



SOUTH ASIAN HEALTH REPORT



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A MESSAGE FROM OUR LEADERS



We are pleased to present the South Asian Health Report, which provides valuable information on the health of South Asians living in our region. We expect it will be a useful resource for health planners and community organizations across Fraser Health, and will inform actions to improve the health and well-being of South Asians in our region.


This report is the first of its kind in Canada and highlights many areas for action. In our region, adult South Asians are three times more likely to have diabetes and two times more likely to have heart disease. Some of the reasons for these higher rates include genetics and cultural influences on health behaviours such as diet and exercise. The impact of social and economic factors, such as education, income and area of residence, show that higher rates

of diabetes and heart disease among South Asians reflect important health inequities.

In our effort to provide a report that highlights meaningful findings, the results are focused on gaps in health and socioeconomic indicators among South Asians in Fraser Health. While these findings allow us to identify targeted areas for improvement, we would like to also acknowledge the many strengths and positive attributes in the South Asian community that can be leveraged to realize these improvements, including social support from larger family groups living together, a strong sense of community belonging, a younger population overall that may be more accessible through social media, lower self-reported smoking rates, and a higher percentage who report abstaining from alcohol.

Fraser Health is committed to providing equitable, respectful and culturally sensitive public health and health care services to our clients, and whenever possible in their own language. Almost a quarter million South Asians make up 15% of our region's population, and the majority of South Asians who live in Fraser Health immigrated to Canada. The South Asian population is diverse with various religions, languages and cultural practices. These cultural practices can act as facilitators or barriers to good health, and our health programs and services can benefit from a better understanding of how these factors influence health among South Asians.

Fraser Health is dedicated to achieving better health among all populations in our region, including South Asians. In 2013, the South Asian Health Institute (SAHI) was established at Fraser Health to improve health and health outcomes for the South Asian population through innovation and evidence-based care. SAHI understands the importance of culture and its impact on health, and aims to be a global leader in South Asian health. Our goal is to improve the health care services received by South Asians with the aim of reducing chronic disease burden at individual,



family, community and health systems levels. To achieve this, we are working closely with health programs across Fraser Health, including diabetes, cardiovascular, mental health and substance use, and maternal and child health. SAHI has also introduced the Sehat Wellness Ambassador program, which offers comprehensive chronic disease prevention and management services primarily to South Asian adults at their places of worship.

Addressing chronic disease prevention and management requires a comprehensive, multi-level approach in partnership with community leaders and stakeholders. SAHI acts as a catalyst for cooperation, collaboration and coordination between Fraser Health and community-based partners to provide culturally relevant services to improve the health of our South Asian community.

Together, we can achieve our vision of providing better care and being the best in health care.

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across the Fraser Health region who took part in the
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information with us.

EXECUTIVE SUMMARY



The purpose of this report is to provide Fraser Health planners, decision-makers and community stakeholders with information about health status, health behaviours and health care access among Fraser Health residents of South Asian descent compared to the overall Fraser Health population, to inform strategies that can improve South Asian health.

A focused and integrated population health approach towards chronic diseases and their risk factors is essential to reduce the burden of chronic diseases on individuals, communities and the health care system. To this end, this report provides a population-based assessment of South Asian health in our region.

SOUTH ASIANS IN THE FRASER HEALTH REGION

South Asians are people whose ethnic roots originate from the Indian subcontinent (India, Pakistan, Sri Lanka, Nepal, Bangladesh, Maldives and Bhutan). Around 75% of South Asians in British Columbia live within the Fraser Health region, where they comprise 15% of the population.

Within the Fraser Health region:

- Nearly 1 in 8 Fraser Health residents identify as South Asian.
- South Asians mainly reside in Surrey, Abbotsford and Delta, where they make up an estimated 34%, 22% and 17% of the local population, respectively (National Household Survey).
- Among South Asians, roughly 1 in 4 have been living in Canada for 10 years or less.
- The South Asian population is significantly younger than the overall Fraser Health population with 51% under 40 years of age. The median age among South Asians was 39 years compared to 46 years in Fraser Health overall.
- Roughly 1 in 5 South Asian residents in Fraser Health do not speak English; other than English the most commonly spoken language is Punjabi (68%).

- South Asians in Fraser Health typically live in larger, multi-generational households compared to the overall population; the average South Asian household size is four, compared to two among the Fraser Health population, and fewer South Asian seniors report living alone.

HEALTH BEHAVIOURS

Healthy lifestyle behaviours, particularly healthy diet and physical activity, are key in maintaining physical and mental health and preventing obesity, diabetes and heart disease. These behaviours are influenced by other determinants of health, including geographical, social, economic and cultural factors.

Among South Asians in Fraser Health:

- 1 in 8 South Asians eat the recommended 5 servings of fruits and vegetables per day.
- Canadian-born South Asians were more likely to eat fast food, drink sugary beverages frequently, and have high screen time, in comparison to those that immigrated to Canada.
- Smoking rates are considerably lower among South Asians.

- Overall, a smaller proportion of South Asians in Fraser Health drink alcohol. However, a significantly higher percentage of South Asians born in Canada reported binge drinking more than once per month (31%) compared to those that immigrated to Canada (12%).

HEALTH STATUS

Chronic diseases are a major burden on our health care system. Across twelve hospitals in the Fraser Health region, one in five patients are hospitalized with three chronic diseases alone – diabetes, chronic obstructive pulmonary disease, and heart disease. In terms of health status, results from the MHMC survey indicate that South Asians in Fraser Health had a higher burden of select chronic diseases compared to the overall population.

- South Asian seniors (65 years of age and over) were significantly less likely to report excellent or very good health and mental health compared to seniors in Fraser Health overall.
- Conventional Body Mass Index (BMI) categories for overweight and obese may underestimate chronic disease risk among South Asians.
- Fifty-eight percent of South Asians would be identified as obese by applying South Asian specific BMI cut-offs (≥ 25 kg/m²).
- The odds of reporting diabetes and heart disease were three and two times higher, respectively, among South Asians compared to the overall Fraser Health population.
- Thirteen percent of South Asians overall, and 46% of those 65 years of age and over, reported being diagnosed with two or more chronic diseases.

BUILT ENVIRONMENT AND COMMUNITY RESILIENCY

Where we live, work and play has an impact on our health. Physical features of our communities, such as sidewalks, availability of parks and access to amenities, influence how we lead our life and impact our health and community connectedness.

- Neighborhoods with a high density of South Asians were less likely to be classified as 'Very walkable' or 'Walkers paradise' using Walk Score®.
- South Asians who reported that their neighborhood had a large selection of fruits and vegetables were two times more likely to eat 5+ servings of fruits and vegetables.
- South Asians and the overall Fraser Health population are more likely to report meeting physical activity recommendations when they feel safe walking in their neighbourhood after dark and have access to natural sites.
- A significantly higher percentage of South Asians (65%) reported having a strong sense of community belonging compared to Fraser Health overall (56%); sense of community belonging increases with positive perceptions of the physical features of a neighbourhood.

HEALTH CARE ACCESS AND UTILIZATION

Regular contact with a health care provider ensures timely access to recommended preventive services as well as proactive management of chronic conditions.

- 90% of South Asians in Fraser Health reported having a family doctor.
- Utilization of effective prevention services such as mammograms and influenza immunizations by South Asians are similar to the general population, but uptake of cervical cancer screening is lower.

The factors that drive health inequities and chronic diseases among South Asians are complex; partnerships and collective action are essential to achieve better health for all communities in our region. The South Asian Health Institute and Population and Public Health look forward to working with our partners in Fraser Health and in the community to improve the health of South Asians.

CHAPTER 1: SOUTH ASIANS IN FRASER HEALTH



KEY FINDINGS:

- Nearly 1 in 8 Fraser Health residents identify as South Asian.
- South Asians mainly reside in Surrey, Abbotsford and Delta, where they make up an estimated 34%, 22% and 17% of the local population, respectively (National Household Survey).
- Among South Asians, roughly 1 in 4 have been living in Canada for 10 years or less.
- The South Asian population in Fraser Health is significantly younger compared to the overall Fraser Health population with 51% under 40 years of age.
- Roughly 1 in 5 South Asian residents in Fraser Health do not speak English; other than English the most commonly spoken language is Punjabi (68%).
- South Asians in Fraser Health typically live in larger, multi-generational households compared to the overall population.

INTRODUCTION

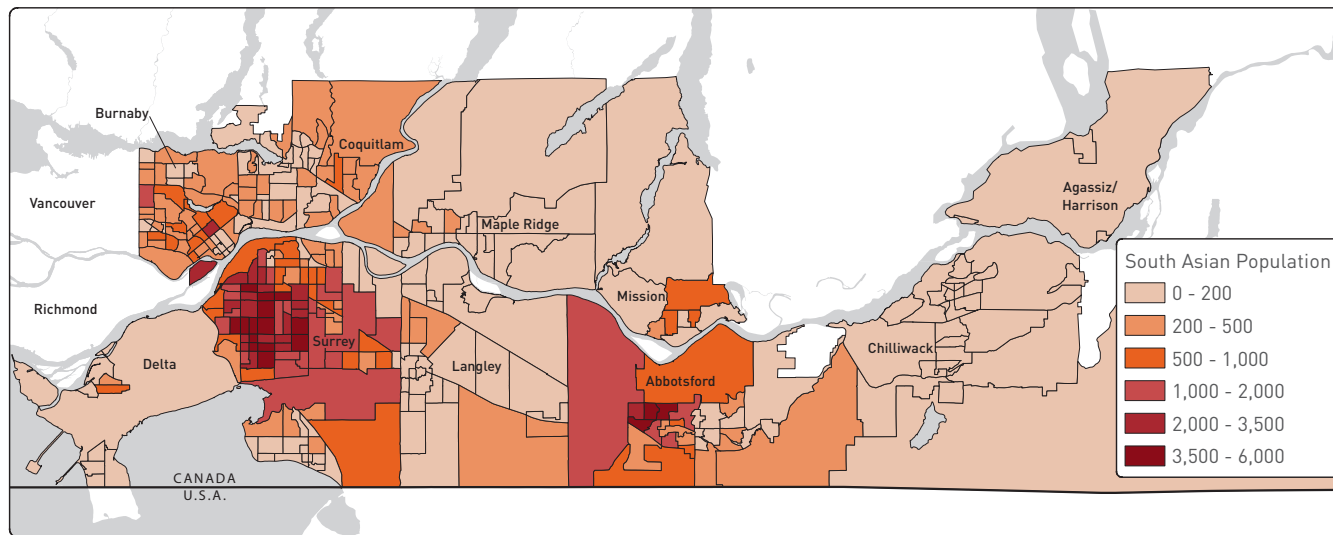
South Asians are people whose ethnic roots originate from the Indian subcontinent (India, Pakistan, Sri Lanka, Nepal, Bangladesh, Maldives and Bhutan) (1). South Asians consist of people from a range of ethnic, religious and linguistic groups who have varied ancestries, immigration histories and personal experiences (2). While many South Asians trace their lineage back to countries of South Asia, a significant number have migrated to Canada from Fiji, Mauritius and countries in Eastern and Southern Africa and the Caribbean (3).

In the early 1900s, the South Asian community in Canada was relatively small and homogenous due to immigration laws limiting Asian and Indian immigration (4). During this period, South Asian immigrants to British Columbia were predominantly male, mostly Punjabi and Sikh, and worked mainly in railroad construction, logging and lumber industries (3). As skills, education and language ability replaced race and country of origin as immigration criteria,

South Asian immigration to Canada started to increase (2). These revised criteria, along with medical and health-related criteria for potential immigrants, contribute to the “healthy immigrant effect”, a pattern in which the primary applicants for migration to Canada are younger, more educated and in relatively good health. This meant that South Asians immigrated to Canada with better health than the Canadian-born population (5).

South Asians are one of the fastest growing immigrant populations in Canada (6). According to the 2011 National Household Survey, South Asians are the largest visible minority living in Fraser Health, making up almost 15% of the estimated Fraser Health population (7). Within Fraser Health, South Asians mainly reside in Surrey, Abbotsford and Delta, where they make up an estimated 34%, 22% and 17% of the local population, respectively (7). Figure 1.1 shows the number of people identifying as South Asian within each Fraser Health census tract.

FIGURE 1.1: South Asian population by census tracts in Fraser Health



Note:

- 1) Multiple responses are permitted, and those categorized as South Asians may identify with multiple ethnicities.
- 2) Statistics Canada's census tracts exclude less populated areas, and therefore the map does not display the full geographic extent of the Fraser Health Authority.

Data Source: Statistics Canada, 2011 National Household Survey (7)

The South Asian Health Institute (SAHI) at Fraser Health was created in 2013 to better understand the health needs of the South Asian population. SAHI's mandate is to advance understanding of key health issues affecting this population and support development of culturally appropriate strategies for improving the health of the diverse South Asian community in Fraser Health (8). It is well known that South Asians have greater rates of diabetes and heart disease. What is less well understood are the patterns of health behaviours among South Asians, rates of other chronic conditions, and how sociodemographic, cultural and neighbourhood factors influence health behaviours and health status.

Public health activities that promote health behaviours can help reduce chronic conditions and the associated costs faced by our communities, including both direct health care costs and societal costs such as disability and premature death. In 2013, the annual economic burden of three modifiable risk factors—excess weight, physical inactivity and tobacco smoking—was estimated

at over \$5.6 billion in British Columbia, of which approximately \$1.8 billion was due to direct health care costs (9).

DATA SOURCES

Most of the information in this report comes from: (i) focused literature reviews and evidence that provide context to data analyses, (ii) analyses of the My Health My Community (MHMC) survey results, and (iii) additional data sources as appropriate (Appendix A).

The MHMC cross-sectional survey (2013/2014) included Fraser Health residents ≥18 years of age; results were weighted to the 2011 National Household Survey by age, gender and education level. Survey respondents were identified as South Asian if they selected this option on the ethnicity question in the survey (i.e., self-identification). When ethnicity data was not available, individuals were defined as South Asian if they identified their birthplace as India, Pakistan, Bangladesh or Nepal, or reported speaking select South Asian languages (Appendix A).

Within Fraser Health, 15,427 adults participated in the MHMC survey. Based on our method, 1,597 people were identified as South Asians, comprising 12% (weighted) of the Fraser Health MHMC sample. The majority of South Asian MHMC participants in Fraser Health lived in Surrey, Abbotsford and Delta, making up roughly 24%, 18% and 19%, respectively, of the sampled population from each municipality. These values are lower than Statistics Canada's (7) estimates partly because the survey only targeted those aged 18 and over.

Within the My Health My Community survey, South Asian adults make up an estimated 12% of the weighted Fraser Health sample.

DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS

In addition to the biological factors such as age, sex and genes, our health status and ability to make changes to our behaviours are shaped by our social and economic status (10). It has been shown repeatedly in Canadian and international research that those in higher income and education groups have greater life spans and lower morbidity and mortality from chronic diseases (10). This section examines key demographic and socioeconomic characteristics among South Asians in the Fraser Health region.

According to the MHMC survey, the median age of the South Asian population in Fraser Health (39 years) was significantly lower than the overall Fraser Health population (46 years). Just over half (51%) of the South Asian population was aged 18-39 years compared to 37% of the Fraser Health population overall (Figure 1.2). As indicated above, age is an important determinant of health since the onset of chronic conditions usually occurs later in life. The difference in

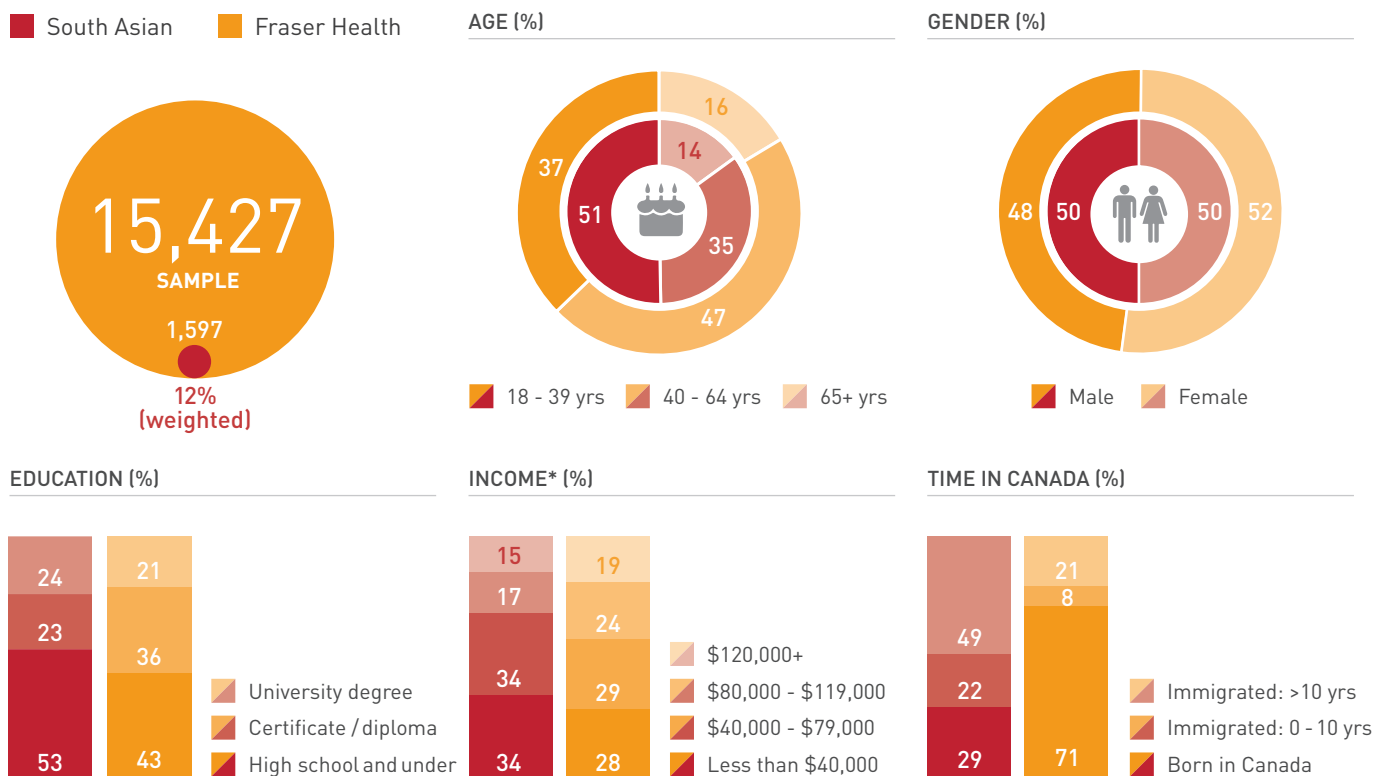
age distribution between the South Asian and Fraser Health populations may partly explain differences in health behaviours, health status and health care utilization.

The median age of the South Asian population in Fraser Health was 39 years, which was significantly lower than the overall Fraser Health population at 46 years.

With respect to education, a significantly higher percentage of South Asians reported their highest level of education as high school or less (53%) compared to the Fraser Health population (43%); however, the percentage of respondents with a university degree was similar between South Asians (24%) and Fraser Health overall (21%). A significantly smaller percentage of South Asians (23%) have a certificate or diploma compared to Fraser Health overall (36%). Income was generally lower among South Asians compared to the Fraser Health population. Among South Asians, 34% had an annual household income below \$40,000 before taxes and deductions, compared to 28% of the Fraser Health population; and 15% of South Asians reported an annual household income of \$120,000 or more, compared to 19% of the Fraser Health population.

Differences in educational attainment and income may explain some of the health status differences between South Asians and Fraser Health overall. Among other factors, higher education makes it easier for a person to get better paying employment, and higher literacy enables a person to understand health care information, appreciate the often complicated and long term consequences of health behaviours and makes it easier to navigate the health care system (10).

FIGURE 1.2: Demographic and socioeconomic characteristics of the South Asian and Fraser Health populations



*Notes: *Income (%): The distribution in each income group only reflects the percentage among those who reported income in the MHMC survey; income was missing for 27% of respondents in Fraser Health overall, and 36% among South Asian respondents.*

In Fraser Health, 71% of South Asian respondents had immigrated to Canada¹, compared to 29% of the overall population; and 22% of South Asians had immigrated and lived in Canada for 10 years or less, compared to 8% in the Fraser Health population (Figure 1.2). The relationship between health and immigration is complex. Various Canadian studies have shown that immigrants, especially those from non-Western developing countries, often experience better health than the host population. This 'healthy immigrant effect' is influenced by a number of factors. For example, individuals who are healthier are more likely to consider leaving their home country, and immigration processes in host countries will tend to select healthier individuals through various screening

requirements (11). The effect of this selection process can be seen in mortality data. A Statistics Canada study (11) looking at mortality rate among immigrants found that immigrants from South Asian countries had significantly lower age-standardized mortality rates compared to those born in Canada (668 vs. 1,230 per 100,000 per year, respectively).

In Fraser Health, 71% of South Asian respondents had immigrated to Canada and nearly one quarter have lived in Canada for 10 years or less.

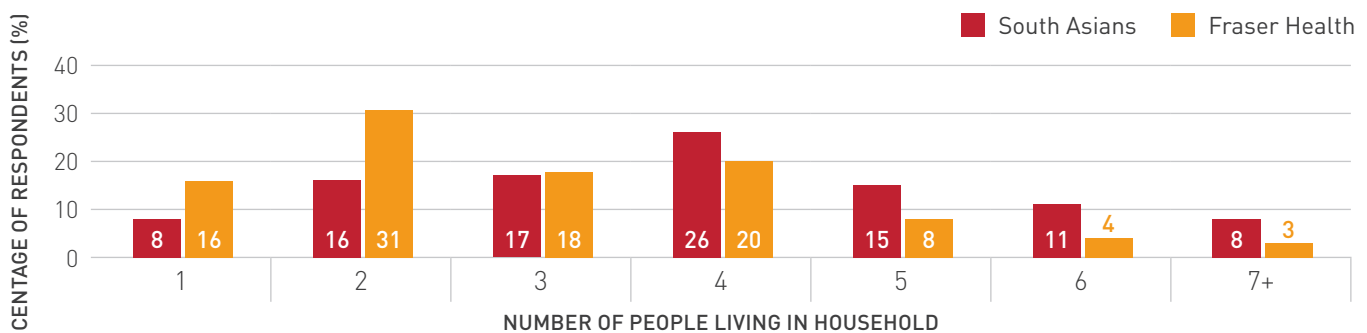
¹ In the My Health My Community survey, "immigrants" were defined as those who reported being born outside Canada. The route to settlement in Canada for this group could include arrival as immigrants, family members joining their spouse or parent, refugees, etc. This differs from how "immigrants" are defined by Statistics Canada. In this report, we will typically refer to the time of immigration to Canada (i.e., 0-10 years vs. >10 years), rather than distinguishing between new/recent vs. long-term.

Newcomers to Canada may face a number of challenges. Upon arrival, the ability to speak English can ease the immigration process, increase chances of finding employment, facilitate communication with health care providers and ease adjustment to life in Canada. In our sample, the most commonly spoken languages by South Asians, other than English, were Punjabi (68%) and Hindi (39%). Twenty-two percent of South Asians, compared to 11% of the Fraser Health population, reported that they do not speak English. Of those who did not speak English, 54% were women, 38% were aged 65 years or older, 88% had less than high school education and 61% had been living in Canada for more than 10 years.

FAMILY STRUCTURE

Families play an important role in the lives of South Asians. Despite the fact that South Asian families have settled in communities over 5,000 miles away from their extended family, family unity is still integral to their values (12). South Asian households in Fraser Health are generally larger compared to the overall population. Sixty percent of South Asians reported living in a household with four or more people compared to 35% of the overall Fraser Health population. In fact, the average number of people in a South Asian household was 4 people compared to an average of 2 people per household in the Fraser Health population. Furthermore, only 9% of South Asian seniors reported living alone, compared to 26% in the Fraser Health population, suggesting that South Asian seniors were more likely to be living with their families in multi-generational households.

FIGURE 1.3: Self-reported household size among the South Asian and Fraser Health populations



Data Source: My Health My Community Survey (2013-14)

The average number of people in a South Asian household was 4 people compared to an average of 2 people per household in the Fraser Health population.

In summary, the South Asian population in the Fraser Health region is diverse. They speak many different languages and practice a variety of

religions. The majority of South Asians in the region are immigrants, with around one quarter born in Canada. Compared to the general population, South Asians tend to be younger, and live in larger, multi-generational households. South Asian immigrants may face increased barriers to health as one in five do not speak English; and have comparatively lower income and education. This diversity as well as the sociodemographic characteristics have implications for planning and delivery of health programs and messages targeted at this population.

CHAPTER 2: HEALTH BEHAVIOURS



KEY POINTS:

- Only 1 in 8 South Asians eat the recommended 5 servings of fruits and vegetables per day.
- Canadian-born South Asians were more likely to eat fast food, drink sugary beverages frequently, and have high screen time, in comparison to those that immigrated to Canada.
- Smoking rates are considerably lower among South Asians.
- Overall, a smaller proportion of South Asians in Fraser Health drink alcohol. However, a significantly higher percentage of South Asians born in Canada reported binge drinking more than once per month (31%) compared to those that immigrated to Canada (12%).

Many factors influence the health of people in Canada, including personal health practices and coping skills, or the actions that individuals take to prevent diseases and promote self-care, cope with challenges, develop self-reliance, solve problems, and enhance health (13).

These personal health practices—which we are referring to as health behaviours or behavioural risk factors—mainly include physical activity, diet, smoking, and alcohol consumption. Positive health behaviours, such as increased physical activity, healthy eating, not smoking, and reducing harmful use of alcohol, act to promote health and prevent disease; whereas the absence of these health promoting behaviours contribute towards the leading causes of disease and death in Canada (14-17). Health behaviours do not happen in isolation; they are significantly influenced by other determinants of health, including, social, political, economic and cultural factors (18).

International and national research has demonstrated that certain health behaviours are less frequent among South Asian populations, potentially putting them at greater risk of poor health outcomes. A case-control study conducted across 52 countries found that health behaviours, including physical activity and daily fruit and vegetable consumption, were significantly lower among South Asians compared to other residents of those countries (19). Similarly, results from the

Canadian Community Health Survey (CCHS) have consistently found that South Asian respondents were less likely to be physically active compared to the overall population (20). In addition to a lack of physical activity, most South Asians report diets that include high-fat dairy products and fried foods, which may increase their risk for cardiovascular diseases (21).

In the MHMC survey, we found that the South Asian population had similar or better rates of certain health behaviours compared to Fraser Health overall, while doing worse on others. In this chapter we examine health behaviours among South Asians in comparison with the Fraser Health population.

DIET

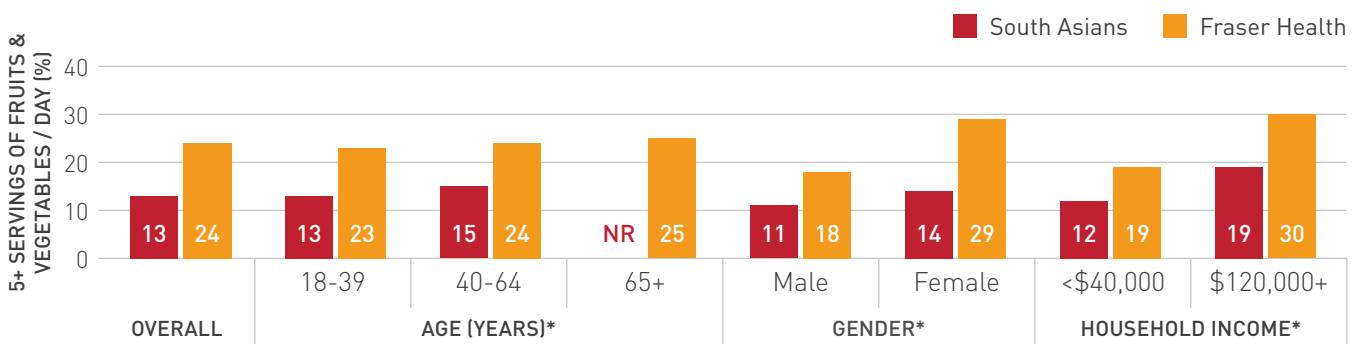
Dietary behaviours are well-studied among the South Asian population. In BC, a recent study found some positive dietary practices among South Asian immigrants, such as an improvement in food preparation practices (i.e., increase in grilling and decrease in deep frying); however, there was also a reported increase in the consumption of convenience foods, sugar-sweetened beverages, red meat, and dining out (22). In the United States (US), a study found that the consumption of soft drinks, fruit juice and chips among South Asians increased with length of residence in the US (23).

Canada's Food Guide states that a healthy diet should include at least 5 servings of fruits and vegetables per day to prevent chronic diseases (24). Only 13% of South Asians reported that they meet this recommendation, which is significantly lower than the 24% of the Fraser Health population that consume 5 or more servings of fruits and vegetables per day.

Roughly half (13%) as many South Asians in Fraser Health report eating a minimum of 5 servings of fruits and vegetables per day compared to the Fraser Health population (24%).

Although consistently lower compared to the overall Fraser Health population, the proportion of South Asians who consumed the recommended number of fruits and vegetables per day differed across various gender, age and income subgroups (Figure 2.1). Among both South Asians and the Fraser Health population, a greater proportion of women met the fruit and vegetable recommendation than men; however, the gap between South Asian women (14%) and women in Fraser Health overall (29%) was much larger compared to men. In terms of household income, a higher percentage of those who earn more consumed the daily recommended fruits and vegetables, which is consistent with what we know about the relationship between income and healthy eating (25). Yet even among those who earned \$120,000 per year or more, a significantly lower percentage of South Asians met the recommendation, at 19%, compared to 30% of those in high-income households among Fraser Health overall.

FIGURE 2.1: Fruit and vegetable consumption among the South Asian and Fraser Health populations



Note:

1) *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

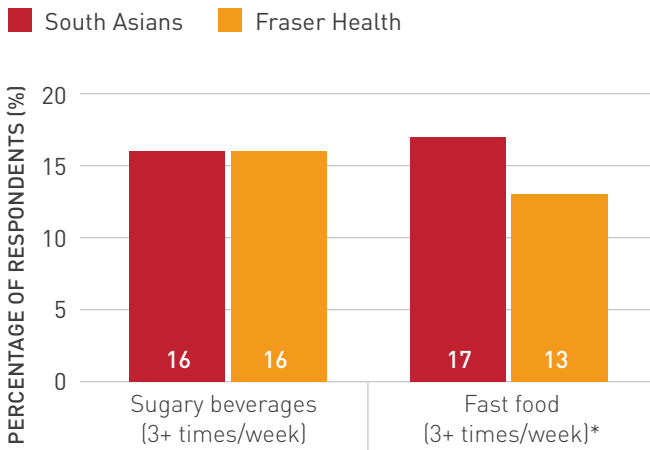
2) NR, numbers too small to report

Data Source: My Health My Community Survey (2013-14)

In addition to not eating enough healthy food, adverse health consequences can result from overconsumption of unhealthy food. Consuming sugary snacks, such as chocolate, sweets ('mithai'), ice cream and fast food, may be associated with weight gain and increased risk of type-2 diabetes (26,27). There were no significant

differences in the reported intake of sugary beverages between the South Asian and overall Fraser Health populations, but a significantly higher percentage of South Asians (17%) reported eating fast food three or more times per week compared to the Fraser Health population (13%) (Figure 2.2).

FIGURE 2.2: Sugary beverages and fast food consumption among the South Asian and Fraser Health populations



Note: *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

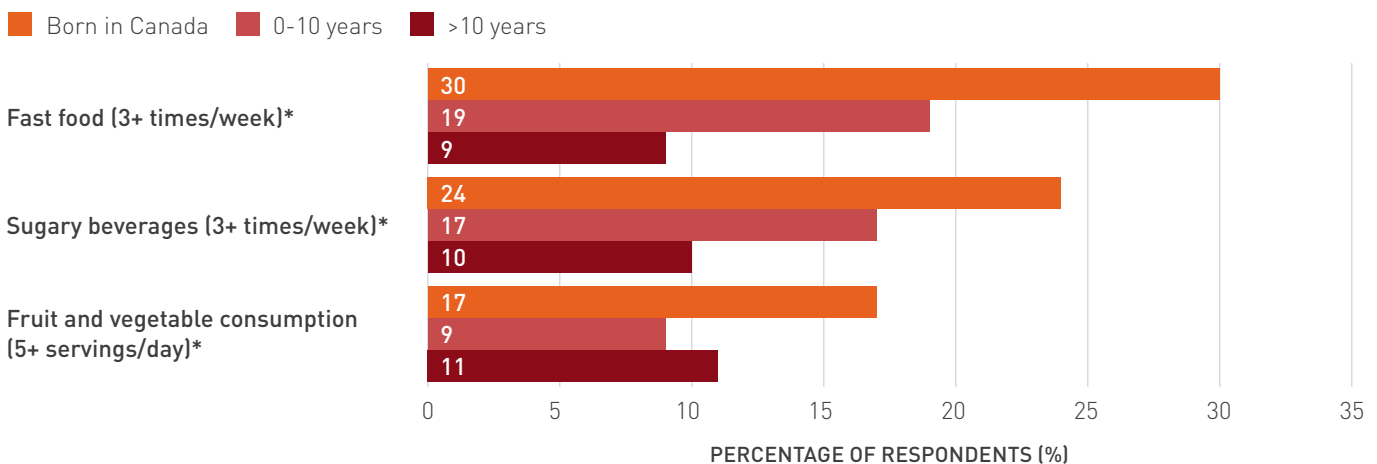
A significantly higher percentage of South Asians (17%) reported eating fast food three or more times per week compared to the Fraser Health population (13%).

While individuals who immigrate to Canada, including South Asians, are typically healthier than their host population upon arrival (i.e., 'healthy immigrant effect'; see Chapter 1), their health and health behaviours may erode over time (11). Among South Asian immigrants, those who had been living in Canada for 0-10 years reported significantly lower fruit and vegetable consumption, higher intake of sugary beverages and higher consumption of fast food, in comparison to immigrants who had been living in Canada for over 10 years (Figure 2.3).

A higher proportion of Canadian-born South Asians in Fraser Health reported consumption of sugary beverages (24%) and fast food (30%) compared to South Asian immigrants. However, there were some positive findings among those born in Canada, with a higher proportion meeting recommendations for fruit and vegetable consumption (17%) compared to other South Asians in Fraser Health.

These results paint a complicated picture of the South Asian diet. South Asians born in Canada, including second and third generation immigrants, may be following less traditional diets and hence eating more fruits and vegetables, but they are also more likely to consume fast food and sugary beverages.

FIGURE 2.3: Dietary behaviours among South Asians in Fraser Health by time in Canada



Note: *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

Ongoing and targeted efforts are needed to enable South Asian people in the region to improve their diet by increasing intake of fruits and vegetables, and eating fewer unhealthy foods.

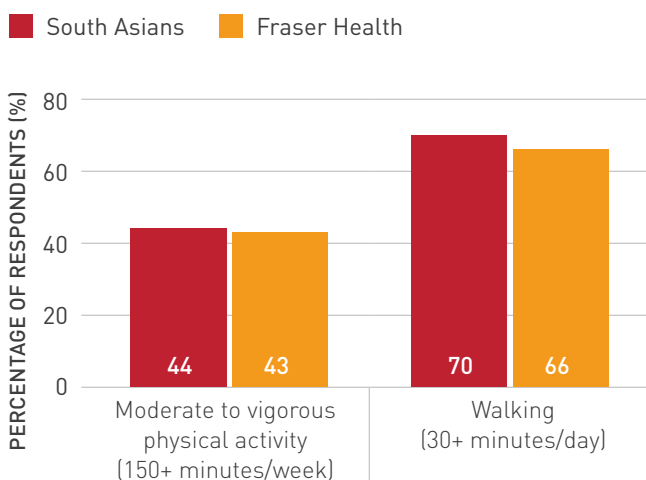
PHYSICAL ACTIVITY AND WALKING

The Canadian Physical Activity Guidelines recommend 150 minutes or more of moderate to vigorous physical activity for adults 18 years and older (28). Substantial research evidence from the United Kingdom (UK) has shown that physical activity levels are generally lower among South Asians, particularly among women and the elderly (29-31). It is important to note that research evidence on self-reported physical activity among South Asians must be interpreted with caution, as exercise and leisure are known to be interpreted differently (31).

Less than half of (44%) the South Asian population met the physical activity recommendation of 150 minutes of moderate to vigorous physical activity per week, with no significant difference reported between the South Asian and Fraser Health populations (Figure 2.4). The percentage of Fraser Health South Asians meeting physical activity recommendations was higher than Peel Region in Ontario, Canada (38%) and in the US (35%).²

Less than half of South Asians report getting 150 minutes or more of moderate to vigorous physical activity per day, which is similar to the Fraser Health population overall.

FIGURE 2.4: Physical activity and walking behaviour among the South Asian and Fraser Health populations



Note: Differences between South Asians and overall Fraser Health population were not significantly different.

Data Source: My Health My Community Survey (2013-14)

There were no differences between the South Asian and overall Fraser Health populations, when stratified by age and gender. However, among individuals who had completed a university education, a significantly lower percentage of South Asians met the recommended minimum physical activity levels (36%) compared to the Fraser Health population (43%). Furthermore, among individuals who reported annual household incomes of \$40,000-80,000 and \$80,000-120,000, a significantly lower percentage of South Asians (34% and 35%, respectively) reported meeting the physical activity targets compared to the Fraser Health population (42% and 43%, respectively).

Within the South Asian population, social and cultural barriers may contribute to inactivity, such as a lack of women-only facilities, sedentary lifestyles among the elderly and perceptions about formal vigorous activity not being important (32).

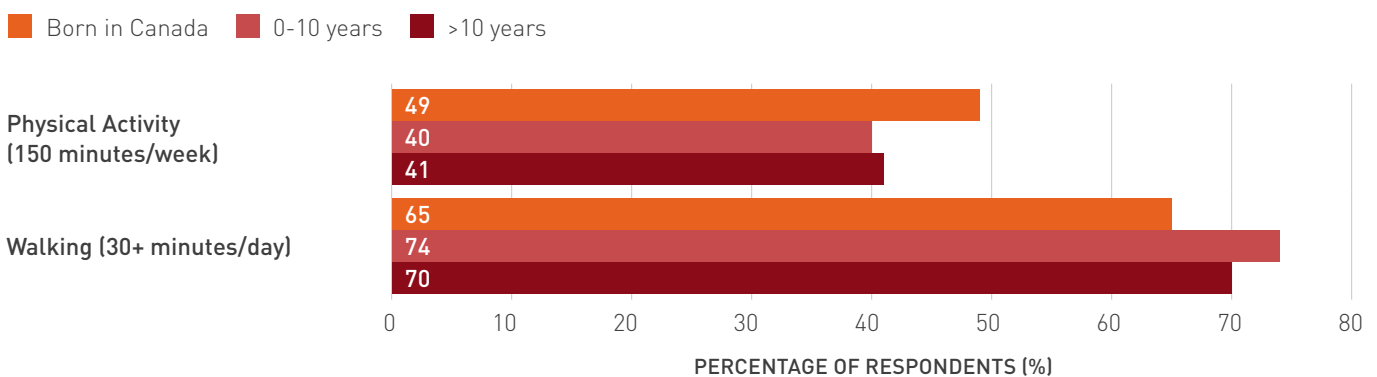
² All inter-jurisdictional comparisons presented in this report should be interpreted with caution due to considerable variations in how measures are collected and reported, and because South Asian populations in other areas may differ with respect to various demographic and socioeconomic factors.

Deeper insight into South Asians' activity levels may be gained by examining walking behaviours, since walking is more social and has fewer physical and cultural barriers than moderate physical activities, especially among women (33). A higher proportion of respondents reported walking at least 30 minutes per day, and there was no significant difference in the percentage of South Asians (70%) and the Fraser Health population (66%) (Figure 2.4). However, there were differences in walking behaviour within certain age and gender subgroups (Appendix B – See Table B.1). In particular, among individuals aged 40-64 years, a significantly higher percentage of South Asians reported walking (73%) compared to the Fraser Health population (63%). Similarly, a significantly higher percentage of

South Asian men reported walking (72%) compared to the Fraser Health population (65%). There were no significant differences between the women of the two populations. These findings suggest that walking could be a key focus area to reduce sedentary lifestyle among South Asians. It is low barrier, both culturally and physically, and may be easier to promote among older South Asians.

A higher proportion of South Asians born in Canada reported meeting recommendations for physical activity (49%) compared to South Asian immigrants in Fraser Health (Figure 2.5). However, walking 30 minutes or more daily was higher among immigrants compared to those born in Canada.

FIGURE 2.5: Physical Activity and walking behaviours among South Asians in Fraser Health by time in Canada

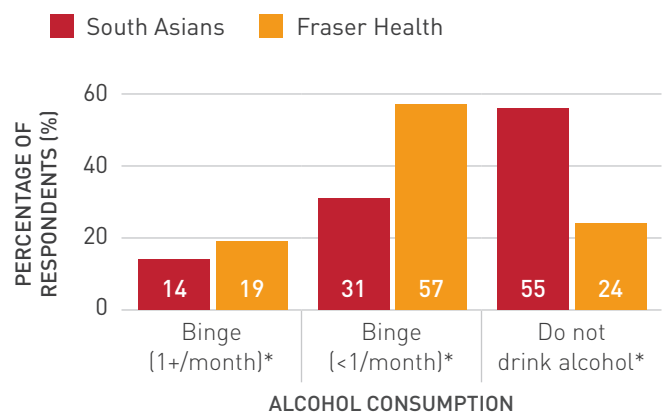


ALCOHOL CONSUMPTION

Harmful use of alcohol can lead to dependency, liver cirrhosis, various cancers and intentional and unintentional injuries (34). In particular, binge drinking patterns, defined for men as consuming five or more alcoholic drinks on one occasion and for women as four or more drinks, have been associated with poor health outcomes.

Based on the MHMC survey, a significantly smaller percentage of South Asians (14%) reported frequent binge drinking compared to the overall Fraser Health population (19%) in the previous 12 months (Figure 2.6).

FIGURE 2.6: Alcohol consumption in the past 12 months among the South Asian and Fraser Health populations



*Note: *Significantly different between South Asian and the overall Fraser Health population, p < 0.05*

Data Source: My Health My Community Survey (2013-14)

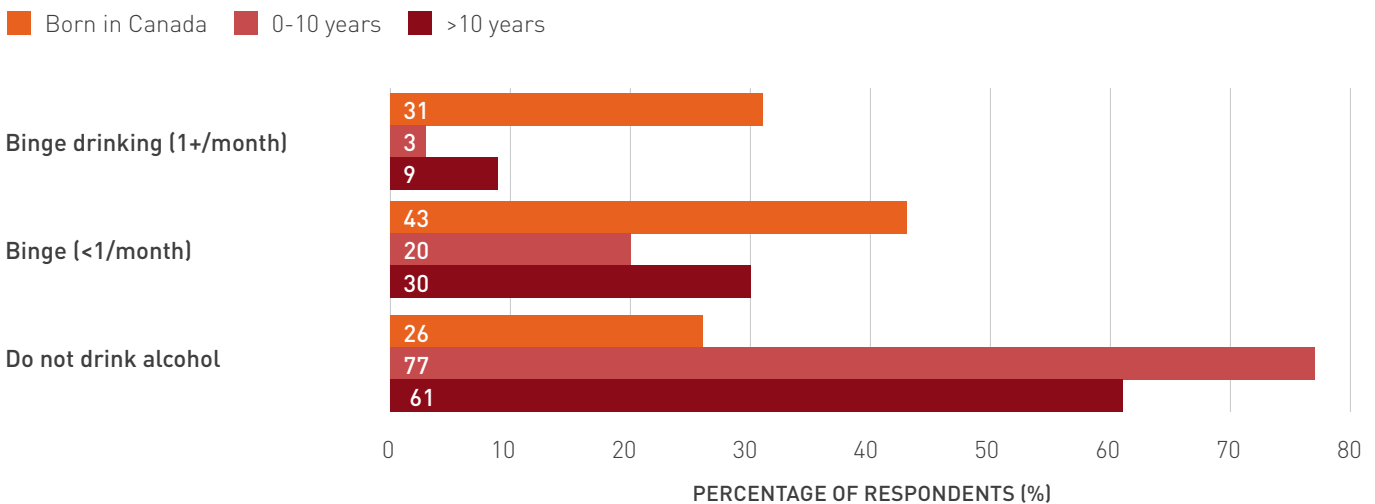
We found that more than half of South Asian respondents (55%) reported that they never drank alcohol, which was about twice the number of abstainers in the Fraser Health population (24%). These differences remained significant after adjusting for demographic and socioeconomic characteristics.

The prevalence of frequent binge drinking among South Asians in Fraser Health (14%) was similar to the rate reported by those residing in Peel Region in Ontario, Canada but differed from behaviours in South Asian countries like India (35). While direct comparisons on drinking behaviour across jurisdictions are difficult to make due to different measures of alcohol

consumption, a national household survey of drug use in India showed that current alcohol consumption ranges from 7% in some areas of the country to as high as 75% in others (36).

Among South Asians, a significantly higher percentage of those born in Canada reported binge drinking more than once per month (31%) compared to those that immigrated to Canada (12%) (Figure 2.7). This rate was also higher than the rate in the overall Fraser Health population (19%). The highest proportion of non-drinkers was among South Asian immigrants who had been living in Canada from 0 to 10 years (77%).

FIGURE 2.7: Alcohol consumption* among South Asians in Fraser Health by time in Canada



Note: *Significantly different among South Asians, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

SMOKING

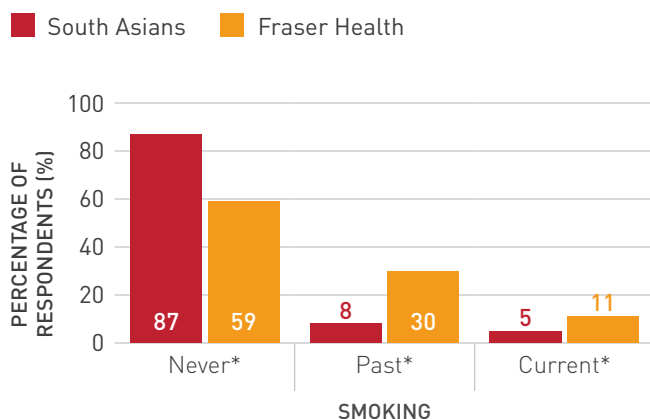
The many deleterious effects of smoking on health are well known; it is the leading preventable cause of death and is a key risk factor for cardiovascular diseases. According to Statistics Canada, in 2014 the smoking rate was 18% across Canada and 14% in British Columbia (37). Smoking is less frequently reported among immigrant South Asians compared to their

host populations (32). Among South Asians living in the UK and Canada, smoking behavior is generally low among men and very rare among women (38). Smoking rates among immigrant South Asians are also lower compared to their country of origin. For example, the current smoking rate among South Asians residing in Peel Region (8%) and Ontario overall (8%) is

considerably lower than rates reported in South Asian countries: 23% in India, 41% in Pakistan, 39% in Nepal and 40% in Bangladesh (35,39,40).

For this report, we defined current smokers as those who reported smoking cigarettes daily or occasionally, past smokers as those who reported no longer smoking cigarettes but used to smoke daily or occasionally, and non-smokers as those who reported never smoking cigarettes. Consistent with studies presented previously, a significantly lower percentage of South Asians reported being current smokers (5%) and past smokers (8%) compared to the Fraser Health population (11% and 30%, respectively) (Figure 2.8). These differences were significant after adjusting for demographic and socioeconomic characteristics.

FIGURE 2.8: Smoking behaviour in the past 12 months among the South Asian and Fraser Health populations



Note: *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

Smoking rates are very low among the South Asian population in Fraser Health. Only 5% of South Asians reported being current smokers, which was less than half the proportion in the overall Fraser Health population.

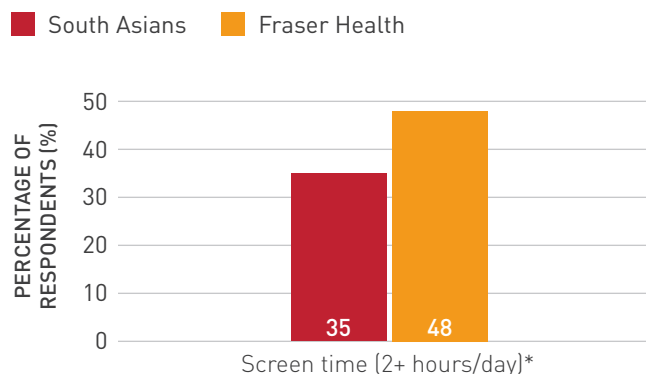
The number of smokers among South Asians was too small to study differences in smoking behaviour between those born in Canada and those that immigrated.

SCREEN TIME

With increasing use of electronic technology in our lives, screen time is a measure of sedentary lifestyle, which is independently associated with a range of physical health outcomes, such as obesity and type-2 diabetes, and overall contributes towards reduced health-related quality of life (41,42). A consensus statement by experts on obesity among Asian Indians has led to the recommendation that screen time should be less than 2 hours a day (43).

We defined excessive screen time as 2 or more hours per day spent watching television or videos, or playing video games on a computer or tablet, outside of work. In Fraser Health, a smaller percentage of South Asians (35%) reported excessive screen time compared to the Fraser Health population (48%) (Figure 2.9). This difference was significant after adjusting for demographic and socioeconomic characteristics. Similar trends were seen across all age and gender subgroups (Appendix B – See Table B.1).

FIGURE 2.9: Screen time behaviour among the South Asian and Fraser Health populations

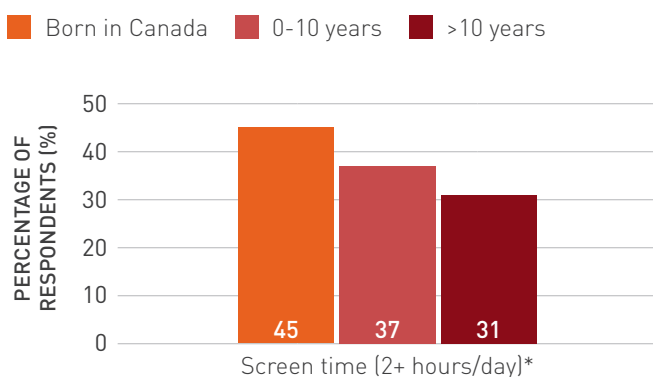


Note: *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

Among South Asians in Fraser Health, those born in Canada were more likely to report excessive screen time (45%) compared to immigrants: 37% among those who immigrated within 0-10 years, and 31% among those who immigrated to Canada over 10 years ago (Figure 2.10). Screen time reported among South Asians born in Canada was very similar to the overall Fraser Health population (48%).

FIGURE 2.10: Screen time among South Asians by time in Canada

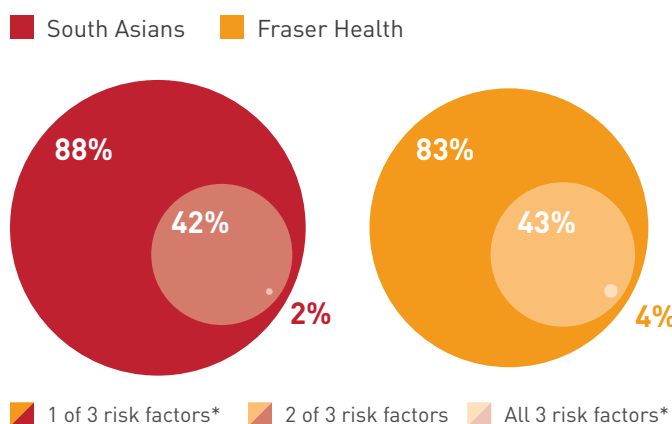


Note: Note: *Significantly different among South Asians, $p < 0.05$
Data Source: My Health My Community Survey (2013-14)

MULTIPLE RISK FACTORS

Risk factors often do not exist in isolation and having multiple risk factors may increase the risk of developing chronic diseases. We defined individuals at high risk of chronic disease as those who reported at least two of the following three behaviours: 1) not getting a minimum of 5 servings of fruits and vegetables per day, 2) being a current smoker and 3) not getting the recommended physical activity of 150 minutes or more per week. In Fraser Health, the percentage of the population having two of the three studied risk factors did not significantly differ between the South Asian and overall populations (42% and 43%, respectively) (Figure 2.11). However, half as many South Asian respondents reported having all three risk factors (2%) compared to the overall population (4%).

FIGURE 2.11: Multiple risk factors among the South Asian and Fraser Health populations



Note: Risk factors that were studied include: 1) not getting a minimum of 5 servings of fruits and vegetables/day, 2) being a current smoker and 3) not getting recommended moderate to vigorous physical activity of 150 minutes/week

Data Source: My Health My Community Survey (2013-14)

Both the South Asian and Fraser Health overall populations indicated cost and time as barriers to improving health. When asked if they were making any changes to improve their health, both population groups reported that they were trying to change their diet (24% South Asians and 19% Fraser Health population) and were consulting with a health professional to improve their health (19% South Asians and 27% Fraser Health population).

In summary, while smoking and overall alcohol intake is lower in the South Asian population, a significantly smaller proportion of South Asians eat the recommended 5 servings of fruits and vegetables per day compared to the overall Fraser Health population. Within the South Asian population in Fraser Health, a significantly higher proportion of Canadian-born South Asians report intake of fast food and sugary beverages, high screen time and binge drinking behaviour compared to those that immigrated to Canada. These results suggest that health promotion and primary prevention interventions should take into consideration differences in health behaviours between South Asians born in Canada and those who immigrated.

CHAPTER 3: HEALTH STATUS



KEY FINDINGS:

- South Asian seniors (65 years of age and over) were significantly less likely to report excellent or very good health and mental health compared to seniors in Fraser Health overall.
- Conventional Body Mass Index (BMI) categories for overweight and obese may underestimate chronic disease risk among South Asians.
- Fifty-eight percent of South Asians would be identified as obese by applying South Asian specific BMI cut-offs (≥ 25 kg/m²).
- The odds of reporting diabetes and heart disease were three and two times higher, respectively, among South Asians compared to the overall Fraser Health population.
- Thirteen percent of South Asians overall, and 46% of those 65 years of age and over, reported being diagnosed with two or more chronic diseases.

Research in Canada, the US, the UK and South Asian countries has shown that South Asians are particularly susceptible to diabetes and cardiovascular disease. Analysis of Canadian mortality data found that South Asian Canadians have higher rates of cardiovascular disease than Canadians of European or Chinese origin (44). South Asians in Canada have 2-3 times the rate of diabetes compared to the overall population (45,46). These findings can be explained by a number of factors including health behaviours, as discussed in Chapter 2, and genetic predisposition that may arise from South Asian ethnicity (21). In this chapter we examine the self-reported health status and chronic conditions among South Asians in comparison with the Fraser Health population.

SELF-RATED HEALTH, MENTAL HEALTH AND STRESS

SELF-RATED HEALTH

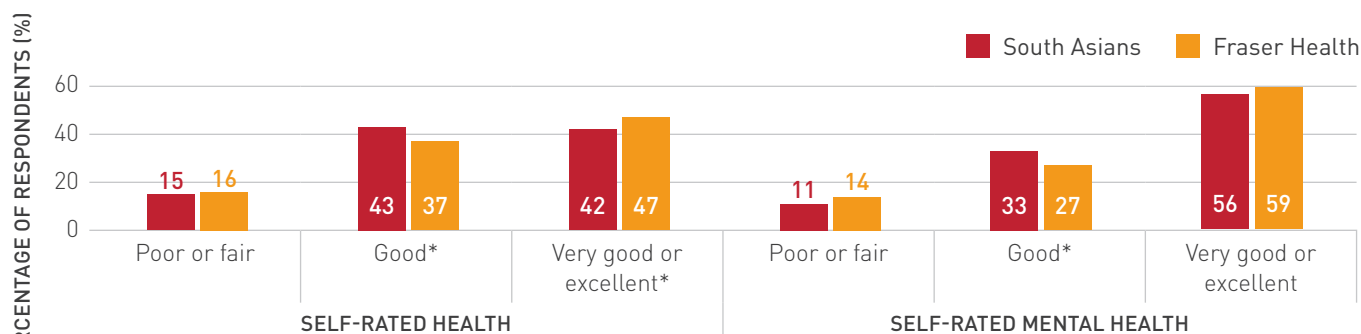
Self-rated health status is an indication of one's overall perception of their health. It has been shown to be a valid measure of individual health across various population subgroups (47). A study by Ahmed et al. (48) analyzed data from the National Health Survey

and found that 65% of respondents rated their health as fair or poor. In Canada, descriptive analysis of the Longitudinal Survey of Immigrants in Peel Region demonstrated that South Asian and East/Southeast Asian immigrants experience a significant decline in self-rated health between six months to four years after immigrating to Canada, compared to immigrants of other origins (35).

In Fraser Health, 42% of South Asians rated their health as 'very good' or 'excellent' compared to 47% of the Fraser Health population (Figure 3.1). Although this difference was significant in the crude comparison, after adjusting for demographic and socioeconomic variables these differences were not significant.

Variation within age groups suggests that as age increases, one's self-rated health decreases (Figure 3.2). Although this trend was observed in both the South Asian and overall Fraser Health populations, the decrease was larger among South Asians. Among those aged 65 years or over, significantly fewer South Asians (29%) rated their health as 'very good' or 'excellent' compared to the overall Fraser Health population (41%). Furthermore, a lower proportion

FIGURE 3.1: Self-rated health, mental health and stress among the South Asian and Fraser Health populations



Note: *Significantly different between the South Asian and Fraser Health populations, $p < 0.05$
 Data Source: My Health My Community Survey (2013-14)

of South Asian females rated their health as 'very good' or 'excellent' [42%] compared to females in the overall population [48%] [Appendix B – See Table B.2]. Differences between men in the two population groups were not significant.

SELF-RATED MENTAL HEALTH

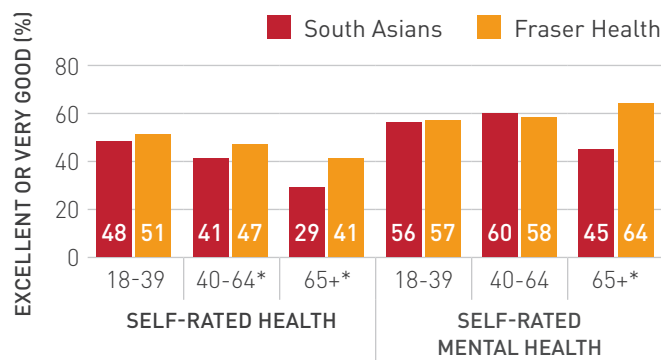
Self-rated mental health is a good indicator for monitoring general mental health [49]. Although there is limited research on self-rated mental health among South Asians in other Canadian and international jurisdictions, a report from Toronto found that there were no differences between racialized groups, such as South Asians, and non-racialized groups on self-rated mental health [50].

Within Fraser Health, the percentage of the population that self-rated their mental health as 'very good' or 'excellent' was also similar among South Asians (56%) and the overall population (59%), even after adjusting for demographic and socioeconomic factors (Figure 3.1).

Self-rated mental health appeared to correlate less with age than self-rated general health; however, there were some important differences between South Asians and Fraser Health overall in the older population. Among people aged 65 and older there was a significant gap between the percentage of South Asians who reported 'very good' or 'excellent' mental health (45%) compared to Fraser Health overall (64%) (Figure 3.2). Poorer self-rated mental health among

elderly South Asians could be due in part to the high prevalence of chronic conditions, limited English language skills, and a lack of culturally sensitive mental health services available [51].

FIGURE 3.2: Self-rated excellent or very good health and mental health, by age, among the South Asian and Fraser Health populations



Note: *Crude differences were significantly different between the South Asian and Fraser Health populations, $p < 0.05$
 Data Source: My Health My Community Survey (2013-14)

South Asian seniors, aged 65 year or more, were significantly less likely to report excellent or very good health and mental health compared to overall Fraser Health seniors.

STRESS

Psychological stress is an important risk factor for cardiovascular disease (52,53). Survey respondents were classified as experiencing 'high stress' if they rated their life as 'quite stressful' or 'extremely stressful'. Our results showed that there were no significant differences in self-reported high stress between South Asians (18%) and the Fraser Health population (19%). Among South Asians who reported experiencing high stress, 24% indicated that a lack of time contributed to their stress, and 13% reported that a work or school situation contributed to stress. Similar reasons were reported by the Fraser Health population, where 31% reported lack of time and 13% reported a work or school situation as contributing to stress.

OBESITY

Obesity is a key risk factor for several health conditions, including high blood pressure, heart disease and diabetes (54). Approximately, half of adult Canadians and British Columbians are overweight or obese (55). Body Mass Index (BMI), an index of weight-for-height, and Waist Circumference (WC) are clinical tools used to assess body fat composition to identify those at higher risk for disease (56). Conventional BMI cut-offs classify BMI of <18.5 kg/m² as underweight, 18.5-24.9 kg/m² as normal weight, 25.0-29.9 kg/m² as overweight and ≥30 kg/m² as obese (57). However, evidence suggests that these BMI ranges underestimate risks associated with obesity among South Asians (Box 1).

BOX 1: South Asian specific Body Mass Index classifications

Several studies from South Asia, UK and Canada have found that South Asians are at greater risk for a number of chronic conditions even at a lower Body Mass Index (BMI) than outlined by the conventional BMI cut-offs. A study by Misra et al. (58) used clinical and biochemical data from previous cross-sectional epidemiological studies and found that a lower BMI cut-off (>23 kg/m²) was a better predictor of metabolic syndrome among Asian Indians compared to conventional cut-offs (>30 kg/m²). In Canada, Razak et al. (59) found that South Asians with a BMI of 21.0 kg/m² have the same level of glycaemic dysregulation as Caucasians with a BMI of 30 kg/m²; in the UK, Kumar et al. (60) found that South Asians with a BMI of 22.5 kg/m² had the same lipid abnormality levels as Caucasians with a BMI of 30 kg/m². They (60) also showed that for a given BMI, South Asians carry more fat with an elevated waist circumference and higher hepatic fat content than people of European origin.

In British Columbia, a cross-sectional study by Lear et al. (56) found that on average, for a given BMI, South Asians have 3.9% more body fat compared to individuals of European descent.

Furthermore, in Ontario, a study using longitudinal data by Chiu et al. (39) found that the rate of diabetes was equivalent among South Asian subjects with a BMI of 24 kg/m², compared to Caucasian subjects with a BMI of 30 kg/m².

Based on the results from these studies and others, a consensus statement was developed, which is being implemented in India, by clinical and research experts for diagnosing obesity, abdominal obesity, and metabolic syndrome among Asian Indians (43). They suggested using both BMI and waist circumference for diagnosing obesity, with the following revised BMI ranges specific for Asian Indians:

BMI CLASSIFICATION	REVISED CUT-OFFS FOR ASIAN INDIANS	CONVENTIONAL CUT-OFFS
UNDERWEIGHT	<18.0 kg/m ²	<18.5 kg/m ²
HEALTHY WEIGHT	18.0-22.9 kg/m ²	18.5-24.9 kg/m ²
OVERWEIGHT	23.0-24.9 kg/m ²	25.0-29.9 kg/m ²
OBESE	≥25 kg/m ²	≥30 kg/m ²

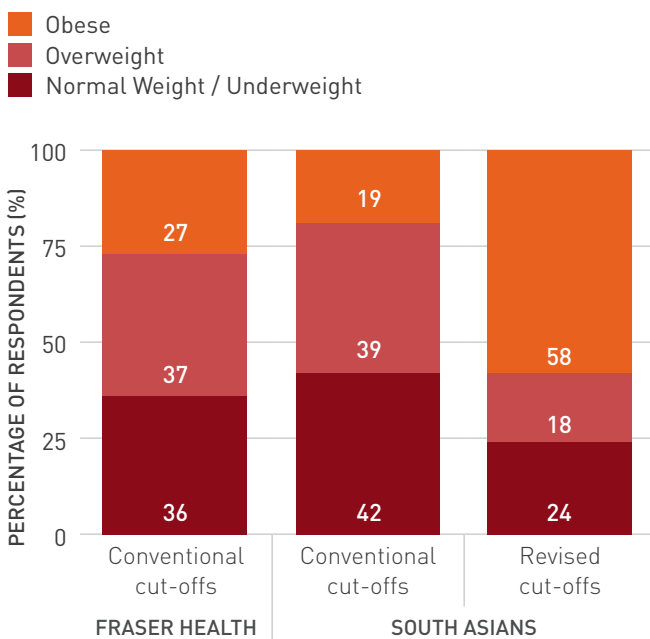
In the MHMC survey, BMI was calculated using self-reported height and weight, and adjusted for reporting bias³; survey respondents were not asked to report waist circumference. We examined overweight and obesity among South Asians using both the conventional BMI cut-offs, and compared to those recommended in the consensus statement for Asian Indians presented in Box 1.

When a conventional BMI cut-off was used, 19% of South Asians and 27% of the Fraser Health population were classified as obese (BMI of ≥ 30 kg/m²) (Figure 3.3). Using the revised obesity cut-off proposed in the consensus statement (≥ 25 kg/m²), over half (58%) of South Asians in Fraser Health were identified as obese. This demonstrates that conventional BMI cut-offs may

underestimate the prevalence of South Asians who are obese and at higher risk of chronic diseases by as much as 39 percentage points. Overweight and obese are used to identify those at higher risk of chronic diseases such as diabetes and heart disease, and individual South Asian patients with a lower BMI may be at higher risk for chronic diseases than expected.

In Fraser Health, 58% of South Asians had a BMI ≥ 25 kg/m². A significantly lower percentage of South Asians aged 18-39 (47%) had a BMI ≥ 25 kg/m² compared to the overall Fraser Health population (53%) in this age group, and there were no significant differences in the older age groups (Figure 3.4). Proportionately fewer South Asians with lower educational attainment had a BMI ≥ 25 kg/m² compared to South Asians with higher education. Among South Asians, 56% with high school or less education had a BMI ≥ 25 kg/m², compared to 64% with this level of education in Fraser Health overall; and 59% of South Asians with a diploma had a BMI ≥ 25 kg/m², compared to 69% with a diploma in Fraser Health overall. There was no significant difference in the reported prevalence of BMI ≥ 25 kg/m² between the population groups with university degrees.

FIGURE 3.3: Body Mass Index (BMI) distribution among the South Asian and Fraser Health populations

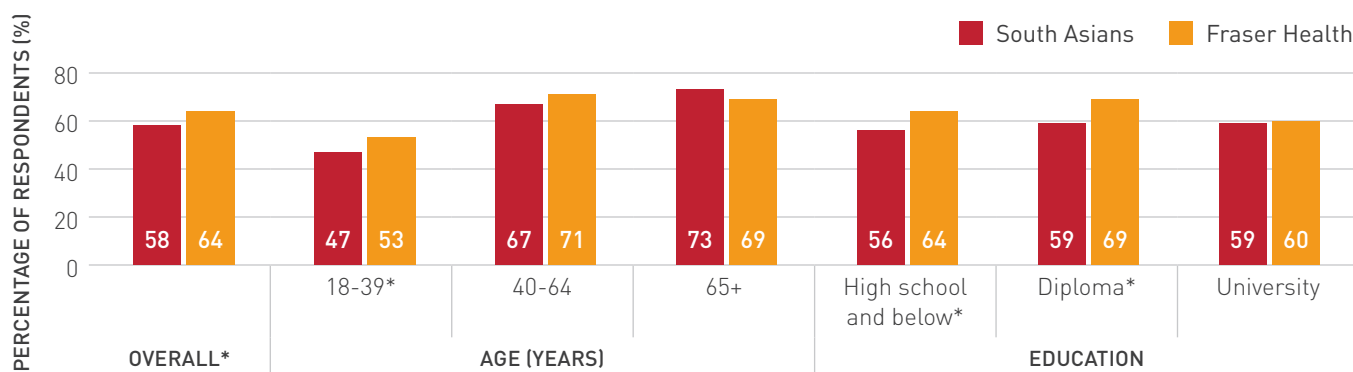


Note: The differences in conventional BMI cut-offs were significantly different between the South Asian and Fraser Health populations, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

³ Reporting bias can be expected in self-reported data where respondents may over-report their height and under-report their weight. Detailed information on the formula used to account for reporting bias can be found in MHMC technical notes (https://www.myhealthmycommunity.org/Portals/0/Documents/Technical%20Notes%20for%20Profiles_Final.pdf)

FIGURE 3.4: Body Mass Index ≥ 25 kg/m² among the South Asian and Fraser Health populations



Note: *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

While there is research evidence supporting the need for revised BMI cut-offs for South Asians—as well as other ethnic groups such as East Asians— validation of revised cut-offs and long-term population level studies are necessary to determine potential public health impact. Additionally, national and international networks/organizations involved in evidence assessment and clinical guideline development should further explore the potential benefits of ethnicity-specific BMIs.

CHRONIC DISEASES

Chronic diseases are by far the leading cause of morbidity and mortality in Canada and around the world. In 2005/2006, over a third of British Columbians accessing health services had one or more chronic conditions (61). Across twelve hospitals in the Fraser Health region, one in five patients are hospitalized with three chronic diseases alone – diabetes, chronic obstructive pulmonary disease, and heart disease.

In addition to reducing quality of life, chronic diseases are a major burden in terms of direct costs to the health care system (acute and hospital care, primary care, Pharmacare) and indirect societal costs (e.g., premature death, personal loss of income, disability). Those with chronic conditions comprise around a third of people accessing services in BC but account for around 80% of combined health care costs (61). In this section we look at how South Asians compare to the overall Fraser Health population with respect to chronic conditions.

DIABETES

Diabetes is an important health issue facing the South Asian population, and particularly those that live in Western countries. For instance, estimates of the prevalence of diabetes in Peel Region (15%), Ontario (12%) and the US (17%) were considerably higher compared to the prevalence reported in some South Asian countries (9% in India, 8% in Pakistan and 5% in Nepal) (35,39,40,43).

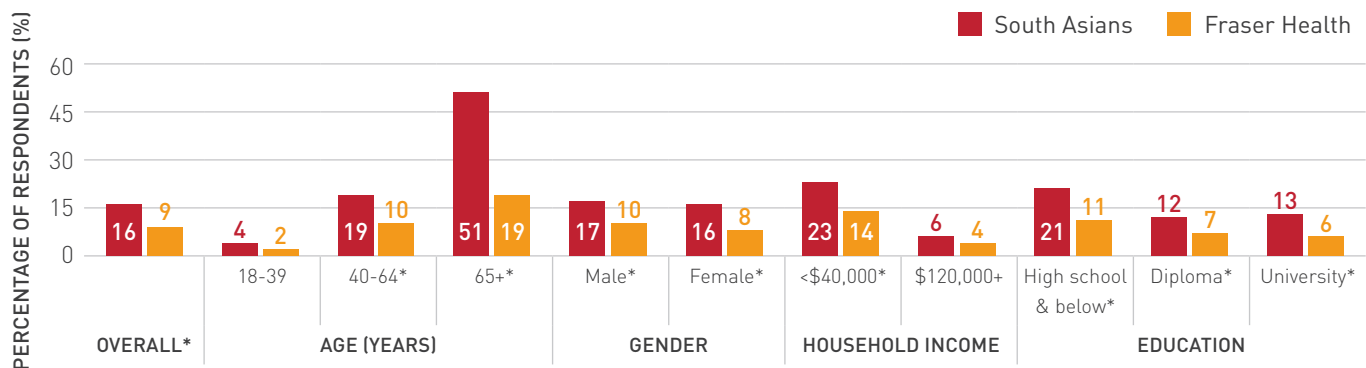
The worldwide prevalence of type-2 diabetes has doubled over the past 25 years and South Asians are at particularly high risk of developing the disease (62). Among South Asians, insulin resistance has been suggested as a central feature of the metabolic syndrome contributing to development of type-2 diabetes (63). Due to genetics, South Asians have a higher tendency to have intra-abdominal fat deposits, which account for high insulin resistance. Furthermore, this high body fat content may be undiagnosed with conventional BMI cut-offs, as cited previously (64). In addition to higher prevalence, a study done in British Columbia found that South Asians developed diabetes at a much younger age (65).

Among MHMC respondents in Fraser Health, the self-reported diagnosis of diabetes was about two times higher among South Asians (16%) compared to the Fraser Health population (9%). These trends were observed across gender, income and education categories (Figure 3.5). Among South Asians who are

65 years of age and over, more than half reported a diagnosis of diabetes. After adjusting for demographic and socioeconomic factors, we found that the odds of self-reported diabetes among South Asians in Fraser Health were 3 times higher (Odds Ratio = 2.8, 95% Confidence Interval = 2.0, 3.9) than those who were not South Asians.

After adjusting for demographic and socioeconomic factors, South Asians had three times higher odds of reporting a diagnosis of diabetes compared to the overall Fraser Health population.

FIGURE 3.5: Self-reported diagnosis of diabetes among the South Asian and Fraser Health populations



Note: *Significantly different between the South Asian and Fraser Health populations, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

HIGH BLOOD PRESSURE

High blood pressure or hypertension is a key risk factor for heart disease and stroke (66). A study by the Heart and Stroke Foundation found that South Asians in Ontario were three times more likely to have hypertension than the general population and were more likely to develop it at a younger age (67). Results from the MHMC survey suggest that there were no significant differences between the self-reported diagnosis of high blood pressure between South Asians and the Fraser Health population, which were both 19%. These results remained similar after adjusting for demographic and socioeconomic factors.

Estimates of the prevalence of high blood pressure among South Asians is similar across a number of jurisdictions in Canada; including Fraser Health (19%), Peel Region (16%) and Ontario (17%) (35,39). It is also similar in a number of South Asian countries, including Sri Lanka (17%) and Pakistan (23%) (68).

HEART DISEASE

There is extensive research evidence on high rates of heart disease among South Asians. A cross-sectional study on cancer and cardiovascular mortality among Canadians showed that death from ischemic heart disease is higher among South Asians compared to those of Chinese and European backgrounds (44). Additionally, South Asian Canadians have higher rates of atherosclerosis and cardiovascular disease than European Canadians (38).

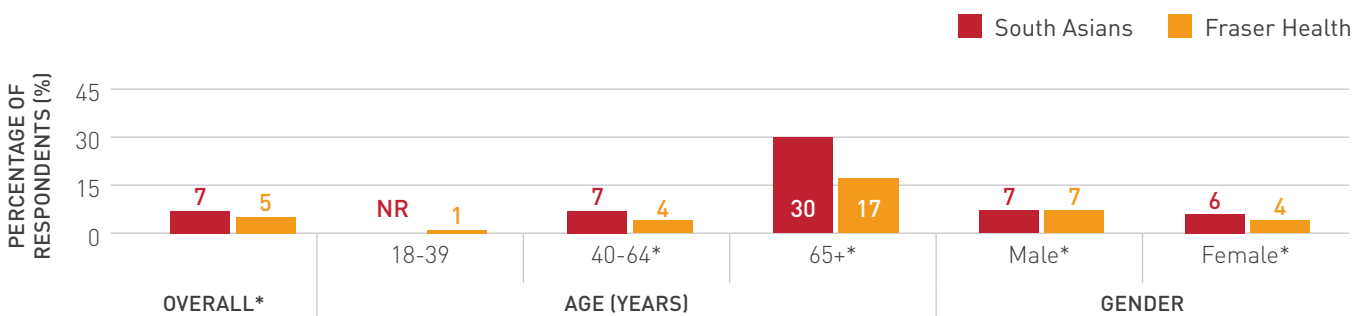
Crude differences in the self-reported diagnosis of heart disease were significantly higher among South Asians (7%) compared to the overall Fraser Health population (5%) and remained significant after adjusting for various demographic and socioeconomic factors (Figure 3.6). The adjusted odds of reporting a diagnosis of heart disease among South Asians in Fraser Health were 2 times higher (Odds ratio = 2.0, 95% Confidence interval= 1.2, 3.2) than those who were

not South Asians. A slightly higher percentage of South Asians in Fraser Health reported being diagnosed with heart disease (7%) compared to those in Ontario (5%) (39).

The crude and unadjusted difference in heart disease prevalence among South Asians and Fraser Health overall increased significantly with age; South Asian seniors aged 65 years or more were significantly more

likely to report being diagnosed with heart disease (30%), compared to overall Fraser Health seniors (17%). Variation by gender showed that there were no differences among males but a significantly higher percentage of South Asian females (6%) reported a diagnosis of heart disease compared to females in the overall Fraser Health population (4%). No significant differences were observed between the two populations when stratified by education or income.

FIGURE 3.6: Self-reported diagnosis of heart disease among the South Asian and Fraser Health populations



Note:

1) *Significantly different between the South Asian and Fraser Health populations, $p < 0.05$

2) NR, Numbers too small to report

Data Source: My Health My Community Survey (2013-14)

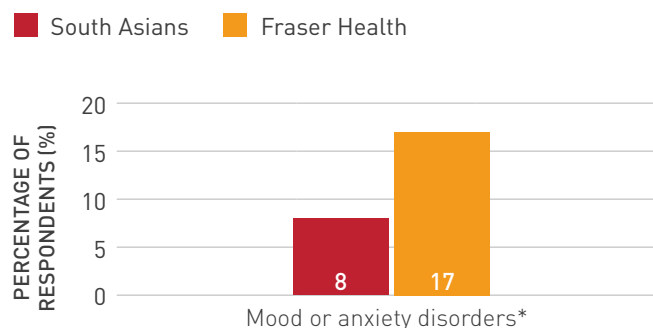
MOOD AND ANXIETY DISORDERS

Culture plays an important role in how mental disorders are manifested, diagnosed and treated. The stigma associated with mental illness may prevent South Asians from seeking treatment, and when they do seek treatment, South Asians often report psychological distress as physical symptoms, so mental disorders may be inappropriately diagnosed (69-71).

Compared to the Fraser Health population overall (17%), a significantly lower proportion of South Asians reported being diagnosed with mood and anxiety disorders (8%) (Figure 3.7). Furthermore, significantly fewer South Asians reported being diagnosed with

mood and anxiety disorders across a range of demographic and socioeconomic characteristics, including age, gender, income and education. This contrasts to the trends in self-reported mental health, where a similar proportion of South Asians and Fraser Health overall rated their mental health as 'poor' or 'fair' (11% and 14%, respectively) (Figure 3.1). In addition to cultural differences, some of these differences may be related to the 'healthy immigrant effect' (see Chapter 1).

FIGURE 3.7: Self-reported diagnosis of mood and anxiety disorders among the South Asian and Fraser Health populations



Note: *Significantly different between the South Asian and Fraser Health populations, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

OTHER CHRONIC CONDITIONS

Chronic breathing conditions: In the MHMC survey, respondents selected chronic breathing conditions if they were diagnosed with any respiratory disease, such as asthma, chronic obstructive pulmonary disease (COPD), chronic bronchitis, emphysema or others. Significantly fewer South Asians (4%) reported being diagnosed with a chronic breathing condition compared to the Fraser Health population (7%).

Arthritis: Arthritis is a less common condition among South Asians, particularly among women (72). In our surveyed sample, a significantly lower percentage of South Asians (8%) reported being diagnosed with arthritis compared to the Fraser Health population (14%).

There was no difference in reported diagnosis of arthritis between South Asians and Fraser Health overall in the youngest (18-39) and oldest (65+) age groups; however, in those aged 40-64 years, significantly fewer South Asians (9%) reported being diagnosed with arthritis compared to Fraser Health overall (15%). With respect to gender, higher rates of arthritis were reported among females compared to

males in both the South Asian population (10% and 6%, respectively) and Fraser Health overall (17% and 10%, respectively). The differences by gender between South Asians and Fraser Health overall were significant and larger among females.

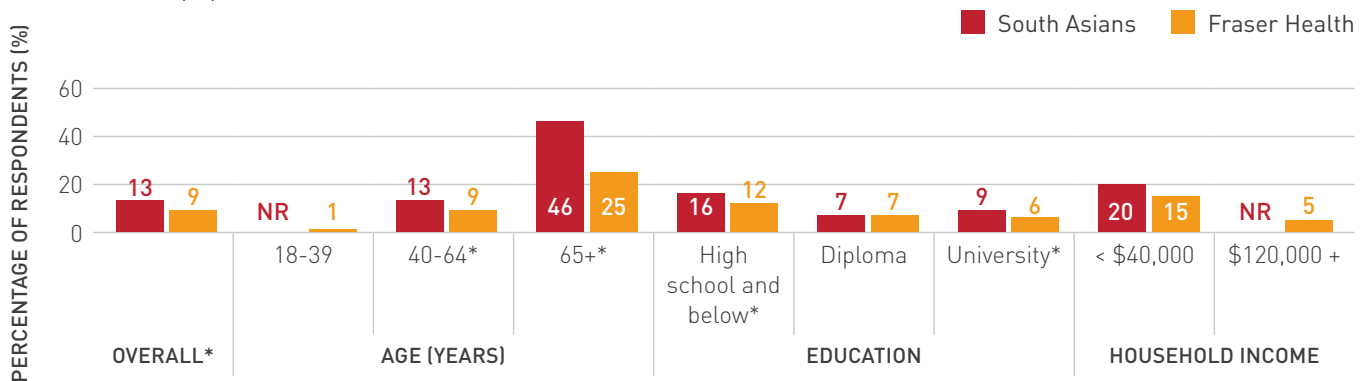
Cancers: We did not analyse the prevalence of cancer among South Asians in this report. Cancer incidence is relatively low in Fraser Health, resulting in too few responses from those reporting a diagnosis of cancer in the MHMC survey to analyse by ethnicity.

MULTIPLE CHRONIC DISEASES

Due to common risk factors, chronic conditions often exist in combination. Multiple chronic conditions can be a major challenge for an individual’s health, and are a major burden on primary and acute care resources. We defined multiple chronic diseases as self-reported diagnosis of two or more of the following conditions: diabetes, high blood pressure, heart disease, breathing disorder and stroke.

Results from the MHMC survey showed that a significantly higher percentage of South Asians (13%) reported having two or more chronic diseases compared to the Fraser Health population (9%) (Figure 3.8). A significantly higher percentage of South Asians reported having multiple chronic diseases compared to the Fraser Health population overall among those 40-64 years of age (13% and 9%, respectively) and 65 years of age and older (46% and 25%, respectively). Although there were no significant differences between the population groups by income, the percentage of those with multiple chronic diseases is generally higher among those with less education.

FIGURE 3.8: Self-reported diagnosis of two or more chronic diseases among the South Asian and Fraser Health populations



Notes:

- 1) *Significantly different between the South Asian and Fraser Health populations, $p < 0.05$
 - 2) NR, numbers too small to report
 - 3) Multiple chronic diseases include diabetes, high blood pressure, heart disease, breathing disorder and stroke
- Data Source: My Health My Community Survey (2013-14)

Among those aged 65 and over, 46% of South Asians reported having two or more chronic diseases compared to 25% of in the Fraser Health population overall.

In summary, a higher proportion of South Asians had diabetes, heart disease and multiple chronic conditions. Chronic conditions, particularly diabetes and heart diseases, occur at a younger age among South Asians, which may mean that South Asians have comparatively fewer healthy life years and more interactions with the health care system at a younger age. This also suggests that our South Asian population would require relatively more complex primary and acute care. The reasons behind the higher prevalence of diabetes and heart disease among South Asians are complex; and likely due to a number of factors including a combination of genetics, health behaviours, culture, and social and economic status.

CHAPTER 4: BUILT ENVIRONMENT AND COMMUNITY RESILIENCY



KEY FINDINGS:

- Neighborhoods with a high density of South Asians were less likely to be classified as 'Very walkable' or 'Walkers paradise' using Walk Score®.
- South Asians who reported that their neighborhood had a large selection of fruits and vegetables were two times more likely to eat 5+ servings of fruits and vegetables.
- South Asians and the overall Fraser Health population are more likely to report meeting physical activity recommendations when they feel safe walking in their neighbourhood after dark and have access to natural sites.
- A significantly higher percentage of South Asians (65%) reported having a strong sense of community belonging compared to Fraser Health overall (56%); sense of community belonging increases with positive perceptions of the physical features of a neighbourhood.

BUILT ENVIRONMENT

Our health is influenced by where we live, work and play. Built environment is the part of a physical environment made by people for people (73). Design of a neighbourhood shapes mental and physical health and chronic disease outcomes by influencing community connectedness and health behaviours such as diet and physical activity (74). According to the Provincial Health Services Authority (75), a healthy built environment includes:

- 1) **Healthy neighborhood design** that allows people to easily connect with each other and with a variety of day-to-day services.
- 2) **Healthy housing** that is affordable, accessible, free of hazards and enables people to engage in activities of daily living.
- 3) **Healthy transportation networks** with safe and accessible transportation systems that incorporate a diversity of transportation modes and place priority on active transport such as walking and biking.

- 4) **Healthy natural environments** that are experienced by and accessible to all, where parks and trails are protected and natural elements are incorporated.
- 5) **Healthy food systems** that support access to and availability of healthy foods for all.

These elements are key to enabling health. For example, initiatives that promote physical activity and healthy eating will not be as effective if people do not feel safe walking alone in their neighbourhood or have safe places to be active, or if high housing costs limit available funds to purchase healthy foods (76).

We studied the geographical distribution of South Asians in Fraser Health (Figure 1.1) and perceptions of the local built environment (Box 2) among South Asians and the Fraser Health population, using data collected through the MHMC survey. These analyses were supplemented with Walk Score® data (Walkscore.com) for each survey respondent, which is a composite score based on proximity to amenities within a neighborhood (77).

BOX 2: Perceptions of local built environment characteristics assessed in the MHMC survey

Perceptions of various neighbourhood features characterizing a healthy built environment were assessed in the My Health My Community survey. Participants responded on a five point scale from strongly disagree to strongly agree for the following neighbourhood features:

- Many *amenities* such as shops, restaurants, services and facilities within easy walking or cycling distance from home.
- *Sidewalks* that are well maintained (paved, with few cracks) and not obstructed.
- *Pathways, special lanes*, separate paths or trails, or shared paths for cyclists and pedestrians in or near ones neighborhood.
- *Feeling safe* walking alone in neighborhood in the dark.
- High *traffic volumes* making it difficult or unpleasant to walk in neighborhood.
- Large *selection of fruits and vegetables* available in the neighbourhood.
- Many *attractive natural sites* such as landscaping, views or parks in the neighbourhood.
- Seeing lots of *people biking and walking* in the neighborhood.

PERCEPTIONS OF BUILT ENVIRONMENT

There is very little research into the relationship between built environment and health among specific ethnic groups in the North American context. We explored this relationship by looking at differences between South Asians and the Fraser Health population with regards to:

- 1) perceptions of healthy built environment characteristics, and
- 2) the relationship between built environment perceptions and health behaviours.

To enable comparisons between the South Asian and Fraser Health populations on built environment characteristics, we examined the relationships within small geographic areas. These geographic areas were categorized as having a high density ($\geq 15\%$ of population) of South Asians or a low density ($< 15\%$ of population) of South Asians, in order to further explore this relationship. Although this approach has limitations, it can be useful for understanding if being South Asian accounts for differences in the impact of built environment on health.

In Fraser Health, a significantly higher proportion of South Asian respondents (64%) in the MHMC survey lived in areas with a high-density of South Asians. Using Walk Score[®], we found that neighbourhoods with a high density of South Asians were less walkable; only 10% of neighborhoods with a high density of South Asians were classified as 'Very walkable' or 'Walkers paradise' compared to 28% of neighbourhoods with a low density of South Asians.

Using Walk Score[®], 10% of neighborhoods with a high density of South Asians were classified as 'Very walkable' or 'Walkers paradise' compared to 28% of neighbourhoods with a low density of South Asians.

There were some significant differences in perceptions of built environment characteristics between South Asians and the Fraser Health population (Table 4.1). In neighbourhoods with a high density of South Asians, a significantly higher proportion of South Asians (49%) reported feeling safe walking alone in the

neighbourhood in the dark, compared to the overall population living in these neighbourhoods (43%). In contrast, in neighbourhoods with a low density of South Asians, a lower proportion of South Asians (46%) reported feeling safe walking alone in the dark compared to the overall population (55%) in the area.

TABLE 4.1: Perceptions of neighborhood built environment characteristics among the South Asian and Fraser Health populations, by density of South Asians in the neighborhood

NEIGHBOURHOOD BUILT ENVIRONMENT CHARACTERISTICS	HIGH SOUTH ASIAN DENSITY NEIGHBORHOODS		LOW SOUTH ASIAN DENSITY NEIGHBORHOODS	
	SOUTH ASIANS (% AGREE)	OVERALL (% AGREE)	SOUTH ASIANS (% AGREE)	OVERALL (% AGREE)
Amenities within walking/cycling distance	58	58	60	62
Sidewalks well maintained	70	69	73	74
Pathways there for walking/cycling	64	61	56*	63*
Feel safe walking after dark	49*	43*	46*	55*
High traffic makes walking/cycling unpleasant (% disagree)	30	30	22	25
Large fruit and vegetable selection available	63*	67*	70	70
Natural sites available	58*	62*	71	76
See people biking and walking	56	57	57	67

*Note: *Significantly different between South Asian and the overall population of the area, p <0.05*
Data Source: My Health My Community Survey (2013-14)

Furthermore, in neighbourhoods with a high density of South Asians, a significantly lower proportion of South Asians felt that there was an adequate selection of fruits and vegetables (63%) and that there were attractive natural sites in the neighbourhood (58%), compared to the overall population in those neighbourhoods (67% and 62%, respectively). Among neighbourhoods with a low density of South Asians, significantly fewer South Asians felt that there were adequate pathways, special lanes, and shared paths for cyclists (56%), compared to the overall population in those neighbourhoods (63%). In both high and low South Asian density neighborhoods, the perceptions

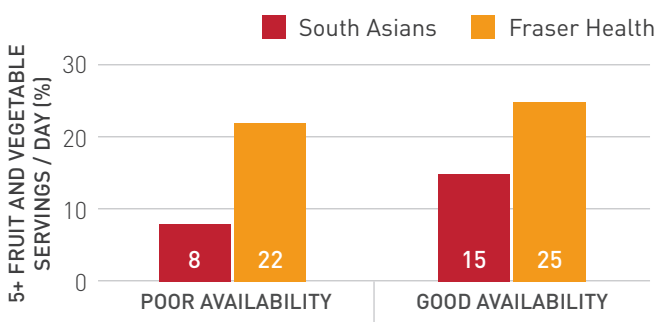
of sidewalks, availability of amenities, high traffic and people biking and walking in one’s neighborhood did not differ significantly.

BUILT ENVIRONMENT AND DIET

The growing obesity epidemic has led many researchers to investigate factors that influence access to healthy foods. For instance, a US study found that individuals living in the worst-ranked food environments, based on density of supermarkets and perceptions of access to healthy food, were 22-35% less likely to have a healthy diet than those in the best-ranked food environments (78).

In Chapter 2, which examined trends in health behaviours, we reported that, compared to the Fraser Health population overall, a significantly lower proportion of South Asians reported consuming five or more fruits and vegetables per day across all demographic and socioeconomic subgroups. Among South Asians, the percentage of individuals who reported meeting the daily recommendation for fruit and vegetable consumption was almost two times higher among those who reported that their neighborhood had a large selection of fruits and vegetables (15%) compared to those who did not (8%); this difference was negligible in the Fraser Health population (Figure 4.1). Hence, efforts to improve local availability and selection of fruits and vegetables have the potential to impact healthier eating patterns in the South Asian population.

FIGURE 4.1: Fruit and vegetable consumption by perceived availability of fruits and vegetables in the neighborhood among the South Asian and Fraser Health populations



Note:

- 1) Note: The differences in fruit and vegetable consumption were significantly different within the South Asian and overall Fraser Health population by availability of fruits and vegetables in the neighborhood (i.e. South Asians were not compared with the overall Fraser Health population), $p < 0.05$
- 2) Poor availability: 'Strongly disagree', 'Disagree' or 'Neutral' response to the statement, "A large selection of fruits and vegetables is available in my neighborhood"
- 3) Good availability: 'Strongly Agree' or 'Agree' response to the statement, "A large selection of fruits and vegetables is available in my neighborhood"

Data Source: My Health My Community Survey (2013-14)

South Asians were almost two times more likely to meet the daily recommendation for fruit and vegetable consumption when they reported that their neighborhood had a large selection of fruits and vegetables.

BUILT ENVIRONMENT AND PHYSICAL ACTIVITY

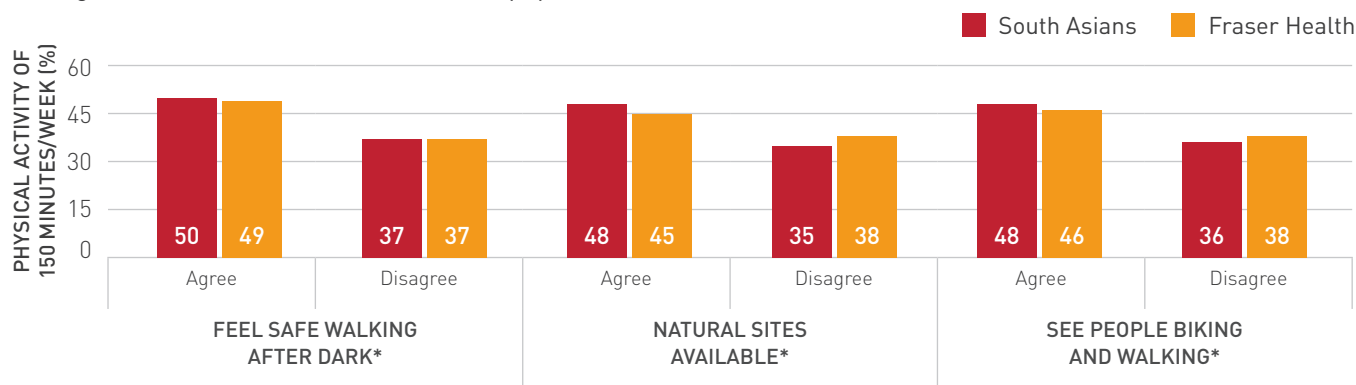
Healthy built environments, including both residential and formal activity spaces and the connections between these spheres, can also play a role in promoting physical activity (79). For example, the presence and condition of sidewalks, trails and pathways has been found to positively impact walking and physical activity (80,81). There is also some evidence that the environmental factors associated with physical activity, particularly among women, may differ across racial or ethnic groups (82).

Overall in Fraser Health, people were more likely to be physically active when they perceived certain positive characteristics of the built environment. In particular, a significantly higher proportion of the population, regardless of ethnicity, met the physical activity recommendation of moderate to vigorous exercise for at least 150 minutes per week among those who 'agreed' or 'strongly agreed' that

- (i) they felt safe walking in the neighbourhood after dark,
- (ii) there are attractive natural sites in the neighbourhood, and
- (iii) other people are biking and walking in their neighbourhood.

The absolute differences between South Asians and the Fraser Health population across built environment characteristics were small (Figure 4.2). Note that this measure refers to recreational physical activity and does not include activities such as cycling to work.

FIGURE 4.2: Physical activity by reported perception of select built environment characteristics among the South Asian and Fraser Health populations



Note:

1) Note: The differences in physical activity were significantly different within the South Asian and overall Fraser Health population by select built environment characteristics (i.e. South Asians were not compared with the overall Fraser Health population), $p < 0.05$

2) Agree: 'Strongly Agree' or 'Agree' response to availability of select built environment characteristics

3) Disagree: 'Strongly disagree', 'Disagree' or 'Neutral' response to availability of select built environment characteristics

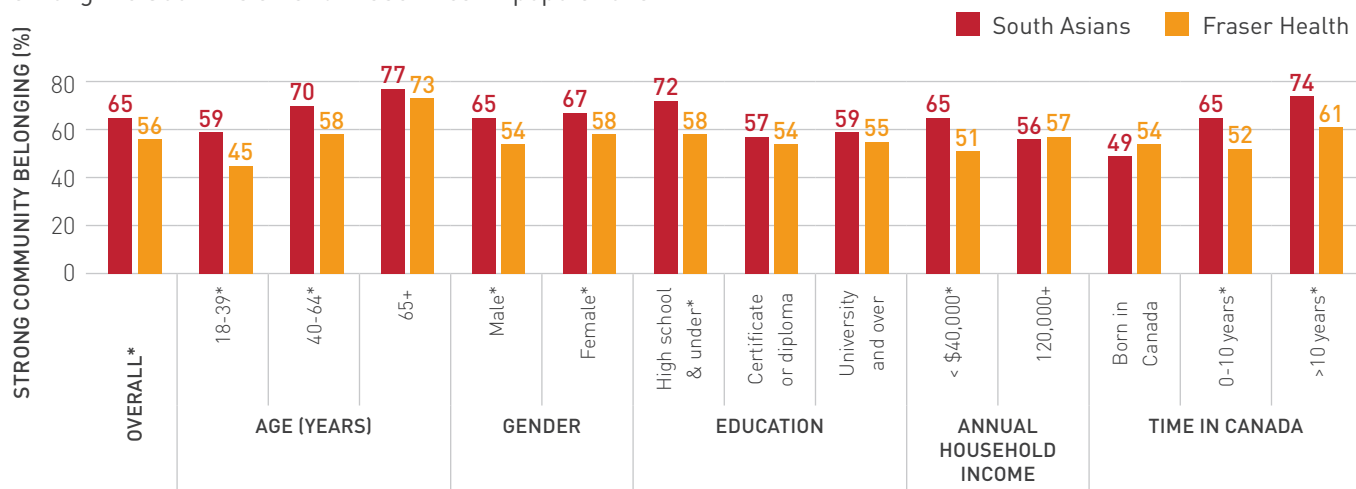
Data Source: My Health My Community Survey (2013-14)

COMMUNITY BELONGING

Social capital is defined as “links, shared values and understandings in society that enable individuals and groups to trust each other and to work together” (83). Higher social capital among neighbours can lead to a greater sense of well-being and positive mental health resulting from a greater degree of community investment, connection and feelings of safety (84).

In Fraser Health, a significantly higher percentage of South Asians (65%) reported having a strong sense of community belonging compared to the Fraser Health population (55%); however, there were important differences among various demographic and socioeconomic subgroups (Figure 4.3).

FIGURE 4.3: Strong community belonging by select demographic and socioeconomic characteristics among the South Asian and Fraser Health populations



Note: *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

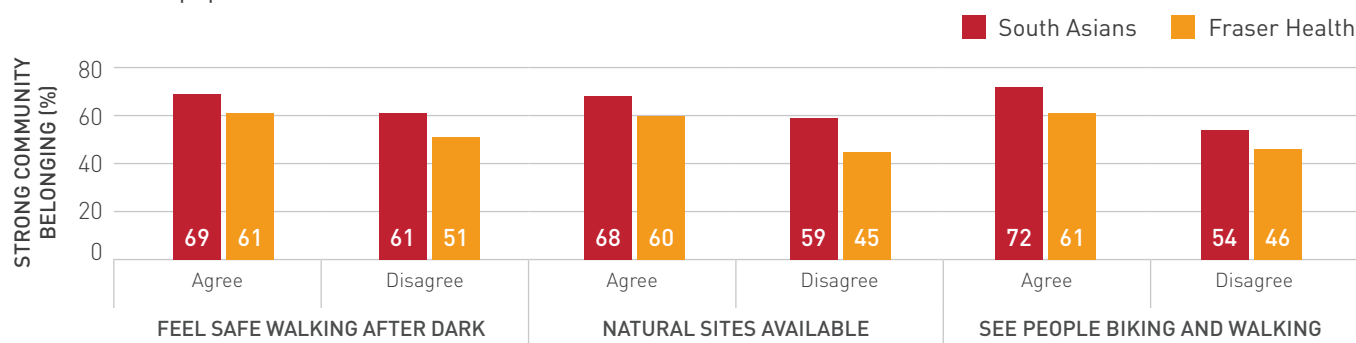
A significantly higher proportion of South Asians, compared to the Fraser Health population reported a strong sense of community belonging across all age groups; however, this difference was only significant among younger age groups (18-39 years, 40-64 years). In both South Asian and Fraser Health overall populations, the percentage of those with a strong sense of community belonging increases with increasing age. Differences in strong community belonging also existed across all education and income groups but were only significant in low education (high school and under) and low income (annual household income < \$40,000) groups where South Asians reported significantly higher sense of belonging compared to the Fraser Health population. It was interesting to find that higher percentages of South Asians reported a strong sense of community belonging.

Finally, a significantly lower percentage of South Asians born in Canada (49%) reported a strong sense of community belonging compared to South Asian immigrants (65% for 0-10 years, 74% for >10 years). Although it was also lower when compared with the rest of the Canadian-born Fraser Health population (54%), this difference was not significant.

A significantly higher proportion of South Asians (65%), compared to the Fraser Health population (56%), reported a strong sense of community belonging.

Within the South Asian and overall Fraser Health populations, a strong sense of community belonging increased with perception of safety, presence of natural sites and seeing people biking and walking in one's neighborhood (Figure 4.4). After adjusting for demographic and socioeconomic factors and perception of select built environment characteristics (safety, presence of amenities, natural sites and of people biking and walking in the neighborhood), South Asians had two times higher odds (Odds ratio = 1.7, 95% Confidence Interval = 1.4, 2.1) of reporting a strong sense of community belonging compared to those who were not South Asians.


FIGURE 4.4: Strong community belonging by select built environment characteristics among the South Asian and Fraser Health populations



Note:

- 1) The differences in strong community belonging were significantly different within the South Asian and overall Fraser Health population by select built environment characteristics (i.e. South Asians were not compared with the overall Fraser Health population), $p < 0.05$
- 2) Agree: 'Strongly Agree' or 'Agree' response to availability of select built environment characteristics
- 3) Disagree: 'Strongly disagree', 'Disagree' or 'Neutral' response to availability of select built environment characteristics

Data Source: My Health My Community Survey (2013-14)



In summary, the impact of the built environment on physical and mental health and health behaviours is an understudied area, particularly in the Canadian context. Findings presented in this chapter provide some evidence that the differences in health behaviours between South Asians and the Fraser Health population can partly be explained by built environment characteristics. In other words, along with other determinants of health, the neighbourhood environments where South Asians live can influence their health and wellbeing. Improvements in built environment will not only enable health behaviours but also assist in improving people's sense of belonging to their community, which has the potential to improve positive mental health.

CHAPTER 5: HEALTH CARE ACCESS AND USE



KEY FINDINGS:

- 90% of South Asians in Fraser Health reported having a family doctor.
- Utilization of effective prevention services such as mammograms and influenza immunizations by South Asians are similar to the general population, but uptake of cervical cancer screening is lower.

Patterns of health care access and utilization have important implications on the health outcomes of populations. Having a regular primary care provider, for instance, plays an important role in maintaining health, preventing and managing chronic illness and improving continuity of care (85, 86). From a health system perspective, access to primary care reduces overall health care costs and ensures people get the right level of care in the right setting at the right time (87, 88).

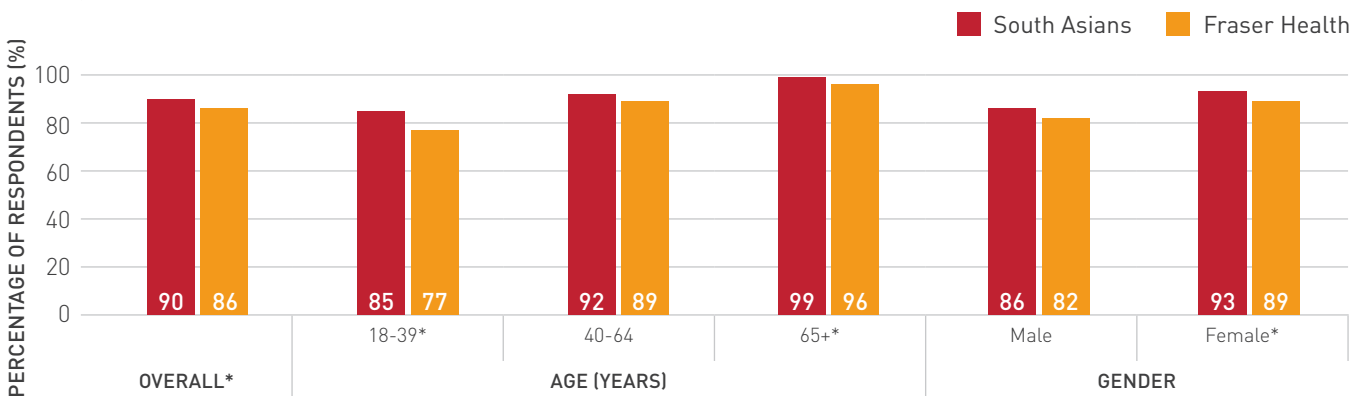
Few studies have explored health care utilization among South Asians living in Canada. In this chapter, we present data on primary care access and utilization by South Asians compared to the overall Fraser Health population.

HAVING A FAMILY DOCTOR

In Fraser Health, the proportion of South Asians who reported having a family doctor (90%) was similar to the overall population (86%); however, there were important differences between the populations by age, gender, time in Canada and education (Figure 5.1).

90% of South Asians in Fraser Health reported having a family doctor.

FIGURE 5.1: Percentage of respondents that reported having a family doctor, by age and gender, among the South Asian and Fraser Health populations

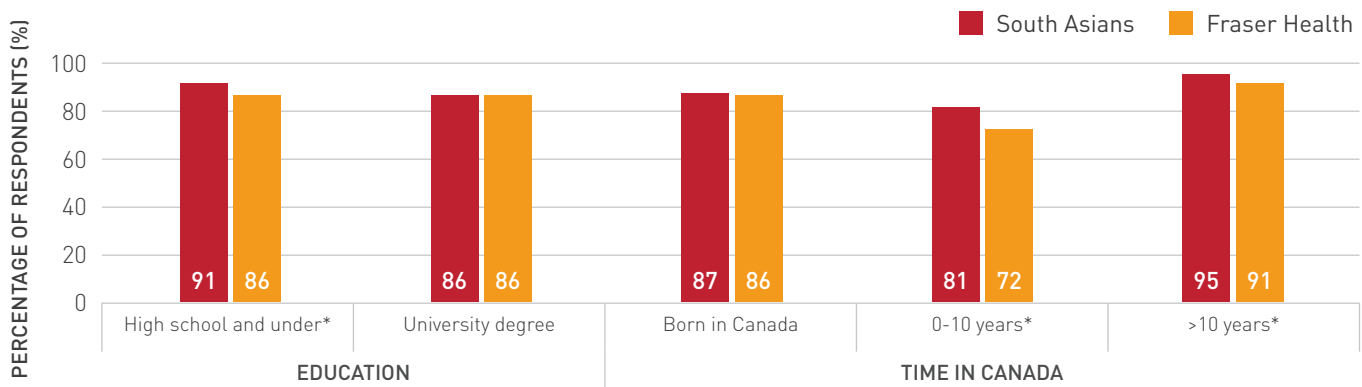


Note: *Significantly different between the South Asian and Fraser Health populations, $p < 0.05$
 Data Source: My Health My Community Survey (2013-14)

The percentage of the population that reported having a family doctor significantly increased with age, among South Asians and in Fraser Health overall. However, a significantly higher proportion of South Asians reported having a family doctor among those aged 18-39 years (85%) and 65 years or older (99%), compared to the Fraser Health population overall (77% and 96%,

respectively). Overall, a significantly higher percentage of females than males reported having a family doctor. However, a significantly higher proportion of South Asian females (93%) reported having a family doctor compared to females in Fraser Health overall (89%). There were no significant differences between males in the South Asian and the Fraser Health populations.

FIGURE 5.2: Percentage of respondents that reported having a family doctor, by education and time in Canada, among the South Asian and Fraser Health populations



Note: *Significantly different between the South Asian and Fraser Health populations, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

In terms of education, a significantly higher percentage of South Asians with high-school education or less (91%) reported having a family doctor than those with the same level of education in the Fraser Health population overall (86%) (Figure 5.2). Among immigrants who have lived in Canada for less than 10 years and 10 years or more, a significantly higher percentage of South Asians (81% and 95%, respectively) reported having a family doctor compared to immigrants in the overall population (72% and 91%, respectively). There was no difference between Canadian-born South Asians and the overall Canadian-born population in Fraser Health. In our analyses (not shown), we found that age, gender, education, income, time in Canada and presence of multiple chronic diseases have a greater degree of association with having a family doctor than South Asian ethnicity.

While it is encouraging to find that a high proportion of South Asians reported that they have a family doctor,

this is not a measure of primary care utilization by this population. In practice, South Asians may face several barriers to accessing primary care services. Some of these barriers were explored through a research project in Fraser Health (Box 3).

UTILIZATION OF CLINICAL PREVENTIVE SERVICES

Optimal provision and uptake of clinical preventive services, such as screening and immunizations, can help prevent or detect disease early, when treatment is more effective (89). The BC Cancer Agency (90) recommends that women aged 21-69 years receive a Papanicolaou test (i.e., Pap test) to screen for cervical cancer and women aged 50-74 receive a mammogram to screen for breast cancer; frequency of screening varies by test type and one's medical history⁴. In 2014, the cervical cancer screening rate in British Columbia was 66% and the breast cancer screening rate was

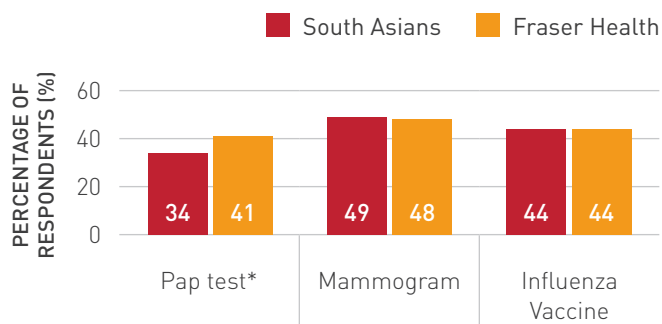
⁴ The Canadian Task Force on Preventive Health Care (97) recommends that women aged 25 to 69 be screened for cervical cancer every 3 years.

60%, both below the recommended participation target of 70% (91,92).

While cancer screening rates among South Asians in Canada are not extensively studied, an Ontario study (93) found that South Asians are more likely to reside in areas with lower rates of appropriate breast, cervical and colorectal cancer screening. Among women aged 21-69 years in Fraser Health, a significantly lower percentage of South Asians reported getting a Pap test (34%) in the previous 12 months compared to the overall population (41%) (Figure 5.3). After adjusting for age, education, income and time in Canada, the odds of South Asian females aged 21-69 getting a Pap test were 30% lower (Odds ratio= 0.7, 95% confidence Interval= 0.6,0.9) than those who were not South Asians. There were no significant differences between the percentage of South Asian (49%) and Fraser Health (48%) women aged 50-74 years getting a mammogram in the previous 12 months. Overall, these rates were lower than those reported by South Asians living in Peel Region (51%) and Ontario (65%) (35).

In addition to screening, vaccination from infections, like influenza, can prevent illness and death. Immunize BC (94) recommends that everyone over the age of 6 months be immunized against influenza. A study on influenza vaccination coverage across ethnic groups in Canada (95) found that South Asians were more likely to get an influenza vaccine compared to those who identified as Caucasians, after adjusting for various demographic and socioeconomic characteristics. In Fraser Health, a similar percentage of South Asians and the overall population reported receiving the influenza vaccine (44%) in the past 12 months. After adjusting for demographic and socioeconomic characteristics, the odds of getting the influenza vaccine did not differ between South Asians and those who were not South Asians. Direct comparators of influenza vaccination rates among South Asians in other jurisdictions were not available.

FIGURE 5.3: Reported use of clinical preventive services among the South Asian and Fraser Health populations in the past 12 months



*Note:**Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

Data Source: My Health My Community Survey (2013-14)

The reasons behind the lower screening rates among South Asians can partly be explained by cultural barriers to accessing primary care and clinical prevention services (Box 3). These data should be interpreted with caution as the survey question from MHMC captured screening behaviour in the previous 12 months while the recommendations suggest screening once every two to five years, depending on test type and individual risk factors. This limitation might result in underestimating screening behaviours in these populations. Furthermore, we expect that a higher than expected proportion of surveys were completed by health care workers, which may result in higher than expected influenza immunization rates.

BOX 3: Closing the Gap: Facilitators and barriers to accessing primary care and clinical preventive services in the South Asian population

A recent Fraser Health research project (96) used focus groups to explore the facilitators and barriers that Surrey's South Asian community members experience in accessing clinical preventive services, and may help to explain some of the reasons behind service use patterns. This is what some of the focus group participants had to say:

"[The doctors] don't listen to the patients. When you tell... about the disease to the family doctor, he immediately prescribed the medicine but don't listen to the patient properly."

(Male focus group participant)

"But now my doctor, he is really good...So if I have any other problems, they should listen to each and every problem. Whatever problem you have, the doctor should listen to you"

(Female focus group participant)

"Doctor should have fixed time. They should have fixed time to see the doctor so at least his advice can be taken. If the doctor's not listening to it, what's somebody's going to go in to see a doctor? So there should be a limit to it."


(Female focus group participant)

Focus group participants emphasized that physicians are highly respected professionals in their culture but that there were significant gaps between what they expected from their physicians and the care they received. They expected their physician to take a leadership role in managing their health and experienced a loss of trust when providers did not actively monitor their health via in-office glucose or blood pressure checks, or advise them on recommended prevention activities.

Participants repeatedly reported very brief consultations with primary care physicians and 'one issue per visit' policies that required multiple visits to address their issues. In several cases, participants reported being given medication without instructions about associated lifestyle changes or potential side effects, or not being allowed to ask questions during a visit. While participants recognized that not sharing a language with their primary care provider could exacerbate concerns about communication, they noted that often these issues persisted even when their provider spoke the same language.

As the purpose of this study was to better understand the patient perspective on access to primary care services, it did not include provider's views on the clinician-patient interaction. Recruitment efforts were designed to reach potential participants from a variety of settings; however, those who chose to participate may have been more likely to have concerns about their health care experiences.

These results suggest that an emphasis on the quality of primary care attachment, including communication and trust, may be a better predictor of both service use and health outcomes than simply whether individuals have a primary care provider.



In summary, a large percentage of South Asians report having a family doctor; however, there were some important differences based on age, sex, education, and time in Canada. Furthermore, there are important barriers and facilitators in the South Asian population in terms of primary care access. Although we found that South Asian women were less likely to have a Pap test compared to women in Fraser Health overall, there were no significant differences observed in mammograms among women and influenza vaccine uptake among South Asians compared to Fraser Health overall.

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APPENDIX A: DATA SOURCES, LIMITATIONS AND ANALYTIC METHODS

MY HEALTH MY COMMUNITY SURVEY DATA

The main source of data for this report was the My Health My Community (MHMC) survey, which was conducted between June 2013 and July 2014. The survey targeted adults aged 18 years of age or older who lived within the Vancouver Coastal Health or Fraser Health regions in British Columbia. The survey was available online, in both English and Chinese, and printed versions were also available in English, Chinese and Punjabi. To ensure that we reached all segments of our population, our field outreach team also administered the survey in person in community settings (e.g. community events, seniors groups, homeless shelters).

The survey respondents were asked questions about demographics, socioeconomic status, health status, health behaviours, health care access, built environment and community resiliency. To ensure respondents reflected the overall target population the data were weighted by age, gender and education using the 2011 National Household Survey data. Detailed information on the survey questions, methodology and data weighting can be found on the MHMC website (<https://www.myhealthmycommunity.org/>).

DERIVING SOUTH ASIAN ETHNICITY AND IMMIGRATION STATUS

South Asian survey respondents were identified primarily through self-identification. When ethnicity data was not available, individuals were defined as South Asian if they identified their birthplace to be Bangladesh, India, Nepal, Pakistan or Sri Lanka. When both ethnicity and birthplace data was not available, if respondents indicated that they were comfortable speaking Gujarati, Punjabi, Urdu, Sindhi, Nepali, Malayalam or Bengali (variations in spellings were accounted for), they were classified as South Asian.

In the My Health My Community survey, “immigrants” were defined as those who reported being born outside

Canada. The route to settlement in Canada for this group could include arrival as immigrants, family members joining their spouse or parent, refugees, etc. This differs from how “immigrants” are defined by Statistics Canada. In this report, we will typically refer to the time of immigration to Canada (i.e., 0-10 years vs. >10 years), rather than distinguishing between new/recent vs. long-term.

STRATIFICATIONS

All indicators were evaluated by stratifications of age (18-39, 40-64 and 65+ years), gender (male and female), highest level of education completed (high school and below, certificate or diploma, and university and above), annual household income (<\$40,000, \$40,000-\$79,000, \$80,000-\$119,000, <\$120,000) and immigration (born in Canada, immigrant from 0 to 10 years and immigrant from over 10 years).

ANALYSIS

Chi-squared tests were performed to determine significant differences between South Asians and overall Fraser Health population. Multivariate regression models were built for select health behaviours and health status outcomes. All models were adjusted by select stratification variables (e.g., age, sex, etc.). In cases where additional variables were used to adjust, it was specified in this report. We did not report any estimates which were unstable; in cases where the coefficient of variation was over 0.33, results were not reported.

LIMITATIONS

The MHMC analyses had some limitations. The data examined were self-reported which can result in social desirability and recall bias. Another limitation is non-response on some key indicators such as household income (25%), walking behaviours (33%) and body mass index (15%). Another limitation is that the data used in this report are cross-sectional, collected at a

single point in time. As a result, while we were able to identify associations between two factors, we could not establish the causal relationship between them.

WALK SCORE® DATA

Walk Score® is a proprietary measure of walkability, which can be accessed at Walkscore.com. We obtained the data for all MHMC participant postal codes from Redfin Real Estate (www.redfin.com). The score was developed by analyzing the distance from a point to nearby amenities (e.g. grocery stores, schools, parks, restaurants and retail). Scores range from 0-100. Amenities within 400 meters of a location are given full points and a decay function applied with increasing distance; zero points are given for distances over 2400 meters. Areas with fewer road intersections and larger average block lengths receive a penalty. Categories used for this analysis were “walker’s paradise” (90-100), very walkable (70-89), somewhat walkable (50-69), and car dependent (0-49).

There are limitations associated with Walk Score® data. The score does not measure all aspects of neighbourhood walkability; factors such as sidewalk quality, obstructions, neighbourhood safety, and quality of the amenities are not captured.

Additional information can be found on Walk Score® website (<https://www.walkscore.com/methodology.shtml>).

APPENDIX B : SUPPLEMENTARY DATA TABLES

TABLE B.1: Health behaviours by age and gender among the South Asian and Fraser Health populations

BEHAVIOUR TYPE		POPULATION	OVERALL [%, 95% CI]	AGE (YEARS) [%, 95% CI]			GENDER [%, 95% CI]	
				18-39	40-64	65+	MALES	FEMALES
ACTIVE LIFESTYLE	Moderate or vigorous physical activity (150+ min/week)	SOUTH ASIANS	43.4 [39.6, 47.2]	41.3 [36.4, 46.1]	40.6 [34.3, 46.9]	58.1 [45.0, 71.2]	49.5 [43.6, 55.3]	36.7 [32.2, 41.2]
		FRASER HEALTH	43.3 [42.1, 44.5]	42.6 [40.7, 44.5]	42.9 [41.2, 44.6]	46.0 [42.3, 49.6]	48.8 [46.7, 50.8]	38.2 [36.9, 39.4]
	Walking (30+ min/day)	SOUTH ASIANS	69.6 [65.6, 73.6]	66.5 [61.1, 72.0]	72.8* [67.0, 78.6]	70.3 [57.5, 83.2]	72.2* [66.6, 77.9]	66.6 [61.0, 72.2]
		FRASER HEALTH	65.8 [64.4, 67.1]	66.4 [64.4, 68.5]	63.4* [61.5, 65.2]	72.0 [68.2, 75.9]	64.9* [62.7, 67.1]	66.7 [65.2, 68.1]
	Screen time (2+ hours/day)	SOUTH ASIANS	35.2* [31.6, 38.7]	37.3* [32.8, 41.9]	28.7* [23.3, 34.0]	43.5* [31.0, 56.0]	34.9 [29.8, 40.0]	35.6* [30.6, 40.5]
		FRASER HEALTH	47.5* [46.4, 48.7]	47.6* [45.8, 49.4]	43.1* [41.5, 44.8]	60.0* [56.6, 63.4]	49.6 [47.6, 51.6]	45.5* [44.2, 46.9]
DIET	Fruit and vegetable intake (5+ servings/day)	SOUTH ASIANS	12.6* [10.4, 14.7]	12.7* [10.2, 15.3]	14.6* [10.4, 18.8]	NR	10.9* [7.5, 14.3]	14.3* [11.7, 17.0]
		FRASER HEALTH	23.6* [22.6, 24.5]	22.8* [21.4, 24.3]	23.7* [22.4, 25.0]	24.9* [21.8, 28.1]	17.8* [16.3, 19.3]	28.8* [27.6, 30.0]
	Sugary beverage consumption (3+ times/week)	SOUTH ASIANS	15.7 [13.0, 18.3]	21.0 [17.1, 24.8]	8.2* [5.1, 11.4]	NR	18.3 [13.9, 22.7]	12.7 [9.8, 15.6]
		FRASER HEALTH	15.9 [14.9, 16.8]	22.0 [20.3, 23.6]	13.7* [12.4, 15.0]	8.1 [6.0, 10.3]	21.5 [19.8, 23.3]	10.7 [9.9, 11.5]
	Fast food consumption (3+times/week)	SOUTH ASIANS	17.4* [14.8, 20.0]	26.0* [22.0, 30.0]	11.0 [7.1, 14.9]	NR	20.1 [15.7, 24.5]	14.4* [11.7, 17.1]
		FRASER HEALTH	13.2* [12.3, 14.0]	19.4* [18.0, 20.9]	10.7 [9.5, 11.9]	5.7 [3.9, 7.6]	16.5 [15.0, 18.0]	10.0* [9.2, 10.8]
ALCOHOL CONSUMPTION	Binge drinking (1+ times/month)	SOUTH ASIANS	13.9* [11.5, 16.2]	20.6 [16.8, 24.4]	8.3* [5.0, 11.5]	NR	19.7 [15.5, 24.0]	7.9* [6.2, 9.7]
		FRASER HEALTH	18.7* [17.8, 19.6]	24.4 [22.9, 26.0]	17.4* [16.2, 18.8]	9.3 [7.1, 11.4]	21.3 [19.7, 22.9]	16.5* [15.5, 17.4]
	Binging infrequently (<1 times/month)	SOUTH ASIANS	30.6* [27.5, 33.7]	29.9* [26.1, 33.8]	34.4* [28.9, 39.9]	23.5* [13.7, 33.4]	33.7* [28.6, 38.9]	27.5* [24.1, 31.0]
		FRASER HEALTH	57.1* [56.0, 58.3]	52.3* [50.5, 54.1]	60.3* [58.6, 61.9]	59.1* [55.6, 62.6]	57.1* [55.1, 59.1]	57.3* [56.0, 58.6]
	No alcohol (past 12 months)	SOUTH ASIANS	55.5* [52.0, 59.0]	49.4* [44.8, 54.1]	57.4* [51.5, 63.2]	72.1* [61.8, 82.5]	46.5* [40.7, 52.3]	64.5* [60.7, 68.3]
		FRASER HEALTH	24.1* [23.1, 25.2]	23.3* [21.7, 24.9]	22.2* [20.8, 23.7]	31.6* [28.3, 34.9]	21.6* [19.9, 23.3]	26.2* [25.0, 27.5]
SMOKING	Current smoker (daily or occasional)	SOUTH ASIANS	5.1* [3.4, 6.8]	6.5* [3.9, 9.1]	NR	NR	7.3* [4.3, 10.3]	2.8* [1.4, 4.2]
		FRASER HEALTH	10.5* [9.8, 11.3]	12.0* [10.7, 13.2]	11.6 [10.4, 12.9]	4.0 [2.7, 5.3]	12.0* [10.7, 13.4]	9.1* [8.4, 9.9]
	Past smoker (daily or occasional)	SOUTH ASIANS	8.0* [6.1, 9.8]	7.7* [5.3, 10.2]	9.7* [6.0, 13.4]	4.5* [0.9, 8.2]	11.9* [8.5, 15.4]	3.9* [2.7, 5.0]
		FRASER HEALTH	30.3* [29.2, 31.4]	19.4* [17.9, 20.8]	33.0* [31.5, 34.6]	47.7* [44.2, 51.2]	31.6* [29.7, 33.4]	29.2* [28.0, 30.4]
	Never smoked	SOUTH ASIANS	86.9* [84.5, 89.4]	85.7* [82.3, 89.2]	85.7* [81.4, 90.1]	94.1* [89.6, 98.6]	80.8* [76.4, 85.1]	93.3* [91.5, 95.1]
		FRASER HEALTH	59.1* [58.0, 60.3]	68.7* [66.9, 70.4]	55.3* [53.6, 57.0]	48.2* [44.7, 51.8]	56.4* [54.4, 58.4]	61.7* [60.4, 63.0]

Note:

1) *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

2) 95% CI: 95% confidence interval

3) NR: numbers too small to report

Data Source: My Health My Community Survey (2013-14)

TABLE B.2: Health status by age and gender among the South Asian and Fraser Health populations

HEALTH STATUS	POPULATION	OVERALL (% , 95% CI)	AGE (YEARS) (% , 95% CI)			GENDER (% , 95% CI)	
			18-39	40-64	65+	MALES	FEMALES
Self-rated health (excellent or very good)	SOUTH ASIANS	42.4* [38.9 , 45.9]	47.7 [43.0 , 52.4]	40.4* [34.6 , 46.1]	29.1* [18.7 , 39.5]	43.0 [37.5 , 48.5]	42.2* [37.9 , 46.6]
	FRASER HEALTH	47.4* [46.3 , 48.6]	50.7 [49.0 , 52.5]	46.9* [45.3 , 48.5]	41.3* [38.0 , 44.8]	47.4 [45.5 , 49.4]	47.6* [46.3 , 48.9]
Self-rated mental health (excellent or very good)	SOUTH ASIANS	55.7 [52.1 , 59.3]	56.2 [51.6 , 60.8]	59.5 [53.7 , 65.3]	44.9* [33.0 , 56.9]	57.6 [52.0 , 63.2]	54.3 [49.8 , 58.7]
	FRASER HEALTH	58.7 [57.6 , 59.9]	56.8 [55.1 , 58.6]	58.3 [56.7 , 60.0]	64.4* [61.1 , 67.8]	60.9 [59.0 , 62.9]	56.9 [55.6 , 58.2]
High stress	SOUTH ASIANS	17.8 [15.1 , 20.5]	20.5 [16.7 , 24.3]	16.0* [11.8 , 20.2]	NR	18.0 [13.8 , 22.3]	17.7 [14.4 , 21.0]
	FRASER HEALTH	18.6 [17.7 , 19.5]	20.7 [19.3 , 22.2]	21.0* [19.6 , 22.3]	6.7 [5.0 , 8.4]	18.9 [17.4 , 20.5]	18.3 [17.3 , 19.3]
Diabetes	SOUTH ASIANS	16.3* [13.1 , 19.4]	4.0* [1.8 , 6.1]	18.8* [14.0 , 23.5]	51.1* [39.0 , 63.3]	16.8* [12.5 , 21.0]	15.8* [11.0 , 20.6]
	FRASER HEALTH	8.8* [8.0 , 9.6]	2.4* [1.8 , 2.9]	10.2* [9.0 , 11.4]	19.4* [16.6 , 22.2]	10.0* [8.7 , 11.3]	7.7* [6.8 , 8.6]
High blood pressure	SOUTH ASIANS	18.6 [15.3 , 21.8]	4.4 [2.3 , 6.5]	24.4 [19.1 , 29.8]	51.9 [39.7 , 64.0]	20.7 [16.1 , 25.2]	16.5 [11.8 , 21.2]
	FRASER HEALTH	19.5 [18.5 , 20.5]	4.9 [4.1 , 5.7]	22.6 [21.2 , 24.0]	43.4 [40.0 , 46.9]	21.3 [19.7 , 22.9]	17.9 [16.7 , 19.1]
Heart disease	SOUTH ASIANS	6.9* [4.5 , 9.2]	NR	6.6* [3.6 , 9.6]	29.5* [17.7 , 41.4]	7.4 [4.5 , 10.4]	6.4* [2.7,10.0]
	FRASER HEALTH	5.0* [4.5 , 5.6]	0.7 [0.3 , 1.1]	4.1* [3.4 , 4.8]	17.3* [14.7 , 20.0]	6.6 [5.6 , 7.6]	3.6* [2.9 , 4.2]
Breathing disorder	SOUTH ASIANS	3.8* [2.5 , 5.1]	3.7* [2.0 , 5.4]	2.9* [1.0 , 4.8]	NR	3.7* [1.7 , 5.7]	4.0* [2.4,5.7]
	FRASER HEALTH	7.3* [6.7 , 8.0]	6.3* [5.4 , 7.1]	7.0* [6.2 , 7.8]	10.6 [8.2 , 13.0]	6.6* [5.6 , 7.7]	7.9* [7.1 , 8.6]
Arthritis	SOUTH ASIANS	8.1* [5.8 , 10.5]	NR	8.4* [5.4 , 11.5]	28.1 [16.5 , 39.7]	6.2* [3.6 , 8.9]	10.0* [6.1 , 13.9]
	FRASER HEALTH	13.9* [13.0 , 14.8]	2.9 [2.3 , 3.6]	15.2* [14.0 , 16.4]	34.9 [31.5 , 38.3]	10.3* [9.0 , 11.5]	17.2* [16.0 , 18.4]
Mood or anxiety disorder	SOUTH ASIANS	8.2* [6.3 , 10.0]	6.6* [4.6 , 8.6]	11.6* [7.8 , 15.3]	NR	7.5* [4.6 , 10.4]	8.9* [6.6 , 11.2]
	FRASER HEALTH	16.7* [15.8 , 17.5]	16.9* [15.6 , 18.3]	19.3* [17.9 , 20.6]	8.7 [6.8 , 10.6]	13.8* [12.3 , 15.2]	19.4* [18.4 , 20.4]
Body Mass Index (BMI) 25+ kg/m ²	SOUTH ASIANS	58.1* [54.3 , 61.8]	47.5* [42.4 , 52.6]	67.0* [61.4 , 72.6]	71.8 [60.8 , 82.9]	61.7* [55.9 , 67.6]	54.3 [49.4 , 59.3]
	FRASER HEALTH	64.4* [63.2 , 65.6]	53.5* [51.6 , 55.4]	71.2* [69.7 , 72.7]	68.6 [65.0 , 72.1]	71.3* [69.4 , 73.1]	57.5 [56.1 , 58.9]
Body Mass Index (BMI) 30+ kg/m ²	SOUTH ASIANS	18.7* [15.6 , 21.7]	17.3* [13.7 , 21.0]	19.5* [14.5 , 24.4]	21.2 [10.2 , 32.2]	17.6* [13.4 , 21.8]	19.7* [15.4 , 24.0]
	FRASER HEALTH	27.2* [26.1 , 28.3]	21.7* [20.1 , 23.4]	30.8* [29.2 , 32.5]	28.7 [25.3 , 32.0]	28.9* [27.1 , 30.8]	25.5* [24.2 , 26.8]
Multiple chronic diseases (two or more)	SOUTH ASIANS	12.3* [9.4 , 15.2]	NR	13.2* [9.0 , 17.4]	45.6* [33.3 , 58.0]	13.4* [9.5 , 17.3]	11.3* [6.9 , 15.6]
	FRASER HEALTH	8.8* [8.1 , 9.6]	1.3 [0.9 , 1.7]	9.3* [8.3 , 10.3]	24.6* [21.4 , 27.7]	10.0* [8.8 , 11.2]	7.8* [6.8 , 8.7]

Note:

- 1) *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$
- 2) 95% CI: 95% confidence interval
- 3) NR: numbers too small to report
- 4) Chronic conditions used to drive multiple chronic diseases included diabetes, high blood pressure, heart disease, breathing disorder and stroke

Data Source: My Health My Community Survey (2013-14)

TABLE B.3: Built environment characteristics by high and low South Asian density neighborhoods in Fraser Health

BUILT ENVIRONMENT CHARACTERISTIC	POPULATION	HIGH SOUTH ASIAN DENSITY NEIGHBORHOOD (% AGREE, 95% CI)	LOW SOUTH ASIAN DENSITY NEIGHBORHOOD (% AGREE, 95% CI)
Amenities within walking/cycling distance	SOUTH ASIANS	58.8 [54.3, 63.4]	60.9 [55.2, 66.6]
	FRASER HEALTH	58.9 [56.2, 61.5]	62.9 [61.6, 64.2]
Sidewalks well maintained	SOUTH ASIANS	70.2 [65.9, 74.5]	73.5 [68.3, 78.6]
	FRASER HEALTH	69.8 [67.3, 72.3]	74.7 [73.5, 75.8]
Pathways there for walking/cycling	SOUTH ASIANS	64.4 [60.0, 68.8]	56.4* [50.6, 62.2]
	FRASER HEALTH	61.5 [58.9, 64.1]	63.4* [62.1, 64.7]
Feel safe walking after dark	SOUTH ASIANS	49.0* [44.3, 53.7]	46.5* [40.7, 52.3]
	FRASER HEALTH	43.5 [40.7, 46.2]	54.7* [53.4, 56.1]
High traffic makes walking/cycling unpleasant	SOUTH ASIANS	30.4 [26.0, 34.8]	22.4 [17.6, 27.1]
	FRASER HEALTH	30.5 [27.8, 33.2]	24.6 [23.5, 25.7]
Large fruit and vegetable selection available	SOUTH ASIANS	62.7 [58.2, 67.2]	70.1 [64.9, 75.4]
	FRASER HEALTH	67.1 [64.7, 69.6]	70.6 [69.4, 71.8]
Natural sites available	SOUTH ASIANS	58.1* [53.5, 62.7]	70.9 [65.4, 76.4]
	FRASER HEALTH	62.7* [60.1, 65.3]	75.7 [74.5, 76.9]
See people biking and walking	SOUTH ASIANS	56.5 [51.8, 61.1]	57.5 [51.8, 63.2]
	FRASER HEALTH	57.2 [54.4, 59.9]	67.7 [66.5, 69.0]

Note:

1) *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

2) 95% CI: 95% confidence interval

Data Source: My Health My Community Survey (2013-14)

TABLE B.4: Walk Score® category by density of South Asians in Fraser Health region neighborhoods

WALK SCORE® DESCRIPTION OF THE NEIGHBORHOODS	HIGH SOUTH ASIAN DENSITY NEIGHBORHOOD (% , 95% CI)	LOW SOUTH ASIAN DENSITY NEIGHBORHOOD (% , 95% CI)
Car dependent	62.6* [60.0, 65.2]	49.5* [48.2, 50.9]
Somewhat walkable	27.4* [25.0, 29.8]	22.5* [21.4, 23.8]
Very walkable or walker's paradise	10.0* [8.4, 11.6]	27.9* [26.8, 29.1]

Note:

1) *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

2) 95% CI: 95% confidence interval

Data Source: My Health My Community Survey (2013-14)

TABLE B.5: Fruit and vegetable consumption by selection of fruits and vegetables in neighborhood, among the South Asian and Fraser Health populations

NEIGHBORHOOD BUILT ENVIRONMENT CHARACTERISTICS		FRUIT AND VEGETABLE CONSUMPTION (5+ SERVINGS/DAY)	
		SOUTH ASIANS [%, 95% CI]	FRASER HEALTH [%, 95% CI]
Large fruit and vegetable selection available	Agree	15.4* (12.3 , 18.4)	24.7* (23.5 , 25.8)
	Disagree	8.0* (5.5 , 10.5)	21.8* (20.1 , 23.5)

Note:

1) *Significantly different between 'Agree' and 'Disagree' within the South Asian and the Overall Fraser population, $p < 0.05$

2) Agree: 'Strongly Agree' or 'Agree' response to availability of select built environment characteristics

3) Disagree: 'Strongly Disagree', 'Disagree' or 'Neutral' response to availability of select built environment characteristics

4) 95% CI: 95% confidence interval

Data Source: My Health My Community Survey (2013-14)

TABLE B.6: Physical activity (150+ minutes/week) by select built environment characteristics among the South Asian and Fraser Health populations

BUILT ENVIRONMENT CHARACTERISTICS		PHYSICAL ACTIVITY (150+ MINUTES/WEEK)	
		SOUTH ASIANS [%, 95% CI]	FRASER HEALTH [%, 95% CI]
Amenities within walking/cycling distance	Agree	42.4 (37.4 , 47.3)	43.2 (41.7 , 44.7)
	Disagree	44.2 (38.1 , 50.3)	43.9 (41.9 , 45.9)
Sidewalks well maintained	Agree	46.4* (41.9 , 50.9)	44.3 (42.9 , 45.7)
	Disagree	34.0* (26.8 , 41.1)	41.1 (38.8 , 43.4)
Pathways there for walking/cycling	Agree	45.8 (40.9 , 50.8)	45.3* (43.8 , 46.8)
	Disagree	38.5 (32.6 , 44.5)	40.4* (38.4 , 42.3)
Feel safe walking after dark	Agree	50.2* (44.5 , 55.9)	49.0* (47.3 , 50.7)
	Disagree	36.8* (31.8 , 41.8)	37.2* (35.6 , 38.9)
High traffic makes walking/cycling unpleasant (% Disagree)	Agree	44.5 (39.2 , 49.7)	45.1* (43.5 , 46.7)
	Disagree	42.3 (36.6 , 47.9)	41.2* (39.3 , 43.0)
Natural sites available	Agree	47.5* (42.8 , 52.3)	45.4* (44.0 , 46.8)
	Disagree	34.8* (28.3 , 41.3)	38.2* (35.8 , 40.6)
See people biking and walking	Agree	47.6* (42.4 , 52.7)	46.2* (44.7 , 47.7)
	Disagree	35.7* (30.2 , 41.1)	37.9* (35.9 , 39.9)

Note:

1) *Significantly different between 'Agree' and 'Disagree' within the South Asian and the Overall Fraser population, $p < 0.05$

2) Agree: 'Strongly Agree' or 'Agree' response to availability of select built environment characteristics

3) Disagree: 'Strongly Disagree', 'Disagree' or 'Neutral' response to availability of select built environment characteristics

4) 95% CI: 95% confidence interval

Data Source: My Health My Community Survey (2013-14)

TABLE B.7: Strong community belonging by age and gender among the South Asian and Fraser Health populations

POPULATION	OVERALL (%, 95% CI)	AGE (YEARS) (%, 95% CI)			GENDER (%, 95% CI)	
		18-39	40-64	65+	MALES	FEMALES
SOUTH ASIANS	65.4* (61.9 , 69.0)	58.8* (54.0 , 63.6)	69.6* (64.0 , 75.1)	76.9 (66.3 , 87.5)	66.6* (62.0 , 71.1)	65.0* (59.7 , 70.3)
FRASER HEALTH	56.0* (54.7 , 57.2)	45.9* (44.0 , 47.8)	57.7* (56.0 , 59.4)	73.2 (70.0 , 76.3)	58.0* (56.7 , 59.3)	54.1* (52.0 , 56.1)

Note:

1) *Significantly different between South Asian and the overall Fraser Health population, $p < 0.05$

2) 95% CI: 95% confidence interval

Data Source: My Health My Community Survey (2013-14)

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