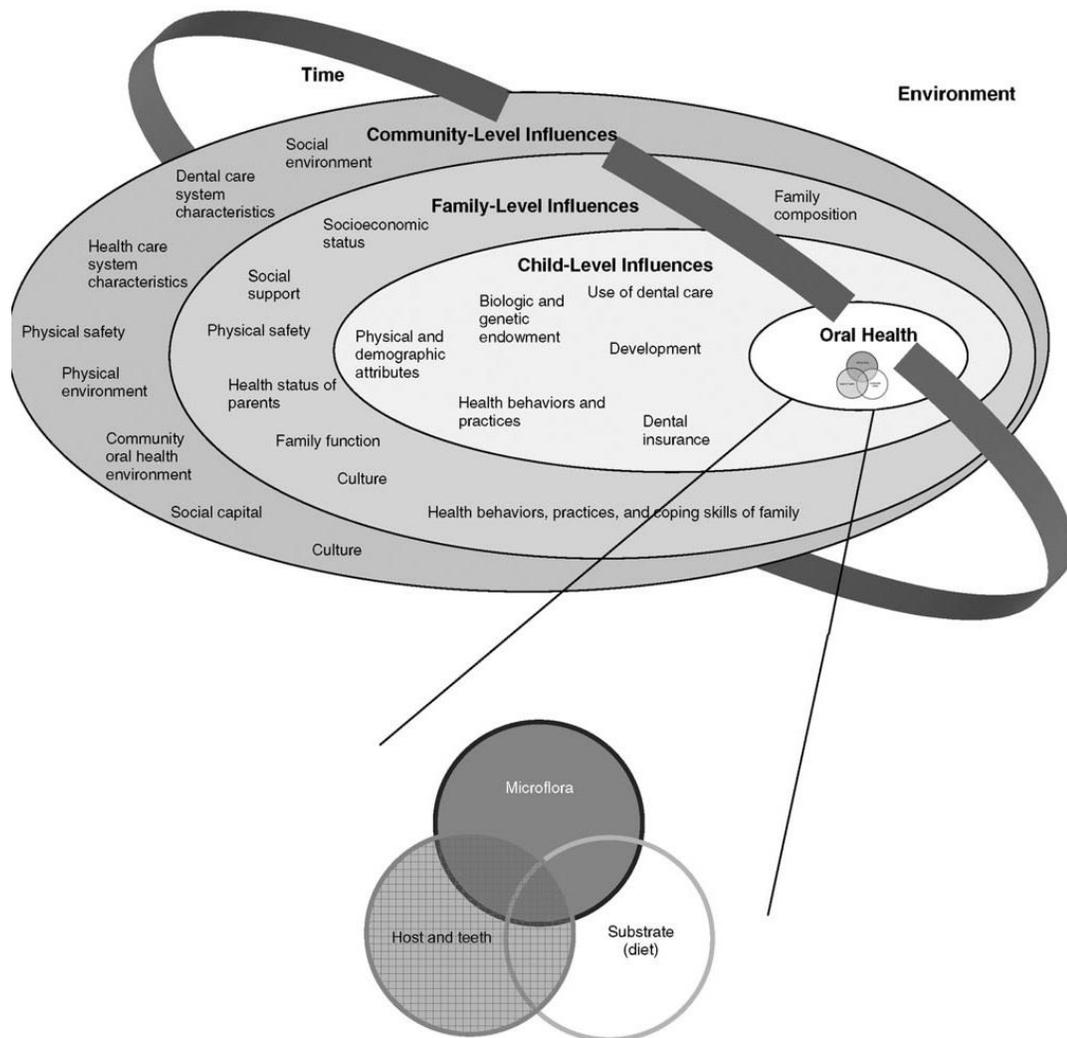
With a particular interest in increasing access to primary dental care for children 0-18 years of age living in vulnerable contexts⁴ in BC, this paper first justifies the significance of access as a key issue by examining population level trends of childhood caries and dental surgery as indicators that barriers to care currently exist. An examination of the current Canadian health system policy and economic context also helps to better understand current barriers to care. Secondly this paper seeks to explore potential ways to improve access to primary dental care for children in vulnerable contexts with an emphasis on system-level⁵ and practitioner oriented solutions. With reference to figure 1 from Fischer-Owens et al (2007), the outer ring of this illustration

⁴ Vulnerable contexts can be understood as the social, economic, geographical and political environments that can influence individual and group capacity and conditions by increasing risk, decreasing choice and ability to cope as examples. Vulnerable contexts can change over time and reflect processes and distribution of power. When thinking about examples of vulnerable contexts and children, this can include children living in poverty, systemic racism or violent home settings. This can also include children living in rural and remote locations, as these living conditions can pose particular challenges. This paper purposefully uses the term vulnerable contexts instead of vulnerable children to avoid labelling children and to underline the focus on the environment and its influence on the human condition.

⁵ System-level can be understood to be a mixture of high level infrastructure and mechanisms that drive and shape health care, including laws, values and principles, practice expectations, workforce training, organizational leadership and financial and reporting flows (Kirch, 2008).

summarizes the system level of focus for this paper and its cascading impact on family and child oral health. As children in vulnerable contexts may not be accessing primary dental care for a variety of reasons, it is necessary to approach and address the concept of access in a multi-dimensional way with proposed actions that can help to overcome barriers that are cost, geography, awareness, safety and health human resource related.

Figure 1: Conceptual Model of the Social Determinants of Oral Health
(Fischer-Owens et al, 2007)



A Critical Review of the Literature

An Overview of the Burden of Childhood Caries and Dental Surgery: Indicators of Barriers to Accessing Care

In Canada there is currently a large gap in population-level data about dental health status and about trends in access to primary dental care. Given that primary dental care falls outside of the definition of essential health care, is largely provided in private clinic settings and is largely funded by private means or insurance, there are limited means of collecting and monitoring data in this area. When thinking about measuring access to primary dental care, the common indicator used (whether or not an individual has seen a dentist within one year), is not systematically collected. To try to mediate this gap in data and work with the information that is publicly available, this paper will look at caries and dental surgery data which can be interpreted as indicators of access to primary dental care.

Caries present in the mouths of children is a public health issue of significant importance in British Columbia, Canada and internationally and an indicator that children may not be accessing primary dental care in a timely way. Province-wide caries screening among kindergarten children in BC between 2012 and 2013 has shown that the impact of caries is significant with 14.6% of kindergarten children having active and visible decay and 18.1% having visible restoration work indicative of the treatment of caries (BC MOH, 2014a). Kindergarten screening assessment outcomes, on a positive note, have shown an improvement over time in BC which should be celebrated. For example, in 2006 to 2007, 17.3% (compared to 14.6% six years later) of children were assessed as having visible decay and 21.7% (compared to 18.1% six years later) of

children had visible restoration work (BC MOH, 2008, 2014a). Despite this decrease in caries at a population level, however, it is important to recognize that inequities in oral health outcomes remain. In particular, there is a significant gap between caries outcomes between Aboriginal children and non-Aboriginal children in BC. In the 2012-2013 screening report, the overall presence of visible caries was 11.1% higher amongst Aboriginal children assessed than non-Aboriginal children (BC MOH, 2014a). The percentage of Aboriginal children assessed as being caries and restoration free was 26.2% lower when compared to the non-Aboriginal population (BC MOH, 2014a). This may be an indicator that Aboriginal children in BC are experiencing less access to primary dental care when compared to non-Aboriginal children. Literature has identified a common trend with higher rates of caries disproportionately being identified amongst sub-populations including children who have newly immigrated, Indigenous children, children living in poverty and children with special needs (Bagińska, 2013; CDA, 2010, CIHI, 2013). This underlines that children in vulnerable contexts may not have equitable access to primary dental care when compared to other children. In a report written by Canadian Institute for Health Information (CIHI), day surgery to address caries in early childhood in Canada (age 1 to 5 years) is estimated to have occurred in 10 of every 1000 children from 2010-2012 (CIHI, 2013). When looking at surgery data in BC (Table 1), one can see that the average surgery rate is higher than the national average with 13.8 of every 1000 children from 2010-2012 having dental surgery with the greatest need occurring in central and north Vancouver Island and the north western part of the Northern region (4,980 cases total) (CIHI, 2013, p. 12). This underlines existing inequalities in dental health outcomes that are geographically relevant and raises questions about potentially limited access to timely and appropriate oral health

promotion and primary dental care in more rural and remote settings. The surgery rates in Table 1 are not controlled for the presence of water fluoridation (an evidence-based and impactful caries prevention measure). However, given that in BC, only 3.7% of the total population is exposed to local water fluoridation (comparatively low when looking at other provinces and territories), its potential to be confounding dental surgery rates across the province is fairly minimal (University of Toronto, 2012).

Table 1: Volume and Rate of Day Surgery for ECC by Location of Residence, Selected Provinces/Territories, Children Age 1 to Younger Than 5, Two-Year Pooled (2010-2011 to 2011-2012)

(CIHI, 2013, p. 17)

	Volume	Rate per 1,000
B.C.	4,980	13.8
East Kootenay Health Service Delivery Area	58	8.3
Kootenay-Boundary Health Service Delivery Area	113	19.6
Okanagan Health Service Delivery Area	247	9.5
Thompson/Cariboo Health Service Delivery Area	349	19.7
Fraser East Health Service Delivery Area	193	6.9
Fraser North Health Service Delivery Area	540	11.1
Fraser South Health Service Delivery Area	824	12.5
Richmond Health Service Delivery Area	123	8.4
Vancouver Health Service Delivery Area	470	10.5
North Shore/Coast Garibaldi Health Service Delivery Area	173	8.5
South Vancouver Island Health Service Delivery Area	347	13.8
Central Vancouver Island Health Service Delivery Area	553	29.4
North Vancouver Island Health Service Delivery Area	191	20.4
Northwest Health Service Delivery Area	377	51.6
Northern Interior Health Service Delivery Area	282	20.6
Northeast Health Service Delivery Area	140	17.0

Children often have to wait for dental surgery in BC, with data from 2013 showing over 1300 children on the wait list and over 10% of these children waiting for six months or longer to receive care (CIHI, 2013, p. 14). Of note is that all the data quoted above does not accurately capture the full scope of the burden of caries and dental surgery in

the child population. Kingergarten dental screening work is not implemented universally across all schools in BC, and is missing some rural and remote schools⁶ where the presence of caries is likely to be higher. Also, dental surgery rates quoted by CIHI are not inclusive of the many surgeries conducted in private clinics surgeons and child health leads working in BC health authority settings, have a shared concern about the number of children currently being admitted into hospital for dental surgery under anesthetic and a collective desire to reduce these rates through improved dental public health and primary dental care (personal communications and observations).

Further examination of early childhood dental surgery data in Canada, shows clearly that the need for childhood dental surgery to address acute disease is not equally distributed, an indicator that not all children have equal access to primary dental care. With reference to Figure 2, one can see that dental surgery rates amongst Aboriginal children are 8.6 times as high compared with non-Aboriginal children, dental surgery rates amongst children living in rural and remote settings are 3.1 times as high compared with children living in urban settings, and dental surgery rates amongst children with the most material deprivation are 3.9 times as high compared with children in the least material deprivation (CIHI, 2013b). As these sub-populations of children are

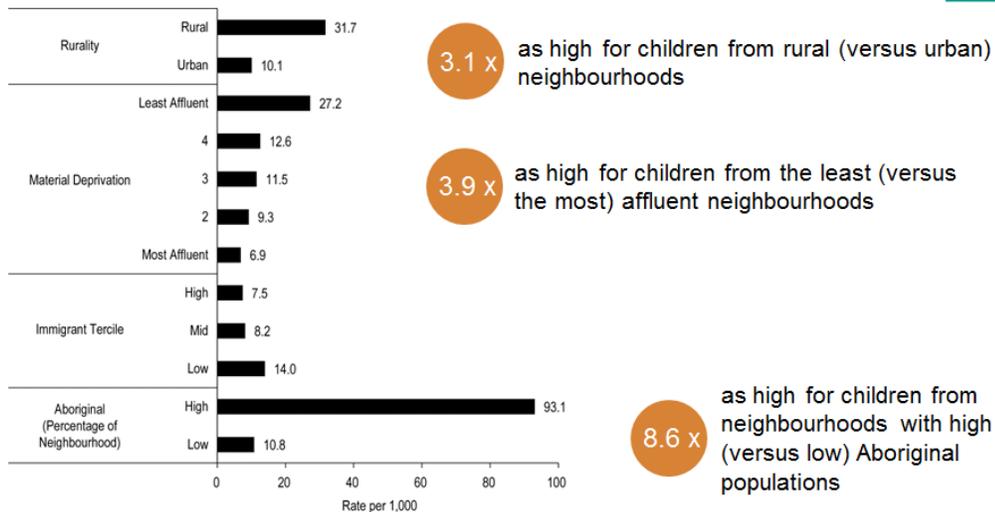
⁶ Standard definitions for rural and remote do not currently exist in Canada and have changed over time. For the purposes of having a reference point for what rural and remote means in the BC context, definitions from the BC Ministry of Health's policy paper have been used, which refers solely to population numbers: Rural – 3,500 to 20,000; Small Rural – 1,000 to 3,500; Remote – 1 to 1,000 (BC MOH, 2015, p. 45). With reference to the Rural and Northern Care Report from Ontario, it is important to acknowledge that rural and remote definitions should also be understood by the distance and means of travel needed to reach a larger centre. Rural can be understood as requiring more than 30 minutes to drive to a larger centre and remote can be understood as being "without year-round road access, or which rely on a third party (e.g. train, airplane, ferry) for transportation to a larger centre" (Ontario Ministry of Health (OMOH), 2015, p. 4)

not mutually exclusive, it is evident that some children experience compounded and particularly high risks of experiencing acute dental decay and potentially requiring surgery.

Figure 2: Rate of Day Surgery for ECC by Socio-Demographic Factors, Selected Provinces/Territories, Children Age 1 to Younger Than 5, Two-Year Pooled (2010-2011 to 2011-2012)

(CIHI, 2013b, Slide 16)

Are Some Populations at Higher Risk?



Notes
 Quebec elected to not participate in this study.
 Analyses of ECC day surgery visits by neighbourhood attributes (rurality, MDI and size of the immigrant or Aboriginal population) exclude residents for whom these attributes could not be calculated.
 Rates were calculated by dividing the number of procedures found in the pooled two-year cohort by the sum of the combined two-year subpopulation estimate.
Sources
 Discharge Abstract Database and National Ambulatory Care Reporting System, 2010–2011 and 2011–2012, Canadian Institute for Health Information; CANSIM Table 051-0001, Geozones Aboriginal File and 2006 Census, Statistics Canada.

As well, when looking at international research, common trends exist where children and adults in rural and remote settings when compared to urban settings experience greater levels of tooth decay, higher rates of tooth extractions and more frequent access of urgent care for preventable oral health conditions (Schwarz, 2006,

Shortridge, 2009, Kruger et al, 2010). Rural and remote care access issues are not unique to dental care. The BC Ministry of Health has recently released a policy framework in 2015, prioritizing rural and remote health generally as an area for concerted action (BC MOH, 2015a). It is widely acknowledged that living in a rural or remote location poses unique challenges in accessing care (health and beyond), due to the common need to travel long distances, population density influencing infrastructure and staffing levels, and the limitations of geography and weather (OMOH, 2015).

Common impacts of limited access to care associated with rural and remote locations include higher levels of hospital visits due to inconsistent availability of primary and community care, a lack of standard expectations for rural and remote care given varying resources and local needs, challenges in referral and continuity of care between rural and urban care and the general scarcity of resources where care providers commonly need to work at the top of or beyond their scope and take on multiple roles (OMOH, 2015; BC MOH 2015a). A report drafted by Roy Romanow has highlighted that the centralization of health services in many of Canada's Provinces and Territories has magnified the relative rural and remoteness of communities and has intensified inequity, in that "people in rural communities have poorer health status and greater needs for primary health care, yet they are not as well served and have more difficulty in accessing health care services than people in urban centres" (Romanow, 2002, p. 162). Geography or location, then, can be thought of as a social determinant of health and contextual factor in relation to access to care. The Ministry's recent policy framework paper focuses on how quality, integrated community-based care can be better supported and connected to specialized services in urban centres to improve population health trends,

patient experience and cost effectiveness (BC MOH, 2015a). Although primary dental care is not explicitly mentioned in this Ministry framework, many of the recommendations from this framework equally apply. Having identified clear inequities in childhood dental caries and dental surgery trends and rural and remote location as particular context that poses particular vulnerabilities, it is important to better understand the policy and economic background shaping these realities.

An Overview of the Canadian Policy and Economic Context of Primary Dental Care: Implications in Relation to Access

Currently primary dental care has a limited presence in the public health care system, which poses potential barriers in relation to accessing timely and appropriate care. Public investment in dental services Canada is 6%, with the remaining 94% of care being paid for by private means, either through employment-based insurance (approximately 51%) or by household out of pocket expenses (approximately 43%) (Quinonez, 2013). This percentage of public investment is low when compared to other countries in Figure 3. Table 2 also illustrates that public spending on dental services in BC is slightly lower than the national average at 5.7% with the highest total private sector spending on oral health at \$459.16 per capita.

Figure 3: Public Coverage of Dental Care in Canada

(CIHI, 2015, slide 13)

Public coverage of dental care is lower in Canada

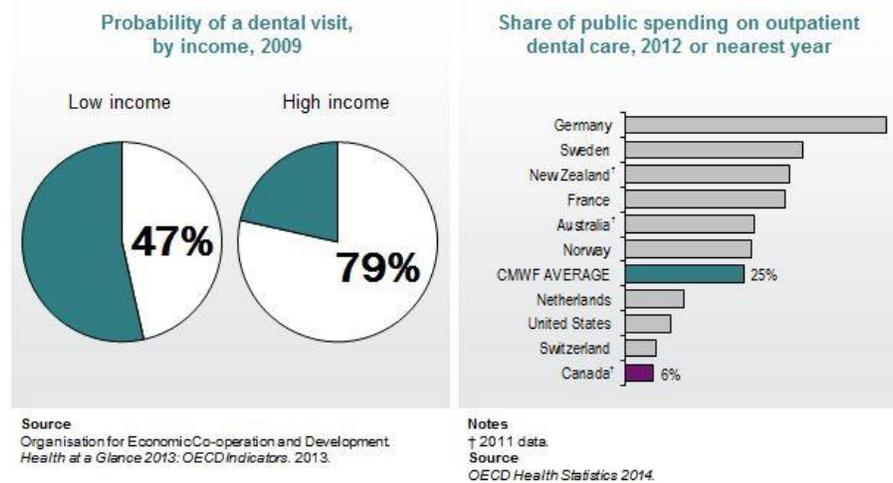


Table 2: Oral Health Care Spending in Canada, 2010

(Optimus, 2014, p. 53)

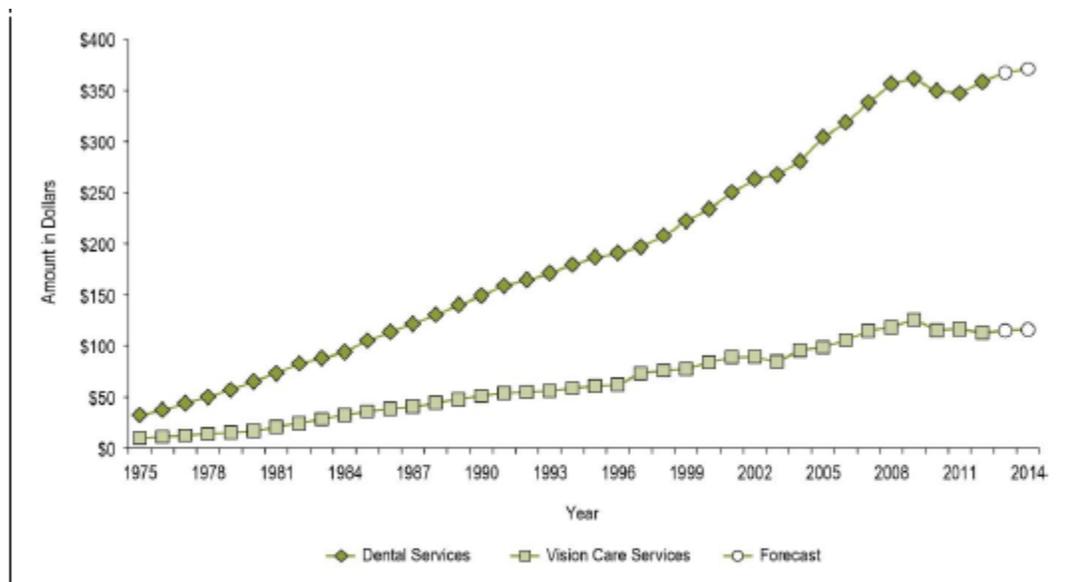
Province	Total Spending on Dental Services (\$000s)	Per Capita Private Sector Spending (\$s)	Per Capita Public Sector Spending (\$s)	Public Sector Spending as % of Total (%)
Newfoundland	97,804	174.25	18.46	9.6
Prince Edward Island	38,262	248.81	21.59	8.0
Nova Scotia	287,033	290.33	15.48	5.1
New Brunswick	266,428	341.36	13.73	3.9
Quebec	2,317,252	273.05	20.59	7.0
Ontario	5,871,274	438.11	5.67	1.3
Manitoba	401,744	290.45	35.27	10.8
Saskatchewan	320,706	264.08	43.91	14.3
Alberta	1,763,577	427.65	40.95	8.7
British Columbia	2,205,291	459.16	27.67	5.7
Yukon Territories	14,707	305.4	125.9	29.2

³ Note that per capita spending for some provinces and the territories may not be comparable to the Ontario data due to high proportion of the population eligible for the federally funded Non-insured Health Benefits (NIHB) Program.

With reference to figure 4, one can see that CIHI's examination of national health expenditure trends between 1975 to 2014, shows a consistent rise in the per capita spending on oral health care, with private oral health care spending rising by 4.6% per year from 2000 to 2012 (CIHI, 2014, p. 54).

Figure 4: Dental and Vision Care Services Expenditure, Total per Capita, Canada, 1975 to 2014

(CIHI, 2014, p.55)



Note

The decreases in dental and vision care services spending observed starting from 2010 are due to the redesign of the Survey of Household Spending (SHS) by Statistics Canada in 2010. See Appendix A for further details.

Source

National Health Expenditure Database, Canadian Institute for Health Information.

A separate study of dental spending in Canada from 2000-2010 completed by authors Ramraj et al, argues that “total real expenditures on dental care, after adjusting for inflation, increased by 56%, while the percentage of dental care expenditures paid by private insurance and through public funds decreased” (2014, p. 1). Ramraj et al also

point out that with a changing job market with more part-time, contract and self-employed positions, employer-based private insurance coverage is anticipated to decrease over time (2014).

With increasing costs, those with limited or no coverage are less likely to be accessing the care they need in a timely way. Cost barriers to primary dental care have been highlighted by the media in BC, with residents reported to be taking safety and health risks by opting to access underground and unlicensed dentists who charge lower fees (Baker, 2013).

Limited public investment in primary dental care in Canada has historical roots that stem back to the early 1900s and were heavily influenced by the Royal Commission on Health Services in the 1960s, when it was recommended that only targeted populations should receive publicly funded oral health services including children, pregnant women and individuals receiving social assistance (GOC, 1964). As Quinonez discusses in his historical evaluation of oral health care policy in Canada, a publicly funded universal approach to oral health care has not developed for a number of reasons, primarily the anticipated costs, opposition from the dental profession, the hope that water fluoridation would negate the need for significant investment in dental care and the political belief that dental health is a reflection of and determined by personal responsibility, behaviour and choice (not sufficiently acknowledging the social determinants) (2013). The division of oral health from broader health and health care has continued over the years and is reflected in the Canada Health Act. Currently only surgical dental care provided in hospital settings is included in the Act (GOC, 1985). Nor have the Commission's recommendations been fulfilled regarding the original proposed

target populations for public coverage. Not all children and pregnant women in Canada currently qualify for publicly funded oral health services.

When examining the limited public investment in primary dental care that does exist, the Federal government funds oral health care coverage for status First Nations community members, Canadian Forces members and Veterans while Provincial governments fund oral health coverage to low income children, individuals with disabilities and individuals receiving social assistance (eg. Healthy Kids Dental Program in BC) (Quinonez, 2013; MOH, 2014b). Beyond this, any families who do not qualify for public coverage but might not be able to afford primary dental care are reliant on community based programs that offer low cost or free services (eg. CODE dental clinic in Nanaimo or the Abbotsford food bank dental clinic) (BCDA, 2015). These low cost or donation based dental clinics in BC are often reliant on the volunteerism of dental staff and are located in larger urban settings with larger populations, underlining again clear inequities in access to care in rural and remote settings (BCDA, 2015). To complicate this picture further, findings from CIHI illustrate that low income populations, despite the availability of publicly funded oral health coverage, are still experiencing barriers in access to care when compared with higher income populations in Canada and are reported as less probable to visit the dentist (Figure 3) (CIHI, 2015). Similarly, the Federal government funds dental care for Aboriginal populations in Canada, yet disproportionately high caries and dental surgery rates persist amongst Aboriginal communities. This suggests or shows that reducing cost barriers to care in theory is not the whole answer. Other ways of thinking about and responding to access are required to fully support individuals to reach and receive the care that they need.

In combination with individual-focused promotion, prevention and treatment services via primary dental care, dental public health is an essential complement in the prevention of dental disease through community-level focused work (CCPA, 2011; HELP, 2011). Examples of dental public health work can be summarized in relation to the guiding frame of the Ottawa Charter, including the development of healthy public policy such as sugar-free beverage policies in school and workplace settings, the taxation of junk foods and the promotion of quality, safe and affordable foods (BC MOH, 2014); advocacy regarding the benefits of water fluoridation and the promotion of locally grown and traditional food sources to create supportive environments for oral health; community action in the development of oral health priorities and programming contributing to greater ownership, engagement and sustainability (BC MOH, 2014); oral health education and personal skill development targeting pregnant women, children and families around diet and hygiene, integrated into various prenatal, early childhood development and school based programming (HELP, 2011); and finally reorienting health services by building the appropriate knowledge, skills and approaches of frontline providers to talk about and address oral health (the dental public health discipline specific core competencies are a key reference). The importance of population health dental research, standardized data collection and the ability to monitor dental disease trends over time are also key parts of dental public health work and an area that warrants significantly more investment and staffing (BC MOH, 2014). A multi-pronged and inter-sectoral approach to oral health promotion and caries prevention that connects with and provides referral to primary dental care should undoubtedly be a major and continuing route to continue to lower caries rates over time.

Methods

The research question generated to drive the research done for this paper was: What system-level and practitioner level factors improve access to primary dental care for children living in vulnerable contexts? A search of both academic published research and grey literature and BC health sector websites (Ministry of Health and Regional Health Authorities) was completed to gather the information used to write this paper.

A combination of terms were used in this research, including: children, oral health, dental, rural, treatment, access, physical, geographical, financial and safety. With reference to the definition of access used in this paper, ease of entry into services is connected to a lack of barriers or restrictions to care. Some examples of potential barriers for consideration were brainstormed in advance and were reflected as search terms to help focus the research. A preliminary search of the database *Web of Science* was completed resulting in 19 articles, 2 of which were relevant. A more targeted search of dental specific journals followed, including *Community Dental Health*, (272 results, 7 relevant articles) *Community Dentistry and Oral Epidemiology* (211 results, 10 relevant articles) and *Journal of Public Health Dentistry* (288 results, 8 relevant articles). Journal articles were assessed for relevance by reading the abstract sections. Research from Canada and countries which have similarly structured oral health services systems were of primary focus (eg. US and Australia), but given the very open and exploratory nature of this research, models from countries with more public funding of primary dental care were included as well. Research from low and middle income countries, where access to oral health care is a common issue and where innovative solutions have been developed to address need, was also included for consideration (eg. Cameroon).

Recognizing that there is a lot of good work happening which may not be fully evaluated or formally published through academic journals, a search of grey literature occurred with a combination of the same search terms. Policy documents, articles, and program descriptions were gathered through online sources including the BC Ministry of Health, the Journal of the Canadian Dental Association, the Canadian Centre for Policy Alternatives and Google Scholar sites. A total of 53 sources of academic and grey literature were considered in the writing of this document. Information from the relevant articles was grouped in relation to the different dimensions of access.

Given that access to primary dental is one of many means of trying to improve the oral health status of children, part of the reading and analysis of the sources described above focused on existing population health and system information to explore the significance of access to primary dental care as a key issue and its related policy context. Any research related to this theme was kept as necessary background. Analysis also included the sorting and theming of article findings according to common barriers to care. Many of these themes were anticipated (cost, rural and remote context and safety barriers), but parent and public awareness and health human resources were two additional areas of focus that emerged. The organization of the solutions focused on findings presented in the following sections of this paper and respond to the key barriers to access that emerged, including cost, geography, awareness, safety and staff.

Findings

Ways to Address Cost Barriers

When exploring cost related solutions to increase access to primary dental care for children living in vulnerable contexts, there are a number of options for consideration, most which revolve around coverage of payments for care. One policy option, demonstrated by Denmark and its “1986 Danish Act on Dental Care” is the prioritization of universal promotion, prevention and treatment for children 18 years old and younger, reminiscent of the Royal Commission’s recommendation (OHS, 2013). Denmark’s Act has ensured that all children have guaranteed coverage that does not require special qualification, with affiliated service and reporting expectations that would be able to identify and address any gaps in service across all children (OHS, 2013). Building the case in Canada for the inclusion of primary dental care for children, youth and pregnant women in the Canada Health Act as originally recommended in the Commission would be a very helpful step forward that would require significant upfront investment, but over time would likely result in lower health system costs. To demonstrate the anticipated cost savings of increasing early access to primary dental care, Sinclair and Edelstein have shown in their research that “low-income children who have their first preventive dental visit by age one are not only less likely to have subsequent restorative or emergency room visits, but their average dentally related costs are almost 40 per cent lower over a five year period than children who receive their first preventative visit after age one” (2005, p.1).

With reference to the concept of proportionate universalism (Marmot, 2010), primary dental care service coverage and care can theoretically be structured in a way which ensures that all children are receiving an appropriate standard of care to theoretically improve overall child oral health outcomes, while investing targeted funding and additional supports for children at risk of poor oral health, in order to decrease existing gaps in oral health status among children. Inclusion of public primary dental care coverage for pregnant women is a key policy change for consideration, as pregnancy is often a prime opportunity to support positive health changes in women and their families, provide oral health education to influence behaviours at home and to emphasize the importance of having infants and children come for regular dental visits (CDA, 2010). Guendelman's (2006) and Binkley's (2010) research has shown that when children have public coverage for oral health services, child access of care is more likely when parents or guardians have coverage as well, emphasizing the importance of a family approach. Saskatchewan's Family Health Benefit program demonstrates this prioritization of family oral health, as extended health coverage is available for working poor families who do not qualify for social assistance (Livingstone, 2004). This program has resulted in a 35% increase in the enrollment and coverage of families living in rural and remote settings and has also resulted in an increased reported use of primary dental services, highlighting the reality that cost is a major barrier to accessing care and that initiatives targeting the working poor can have significant and positive results (Livingstone, 2014).

Tax rebates are another approach to reducing cost barriers to primary dental care services. The introduction tax rebates for primary dental care in Australia has been shown to double the total amount spent by the Australian government on publicly funded

and provided direct services (Mass et al, 2006). Good public uptake of this type of tax rebate is positive, however, in the spirit of distributing public resources fairly to benefit those with highest relative need and lowest relative means, it is important to ensure that tax rebate rates follow a gradient that aligns with income. Rebates could also potentially be structured to prioritize and encourage oral health promotion and preventative care, with full rebate rates for upstream care and lower rebate rates for downstream care. Rebates, however, do not address the fact that up-front payment for care can be a major access barrier, particularly for those with limited resources.

Requiring mandatory private insurance is another option which countries like Germany and Japan currently have in place to ensure primary dental care coverage (OHS, 2013). Having an income-based gradient of subsidization for private insurance through public funding would be one way of ensuring that the cost of purchasing the insurance is not unfairly burdensome for low income populations (similar to how one's payment for MSP or fair pharmacare in BC is determined).

Approaches to reducing cost barriers to primary dental care services that are more targeted to vulnerable contexts include publicly funded travel subsidies or innovative transportation options (eg. Travel Assistance Program and Health Connections Program funded and provided in BC) to help off-set the costs of families of leaving their community to access care. This type of model can also be paired with other health and social sector appointments to increase efficiency.

Volunteer based models of primary dental care are other options that reduce or eliminate cost barriers for individuals who need care, but are highly dependent on

community will and continued efforts to ensure sustainability. The Community Dental Access Initiative in the US for example (RAC, 2015), is a model where dentists receive modest honorariums in recognition of their volunteered time and patients complete community service to pay for the care received. With a significant return on value of over 300%, there are broader social benefits from the community service that is a part of this model that is interesting to consider.

Research that has been conducted in the US in relation to Medicaid policy for primary dental care provides insight into how policies and practice could be modified in Canada to increase access to care for those who currently have public coverage. Research has shown that the burden of extra paperwork, lower public compensation rates when compared to private sector rates, and the frequency of missed appointments and lost earnings when working with marginalized populations are all commonly cited concerns amongst dental practitioners in the US, which has been reported to result in some dental clinics not accepting patients with Medicaid coverage (Pourat et al, 2015; Akelson et al, 2013). This type of circumstance is similar in BC. I have heard from qualitative community engagement input from First Nations community members that dentists and other extended health providers have hesitated to provide or not provided service due to the individual having non-insured health benefits coverage (federally funded coverage). Recommendations from the literature to alleviate the above discussed barriers include increasing public compensation rates for services (with the potential for strategically weighted compensation rates that incentivize preventative care and early treatment) and looking at ways to increase the efficiency of the administrative process to ensure the timely payment of dental clinics (Akelson et al, 2013). Pourat et al's work has

shown that solo practicing, female and older dentists are less likely to accept Medicaid patients (2015). A similar scan of dentist offices in BC and across Canada would be helpful to be able to identify who may not be opening their doors to patients with public coverage accompanied with engagement to better understand why this is the case. Ongoing engagement with dental teams could provide the opportunity learn about current successes and challenges in working with public coverage programs and could also be used as an opportunity to build awareness amongst dental staff about ongoing inequities in oral health outcomes and the importance of their role in closing these gaps, in part by reaching out to and welcoming patients with public dental coverage.

Co-location and cost sharing with other dental clinics or primary care settings with shared administrative and support staff, also has the potential to lower overhead costs which can in theory be passed on in lower fees to patients (Wendling, 2010). Co-location with primary care clinics also provides the opportunity for increased co-referral and collaborative care between physicians and dental staff.

Another means of reducing cost barriers to primary dental care, is moving from the public funding of dental coverage programs (which continues to support a fee for service model of care with typical upfront costs for the patient) to the public funding of dental staff through salaried or capitation models of compensation, where public funding can be attached to specific service expectations and deliverables of staff who are hired, with the potential to prioritize care for children and youth in vulnerable contexts for example. In Australia, a capitation model of payment has shown positive results, where university based dental teams (including students) are compensated with a set amount of funding for each child or youth enrolled as a part of their practice for a set period of

time (Conquest, 2015). This approach has successfully resulted in being able to care for more children and youth, triage patient needs, reduce waitlists for care and promote a preventative approach to oral health (Conquest, 2015).

To summarize the solutions-focused findings reviewed above in an action-oriented way:

- Use legislative policy as a means of prioritizing desired service provision that focuses on the oral health needs and outcomes of children and their families
- Subsidize or publicly fund oral health coverage that support working poor families, who do not qualify for income assistance but demonstrate clear need
- Consider tax rebate incentives and travel assistance programs to reduce financial burden
- Improve dental staff experiences with public dental coverage programs and administrative processes
- Explore innovative and alternative payment models that promote preventative care for children and families

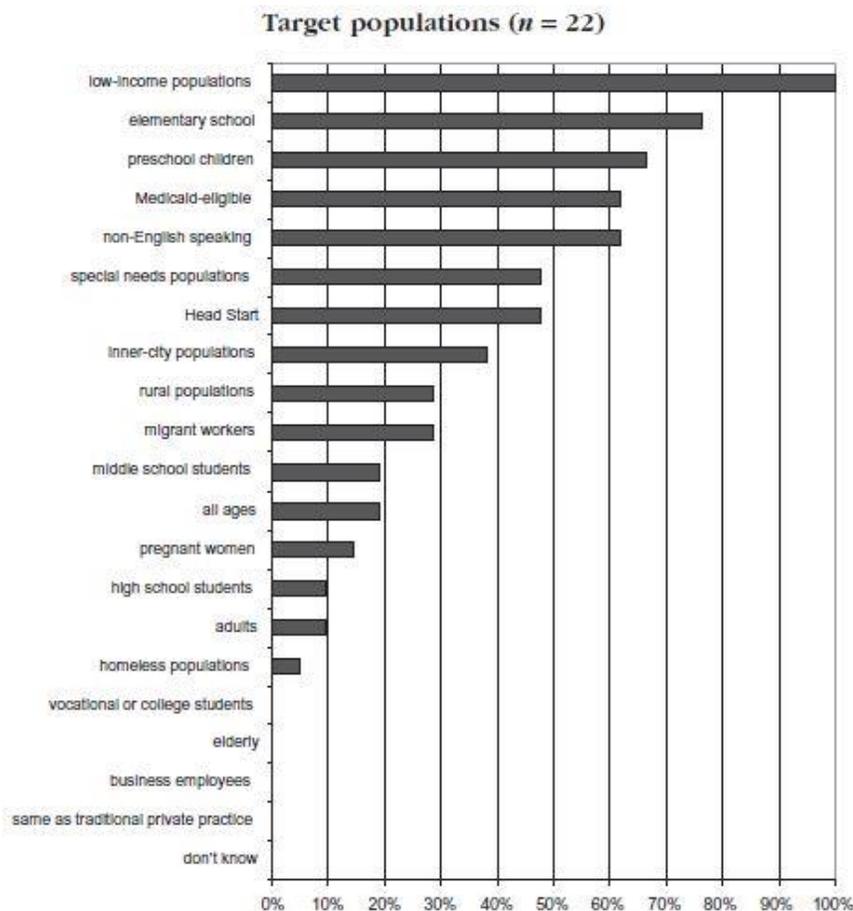
Ways to Address Geographical and Physical Barriers

Geographical and physical access to early dental treatment for children living in vulnerable contexts can include factors such as the location, hours, types of infrastructure and equipment available and transit options. Primary dental care clinics can offer office hours beyond 9am-5pm, practice on weekends and provide outreach or home visits that can be done with minimal equipment as solutions that are similar to approaches taken by some general physicians. From a review of the literature, mobile dental clinics are often cited as another approach to improving physical access to treatment, where vans equipped with one or two dental chairs and affiliated equipment are able to drive from community to community, with paid or volunteer staff (Carr, 2008). Although mobile clinics do certainly reduce the need for client travel, the capital cost and

upkeep of vans can be quite expensive and they often rely on private funding or donations for ongoing financing (Carr, 2008). As dental staff can be voluntary and rotating, continuity of care with the same dental team is not achieved. Carr's study of multiple mobile clinics does successfully show, however, that this outreach model has the potential to reach underserved and priority target populations including low income populations and children (Figure 5).

Figure 5: Sub-Populations Reached by Mobile Dental Clinic

(Carr, 2008, p. 235)



From a review of rural dentistry programs described in grey literature, a program called “Smiles on Wheels” stood out as an effective means of providing early treatment to children in rural settings. A mobile clinic, shared amongst six communities, serves children from low income families and with parent/guardian consent, children are able to receive treatment during school hours on school grounds, free of charge (RAC, 2015). This same mobile clinic also partners with Head Start programming to be able to provide treatment for pregnant women. Originally started with Federal grant money in the USA, the program is now ongoing and self-sustaining through a combination of billings to Medicaid and through the establishment of an affiliated clinic, where the participating dentists are able to take on other clients (RAC, 2015).

The investment in quality equipment and infrastructure in school-based or community health settings (like a health centre or primary care clinic) is strategic and important to get children and families comfortable with seeing and being around oral health services when they are accessing other programs and services in the same space. The integration of primary dental care into a broader “health home” not only builds visibility and familiarity, but also promotes integration between oral health and general health services (BC MOH, 2014, p.64). Having a well-equipped and up to date clinic space is essential for primary dental care providers to do their work well and is an added incentive for dental providers to live in or travel to more rural locations to practice (Kruger et al, 2010).

Tele-dentistry is showing promising signs of being able to assist with conducting dental assessments, consultations and oral health education virtually with the aim of reducing the need for child and family travel (Bradley, 2009). Tele-dentistry also has the potential to support dental therapist consultations with supervising dentists to ensure

quality care. Tele-health equipment could be effectively paired with existing or new capital investment in dental chairs in rural school-based or community settings, to allow for appropriate spaces for preventative dental care and minor restoration. In Australia, having video-conferencing equipment in rural and remote settings, has allowed for specialists in larger city centres to support new dental graduates in their first years of work (Kruger et al, 2010).

In rural and remote communities, where population numbers might be particularly small, there is evidence that a hub and spoke model of primary dental care can be both cost-effective and helpful in bringing service closer to home for residents. Fly-in dental services support a number of Indigenous communities in Australia, where dentists are located in a larger city with a central clinic and travel to smaller communities for approximately a week at a time to provide care for clients (Dyson et al, 2012). Frequency of service is based on population need (Dyson et al, 2012). This hub and spoke model has been evaluated to show that with service to five remote communities, the “cost-to-value-of-care” of this approach is comparable to larger publicly funded dental services (p. 337). Calculations showed that 25% of this model’s costs went to travel, but considering that there is minimal staffing travelling into a community to provide care, compared with the alternative of community members travelling out, or not acting/taking action until urgent care is needed, this model from a larger lens is very cost effective in the long term.

To summarize the solutions-focused findings reviewed above in an action-oriented way:

- Explore the feasibility and appropriateness of mobile dental clinics to provide outreach primary dental care.

- Consider the installation and staffing of school-based dental chairs.
- Pursue opportunities to expand tele-dentistry in relation to oral health education, consultation and inter-professional dental practice.
- Implement hub and spoke, fly-in fly-out dentistry models in rural and remote settings, where multiple communities may be interested in coordinating and sharing dental staff.

Ways to Address Awareness Barriers

Building individual and community awareness of the connection between oral health and overall health and the importance of regular check-ups as an important and normal way of maintaining healthy teeth is another way of increasing child and family access to primary dental care, particularly in vulnerable contexts (BC MOH, 2014b). Developing awareness about the connection between the oral health of parents and children and the importance of dental hygiene and regular preventative care is a potential motivation for parents to bring their children to seek primary dental care to ensure that they are caries free. Incorporating oral health education into prenatal care, post-partum and early child development visits and programming has been shown to be a successful way of increasing parent and guardian awareness of oral health, hygiene and what dental services are accessible to them in their community (BC MOH, 2014b). Pregnancy and the early years are opportune times to provide education, promote behaviour change and establish positive and ongoing care connections with parents and families.

Practice standards and affiliated professional development for primary care providers to provide basic oral health education and referrals at strategic times can be an effective mechanism. When looking at Perinatal Services BC's current prenatal, maternity and post-partum/newborn care pathway and checklist documents, there is no

mention of maternal or infant oral health and appropriate educational messaging around hygiene and visiting dental care (PSBC, 2015). This is a potential place to initiative change in the BC context. Human Early Learning Partnership's research in BC has underlined the importance of building oral health education into public health and community parenting programming (2011), which provides an excellent opportunity to invite primary dental care practitioners in as guests to answer questions and establish early relationships. Interactive approaches to knowledge and skill development where parents are able identify their own knowledge needs, behaviour change goals and desired ways forward have been shown to be particularly effective – motivational interviewing and role playing being two highlighted approaches (HELP, 2011).

In the UK, a program called Child Smile has been highly successful in linking families with primary dental care, where public health nurses work with families to build awareness about diet and dental hygiene and facilitate dental check-ups (Optimus, 2014), which in Canada is recommended to occur at the eruption of a child's first tooth or by the age of one (CDA, 2010). This type of model could theoretically work across a number of frontline providers working with families, including public health nurses, social workers, day care and early childhood education providers.

To summarize the solutions-focused findings reviewed above in an action-oriented way:

- Build parent awareness about oral health and the role of preventative primary dental care services.
- Develop oral health education and primary dental care referral information into maternity/early years visits and programming
- Ensure that a variety of frontline practitioners access and understand practice standards and professional development to provide basic oral health information.

Ways to Address Safety Barriers

Safety is an area of particular importance in the health care system, with provider approaches and practice, services standards and training and the overall infrastructure and feel of a health care environment, collectively having an impact on patient experience of safety. Feeling safe or not feeling safe can have an impact on access to care and can influence parent decision making about whether or not to bring their children to a dental clinic (Goettems et al, 2012). If a child, for example, has been exposed to early and regular primary dental care, the primary dental care environment and the dental practitioners are likely to be familiar and not as intimidating for a child. Pairing an unfamiliar environment with an extensive dental procedure, could be a traumatizing experience for a child and their parents or guardians that could in turn result in further avoidance of care with continued consequences that can cross generations. Esa et al have shown with their international research that fear of primary dental care in young populations has a clear correlation with rural and remote location (2014).

Akelson's research points at ways that primary dental care facilities and their staff can be family friendly in their approach to promote positive experiences of safety in primary dental care. Creating a children's play space in the office, being welcoming of parents and guardians who want to accompany their child in the dental room, speaking and interacting with children with language and approaches that are age-appropriate and being cognizant about how care can be provided in a timely and appropriate way for children and families (eg. avoiding the need for multiple visits; providing breaks for children when restless) are all examples provided for how clinics can be family friendly (Akelson, 2013, p. 29). Ensuring that all dental practitioners have the opportunity to learn

about and build personal skills and experience in working with children is essential to ensure that dentists in particular feel comfortable and accept young children as a part of their client base. Having dental chairs located in school settings for primarily preventative care, is another measure of exposing children at a young age to primary dental care environments.

In a broader sense, safety in primary dental care also warrants looking at the power dynamics of the relationship between dental practitioners and patients and how this can impact access to care. As a review completed in Ontario has pointed out, Aboriginal and immigrant community members report that they “often are reluctant to visit dentist offices where they do not feel welcome and that do not respect their culture, understand their social situation and do not speak their language” (OHS, p. 68). Cavin’s research points at the importance of health providers and support staff to be individually and collectively aware of their social position and power relative to the patient in a health care setting like a dental clinic (2015, p. 21). Often a lack of primary dental practitioner awareness and acknowledgement of the social and economic contexts of patients can lead to an approach to care that focuses on and blames individual health behaviours without looking at the broader factors and environments influencing health outcomes. Patients can as a result feel judged and disrespected (Cavin, 2015). In order to reduce patient intimidation and feelings of discrimination, particularly amongst marginalized sub-populations, person-centered care is a way forward where the patient is understood and treated as a partner, expert and key decision maker in their own oral health. This very much aligns with existing work in the BC health sector such as the BC Patient Centered Care Framework, Patients as Partners and the cultural competency training developed

by Provincial Health Services Authority. Using plain language, making the time and effort to get to know a patient and their living context, providing information about choices in care and assisting patients in making their own decisions and asking for feedback about patient experience are all examples of how the safety of care can be improved. Person-centred dentistry is a relatively new concept, and one that is increasingly being monitored through patient satisfaction measures as a part of quality, with “connection, attitude, communication, empowerment and feeling valued” being key focal points (Mills et al, 2015).

As another approach to increasing experiences of safety and access to oral health care, international research supports the role of traditional healers as an approachable and trustworthy health provider who can share tradition knowledge, oral health promotion information in a culturally appropriate way and can function as a referral point and source of emotional and spiritual support for individuals who need to see a dental provide (Agbor, 2011). In the BC context, the concept of community representatives who can be trained to provide basic oral health promotion information and act as a gateway to accessing preventative dental care and treatment, working within their cultural community, and providing information in a culturally appropriate way and in the local language is a promising possibility. Currently the First Nations Health Authority funded Children’s Oral Health Initiative (COHI) program has COHI aides who have this particular role. Creating safe and positive experiences with oral health care early in life, therefore, is an important way to try to improve access to primary dental care across the life span.

To summarize the solutions-focused findings reviewed above in an action-oriented way:

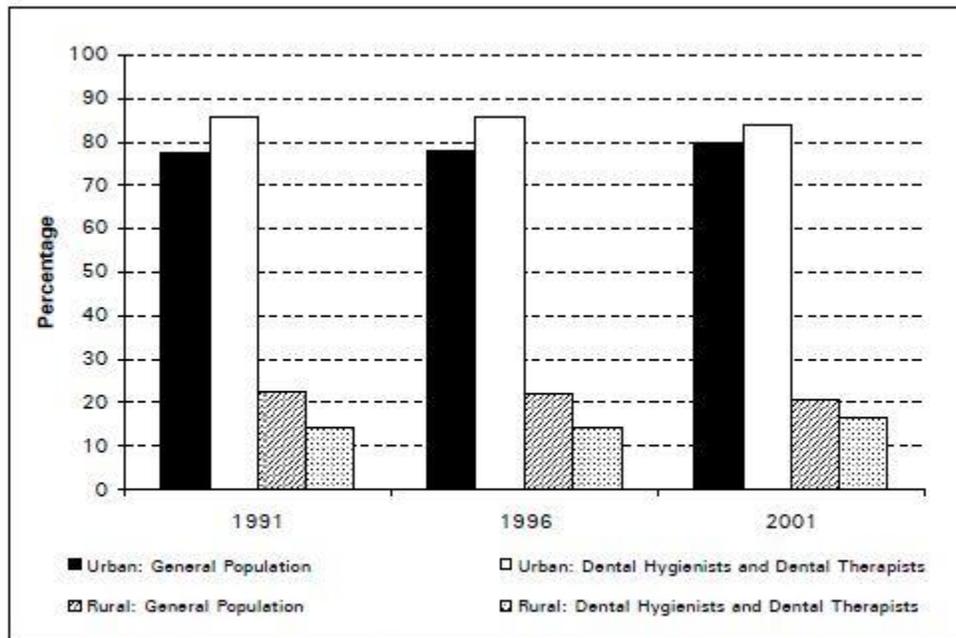
- Ensure that children and families have early exposure to oral health care environments and services.
- Pursue physical environment and staff practice modifications to create family friendly primary dental care atmospheres.
- Provide patient centered care that recognizes a patient's socio-economic context.
- Increase dental staff awareness of their personal power, position, attitude and behaviour and how this can impact patient experience.
- Expand culturally appropriate care supported by community health representatives.

Ways to Address Health Human Resource Barriers

Increasing access to primary dental care for children who live in vulnerable contexts has a clear relationship with addressing staffing related issues with a particular focus on the unique realities of rural and remote settings. With physician shortages and rural emergency room closures often talked about in the media, it is a common challenge for residents in rural and remote settings to find and maintain a long term relationship with primary and community care providers. Similarly the availability of primary dental care practitioners for children and families can be limited in rural and remote settings. As an example, CIHI's report from 2007 shows trends in the distribution of dental hygienists and dental therapists (Figure 6), where staff numbers are markedly lower in rural settings and were not shown to increase over a 10 year period from 1991 to 2001 (CIHI, 2007, p. 17). In small communities, population numbers and service need is often not high enough to support a dentist's permanent private practice. Innovative and shared models of care, therefore, are commonly needed.

Figure 6: Percentage Distribution of Dental Hygienists and Dental Therapists and the General Population by Urban - Rural Locations, Canada, 1991, 1996 and 2001

(CIHI, 2007, p. 18)



Source: Statistics Canada, Census of Population.

Learning from recruitment and retention strategies with family physicians, there are a number of ways to try to increase the number of type of primary dental care practitioners available that include training, scheduling flexibility, housing subsidizations, compensation incentives and practice supports to ensure that staff are working to the top of their scope of practice (Health Force Ontario, 2015). Training initiatives based in Australia have focused on providing dentists in training the option to complete rural based practicums in their final year of school to promote students to think about working in a rural environment following their graduation from university (Bazen et al, 2007). Results from this work showed that due to the voluntary nature of the program, many of

the students participating had a pre-existing interest in practicing in rural settings, but that a practicum provided the opportunity to solidify decision making and did result in many graduating students choosing to work in rural settings (Bazen, 2007). It would be interesting to explore if rural placements as a part of broader dental practitioner training would result in an increased number of graduating hygienists, therapists and dentists, who otherwise would not have considered living and working in a rural setting, choosing to enter into rural practice,. Some capacity considerations in developing a mandatory rural practicum program would be the travel and accommodation costs for students and the interest of local dentists who are willing to participate and mentor students.

Applying this concept of a rural practicum placement to all dental practitioner training programs seems particularly important in relation to data from CIHI. Findings show that “most dental hygienists and dental therapists in Canada tend to stay in the same community over time” with 64% of dental hygienists and 75% of dental therapists being categorized as non-movers from 1991-2001 (CIHI, 2007). Creating exposure to and a comfort level working in rural settings for other types of dental staff could result in increased access to care, as some smaller communities of might not need the full time services of a dentist, but could keep a full time hygienist or therapist busy.

Increasing the opportunity for physicians, public health nurses, nurse practitioners and primary dental care practitioners to be co-located together and practice in inter-disciplinary team settings can also be beneficial in making the connection between primary care and primary dental care and cross-referrals more of a standard. Kenney et al discuss how well child checks with a physician have been coordinated with

dental screenings and timely referral to dental treatment when necessary (Kenney et al, 2011). Building on this model, similar relationship building and inter-disciplinary care can be supported between other providers such as nurses and dental hygienists, with the aim that any anticipated child and family interaction with the primary care system (eg. immunizations) can provide the opportunity for oral health assessments and referrals to treatment. In theory, public health and primary staff can be trained in the basics of oral health assessment and the application of fluoride varnish to participate in preventative care in systematic way where any door is the right door to access this type of care. Currently in BC, the College of Dental Surgeons of BC classifies the application of fluoride varnish as an unrestricted intervention with minimal public risk that does not require supervision in its use and can be applied by any individual who receives training in its application (MOH, June 2015). Implementing fluoride varnish application in primary care and school settings systematically, however, would require changes to service standards, MSP billing schedules and accompanying professional development, but could be achieved. This approach to collaborative and inter-disciplinary work is particularly exciting. Incorporating oral health promotion and prevention education and basic practice skill sets as a part of all health practitioner training (eg. physicians, nurses, midwives, home care aides, etc.) is another means of building greater awareness of and connection between oral health and general health.

Investment in increasing the number of trained dental therapists can also increase access to cost-effective primary dental care, as dental therapists have a significant and varied skill set that includes promotion and preventative services, dental exams and diagnosis, basic dental fillings and extractions (Nash et al, 2014 p. 9).

Although the scope of practice and competencies of dental therapists have been questioned by the dentist profession and by patients themselves, dental therapy has been evaluated to provide an equivalent quality of work when compared with dentists (Nash et al, 2014). Dental therapists work under the supervision of a dentist in person or via distance (CDA, 2015). Currently in BC, there are a number of dental therapists hired by the First Nations Health Authority working in more rural and remote locations (FNHA, 2015). Dental therapy is an increasingly common dental staff position internationally. It tends to be a salaried position as opposed to a fee-for-service compensation and typically is targeted to providing care for children in school and community based settings (Ramraj et al, 2014). Dental therapy provides a nice middle ground of services, where preventative care and basic restorative treatment can be provided for children with referrals to dentists for more complex care, similar to a nurse practitioner and family physician model of primary care. In rural areas with few or no dentists, this model works well to ensure that the cost of client travel is minimized and a dentist's skill and time is maximized to provide more complex care when needed (Ramraj et al, 2014). A dental therapy school located in Ontario previously has closed. Partnered work to advocate for and re-establish a dental therapy school in Canada would be an important step in increasing the number of and practice support for dental therapists locally. Targeted awareness building for dentists and dentists in training about the importance of dental therapists in the field of primary dental care would be a complementary piece of work, given that dental therapists are required to practice under the supervision of dentists and need their continued support for both parties to work to the top of their skill sets. Movement to work towards dental therapists being able to work independently would be another potential endeavor in BC that would require significant research, dialogue and

negotiations with the College of Dental Surgeons of British Columbia and the British Columbia Dental Association and potential changes to BC's Health Professions Act. Concern from dentists regarding the practice and financial impacts of expanding dental therapy are anticipated and would require a clear case to be built illustrating the need and benefits of therapist practice for population oral health outcomes as well as a demonstration of how therapist practice can complement and benefit dentists and their individual practices.

In a similar vein, in support of practitioners being able to practice to the top of their scope, provinces like Ontario have worked towards regulatory changes that can allow for dental hygienists to be able to work independently and without the direct supervision of a dentist, to provide care within their typical skill set in addition to basic oral examinations (Optimus, 2014). Preliminary results from this regulatory change have shown that this independent-hygienist model has allowed for increased provision of care in rural and remote settings at a reduced cost without any concerns from dental insurance providers (Optimus, 2014). Empowering primary dental care practitioners of various levels to work to the top of their training and in support each other whenever possible, is a particularly exciting way forward in this field.

Financial incentives can also be considered in recruiting and retaining dental staff. University loan forgiveness, scholarship options, tax incentives and special small business loans for dentists who commit to practicing in rural and remote locations for an agreed amount of time are options (Skillman et al, 2010; Pourat et al, 2010). These options, however, do not guarantee that an individual will stay for the long term. Looking

at ways to encourage individuals who live in rural and remote settings to enroll in primary dental care training through the provision of financial incentives and exploring the possibility of distance education options with post-secondary partners may be more effective, with the assumption that these individuals would be more likely to stay in a rural and remote setting where they have an established comfort level and social network.

Another approach to increase access to primary dental care and staff, involves the coordination of appointments and care. Research has shown the effectiveness of a dental coordinator, who can support individuals and families in finding a dental practitioner, scheduling and confirming appointments and understanding oral health information (Binkley, 2009). Building on this position's scope, a coordinator could also potentially help with coordinating other health appointments on the same day, particularly if travel outside the community is required. Given that this coordinator role has been found to be effective through email and telephone (Binkley, 2009), it is possible for a coordinator to be hired to support a few rural and remote communities at the same time.

To summarize the solutions-focused findings reviewed above in an action-oriented way:

- Explore opportunities for rural practicum placements for dental staff in training (inclusive of dentists, hygienists and therapists).
- Provide special compensation and incentives for practicing in rural settings.
- Increase integrated care between primary care and oral health services (inter-disciplinary collaboration).
- Expand training and practice support for dental therapists, with a particular focus in school-based settings.
- Develop policy and practice supports for dental hygienists to work to the top of their scope.
- Promote primary dental care provider coordination with other primary care providers, including physicians, nurses and NPS as examples.

Discussion and Recommendations

Having reviewed a large breadth of literature, it is evident that there are a number of potential system-level and practitioner focused actions that can be pursued with a particular interest in improving attendance at primary dental care for children who live in vulnerable contexts to ultimately reduce levels of childhood caries and the need for dental surgery. Having discussed cost, geography, public awareness, safety and staff oriented barriers and solutions in relation to accessing primary dental care, it is appropriate that an ideal action plan should address all of these dimensions to varying degrees based on the local context and need. Addressing access holistically is particularly important, as there is not typically one standard solution to best meet the needs of individuals or populations. Being innovative and flexible in the location, funding, infrastructure, staff combinations and family-friendly approaches to care that best meet the local context and maximize local resources are crucial. Inter and cross-disciplinary communication and partnership between dental care, medical care, social work and educational sectors is a particularly promising area to explore further, as the more frontline practitioners who can share oral health messaging and refer families to primary dental care, the more likely parents and children are going to be reaching the knowledge, skills and care they need in a timely way.

Planning and implementation of many of the solutions discussed in this paper can be approached in a shared manner to better serve multiple communities. The joint funding and sharing of a primary dental care practitioner, mobile equipment or public transportation are all examples of how communities can potentially pool their resources to improve access in a more cost effective way. Being able to facilitate cross-municipality

discussions therefore, where community leadership and community members can be involved in the process of assessing and identifying ways to better partner in a sub-regional way is important.

It is important to recognize that many of the solutions outlined in this paper require varying levels of public funding. Ultimately this underlines the overarching policy problem that we continue to face in Canada, which is that dental care is largely unacknowledged in the Canada Health Act and hence not universally accessible at a cost that is affordable for all across the life span. Although it may not be politically or economically popular or feasible to include primary dental care as a part of our medicare system for all ages, there is certainly an opportunity for long-term cost-savings and improved health outcomes with targeted coverage for sub-populations, including all pregnant women, children and youth. Universal coverage of preventative services such as fluoride varnish and standard check-ups is another way forward that embodies upstream investment that, if universal, could lead to related improvements such as more concerted expectations and efforts to reach and serve all community members, while better tracking service provision and access over time.

To improve access to primary dental care for children living in vulnerable contexts in BC, the following recommendations for change have been developed and categorized as shorter term actions versus longer term actions that can be considered by the health sector. A short-list of recommendations that seem most appropriate for me to move forward in my work place setting has also been created. This list of recommendations moves beyond and builds on what has already been discussed in the literature (based on my learnings from the MPH program and current work experience)

and looks at the specific opportunities and broader supports needed to create momentum behind this work.

Short Term Recommended Actions

1. Look at ways that dental staff currently employed by regional health authorities and First Nations bands can better work together and provide more comprehensive care for children and families living in vulnerable contexts, with a focus on evidenced based preventative care (screenings, varnish and sealants).
2. Build awareness across dental health care, public health, primary care, early childhood care and school-based staff about current inequities in childhood caries rates and reinforce key oral health promotion messaging to share with children and families. Awareness building about different dimensions of access would also be helpful with this target audience.
3. Support relationship building and partnership between local municipalities, First Nations communities, regional health authorities and local primary dental care staff to discuss shared priorities, existing resources and key actions to improve access to primary dental care, with children living in vulnerable contexts particularly in mind.
4. Continue engagement work in support of developing and implementing evidence-based healthy public policies that support improved oral health outcomes for children living in vulnerable settings and their families, focusing on water fluoridation, food security and sugar sweetened beverages as key focal points. Public health partnering with an unusual suspect or partner in this work could be highly beneficial (eg. business sector partner).
5. Build closer and formalized relationships between rural and remote service providers and leadership in dental care training programs at universities and colleges in BC to promote rural practicum placements and support rural recruitment and retention strategies (inclusive of dentists, hygienists, therapists and dental assistants).
6. Engage with primary dental care staff and patients to better understand current barriers to publicly funded dental coverage programs, with a particularly interest in any trends in serving children living in vulnerable contexts..
7. Build on existing regional health authority and on-reserve tele-health infrastructure to pilot tele-health equipment to support oral health consultations and education in support of children living in vulnerable contexts.

8. Explore ways to leverage or influence existing provincial strategic planning, funding and service standard expectations in relation the recent release of MOH's rural and remote policy paper and priorities, building on current dental public health programming.

Longer Term Recommended Actions

1. Continue to advocate and build a business case for the inclusion of universal oral health services (including oral health promotion, preventative care and treatment) in the Canada Health Act. Given the increasing financial constraints on the health care system – focusing on universal care for children, youth and pregnant women, as originally recommended in the Commission would be a start that has a strategically upstream / public health approach.
2. Develop nation-wide oral health service standards and related measures that prioritize access to prevention and early treatment of childhood caries and the reduction of inequitable oral health outcomes across children.
3. Work towards the re-establishment and growth of dental therapy schools across Canada and in BC and continue to support the therapists who are currently practicing.
4. Build oral health information and care into primary care provider curriculum and training for family physicians, nurse practitioners and nurses to be able to conduct basic oral health assessments, to refer to primary dental care and to apply fluoride varnish with affiliated billing codes.
5. Continue to conduct and collect dental caries and dental surgery data systematically in order to monitor population health trends over time. Build on this population data collection to be able to better monitor trends in relation to oral health status and access to dental care services.
6. Collect and share examples of evidence-based practice and models in Canada that have successfully increased oral health service access in rural and remote settings or decreased hospital-based child dental surgeries.

Priority Actions to Bring Forward within Aboriginal Health

1. Work towards the re-establishment and growth of dental therapy schools across Canada and in BC and continue to support the dental therapists who are currently practicing.
2. Look at ways that dental staff currently employed by regional health authorities and First Nations bands can better work together and provide more

- comprehensive care for children and families living in vulnerable contexts, with a focus on evidenced based preventative care (screenings, varnish and sealants).
3. Continue engagement work in support of developing and implementing evidence-based healthy public policies that support improved oral health outcomes for children living in vulnerable settings and their families, focusing on water fluoridation, food security and sugar sweetened beverages as key focal points. Public health partnering with an unusual suspect or partner in this work could be highly beneficial (eg. business sector partner).
 4. Engage with primary dental care staff and patients to better understand current barriers to publicly funded dental coverage programs (eg. First Nations Health Benefits Program), with a particular interest in any trends in serving children living in vulnerable contexts.

Being able to promote early access to appropriate oral health services for children is a crucial support to the overall physical, emotional, mental and spiritual health and development our young populations of today and generations to come. Ensuring that all children, regardless of their context, have equal opportunities to grow and maintain good oral health is a very worthy goal that warrants significant funding, service planning, staffing and collaboration across sectors to achieve.

Summative Reflection

Being able to write this paper has been an excellent way to re-visit the key content and learnings from the Master of Public Health program and reflect on the application of many of these ideas in my current work. I was able to look at the burden and distribution of disease, related inequities, affiliated health service usage trends and the broader Canadian health system context including health human resources, the economic climate and the existing policy environment. This research has re-emphasized for me the importance of grounding all work in existing and varied forms of evidence, both academic and grey literature.

Focusing on access to primary dental care for children aligns nicely with the upstream philosophy of public health, where prioritizing a focus on health promotion and disease prevention in young populations and their families supports healthy development and longer term positive health outcomes. Working in the field of public health, this paper has helped me to think about ways to improve access to primary dental care within the current limitations of the health care system, while also highlighting clear areas for continued advocacy work. It is clear that we all have a part to play in working towards change. Health associations, academic institutions, regulatory colleges, health authorities, non-governmental organizations, inter-sectoral partners, research bodies, individual practitioners, community leadership and community members themselves all have a particular perspective and role that is crucial to promoting oral health and improving access to care.

Appendix 1

Overview of Primary Dental Care Practitioners

Text directly quoted from: Canadian Dental Association. (2015). *Your Dental Health Care Team An Overview Fact Sheet*. Retrieved at: http://www.cda-adc.ca/_files/oral_health/talk/yourteam.pdf

Dentist

Your dentist brings years of specialized education to understanding your oral health. Only dentists can examine your teeth, gums, and mouth, and recognize any problems that could affect your overall health.

They have the training and skills to:

- Examine and diagnose your oral condition
- Recommend treatment, and carry it out
- Look for signs of oral cancer — and often be the first to spot them
- Help you understand oral health care and its importance, helping you to keep your teeth healthy and comfortable for your entire lifetime
- Inform you about post-operative care options
- Perform emergency or required procedures now — and help you determine a long-term treatment plan that meets your needs and circumstances

Dental Therapist

In some jurisdictions, dental therapists work with dentists to provide community-based preventive oral health programs. They also perform basic dental treatment and preventive services as well as providing patient assistance and referrals.

Dental Hygienist

The dental hygienist is registered and trained to clean your teeth and to help you develop a home-care routine tailored to your needs. Regulations vary from province to province, but a dental hygienist's work will often include:

- Taking x-rays
- Taking dental impressions
- Cleaning, polishing, and applying fluoride to your teeth
- In some jurisdictions, the dental hygienist may be allowed to perform a basic exam.

Dental Assistant

This is the team member who prepares you for treatment, sterilizes instruments, assists your dentist, and helps keep your mouth dry during procedures. In some jurisdictions, a dental assistant may also take x-rays, make dental impressions, and polish and apply fluoride to your teeth.

Receptionists and Business Staff

Receptionists maintain the dental team's schedules and allow the office to run smoothly. The receptionist is usually your first point of contact, and may often provide you with general information about your appointment and billing.

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