Chief Medical Health Officer's report 2025

Oral health in the Fraser Health region: Opportunities for action

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Contents

A message from Fraser Health's Chief Medical Health Officer

Oral health is a fundamental aspect of overall health and well-being. Poor oral health can lead to a range of adverse outcomes, including dental cavities, gum disease and even systemic conditions such as cardiovascular disease and diabetes.

By sharing data, evidence and best practices from Fraser Health and other jurisdictions, this report aims to stimulate conversation about oral health, fluoridation practices and oral health inequities. It highlights areas where public health, dental professionals, governments and Indigenous partners can continue to work together to promote equity and improve oral health for all.

The report acknowledges the existence of oral health inequities in our region and emphasizes the importance of coordinated efforts across various government sectors and Fraser Health's public health initiatives to address these disparities. It highlights the need for continued collaboration and strategic action to ensure equitable access to quality oral health care for all individuals, irrespective of their background or socioeconomic status.

I would like to thank all those who have contributed to this report, including the Fraser Health dental health and epidemiology teams, as well as colleagues who provided review and advice.

Sincerely,

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Acknowledgements

Fraser Health thanks the many dedicated people who contributed to this report, including those who collected and analyzed the data, reviewed the draft and provided input at different stages of development.

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Territory acknowledgement and partnership commitment

We recognize that Fraser Health provides care on the traditional, ancestral and unceded lands of the Coast Salish and Nlaka'pamux Nations and is home to 32 First Nations within the Fraser Salish region. We are grateful for the care that First Nations have taken of the land and of their communities' health since time immemorial.

We are dedicated to serving all Indigenous Peoples and honour the unique cultures of the First Nations, Métis and Inuit living within the Fraser Salish region. We commit to working together with Indigenous partners to build a more equitable system of care, including culturally safe oral health services that support the health and well-being of Indigenous Peoples across the Fraser Salish region.

Suggested citation

Fraser Health Chief Medical Health Officer. (2025). *Oral health in the Fraser Health region: Opportunities for action*. Surrey, BC: Fraser Health.

Executive summary

Oral health can have a significant impact on our overall health and well-being. Poor oral health can include dental cavities, which are the most common non-communicable disease in adults and children worldwide and can have immediate adverse outcomes, such as toothache, pain and temperature sensitivity. Poor oral health can also lead to gum disease, which has been associated with cardiovascular disease, diabetes mellitus and poor pregnancy outcomes.

Poor oral health has broad impacts on the community and the health care system. It is estimated that Fraser Health spends up to three and a half million dollars per year treating symptoms of cavities and related oral health concerns. Findings from the 2007-2009 Canadian Health Measures Survey (CHMS) suggest that 2.3 million school days and 4.2 million working days are missed each year in Canada due to oral health problems and treatment, costing the Canadian economy one billion dollars per year.

In British Columbia, public health programs monitor the oral health status of the population through a dental survey of kindergarten students. The most recent survey was carried out by Fraser Health in the 2022-2023 school year and found that 33 per cent of kindergarten students in the Fraser Health region have at least one current or previous cavity. Further analysis by Fraser Health found that cavities are closely linked with social inequities. In 2022-2023, kindergarteners living in the lowest income neighbourhoods in the Fraser Health region experienced a cavity rate of 40 per cent, while children residing in the highest income neighbourhoods experienced a cavity rate of only 27 per cent. Previously published provincial data from the 2018-2019 Kindergarten Dental Survey show that there are also significant differences in cavity rates observed between Indigenous (First Nations, Inuit and Métis) and non-Indigenous children in B.C., with Indigenous children having a cavity rate 21.1 percentage points higher than non-Indigenous children.

Self-reported data in the 2007-2009 CHMS showed that 96 per cent of Canadian adults have experienced one or more cavities in their lifetime. Similar to the kindergarten age group, there is also evidence that social inequities influence oral health among the adult population. Racialized populations, immigrants, Indigenous populations, people who identified as transgender or non-binary and those with at least one functional difficulty were less likely to have visited a dental professional in the past 12 months when compared with those that are non-racialized, Canadian-born, non-Indigenous, cisgender or do not have functional difficulties.

Cavities and other oral health concerns are preventable. There are a number of dental care programs that have been established to assist priority populations in accessing necessary dental care. One of the largest initiatives is the Canadian Dental Care Plan (CDCP), which provides funding for dental care to Canadians who have a household income of less than $90,000 per year and lack access to private dental insurance.

The B.C. Dental Benefit similarly supports low-income British Columbians to access dental care and population-specific programs have been established for children, newcomers to Canada and First Nations Peoples in B.C.

There are also universal health promotion and disease prevention programs that can be applied across the population. Community water fluoridation (CWF) has shown success in preventing cavities; however, there has been limited uptake of CWF in British Columbia. Only 1.5 per cent of people in B.C. receive water from fluoridated water supplies and no communities in the Fraser Health region have implemented CWF

Support for CWF varies within communities, with some expressing concerns about the safety and efficacy of water fluoridation while others cite infrastructure costs as a reason not to pursue CWF. A 2024 report from the National Toxicology Program (NTP) of the United States and a recent Cochrane review on the effectiveness of CWF have reignited the debate. The reports reinforce that dosage is important and do not conclude that there is harm from the currently recommended fluoride levels of 0.7 mg/L in community water systems.

Additionally, the Cochrane report acknowledges that the population-level benefits of CWF may be lower now compared to pre-1975 but other research suggests that there are still important benefits of CWF for underserved communities who are disproportionately affected by cavities.

Failure to address oral health concerns can come at a high cost to the individual, the health care system and society as a whole. There is an opportunity for public health authorities, dental health professionals and other health and social service providers to collaborate and support improved oral health across the population.

To achieve this goal, Fraser Health supports the following actions through our local service delivery, partnerships and collaborations:

1. Increase public awareness of good oral health behaviours by developing client resources that are tailored to diverse populations; build knowledge of oral health promotion across health and social service providers; and ensure the public receives accurate information about fluoride and water fluoridation.
2. Enhance monitoring and surveillance of population oral health status by supporting ongoing review and improvement of the B.C. Kindergarten Dental Survey and considering expansion of school-based surveys to include 12-year-olds.
3. Improve the capacity of dental public health leadership for consultation, collaboration and coordination to support the development and implementation of robust, standardized oral health strategies, initiatives and programs.
4. Continue to build awareness of the barriers that exist for diverse clients attempting to access dental care and the need to provide programming that addresses those social inequities.
5. Support implementation of CWF by assessing local communities' level of support, taking action to implement CWF or address community concerns as needed and reviewing current legislation and infrastructure programs to identify opportunities to reduce barriers for communities that want to implement CWF.

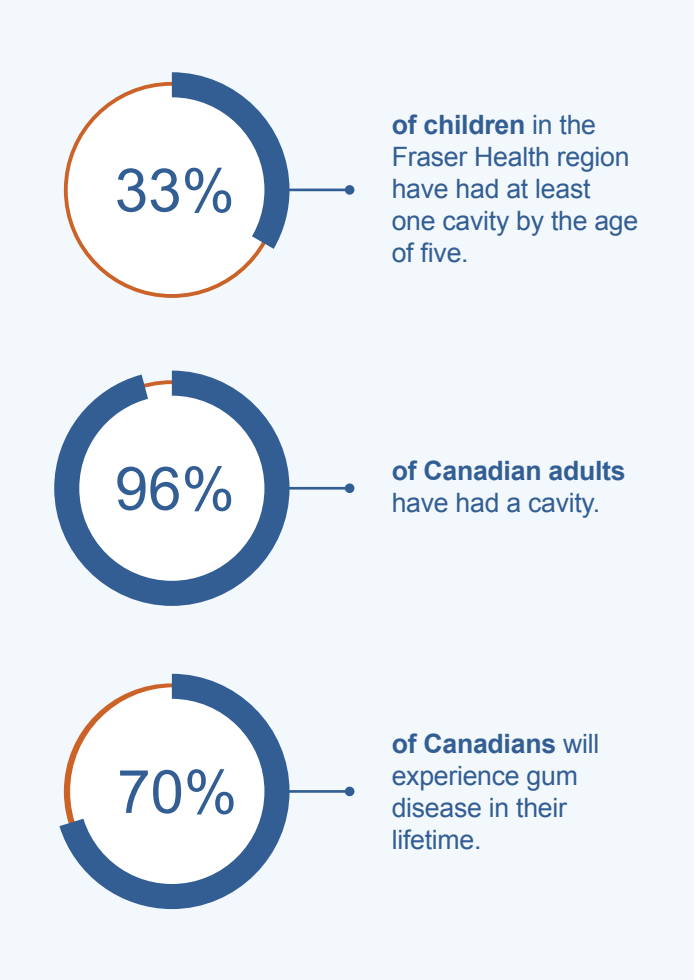
A: The importance of good oral health

Oral health is an important aspect of overall health. The World Health Organization describes oral health as "the state of the mouth, teeth and orofacial structures that enables individuals to perform essential functions such as eating, breathing and speaking, and encompasses psychosocial dimensions such as self-confidence, well-being and the ability to socialize and work without pain, discomfort and embarrassment".[1] Good oral health is achieved when a person is free of any tooth decay or diseases that limit their ability to use their mouth for daily activities. For many people, poor oral health is a temporary or mild condition; however, serious consequences can result from ongoing or untreated oral conditions.

Dental cavities, also known as dental caries, are a form of tooth decay and are the most common non-communicable disease in children and adults worldwide.[2] In the Fraser Health region, 33 per cent of the population have experienced at least one cavity by the age of five years old.[3] Across Canada, the Canadian Health Measures Survey (CHMS) found that 96 per cent of adult Canadians have a history of cavities.[4]

Immediate adverse outcomes from cavities include toothache, pain and temperature sensitivity. Cavities can also have long-term health consequences, such as tooth loss, changes in chewing, increased risk of periodontal disease (or gum disease) and dental abscesses, which are infections of the dental root structure.[5]

Periodontal disease may begin as a mild inflammation of the gums known as gingivitis. This affects 70 per cent of Canadians at some point in their lives.[6] Gingivitis is reversable but if left untreated can lead to periodontitis – a gum infection that can permanently destroy the bone that supports the teeth, leading to teeth loosening and eventual tooth loss.



Terms in blue are defined on pages 39-41

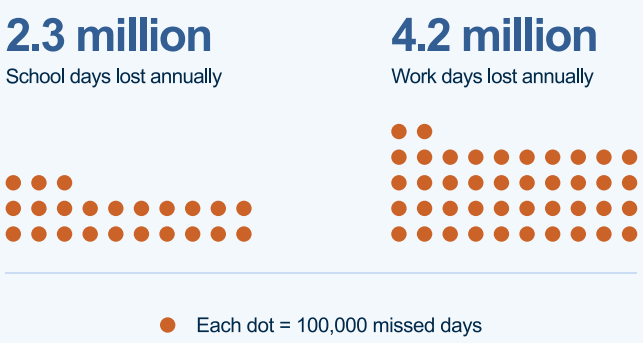
Oral bacteria associated with gingivitis and periodontitis is a serious concern since it can have a negative impact on other parts of the body. Periodontitis has been associated with cardiovascular diseases, including hypertension, atrial fibrillation and coronary artery disease. Emerging evidence suggests that high levels of oral bacteria increase the levels of pro-inflammatory cytokines in our body linked to inflammation in the cardiovascular system.[7] Evidence also suggests that the inflammation and bacteria associated with periodontitis can impact our metabolism and glucose tolerance, with negative consequences for people with diabetes.[8] Finally, hormonal changes during pregnancy can impact oral health, increasing the risk of cavities, gum disease and periodontitis for the pregnant person. Periodontitis has been associated with poor pregnancy outcomes, including pre-term birth and low birth-weight babies; however, the pathway to these outcomes is not fully understood.[9]

Poor oral health can also have a significant impact on social and emotional health across the lifespan. Early childhood cavities take a toll on pre-schoolers' health, affecting their development, school performance and behaviour.[10] Childhood cavities may also cause damage to the permanent teeth that are still forming.[11] In adolescent age groups, tooth decay and tooth loss can affect adolescent's psychosocial behaviour and lead to reduced self esteem.[12] Adults with dental cavities have reported lower self-rated quality of life.[13] Finally, poor oral health has been associated with loneliness and social isolation among older adults.[14]

The economic benefit of preventing poor oral health

The Government of Canada estimates that 2.3 million school days and 4.2 million working days are missed each year due to oral health problems and treatment. While some of this time is used to attend preventive appointments and routine check-ups, a significant portion may be associated with preventable oral health conditions. Lost school days can negatively impact academic achievement for children and youth. In addition, missed work days reduce productivity, leading to a $1 billion loss for the Canadian economy each year.[15]

Oral health problems cost the Canadian economy $1 billion a year



For this report, we analyzed some costs related to oral health prevention and treatment based on services provided within our Fraser Health Emergency Department, surgical service and Population and Public Health programs. Although this is not a comprehensive economic analysis, these estimates provide some insight on the financial impact dental health concerns have on the health care system.

We found that an average of 3,410 Emergency Department visits are related to cavities or dental health conditions each year. While these visits may bring some relief to patients in the form of a prescription or a referral, very little dental treatment can be provided in the emergency room. Based on the average Fraser Health cost for an emergency department visit,[16] the estimated total annual cost of these visits is $1.5 million per year.

In addition, Fraser Health hospitals support an average of 761 cavity-related day surgeries per year. Based on the estimated day surgery cost in Fraser Health,[17,18] the annual cost of these surgeries in Fraser Health hospitals is approximately $2 million per year. These numbers do not account for health system costs of referrals from the Fraser Health dental program to BC Children's Hospital in Vancouver or private dental clinics for service.

The good news is that many oral health conditions are preventable through measures which come at a lower cost, such as regular oral hygiene, early intervention and water fluoridation.

While many Fraser Health community members access preventive care using dental insurance coverage, Fraser Health operates a fluoride varnish program for children who are not under the care of a regular dental provider to help prevent cavities.[19] Families can access these services by contacting their local public health unit or visiting a public health dental outreach clinic in the community. In 2023-2024, Fraser Health conducted 6,898 applications of fluoride varnish across the region. At roughly $8 per fluoride varnish application, this amounts to approximately $55,000, about two per cent of the cost of the cavity-related Emergency Department visits and day surgeries. A cost-effectiveness analysis in Manitoba showed that routine fluoride varnish applications resulted in a savings of $823 per child over five years compared to treating with dental surgery after the children developed cavities.[20]

Community water fluoridation (CWF) can also provide another layer of population protection against cavities. An analysis completed in Québec in 2013 found that every $1 invested in CWF saves up to $83 per person in dental care.[21] There has been limited uptake of CWF in British Columbia with only 1.5 per cent of people in B.C. receiving water from fluoridated water supplies. No communities in the Fraser Health region have implemented CWF (see Section D for more information on CWF).

B: Current state of oral health in the Fraser Health region

A variety of surveys and methods are used at the local, provincial and federal levels to monitor trends in oral health and dental care access and identify areas of concern or opportunities to improve health outcomes.

One of the main sources of oral health data for the Fraser Health region is a Kindergarten Dental Survey, which is conducted by regional health authorities every three years. This surveillance helps to monitor the percentage of children who have a current or previous cavity (the childhood cavity rate).[22] The survey currently uses the d3ft index to measure children's oral health, which may underestimate the oral health needs of children in B.C. (see Spotlight 1). Certified Dental Assistants and Dental Hygienists attend each kindergarten class to examine the children and document their dental health status. In 2022-2023, Fraser Health's dental team surveyed 17,852 students.

A regional or provincial surveillance program can be a powerful tool for monitoring the oral health of the population. At the same time, we acknowledge that Indigenous populations have experienced direct harm within the health care system,[23] including through health surveillance systems. There are ongoing concerns regarding collection of Indigenous identity data, as well as the use and reporting of Indigenous data. While these concerns are being addressed, we will only report data from our most recent Fraser Health dental survey in aggregate and will defer to other previously collected data to demonstrate social inequities in health that may exist between population groups. We support close collaboration with Indigenous communities to ensure our programs produce a benefit to all communities and we are also taking steps to address Indigenous-specific racism within Fraser Health (see Spotlight 6).

Children

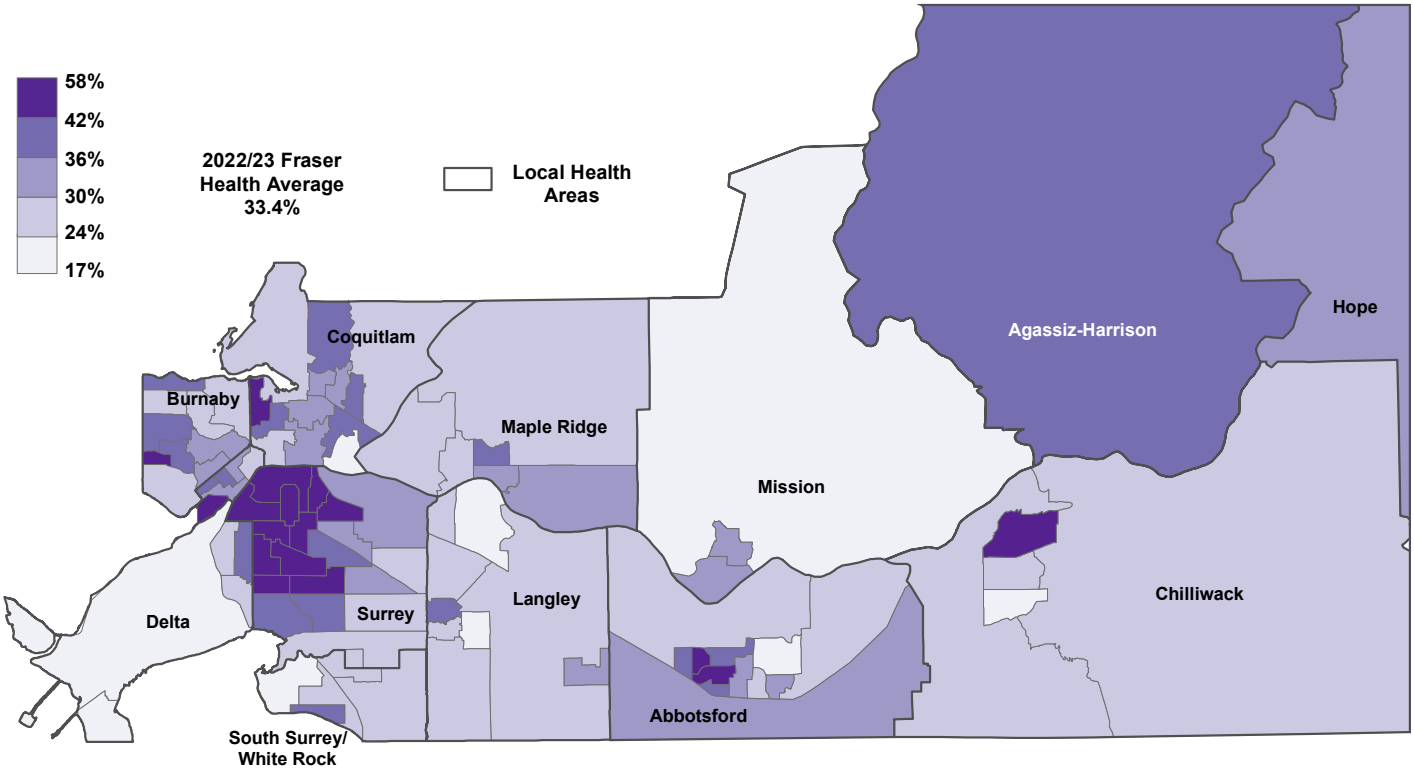
The most recent Fraser Health dental survey of kindergarten students (2022-2023) found that 33 per cent of kindergarteners in the Fraser Health region have a previous or current cavity.[24]

A closer look at the data for each community in the Fraser Health region shows that childhood cavities are not evenly distributed (see Appendix A for community-specific maps).

The map in Figure 1 shows that some neighbourhoods have a childhood cavity rate as low as 17 per cent while other neighbourhoods have a childhood cavity rate as high as 58 per cent. There are 17 neighbourhoods in the Fraser Health region that have a childhood cavity rate of at least 42 per cent. Eleven of these 17 neighbourhoods are found in Surrey, the most populous city in our region.

Figure 1: Children's oral health in Fraser Health

Percentage of kindergartners with current or previous cavities by neighbourhood, 2022-2023 school year



Data Sources: Kindergarten Dental Survey 2022-2023. Geographic unit is HELP neighbourhoods from UBC. Projection: UTM Zone 10N. Prepared by: Population Health Observatory, Fraser Health, November 2024.

Spotlight 1: Differences between population dental health measurements

One way to measure a person's dental health is to count the number of decayed, missing or filled teeth in their mouth using a standard survey tool (for example, the d3ft index or the dmft index). This gives a score for each person, which can be averaged across the population to provide a measure of overall dental health in the community. Although an individual's score can never go down (since the teeth affected will always be either decayed, missing or filled), changes at a population level over time indicate whether our dental health is getting better or worse.

The B.C. Kindergarten Dental Survey uses the d3ft index, also known as the "broken enamel survey", to measure the dental health of the kindergarten population. This index is relatively easy to administer, as the dental professional looks for visibly broken enamel in the child's mouth[27]. The d3ft index can miss earlier signs of tooth decay, though, which may appear as dark spots before the enamel is broken. As a result, the d3ft index can underestimate the dental health needs of the population.

Other indices may provide more sensitive measures of dental health in the population. For example, the dmft index includes earlier signs of decay in the count of decayed, missing or filled teeth. It is currently used in oral health programs across Canada, including the Canadian Health Measures Survey and the Children's Oral Health Initiative (COHI), which is delivered by the First Nations Health Authority in B.C. and Indigenous Services Canada in other parts of the country. Using the dmft index typically results in a higher score than the d3ft index, indicating worse dental health but it provides a more complete picture of the oral health needs of the population.

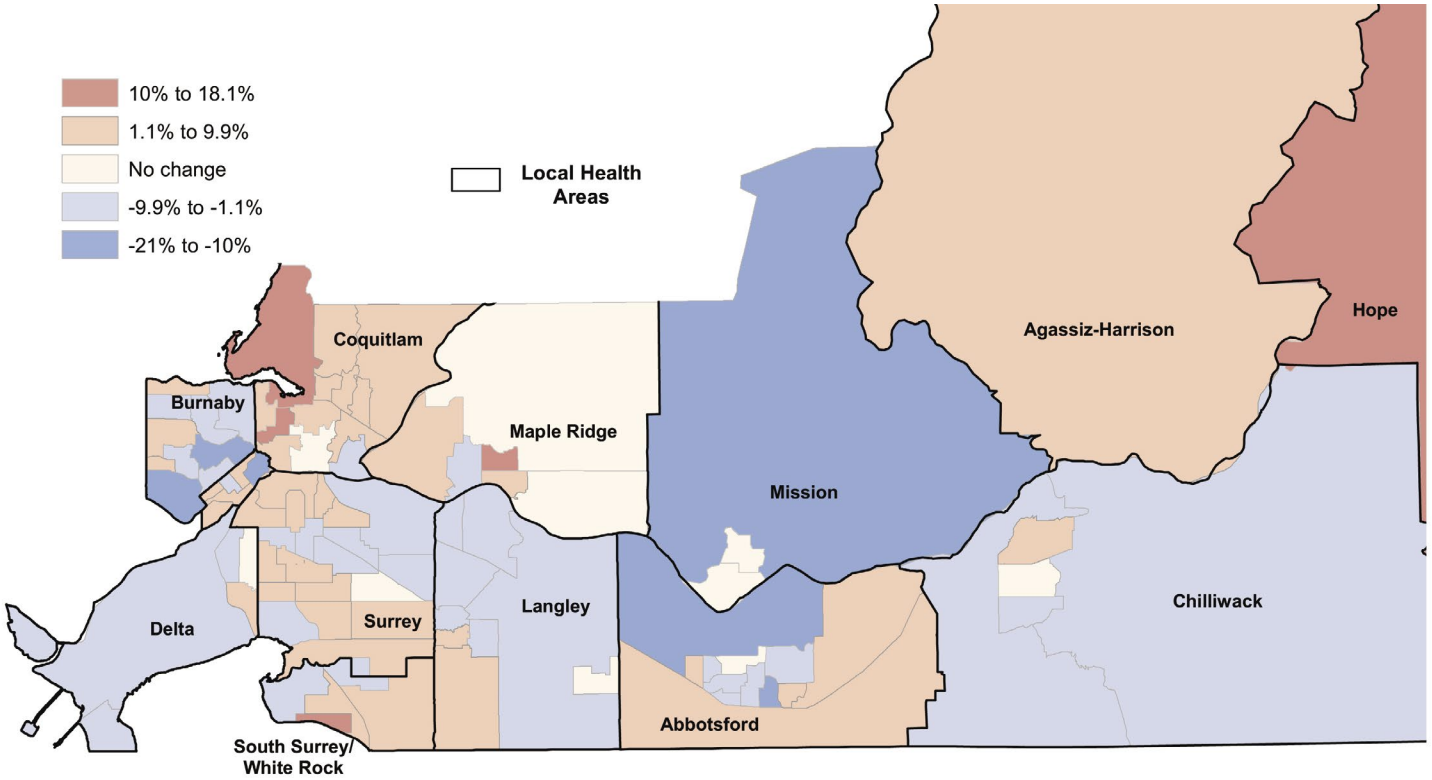
Another measure that is used internationally is the International Caries Detection and Assessment System (ICDAS), which measures both the number and severity of cavities. This provides a more detailed assessment than either the d3ft or dmft indices but it can be more time- and resource-intensive to implement compared to the simpler indices.[25]

Figure 2 illustrates the change in neighbourhood dental cavity rates from 2018-2019 to 2022-2023, with orange and red showing an increase, blue showing a decrease and yellow indicating no change. The average cavity rate in our region has remained the same at 33 per cent since the last dental survey of kindergarteners; however, there have been significant changes at the neighbourhood level.

About half of Fraser Health neighbourhoods experienced an increase in dental cavity rates between 2018-2019 and 2022-2023, with five neighbourhoods (shown in red on the map) showing an increase of 10 percentage points or more over the three-year time interval. These increases could be due to changing demographics in the community or changing oral health behaviours within the population.

Figure 2: Children's oral health in Fraser Health (comparison of 2018-2019 and 2022-2023)

Rate difference for kindergarten cavities (percentage)
fiscal year 2022-2023 minus fiscal year 2018-2019



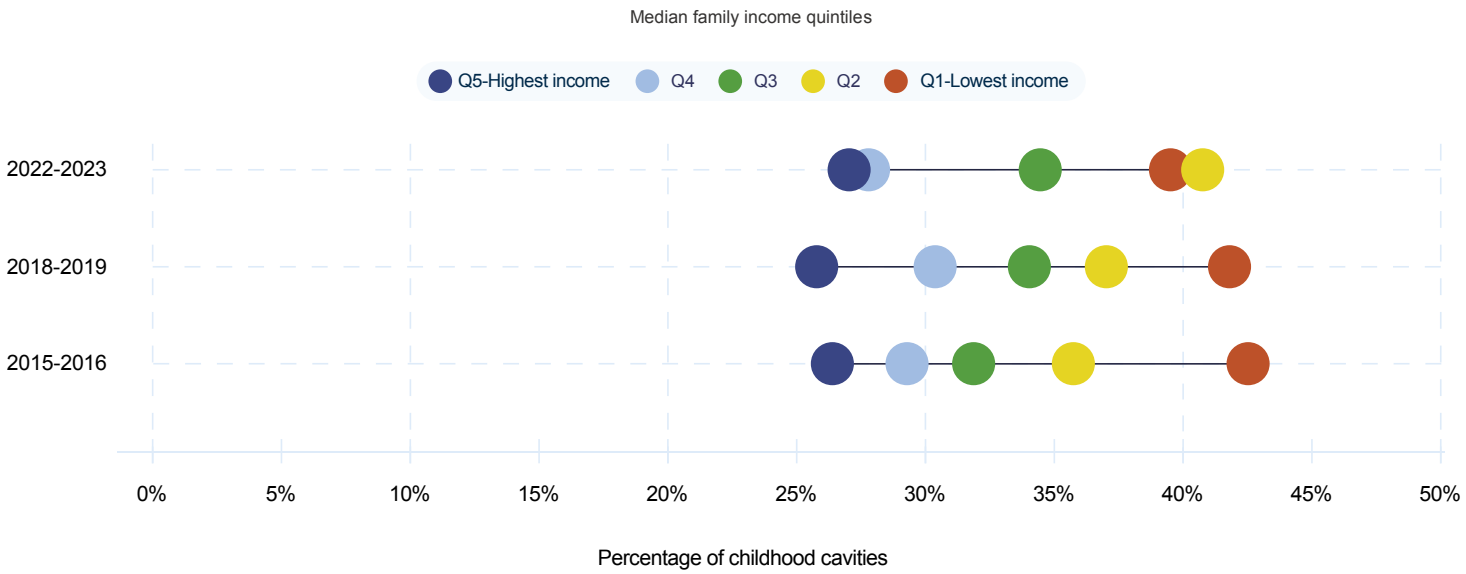
Data Sources: Kindergarten Dental Survey 2018-2019 and 2022-2023. Geographic unit is HELP neighborhoods from UBC. Projection: UTM Zone 10N. Prepared by: Population Health Observatory, Fraser Health, November 2024.

In addition to monitoring dental cavity rates by geography, we can also assess differences by socioeconomic status (SES). Typically, people with higher income or education levels experience fewer cavities, as they often have more resources, higher levels of health literacy and better access to providers to help maintain good oral health.[26]

Within the Fraser Health region, we see this trend at a neighbourhood level. Figure 3 shows lower income neighbourhoods have higher rates of childhood dental cavities.[24] In 2022-2023, kindergarteners living in the lowest income neighbourhoods (Q1 and Q2) experienced cavity rates of 40 to 41 per cent, whereas kindergarteners residing in the highest income neighbourhoods (Q5) experienced a cavity rate of only 27 per cent.

While lower income neighbourhoods experience a higher rate of cavities, the issue of cavities does not only impact low-income families. Over 40 per cent of children with cavities in the region come from middle income neighbourhoods (Q3 and Q4). Even in the highest income neighbourhoods (Q5) cavities are a concern, as more than a quarter of the children enter kindergarten with current or previous cavities.

Figure 3: Health disparities in the percentage of childhood cavities in Fraser Health neighbourhoods by income quintiles

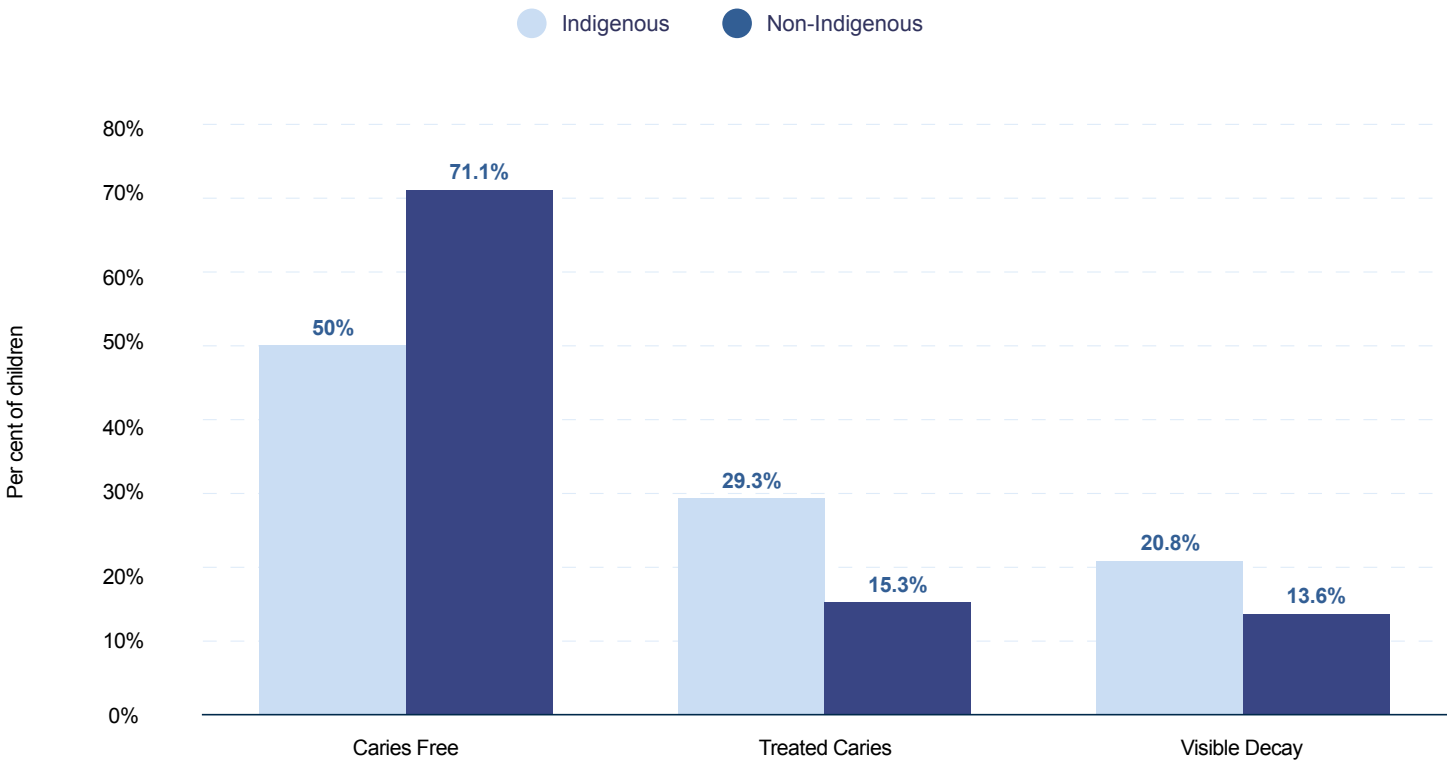


Data Sources: Paris, Kindergarten Dental Survey data 2022-2023 combined with Census 2021 Profile, Kindergarten Dental Survey data 2015-2016 and 2018-2019 combined with Census 2016 Profile

Finally, previously published Kindergarten Dental Survey data suggests that there are differences in childhood dental cavity rates between Indigenous and non-Indigenous populations. Data from the 2018-2019 survey showed that 28.9 per cent of non-Indigenous kindergarteners in B.C. had visible tooth decay or treated caries (cavities) compared with 50.1 per cent of Indigenous kindergarteners.[27]

It is important to note that there is no evidence that these differences are due to ethnic or racial differences. Instead, research has demonstrated that the higher childhood cavity rates among Indigenous Peoples are associated with barriers to accessible and culturally safe dental care and preventive resources.[28, 29] The data and the lived experience of Indigenous Peoples suggest that there is an urgent need to address anti-Indigenous racism within the health care system and the broader systems of oppression that are contributing to poorer oral health outcomes for Indigenous children and communities.[23]

Figure 4: Percentage of Indigenous and Non-Indigenous kindergarteners with dental caries and visible decay, British Columbia, 2018-2019



Data Sources: 2018-2019 Provincial Dental Health Survey Report, A Provincial and Regional Analysis

Youth and adults

Unlike younger children, data on the oral health of youth and adults in B.C. depends on self-reported surveys.

The 2007-2009 Canadian Health Measures Survey (CHMS) collected information on dental health problems and found that most Canadians have experienced at least one cavity in their life.[4] This includes 57 per cent of six- to 11-year-olds, 59 per cent of 12- to 19-year-olds and 96 per cent of adults aged 20 to 79. In addition, 20 per cent of Canadian adults reported having a current cavity that needed a filling and 12 per cent of Canadians reported ongoing pain in their mouth in the previous year.

In addition to oral health outcomes, we can also assess our population's ability to access dental care. The 2023-2024 Canadian Oral Health Survey found that only 75 per cent of B.C. participants had visited a dental professional in the past year and three per cent had never visited a dental professional.[30] The 2021 BC COVID-19 SPEAK survey found that 32 per cent of adults in the Fraser Health region reported difficulty accessing a dentist.[31] The 2023 B.C. Adolescent Health Survey found that 17 per cent of youth aged 12 to 24 in our region had not visited a dentist within the last 12 months.[32]

In 2019, Fraser Health carried out a survey using our Health Chat panel to learn more about dental care access within our region, including dental insurance coverage. Over 20 per cent of respondents indicated they did not have access to dental insurance coverage.[33] Among the 77 per cent of respondents who did have dental insurance coverage, 70 per cent had plans paid for by their employer and 23 per cent paid for dental insurance out-of-pocket.[33] Dental plans cover a range of preventative and restorative services; however, insurance deductibles and limited coverage for certain procedures may result in additional costs to the individual beyond what their insurance covers.

The percentage of Health Chat survey respondents that routinely visited a dentist was higher among people with dental insurance coverage and those with higher income levels (see Table 1).

Table 1: Effect of income and insurance on routine dental visits for Fraser Health's Health Chat survey respondents

	Per cent of people who visit the dentist at least once per year
Income Level	
<$40,000	67%
$40,000-$79,999	85%
$80,000-$119,999	92%
$120,000 and above	95%
Has dental insurance	
No	64%
Yes	92%

Data Sources: Fraser Health Population Health Observatory. 2019.[33]

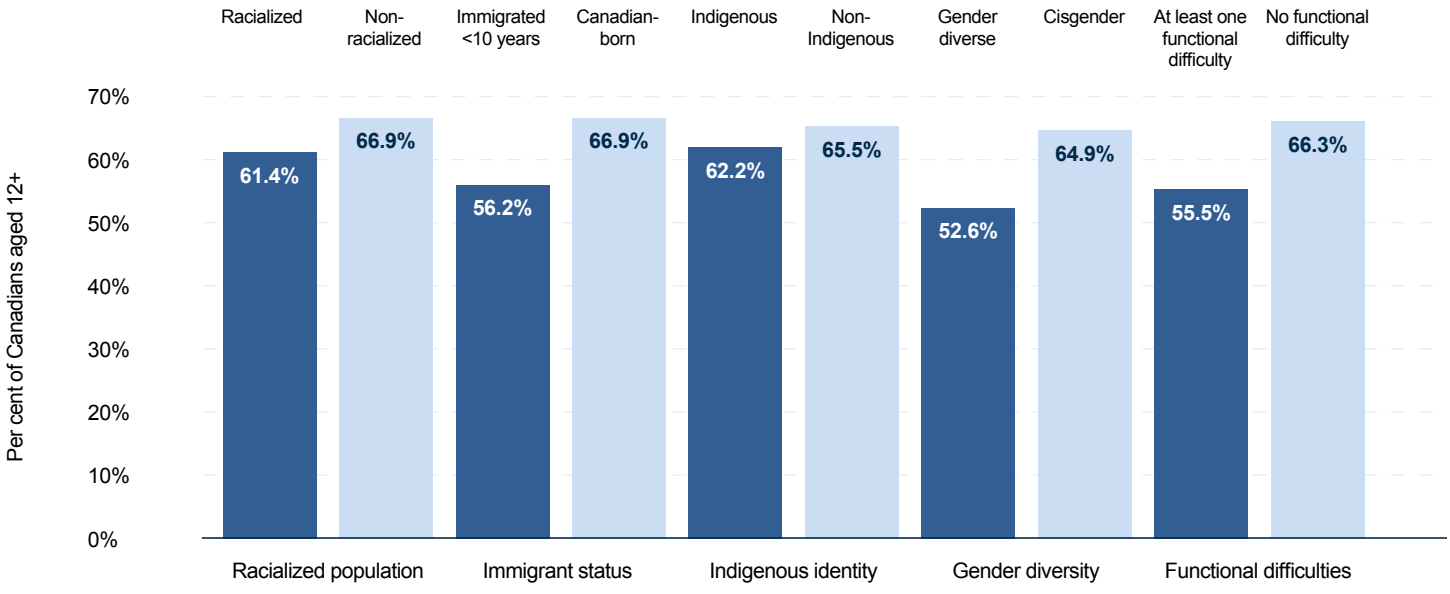
This local finding reflects the results of the 2022 Canadian Community Health Survey (CCHS), which found that 76 per cent of Canadians aged 12 years and older who had private dental insurance coverage had visited a dental professional in the past 12 months, compared with only 51 per cent of those who did not have any dental insurance.[34] Additionally, 75 per cent of Canadians 12 years and older with family incomes of more than $90,000 per year had visited a dental professional, compared with 54 per cent of those with a family income of less than $70,000.

It is important to note that the numbers reported here largely pre-date the implementation of the federal government Canadian Dental Care Plan (CDCP), which aims to mitigate lack of dental insurance coverage. CDCP funding applications have opened on a rolling basis across various age groups and priority populations from 2023 to 2025.[35]

Impacts of the CDCP funding program may be seen in upcoming provincial and national health surveys (see Section C for additional information on the CDCP).

Finally, in addition to differences in access by income or insurance coverage, the 2022 CCHS shows that dental visits can vary significantly across diverse populations. The survey found that Canadians aged 12 years and older were significantly less likely to have seen a dental professional in the past 12 months if they were recent immigrants, part of a racialized population (in particular Black and South Asian), Indigenous, trans-gender or non-binary or had at least one functional difficulty.[34]

Figure 5: Per cent of Canadians aged 12 years and older that saw a dental professional within the past 12 months



Data Sources: Statistics Canada, 2022, Canadian Community Health Survey.[34]

Spotlight 2: Dental care during pregnancy in the Fraser Health region

Oral health care during pregnancy is important as it can affect the health of the birthing parent and their child. Periodontitis has been associated with poor pregnancy outcomes, including pre-term birth and low birth-weight babies.[9]

Despite the importance of oral health care during pregnancy, there is evidence to suggest low uptake of oral health care services among pregnant people in the Fraser Health region. A 2012-2013 study conducted in Surrey, B.C. found that most pregnant people considered dental care during pregnancy to be important but less than half had visited a dentist in the past year and 23 per cent saw a dental professional only for emergency purposes.[36] The study identified financial affordability as the most important enabling factor for use of dental services, suggesting that dental visits could improve among this population with the expansion of public funding for dental care (see Section C for information on the Canadian Dental Care Plan).

Older adults

Adults aged 65 years and older are also vulnerable to poor oral health. Older adults may have medical comorbidities leading to reduced capacity to attend to their oral health.[37] A dental survey carried out with long-term care residents in B.C. found that 91 per cent of all residents surveyed had "moderate" or "severe" oral health conditions and 75 per cent had a need for dental treatment.[38] Oral health impacts the health of older adults disproportionally, since oral health issues in older adults have been linked to infections, heart disease and diabetes – medical conditions that older adults experience at higher rates than other segments of the population.[39, 40, 41]

Additionally, older adults are less likely to be insured or employed, so payments for dental care may not be feasible. The 2022 CCHS found that only 60 per cent of Canadian adults aged 65 and older had visited a dental professional within the past 12 months – the lowest of any age group surveyed. Fifty-eight per cent of those aged 65 years and older reported not having any dental insurance.[34] Similar to above, future surveys may show that financial barriers have be reduced with the introduction and expansion of the CDCP (see Section C for additional details on oral health programs).

C: Oral health programs in the Fraser Health region and British Columbia

One of the foundational principles of population and public health is to influence the social, ecological and structural determinants of health. This includes taking action on systemic racism within population and public health and working to eliminate preventable health disparities so that no one is left behind.[42] As noted above, there is a clear difference in oral health outcomes across groups and there is variability in access to dental services within the Fraser Health population depending on social factors, such as one's income or insurance status. Addressing these inequities can be challenging, as oral health care services in B.C. are currently delivered through a mix of public and private providers.

Most oral health care services are provided by dental professionals funded by dental insurance coverage. Emergency dental surgeries and treatments, however, may be provided through publicly funded hospitals or clinics and paid for by the provincial Medical Services Plan (MSP). Select preventive services, such as dental screening and fluoride varnish for children, can be accessed through private dental clinics but these are also delivered through public health programs within the regional health authorities for children who are not under the care of a regular dentist and meet certain criteria. Additional services provided by First Nations Health Authority are also described below.

There is a role for public health to help strengthen coordination between these various systems. B.C.'s population and public health framework outlines six enabling functions of public health.[42] The enabling functions of particular importance to oral public health include data and analytics (see Section B), governance, legislation and regulation and intersectoral collaboration.

These enabling functions provide cross-cutting support to the core public health functions and strengthen population and public health overall.

Dental public health leadership has experience navigating the mixed service and funding models across oral health programs to inform public health dental programs and initiatives. At the same time, there are opportunities to improve governance and collaboration in the system to support integration of oral health knowledge into policy decisions, updates to oral health strategies and the delivery of robust, standardized public health dental programs across the province.

In various ways, the oral public health services delivered through Fraser Health aim to improve the availability, accessibility and acceptability of our services to ensure everyone in our community has the opportunity to receive quality care.

Universal oral health programs

Universal programs aim to provide services or benefits to all members of a population, regardless of their individual circumstances. The goal is to promote equity by providing a baseline level of support for all.

Oral health promotion and health education

Health education is an important strategy to encourage healthy behaviours. Health authorities in B.C. have developed educational resources on topics related to routine dental hygiene (flossing and brushing), preventive dental care and oral health conditions such as toothaches, gum problems and cold sores. Provincial educational resources are housed on HealthLink BC and are often shared by health authorities, community partners and dental professionals.

We need to consider how effectively these resources serve diverse populations. The resources have been translated into multiple languages to make them more accessible but the information contained is not tailored to unique cultural groups. This is particularly relevant to our region, as we serve 32 First Nations and over 36 per cent of our population has immigrated from another country.[43] Given the variation in dental health practices around the world, Fraser Health community members may benefit from culturally relevant information that addresses their pre-existing knowledge and beliefs about oral health.

Spotlight 3: What is Fraser Health doing to support oral health promotion and education?

The Fraser Health dental team participates in community outreach on an ongoing basis. These outreach events provide an opportunity for tailored education and clinical services based on the unique needs of diverse populations and cultural groups. This may include sharing printed resources, offering presentations and having one-to-one conversations with community members to address their questions and share information. The Fraser Health dental program works particularly closely with our school district partners to deliver oral health education to pre-school students, school-age children and their families.

The Fraser Health dental program is also collaborating with our partners in Home Health to better understand what oral health support is needed by elderly clients and those requiring additional medical supports. This will help to ensure that our information and services can be tailored to this population's unique needs.

Dental screening in schools

As noted above, the B.C. Kindergarten Dental Survey is conducted every three years in kindergarten classes across the province. As they are completing the survey, Fraser Health dental team members identify children with oral health concerns and send a letter home to their caregivers to inform them that the child should see a dental professional. The letter also outlines the support that public health can offer if the family has barriers to accessing dental care. Since the universal survey only occurs every three years, families whose children attend kindergarten in the off-years may miss the opportunity to be informed if their child has dental health care needs. Additional screening is conducted by some health authorities to address this concern, including an annual screening program for high priority schools in the Fraser Health region (see Spotlight 4 below).

At this time the kindergarten dental surveys are common in several provinces but a few – including Saskatchewan[44] and Ontario[45] – conduct surveys in older grades on a universal or priority basis. The World Health Organization recommends that 12-year-olds be one of the indicator age groups for population dental health surveillance.[46] A dental survey of this age group would provide information on the health of permanent teeth rather than the mainly primary or "baby" teeth in the kindergarten students and occur at a time point when health authorities can still reach most of the population, as school attendance may decline through the teenage years in some populations.[46, 47] The addition of this survey could further identify those at high risk of poor oral health, reinforce preventative habits and prevent future complications.

Spotlight 4: What is Fraser Health doing to screen children annually?

In addition to the universal Kindergarten Dental Survey, which occurs every three years, the Fraser Health Public Health Dental Program provides annual screening for kindergarten students at high priority schools with dental cavity rates of 20 per cent or higher. If screening identifies that a child may need dental care, the family will receive a letter indicating they should seek care and outlining the support public health can offer to navigate dental access programs. In 2023-2024, the high priority screening program screened 8,337 children and referred 25 per cent for follow-up care.

Community water fluoridation

Fluoride is a mineral that helps to prevent tooth decay and may repair teeth that have been damaged by plaque. It is commonly found in mouth care products such as toothpaste and can be added to public drinking water to ensure everyone can benefit from its effects.

Despite substantial evidence on the safety and efficacy of CWF, it is not commonly practiced in B.C. Only 1.5 per cent of British Columbians drink from a fluoridated community water system[48] and no communities in the Fraser Health region are currently fluoridating their water. Implementation of CWF in a B.C. community requires approval through a local referendum under the *Local Government Act*, *Community Charter* or *Municipalities Enabling and Validation Act* depending on the jurisdiction[49, 50, 51] (see Section F for further discussion on CWF).

Spotlight 5: What is Fraser Health doing to support community water fluoridation?

Fraser Health staff collaborate with municipal and regional governments to address local health issues. We share data on health concerns in the region, present evidence on best or promising practices and support the development of healthy public policies and programs that promote health and well-being. This includes advocating for policies that address the social determinants of health such as income supports, improved access to education and increased inclusion for diverse populations.

Where appropriate, Fraser Health shares information on the benefits of community water fluoridation in reducing the rate of dental cavities. We will continue to work alongside local governments and health care partners in support of community water fluoridation in our local communities.

Equity-based dental access programs

Equity-based dental access programs can help to ensure that populations facing barriers to care are able to access the services they need. Most of the programs are tailored to address specific barriers and serve a priority population. In keeping with our foundational principles of health equity, Fraser Health's public health dental team plays an important role in sharing information about these programs with our clients and assisting community members in applying for support. A few of the programs and services available to specific populations are outlined below.

Low-income individuals and families

The largest-scale dental access programs are income-tested and support low-income individuals and families who lack other dental insurance coverage.

The CDCP is a recently-launched federal program intended to close the gap in dental care left by the *Canada Health Act*. Canadian residents who meet certain eligibility criteria can apply to receive federal funding to help pay for dental services. Applications opened in December 2023 for seniors aged 87 and above. Seniors over the age of 65, children under the age of 18 and those with a valid Disability Tax Credit certificate could apply at various points throughout 2024. The last phase of applications, covering adults aged 19 to 64, was officially launched in March 2025.

The CDCP was initially rolled out in 2022 as the interim Canadian Dental Benefit (CDB) for children aged 0 to 12. An evaluation of the CDB suggests that the program has been successful in reaching families in the lowest income brackets and supporting earlier intervention.[52]

While the CDCP marks a significant milestone in the expansion of publicly funded dental health care in Canada, the need to complete an application to access the program introduces a barrier to access that does not exist for other universal health services in Canada. Once someone is able to access CDCP funds, they may still face additional charges for dental services, as the amount covered by CDCP is less than the fee schedule followed by many dental professionals in B.C.[53, 54]

Another program to support low-income British Columbians is the B.C. Government's dental coverage for those on income or disability assistance called the B.C. Dental Supplement. This includes the B.C. Healthy Kids Program, which provides enhanced coverage for children from low-income families. An important difference between the CDCP and the B.C. Dental Supplement is that there is no application process for the provincial Dental Supplement. A person will need to establish their eligibility for income or disability assistance but once this has been confirmed, the provincial Dental Supplement is included as a part of their assistance program.

Spotlight 6: How does Fraser Health support access to care?

The Fraser Health public health dental team supports community members who need assistance accessing dental care. The team connects individuals and families who lack dental insurance with low-cost or free dental clinics, such as the University of British Columbia Dental Clinic or local practitioners who accept lower fees for their services.

The team also helps community members complete applications for dental access funds, including the "Save a Smile" program and the CDCP. While barriers to accessing these support programs still exist, the dental team can help overcome barriers.

Fraser Health also provides direct dental care to some children in our region. Children under 36 months of age who are not under the care of a regular dentist can attend a public health dental clinic to receive a cavity risk assessment, dental health counselling and fluoride varnish if the child is considered at risk of tooth decay.

Additionally, Fraser Health supports a community-based program to assist adults with a developmental disability who need help to resolve dental problems. Services are available to individuals eligible under the Community Living BC (CLBC) guidelines. Dental staff help adults living individually or in supported homes to achieve good oral health.

First Nations communities

Jordan's Principle is an important legal framework that supports health care access for First Nations children. It was named in honour of Jordan River Anderson – a young boy from Norway House Cree Nation in Manitoba who was born with multiple disabilities. At the age of two, doctors indicated Jordan could be moved to a special home for his medical needs but the federal and provincial governments could not agree who should pay for his care. While the disagreement between jurisdictions played out, Jordan remained in the hospital until he passed away at the age of five.

Jordan's Principle, has been upheld by the federal court in Canada and requires all levels of government to work together to ensure First Nations children receive health care services they need without delay.[55] This has been applied in B.C. to support First Nations children to receive oral health care in a timely way; however, there can still be delays and barriers to accessing care.

Status First Nations people in B.C. also have access to dental benefits through the program known federally as Non-Insured Health Benefits. In B.C., these benefits are delivered through Pacific Blue Cross and provide funding for care through private dental clinics. The In Plain Sight report documents the frequency with which Indigenous Peoples encounter dehumanizing and traumatizing experiences of Indigenous-specific racism in B.C. health systems, including instances of Indigenous patients being subject to invasive dental procedures without informed consent.[23, 56] These experiences of coercion and mistreatment have led to lasting trauma, fostering distrust in health care providers. This trauma, compounded by ongoing anti-Indigenous racism, often means people avoid dental care even when services are available and accessible.

The First Nations Health Authority (FNHA) offers a range of programs to support oral health in B.C. First Nations communities. COHI is an early childhood tooth decay prevention program designed for First Nations children aged zero to seven, their caregivers and pregnant individuals living or accessing services in First Nations communities. It currently operates with staffing by a COHI Provider, who is a dental professional, and a COHI Aide, who is most often a community member. The program provides oral health education, basic dental care and referrals for dental treatment to over 80 First Nations communities in B.C.; including 19 communities in the Fraser Health region.[58]

FNHA also offers the Community Oral Health Services (COHS) program.[59] This program employs dental therapists and hygienists to provide preventative and treatment-focused oral health services for First Nations individuals of all ages who are living at-home/on-reserve. Under the supervision of a dentist, the dental therapists can provide routine check-ups and examinations, teeth cleaning, fluoride applications, restorations, extractions, root canal treatments for babies and other referrals and health promotion activities. This program can be particularly impactful in remote and isolated communities that may have limited access to dental professionals. There are currently four active COHS communities in the Fraser Health region.

Finally, some communities receive FNHA funding to operate their own community oral health programs and services. FNHA also provides funding to dental contractors to travel into remote communities to provide services.

Spotlight 7: What is Fraser Health doing to improve cultural safety and address anti-Indigenous racism?

All staff and medical staff working in Fraser Health are supported to attend cultural safety and implicit bias training as an initial step to raise awareness of the discrimination that could be present in our services.

The Cɬhi:ya:ỳəstəl' (Working Together) Indigenous cultural safety and anti-racism course is designed to give all current and future Fraser Health staff an introduction to the Indigenous communities in the Fraser Salish region. This course was developed with guidance from the Indigenous Health Collaborative Council, in partnership with First Nations Health Authority, Métis Nation British Columbia and the First Nations Health Council. This course is required for all Fraser Health staff, medical staff and volunteers. For more information on Cultural Safety and Humility at Fraser Health see: Cultural safety and humility - Fraser Health

The BC College of Oral Health Professionals, with whom Fraser Health practitioners are registered, is also supporting work through its Strategic Plan 2024-2027, which includes "cultural safety and humility" as a key focus area.[57]

Newcomers

The majority of newcomers to Canada, including temporary foreign workers, international students and economic migrants, are responsible for funding their own health and dental care when they first arrive in Canada if school or employer health insurance plans are not available to them.

Newcomers become eligible for provincial MSP after six months of continuous residency in B.C. It is important to note, however, that if they leave the province for any reason, including work or family emergencies, then the six-month waiting period for MSP eligibility re-starts. Additionally, since MSP only covers medically necessary oral health procedures, newcomers (and other British Columbians relying on MSP) may not have access to preventive care unless they pay out-of-pocket or have private dental insurance.

Refugees are a unique group of newcomers that have some assistance sooner than other newcomers due to federal government programs. Resettled refugees, protected persons and refugee claimants in Canada are eligible for the Interim Federal Health Program (IFHP) until they qualify for provincial or territorial health insurance. The enrollment process is relatively seamless for government sponsored refugees; however, privately sponsored refugees can face barriers to accessing the IFHP as additional paperwork and verification needs to be submitted. Additionally, the IFHP covers a limited range of emergency dental care services and does not cover basic and preventive dental care.

Additional populations and remaining gaps

The programs outlined above support a significant number of people who are facing (largely financial) barriers to access; however, some populations are still underserved. For example, dental clinics are more commonly found in heavily urbanized areas across Canada, meaning those living in rural and remote communities may not have easy access to a dental professional.[60] Even within urban areas, there can be inequitable distribution of dental clinics, with a greater number of dentists per capita operating in high-income neighbourhoods than in low-income neighbourhoods.[61] The Fraser Health region tends to have good availability of dental clinics; however, people in more rural communities may need to drive some distance to reach a clinic.

Acceptability describes whether someone is willing to seek health services, based on perceptions that the services are effective and that health care providers are responsive to the client and free of social and cultural biases.[62, 63] Even if health care services are available and accessible, people may not seek care if they fear they will be treated unfairly or face disrespect or discrimination.

People living with disabilities, neurodiversity or cognitive or mobility challenges may continue to face physical and social barriers to access. It is currently up to individual clinics to invest in infrastructure such as wheelchair accessible chairs or ceiling lifts. It is also up to individual clinicians to pursue additional training to support diverse people, such as the University of British Columbia's Autism and Neurodiversity in Dentistry education module and Geriatric Dentistry Program resources. If clinics are not willing or able to support these practice changes, then the availability of funding may not address all of the access barriers that exist for these groups.

Spotlight 8: What is Fraser Health doing to support equity, diversity and inclusion?

Fraser Health has a vision to create inclusive health care environments that foster trust and respect and actively address systemic barriers and biases while providing equitable health care for diverse community members. The health authority released its Equity, Diversity and Inclusion Strategy in 2024, setting a framework for the organization in its efforts to provide equitable and safe care for the communities we serve and respectful and inclusive working environments for staff and medical staff.

The four strategic pillars of this strategy are ensuring inclusive environments; enhancing capacity-building; delivering equitable care; and incorporating equity, diversity and inclusion in organizational systems.

The BC College of Oral Health Professionals, with whom Fraser Health practitioners are registered, is also supporting this work through its Strategic Plan 2024-2027, which includes "cultural safety and humility" and "health equity and anti-discrimination" as key focus areas.[57]

D: Discussion on community water fluoridation

As noted previously, CWF is an important universal oral health intervention. Fluoride is a mineral that strengthens the tooth's surface, helping to prevent cavities from forming. Fluoride is often added to oral health products, such as toothpaste and mouth wash. It also exists naturally in Canada's lakes, rivers and groundwater and the presence of fluoride in drinking water has been shown to benefit a community's oral health.[64]

In areas where the naturally occurring fluoride in water is low, communities can add fluoride to their public drinking water with the goal of bringing the fluoride content of the water to 0.7 milligrams per liter (mg/L) – the fluoride concentration level recommended by Health Canada for safe cavity prevention.[65, 66]

In 1945, Brantford, Ontario became the first community in Canada to fluoridate their water supply. As of 2022, 38.8 per cent of Canadians drink from water systems that have added fluoride at a level that promotes good oral health; however, this includes only 1.5 per cent of British Columbians and no communities in the Fraser Health region are currently fluoridating their water.[67]

Table 2: Provincial and territorial estimates for community water fluoridation systems coverage, 2022

Income Level	Per cent of population with fluoridated water systems
British Columbia	1.5%
Alberta	43.0%
Saskatchewan	40.4%
Manitoba	68.3%
Ontario	73.2%
Quebec	1.0%
New Brunswick	1.1%
Nova Scotia	50.4%
Prince Edward Island	25.1%
Newfoundland and Labrador	0.0%
Nunavut	27.7%
Northwest Territories	68.6%
Yukon	0.0%
Canada	**38.8%**

Data Sources: Public Health Agency of Canada. (2022).[67]

Effectiveness of community water fluoridation for cavity prevention

A large body of evidence shows that CWF is a safe and effective measure to prevent cavities.[64, 68, 69] In Canada, we can look to Alberta for a real-world example of how cavity rates can change when fluoride is removed from community water system.

Edmonton began fluoridating its water in 1966, while Calgary began CWF in 1991. In 2011, the City of Calgary stopped fluoridating its water while Edmonton continued. In the 2018-2019 school year, researchers examined the dental cavity rates in grade two students in these respective cities and found that dental health had worsened significantly in Calgary compared to Edmonton.[70] Between 2013-2014 and 2018-2019, the percentage of grade two students with at least one decayed, extracted or filled tooth increased by 8.2 percentage points in Calgary, while Edmonton saw a decrease of 3.6 percentage points. In 2021, Calgary voted to reintroduce fluoridation of the municipal water supply.

In addition to being an effective dental health intervention, CWF may also be a cost-effective method of preventing cavities. While introducing and operating a CWF system requires initial investment, an economic analysis completed in Québec in 2010 found that every $1 invested in CWF saved between $7.32 and $83 per person in dental treatment costs to the health care system – mainly from the reduction of cavities and their consequences.[71] A similar cost-benefit analysis in B.C. may help determine the full benefit that CWF may provide to our local communities.

Areas for continued monitoring

Despite a large body of evidence showing the effectiveness and safety of CWF for cavity reduction, public debate on the use of CWF continues. In B.C., the decision to fluoridate water requires approval from the community through a referendum.[49, 50, 51] Very few communities have gone forward with a referendum and, in those that have, there has typically not been enough support to adopt CWF.

Those who have concerns about CWF often rely on select publications – and recently, a court decision – to build their case against CWF but the quality and interpretations of this evidence have come into question.

The first recent publication to highlight is a 2024 Cochrane review on the use of water fluoridation to prevent cavities.[72] The authors of the Cochrane review concluded that CWF likely contributes to a reduction in childhood cavities but at a lower rate than was seen in pre-1975 studies. This is largely due to the increased availability of fluoridated toothpaste and other oral hygiene products, meaning that the absolute difference in protection between areas with and without CWF is reduced.

Some critics of CWF have used this Cochrane review to suggest that CWF is ineffective;[73] however, this does not align with the findings of the review. The American Dental Association (ADA) posted a response to the Cochrane review, noting concerns with the quality of some of the studies included in the review and that many relevant studies were excluded.[74] In addition, the ADA points out that the authors of the review noted significant cost-savings in communities that implemented CWF but this was not highlighted as a main finding of the review. As a result, the review likely underestimates the full benefit of CWF.

Another concern that is raised about CWF relates to the safety of fluoride exposure. As with many health interventions, the dosage is important. It has been established that high levels of exposure to fluoride can cause harms to health, such as dental fluorosis (changes in teeth colour) and skeletal fluorosis (changes in bone structure).[75] Health Canada recommends 0.7 mg/L as the optimal level of fluoride in drinking water, providing people benefit from fluoride while minimizing risk to their health.[76]

Concerns about safety have been re-ignited with a National Toxicology Program (NTP) 2024 publication of a systematic review on fluoride exposure and children's IQ levels. The review determined exposure levels of 1.5 mg/L could lead to reduced IQ levels in children; however, it did not find a causal relationship, nor a plausible biological explanation on how this would occur.[77] Importantly, they noted that there was insufficient data to determine if the low fluoride level of 0.7 mg/L currently recommended for U.S. community water supplies has a negative effect on children's IQ.

The NTP review was not meant to be a risk assessment on the safety of CWF alone nor does it comment on the benefits of the practice. Regardless, it has been used to support arguments against CWF.

In 2024, citing the NTP review, the United States District Court in Northern District of California noted that while it did not "conclude with certainty that fluoridated water is injurious to public health," the *Amended Toxic Substances Control Act* will only deem an exposure safe if it is less than one-tenth of the hazardous exposure level.[78] Based on the NTP review, this automatically places a water fluoridation level of 0.7 mg/L in the category of a potential health risk. As a result, the court ruled that the United States Environmental Protection Agency must engage in a regulatory response, regardless of evidence supporting the safety of CWF at 0.7 mg/L.

Prior to this court ruling, multiple agencies, including the American Academy of Pediatrics (AAP) and the ADA, had already expressed significant concerns with how the NTP review was conducted. They noted the review omitted evidence from many large studies that showed no effect of fluoridation on children's IQ and they also questioned the quality of the studies included in the NTP report.[79] After the court ruling, the ADA and AAP reaffirmed their support for CWF.[80]

Future directions for community water fluoridation

Throughout these debates, it is important to acknowledge that not everyone has equal opportunity to practice healthy behaviours. We know that oral health follows a social gradient with those who face economic or social disadvantage being more likely to experience poor outcomes. There is some evidence to suggest that CWF may be an important factor in reducing inequities in children's oral health.[81] The contribution to overall population health may be reduced as individual oral hygiene practices improve; however, the benefits for disadvantaged populations and the resulting movement towards health equity must be considered when deciding whether to fluoridate a community's water.

Research into these emerging issues, continued assessment of the appropriate dosage for CWF and conversation about the best approach for each community will continue. At this point in time, however, CWF remains a recommended practice to prevent cavities. Within Canada, CWF has strong support from the Canadian Pediatric Society, the Public Health Agency of Canada, Health Canada and the Canadian Dental Association.[82] There is also strong support internationally, with governments in New Zealand and the United Kingdom re-affirming their support.[83, 84] Locally, Fraser Health is prepared to support our local communities as they address CWF misinformation and explore opportunities to implement CWF in local water systems.

E: Areas for action

There have been significant actions in recent years that will support improved oral health for British Columbians; however, there are still opportunities for improvement. The sections below outline some of the actions that governments, health authorities and health care providers can take to help improve the oral health status of British Columbians. Fraser Health remains a committed provider and supportive partner of the oral health system in B.C.

Oral health promotion and education

While oral health promotion resources are available, there is an opportunity to further work with dental health and other health and social service professionals to increase the public's awareness of good oral health behaviours, including:

1. Collaborating with community representatives to develop client resources that are tailored to different life stages and meet the information needs of diverse populations.
2. Regularly updating oral health promotion campaigns, ensuring reach is maximized through a combination of provincial, regional and local efforts.
3. Partnering with educational programs for allied health and social service providers on the topic of oral health so that all service providers are better prepared to integrate oral health promotion into their activities.
4. Working with local and regional governments to provide communities with accurate information about fluoride and water fluoridation and ensure that misinformation is addressed.

Monitoring and surveillance

Many partners, including Fraser Health and other regional health authorities, have benefited from the data that is available through the B.C. Kindergarten Dental Survey. These benefits can be strengthened by:

1. Reviewing the d3ft indicator used in the B.C. Kindergarten Dental Survey with consideration to implementing the dmft indicator in order to collect more detailed information that is comparable to other jurisdictions in Canada.
2. Reviewing the target ages for oral health surveillance with consideration to expanding the school-based program to include screening at 12-years-old, as recommended by the World Health Organization.[46]
3. Acknowledging Indigenous-specific racism in health systems and working together with First Nations communities to ensure oral health surveillance programs collect meaningful and accurate information and contribute to actions to improve oral health.

Dental public health leadership

There is a complex mix of service and funding models for dental health care in B.C. As a result, there is a need for a robust and coordinated structure for public and private collaboration across oral health programs to ensure all parts of the system are working collectively to achieve positive health outcomes. This can be supported by the following action:

1. Improving the capacity of dental public health leadership for consultation, collaboration and coordination to support the development and implementation of robust, standardized oral health strategies, initiatives and programs.

Access to care

In addition to more established equity-based dental health programs, the federal Canadian Dental Care Plan has significantly improved access to dental care in recent years, though inequities continue to exist. These could be ameliorated through some of the following actions:

1. Continuing support for clients to access CDCP funding, monitoring the positive impacts of the program and assessing potential ongoing gaps related to coverage rates, services required and the income level at which someone becomes eligible for funding.
2. Continuing to monitor and help faciliate access to dental supports and services, such as the B.C. Dental Supplement, and identifying opportunities to expand the reach of these programs to serve priority populations.
3. Exploring opportunities to expand annual school-based screening to support families not identified though the B.C. Kindergarten Dental Survey and who may not otherwise receive dental care or referrals for their children.
4. In collaboration with the dental college and associations supporting dental professionals, identifying and addressing the barriers dental offices may face in serving clients with diverse needs such as people with mobility challenges, neurodiverse clients and those with diverse cultural backgrounds and developing strategies to address those barriers and create more equitable service options.

Healthy public policy

Given the low rates of community water fluoridation (CWF) in B.C., there are a number of ways regional health authorities and all levels of government can support discussions and reduce barriers to implementing CWF, including the following:

1. Regional health authorities and local and regional governments collaborating to assess local communities' support for CWF and take action to address community concerns, as appropriate. This could include cost-benefit analyses for B.C. communities to determine the return on investment of implementing CWF within a community.
2. Supporting a review of infrastructure programs and current legislation related to CWF, including the *Local Government Act*, the *Community Charter* and the *Municipalities Enabling and Validation Act* and consider amendments to reduce barriers to implementing CWF.

Definitions

Acceptability	The ethical and cultural appropriateness of health services for people from different backgrounds.
Accessibility	The degree to which physical, financial or social barriers limit a person's ability to access services.
Availability	The existence and sufficiency of resources, personnel and facilities to meet the needs of the population.
Canadian Community Health Survey	An annual survey conducted by Statistics Canada to collect health-related data at the sub-provincial levels of geography (health region or combined health regions).
Canadian Health Measures Survey	A survey conducted by Statistics Canada every two years to collect health-related information and physical measures from Canadians via a household interview and direct physical measures at a mobile examination centre.
Dental caries	See dental cavities.
Dental cavities	A permanently damaged area on the surface of a tooth that may develop into an opening or hole in the tooth. Dental cavities are caused by acid that is produced when bacteria breaks down food and sugar. This term can be used interchangeably with dental caries.
dmft index	A dental survey tool that measures oral health by counting the number of decayed, missing and filled teeth in a child's mouth, with decay documented at an earlier stage than the d3ft index. This survey tool is commonly used across Canada and throughout the world.
d3ft index	A dental survey tool, also known as a "broken enamel survey". This survey tool is similar to the dmft index but only documents decayed teeth that are showing broken enamel. Earlier signs of tooth decay are not counted towards the total number of decayed, missing and filled teeth in a child's mouth.

Equity	All people (individuals, groups and communities) have fair access to, and can act on, opportunities to reach their full potential and are not disadvantaged by social, economic and environmental conditions including socially constructed factors such as race, gender, sexuality, religion and social status.
Functional difficulty	When an individual reports having "a lot of difficulty" or "cannot do at all or unable to do" at least one of the following activities of daily living: difficulty seeing, even if wearing glasses; difficulty hearing, even if using a hearing aid; difficulty walking or climbing steps; difficulty remembering or concentrating; difficulty with self-care; difficulty communicating when using your usual language.
Gingivitis	An inflammation of the gums, usually caused by a bacterial infection.
Periodontal disease	A set of inflammatory conditions affecting the tissues surrounding the teeth, also known as gum disease. If left untreated, periodontal disease can develop into periodontitis.
Periodontitis	A gum infection that can permanently destroy the bone that supports teeth, leading to tooth loosening and eventual tooth loss.
Population health surveillance	The World Health Organization defines population health surveillance as "the continuous and systematic collection, orderly consolidation and evaluation of pertinent data with prompt dissemination of results to those who need to know, particularly those who are in a position to take action".
Priority populations	Priority populations are groups of people who, due to their social and/or economic circumstances, face greater challenges in accessing health care, experience poorer health outcomes or are more vulnerable to specific health risks compared to the general population.
Social inequities in health	The World Health Organization defines social inequities in health as "systematic differences in health status between different socio-economic groups." These differences are caused by the social conditions in which people are born, grow, live, work and age. These inequities are socially produced and therefore modifiable which makes them unfair.

Socioeconomic Status (SES)	The social standing or class of an individual or group. It is often measured as a combination of education, income and occupation. SES is used in public health and social sciences to understand how economic and social conditions influence health outcomes, access to healthcare and overall quality of life. Higher SES is often associated with better health, longer life expectancy and greater access to healthcare services, while lower SES can be linked to poorer health outcomes and limited access to resources.

Additional resources

Fraser Health resources and story map on oral health in children:
Preventing dental cavities - Fraser Health

Report on the Findings of the Oral Health Component of the Canadian Health Measures Survey 2007-2009:
Canadian Health Measures Survey – Oral Health Component Report (PDF)

Canadian Oral Health Survey reports:
Canadian Oral Health Survey

HealthLink BC Dental Health resources:
Dental Care During Pregnancy | HealthLink BC
Dental Care for Your Infant and Toddler | HealthLink BC
Basic Dental Care From Birth to 16 Years | HealthLink BC
Dental Care for Older Adults | HealthLink BC

UBC Autism and Neurodiversity in Dentistry resources:
Autism and neurodiversity in dentistry – UBC

UBC Geriatric Dentistry resources:
Geriatric Dentistry Program – UBC

Data notes

Costs associated with emergency department visits (page 11)

Data from Winrecs and/or Meditech systems. The data set for cavities and dental health related visits includes all visits with discharge diagnosis codes of K02.7, K04.9. For visits with discharge codes of K08.9 or K08.87, those with presenting complaints of trauma, select injuries, feeding issues or undetermined causes (102, 105, 155, 266, 510, 552, 556, 557, 801- 806, 704, 407, 998, 999, 002, and 310) were excluded. Visits without these presenting complaints were further assessed for keywords in the visit reason or chief complaint notes. Those with any of the inclusion keywords (cavity(ies), filling, abcess/abscess, crown, root canal, canal, toothache, tooth ache, extraction/extracted, decay, ongoing dental pain) were included in the final dataset. For visits that did not have the inclusion keywords, those visits without any of the exclusion keywords (TMJ/tempomandibular, tumor of the jaw/jaw tumor, cyst of the jaw/jaw cyst, cold sore, tongue, teething, gum, stomatitis (for gingivostomatitis) were included in the final dataset.

The average cost for a Fraser Health emergency department visit is $440, based on an internal fees report. We reviewed three years' worth of emergency department visit data to determine the average number of cavity and dental health-related emergency department visits per year. This annual average was multiplied by $440 to calculate the estimated average cost per year.

Costs associated with hospital day surgeries (page 11)

Data from the **Canadian Institute for Health Information (CIHI) Your Health System: Insight (YHS)** online tool. The data set for cavities related day surgeries includes Surgeries with a MRDx/Main Problem of (dental caries (K02) OR diseases of pulp and periapical tissues (K04) AND a principal/main intervention of one of the following: 1FD52, 1FE29, 1FE53, 1FE57, 1FE87, 1FE89, 1FF53, 1FF56, 1FF59, 1FF80, 1FF87, 1FF89. Using resource intensity weighting the YHS: Insight tool provides the cost of day surgeries by category.

Figure 1 and 2 (page 14-15):

Map data from 2022-2023 Kindergarten Dental Survey in figure 1, ArcMap used to spatially join and display school numbers of children with cavities at the neighbourhood level. In figure 2, the rate differences between 2018-2019 and 2022-2023 surveys were displayed.

Figure 3 (page 16):

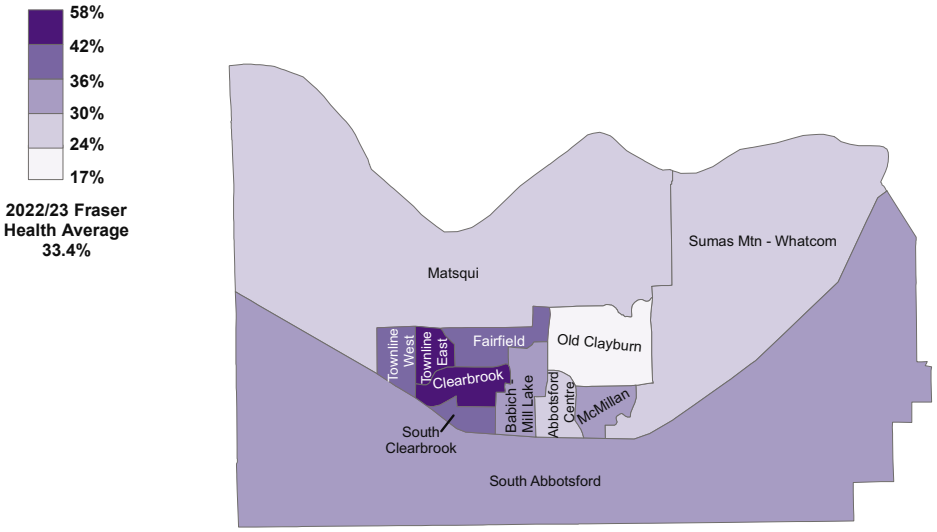
Equiplots were developed by the International Center for Equity in Health in Brazil to visualize health inequalities. This plot type was recreated in R Studio at Fraser Health. These equiplots show patterns of kindergarten cavity prevalence rates among income groups. Neighbourhoods were sorted into five equal groups (quintiles) based on their median family income quintile. Quintile 1 (Q1) has the poorest 20 per cent of neighbourhoods with the lowest median family incomes, while quintile 5 (Q5) has the richest 20 per cent of neighbourhoods with the highest median family incomes. The neighbourhood childhood current or previous cavity rates were calculated for each quintile group and displayed on the equiplot.

Table 1 (page 18):

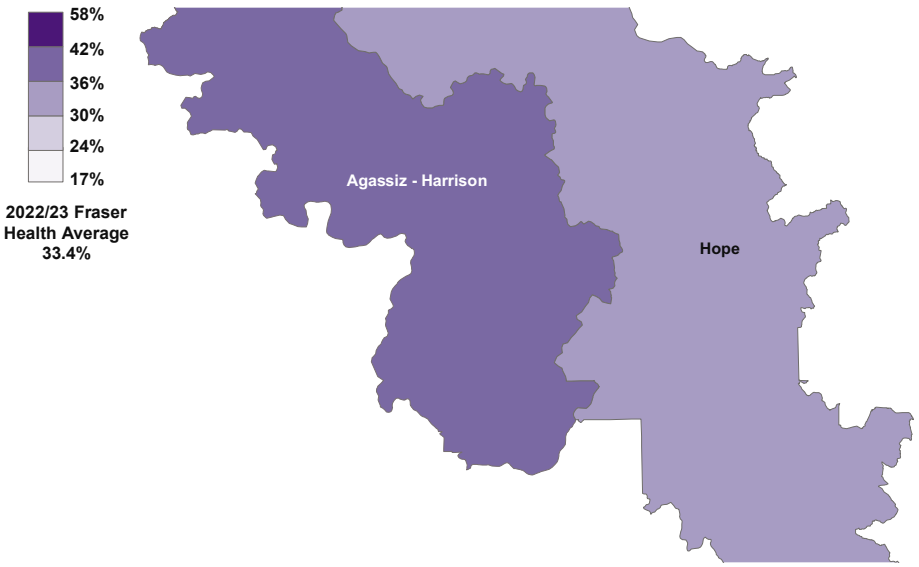
Data from the Health Chat water fluoridation survey was analyzed for the associations between routine visits to the dentist at least once a year and either income level of respondent or whether they had dental insurance.

Appendix A:
Community maps of childhood cavity rates

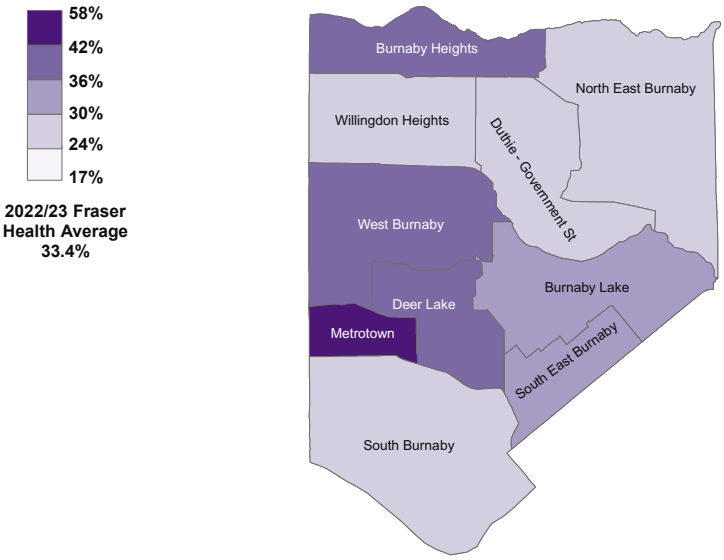
Abbotsford:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year



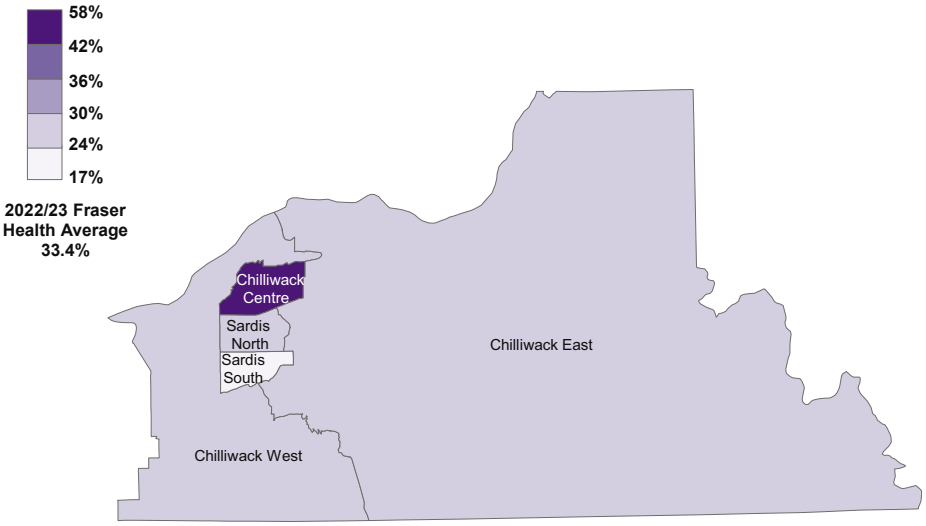
Agassiz-Harrison and Hope:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year



Burnaby:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year

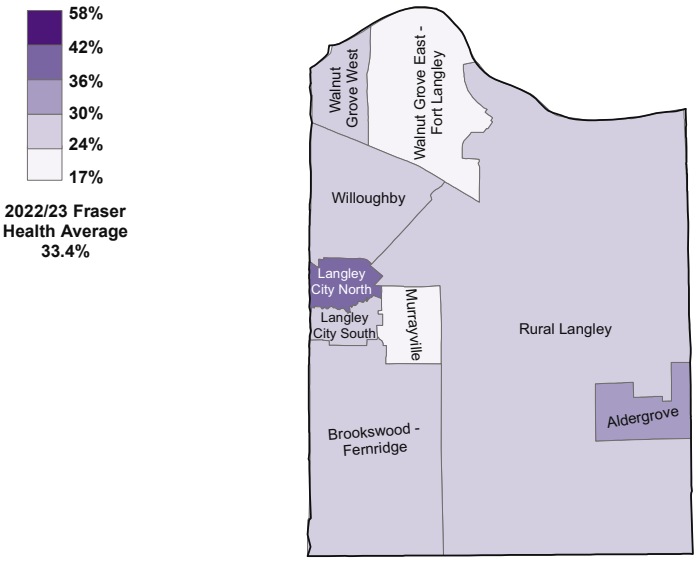


Chilliwack:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year

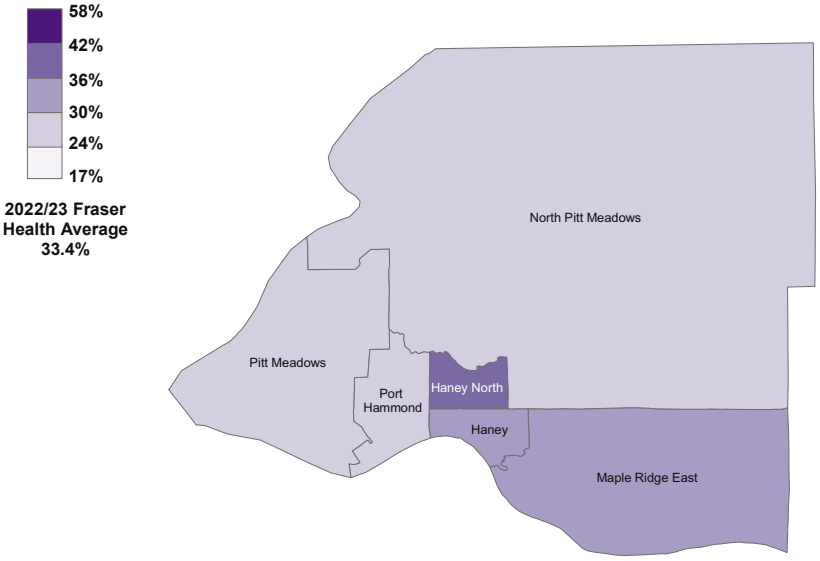


Delta:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year

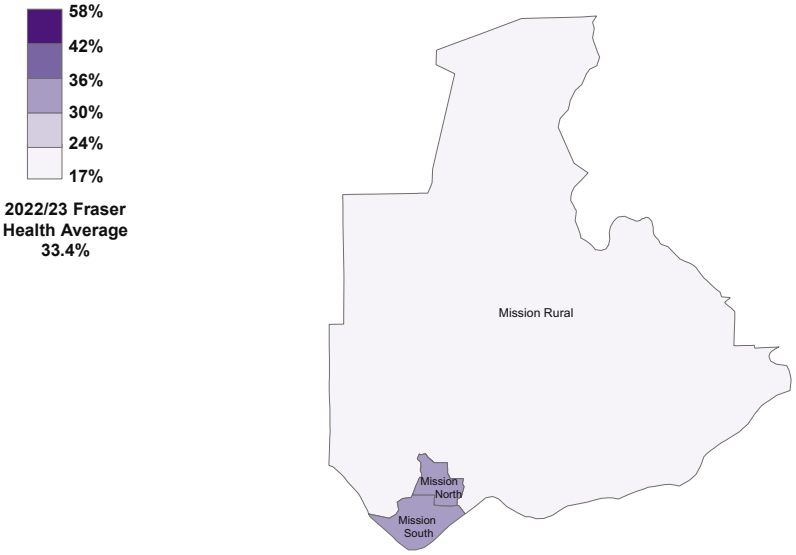
Langley:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year



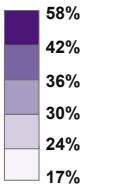
Maple Ridge/Pitt Meadows:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year



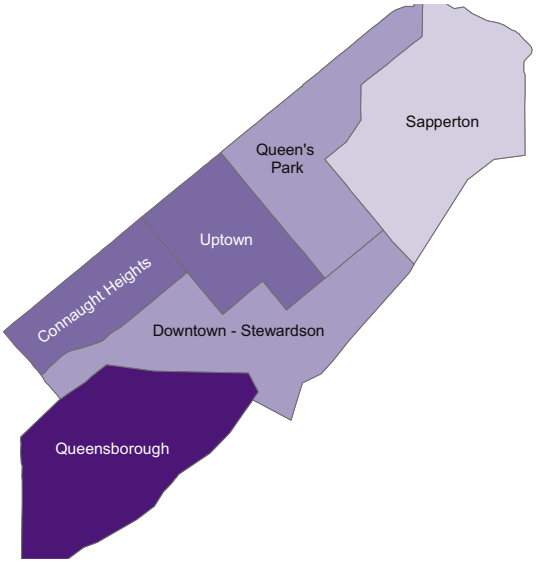
Mission:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year



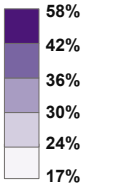
New Westminster:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year



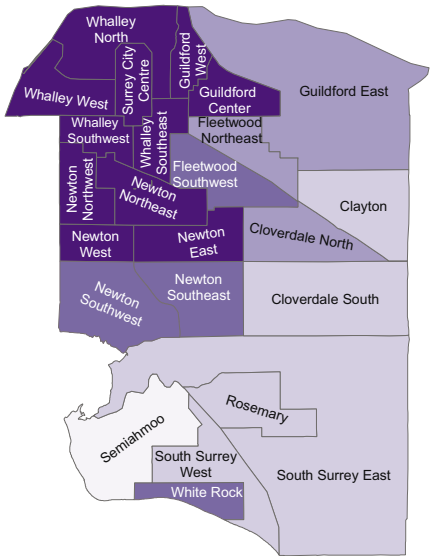
2022/23 Fraser Health Average 33.4%



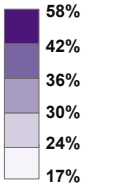
Surrey and White Rock:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year



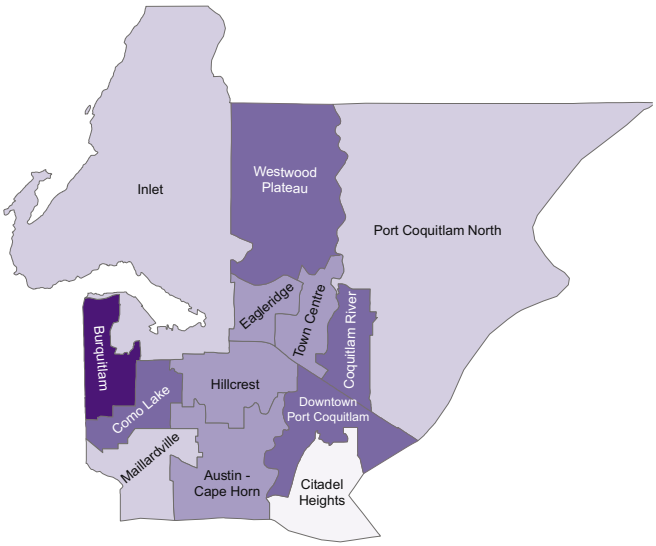
2022/23 Fraser Health Average 33.4%



Tri-Cities:
Percentage of kindergarteners with current or previous cavities by neighbourhood, 2022-2023 school year



2022/23 Fraser Health Average 33.4%



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