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**DIETARY INTAKE, PHYSICAL ACTIVITY, FOOD SECURITY AND NUTRITIONAL
STATUS OF NEWCOMER CHILDREN IN SASKATCHEWAN**

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To the College of Graduate Studies and Research

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by

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ABSTRACT

Newcomers are usually healthy when they arrive in Canada, but subsequently experience health declines shortly thereafter. It is important to understand the health and nutrition issues of newcomer children, as well as healthcare access issues, as poor dietary and physical activity patterns established early in childhood combined with poor healthcare access can impact the development of chronic disease.

This study evaluates the health/nutritional status of newcomer children through a cross-sectional analysis of 300 participants aged 3 to 13 years who have been in Canada for less than 5 years and currently live in Regina or Saskatoon. Questionnaires evaluate socio-demographics, food security, and physical activity. Participants' diets were assessed through 24 hour recalls. Physical measurements included total body bone mineral content (TBBMC), blood pressure, serum vitamin D, total cholesterol, and glucose. In-depth interviews were also completed with 19 families and 24 service providers to understand lifestyle changes and barriers and supports to healthcare access in the Regina Qu'Appelle and Saskatoon Health Regions.

Sixty-two percent of refugees and 43% of immigrants experienced food insecurity. Recent newcomer families and families that included parents with lower education levels were at higher risk for household food insecurity. Older children, those with better educated parents, and those who consumed a poorer quality diet were at higher risk for being overweight/obese. Although immigration status was not a significant risk factor for overweight/obesity, older immigrants (11-13 yrs) were at significantly higher risk of having waist circumference ≥ 90 th percentile (55%) compared to refugees (20%). Significantly more refugees (23%) had stunted growth compared to immigrants (5%). Refugees, and especially refugee children from Asia, appeared to be at greater risk for lower percentile heights. Participants had low intakes of vitamin D (91%) and calcium (80%). Seventy-two percent of refugee

and 53% of immigrant children had insufficient serum vitamin D levels. Sixty percent of refugees and 42% of immigrants had high blood cholesterol.

Participants were sufficiently active (71.5%); however, a high proportion also engaged in too much sedentary activity (58.4%). Parents indicated interest in having their children involved in sports and activities that are typical in their cultures. Barriers to participation in physical activities included: recreational physical activity being a foreign concept, cultural limits to women's and girls' participation, lack of awareness of available activities, transportation difficulties, busy schedules, limited financial resources, safety concerns, and children's preference for screen time.

Overall, the greatest barrier to accessing healthcare services was health system navigation difficulties; understanding how to access care that resulted in service delays. Service providers experienced difficulties with making appointments with newcomers and having good communication to facilitate shared understanding of health issues. Participants mentioned difficulties with accessing appropriate interpretations services. Changes to interim federal health benefits created confusion around eligibility so some healthcare providers were reluctant to provide care. Newcomers frequently spoke about concerns with high drug costs that would be covered by provincial health benefits programs, but they lacked awareness of these programs. Service providers perceived that gender and cultural concerns were a barrier to care.

Overall newcomer children are at high risk for inadequate consumption of milk products, which puts them at risk for low intakes of vitamin D and calcium, and subsequently low levels of serum vitamin D. Health concerns for refugee children include food insecurity, poor diet, stunting and high blood cholesterol levels. Older immigrant children are more at risk for overweight, obesity, as indicated by at-risk waist circumferences. The study results also indicate the need to evaluate how the health system can be adjusted to be more responsive to the healthcare needs of newcomer children and their

families. Provincially we need to ensure that all newcomers are aware of provincial health benefit programs. Health regions may give consideration to refining services to better meet the needs of newcomers by providing training to increase the cultural competency of staff and embedding the use of available interpretation services into standard work processes.

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DEDICATION

Dedicated to Gayatri Nepal, Lili Htoo and Jaw Na Thar, interpreters who are more than interpreters. They provided culturally sensitive liaison services to their respective community members that ensured good participation.

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LIST OF ABBREVIATIONS

CCHS: Canadian Community Health Survey

CHEP: CHEP Good Food Inc. (a community-based organization in Saskatoon that promotes food security)

PATH: Providing Access to Healthcare

RCC: Regina Community Clinic

REACH: Regina Education and Action on Child Hunger

RQHR: Regina Qu'Appelle Health Region

RRLIP: Regina Region Local Immigration Partnership Project

SHR: Saskatoon Health Region

TBBMC: Total body bone mineral content

WHO: World Health Organization

DEFINITIONS

Immigrant: A non-national who moves into a country for the purpose of settling (International Organization for Migration, 2004).

Refugee: A person who fears returning to his or her home country (for fear of persecution, cruel and unusual treatment, or punishment) and who seeks the protection of another country (Citizenship and Immigration Canada, 2010).

Newcomer: Immigrants and refugees who have established residence in another country within the past 5 years.

1. INTRODUCTION

1.1. Statement of Problem

The large majority of the 248,000 plus newcomers who annually arrive in Canada (Chagnon, 2013) are in fairly good health, somewhat better than the average Canadian, but often experience health declines shortly thereafter (DesMeules et al., 2004; Gushulak, 2007; Newbold, 2009). Although the research is not conclusive, it has been hypothesized that selective immigration policies, better access to healthcare in Canada and/or changing lifestyle patterns may account for the decline in immigrant health status over the first few years in Canada (Gushulak, 2007; McDonald & Kennedy, 2004), although other research has focused on immigration as one of the many inter-related social determinants of health that impacts health status (Thurston et al., 2006). Although there are some preliminary research studies on the health status of newcomer children, the results are not comprehensive enough to inform a robust description of newcomer children's health status. Given that existing research on Western populations has demonstrated that children establish dietary patterns during their preschool years (Teegarden et al., 1999; Drewnowski, 1989); the early signs of chronic disease may manifest in childhood (American Academy of Pediatrics, 1992; Jolliffe & Janssen, 2007); young children often experience successful lifestyle changes as a result of interventions (Fitzgibbon et al., 2005; Eliakim et al., 2007; Van Horn et al., 2003); and that healthy lifestyle practices adopted as a result of lifestyle interventions during childhood often persist into adulthood (Dorgan et al., 2010); it is important to situate the salient health and nutrition issues observed among newcomer children within the existing research context. It is now vitally important to study the health and nutritional status of recently arrived newcomer children to identify current health and lifestyle

concerns and to better understand their pattern of healthcare services utilization and any barriers or enhancers that may be affecting this pattern.

1.2. Background to the Problem

The Canadian population is made up of ethnic groups from around the world. According to the National Household Survey, 2011, 19.1% of the Canadian population self identify as a member of a visible minority group (Statistics Canada, 2013). Projections indicate that approximately 1 in 3 Canadians will be a member of a visible minority group by 2031 and that the visible minority population will be over-represented in the younger age groups. Up to 35% of the population under 15 years of age may belong to a visible minority group, while only about 18% of the population over the age of 65 years will likely be member of a visible minority in 2031 (Statistics Canada, 2010). In comparison, the Aboriginal population in Canada is anticipated to be between 1.7 million and 2.2 million by 2031, representing between 4.0% and 5.3% of the total population (Statistics Canada, 2011b). The growing ethnically diverse Canadian population is partially due to increasing immigration to Canada. The number of permanent residents annually welcomed into Canada has steadily increased from 221,349 in 2003 to a peak of 280,681 in 2010 and then decreased to 248,000 in 2011 (Chagnon, 2013). The permanent residents admitted in 2011 included family class immigrants (22.7%), economic immigrants (62.8%), refugees (11.2%) and others (3.3%) (Chagnon, 2013). Although overall immigration to Canada decreased in 2011, the number of permanent residents who annually take up residence in Saskatchewan has steadily increased from 1,668 in 2003 to 8,955 in 2011. The permanent residents who arrived in Saskatchewan in 2010 included family class immigrants (7.7%), economic immigrants (85.5%), refugees (6.1%) and others (0.7%) (Chagnon, 2013). Recent population growth in Saskatchewan is largely attributable to immigration with 54% of the

population increase due to immigration in 2009 (Government of Saskatchewan, 2009). Recent immigrants who land in Saskatchewan appear to become long-term residents as 86.6 per cent of those nominated through the provincial nominee program that arrived between 2000-2006 were still living in the province in 2006 (Government of Saskatchewan, 2009). Given the diversity of the Canadian/Saskatchewan population and the large annual influx of newcomers, it is important to understand potential health and nutritional concerns among newcomers and to situate these concerns within the overall Canadian context to inform the development of effective health and social services policies and programming to encourage the establishment of healthy lifestyle practices in childhood, which in turn promotes the development of an overall healthy, productive Canadian population. Since the development of metabolic and cardiovascular risk factors often begins in childhood and continues to adulthood (Jolliffe & Janssen, 2007) and childhood lifestyle interventions have short and long term positive impacts (Fitzgibbon et al., 2005; Eliakim et al., 2007; Van Horn et al., 2003; Dorgan et al., 2010), it is important to identify potential health and nutritional concerns of newcomer children and possible interventions to support risk factor management in early disease stages.

Chronic diseases are the leading cause of death around the globe, responsible for approximately 63% of deaths worldwide. The majority of these deaths (63%) are attributed to diabetes, cancers, cardiovascular diseases and chronic respiratory diseases (Alwan et al., 2010). The proportion of deaths attributable to these causes increases to more than 70% for almost all high-income countries, including Canada at 89% (World Health Organization, 2011). As a high-income country Canada faces many lifestyle and chronic health condition challenges common to all high income nations. Common, preventable risk factors associated with lifestyle underlie most chronic diseases. Raised blood pressure (responsible for 13% of deaths globally), followed

by tobacco use (9%), raised blood glucose (6%), physical inactivity (6%), and overweight and obesity (5%) are the leading risk factors for global mortality (World Health Organization, 2009). Among high-income countries the most prevalent risk factors include total fat consumption, raised total cholesterol and physical inactivity among women; while tobacco use among men and overweight and obesity are the most prevalent risk factors in middle-income countries (World Health Organization, 2011).

In Canada the most common risk factors are overweight (63.2%), raised cholesterol (56.2%), raised blood pressure (33.6%), and obesity (26.2%) (World Health Organization, 2011). Similarly, provincial statistics indicate that common risk factors are overweight (59.5%) and raised blood pressure (18.7%) in Saskatchewan (Statistics Canada, 2013a & 2013b).

Provincial statistics on raised cholesterol and obesity separate from overweight are not available. Although many of these risk factors develop in adulthood, 21.8% of Canadian youth, including 27.8% of Saskatchewan youth, between the ages of 12 and 17 years are considered overweight or obese (Statistics Canada, 2013c). As all of these risk factors are associated with lifestyle choices that are often well established at a young age, newcomers who arrive in good health may be at risk for developing risk factors if they adopt some common Canadian lifestyle habits.

Since most newcomers to Canada arrive in good health, but many experience declining health to a level at par with the average Canadian within a few years, it is important to understand the underlying factors beneath this change. Some research suggests that immigrants who abandon their traditional diets and adopt more Western foods are at higher risk of developing coronary heart disease, increased body weight and certain cancer (Lee & Huang, 2001). Although there is limited information available on the health of newcomer children, there is some evidence that BMI increases with each year of residency in the United States, such that

they are as likely to be overweight as other visible minority children and at risk for developing associated adverse health consequences (Strickman-Stein, Gervais, Ludwig, Messiah, Lipshultz, and Miller, 2010). This limited information behooves further research related to immigrant children's health and nutritional status, lifestyle habits and health care utilization patterns to better understand the pathways to declining health status in adulthood and to identify possible intervention opportunities.

1.3. Purpose of the Study

The purpose of this study is to evaluate the health and nutritional status of immigrant and refugee children aged 3 to 13 years who have been in Canada less than 5 years and to characterize their healthcare services utilization patterns. The study focuses on this age group because children should be largely transitioned from breastfeeding to regular food by age 3, they have more opportunities to choose which foods to eat, they begin to establish their food preferences in childhood (Teegarden et al., 1999; Drewnowski, 1989) and risk factors of chronic disease are evident in childhood (American Academy of Pediatrics, 1992; Jolliffe & Janssen, 2007). Accordingly, it is important to focus on this age group to inform the development of potentially effective lifestyle intervention programs.

1.4. Research Questions

1. Do newcomer children have healthy nutritional status?
 - a. Do newcomer children have normal serum vitamin D, lipid or glucose; normal bone density.
 - b. Do newcomer children have adequate dietary intakes of key nutrients? (i.e. vitamin D, calcium)

- c. Are newcomer children physically active?
- d. Do newcomer children live in food secure households?
- 2. Is there an association between dietary intake of key nutrients, physical activity, food security and nutritional status?
- 3. Describe how immigrant children access curative healthcare services when indicated and/or preventative healthcare services in comparison to best practice recommendations.
 - a. Describe barriers and enhancers that impact access to healthcare services.

1.5. Scope of the Study

The study involves an assessment of the health and nutritional status and healthcare services utilization patterns of 300 immigrant and refugee children aged 3 to 13 years who have been in Canada less than 5 years. Approximately half of the study participants will be from Saskatoon and the other half from Regina. The study primarily focuses on an assessment of physical health, lifestyle habits and selected socio-demographic factors, so largely does not address mental health issues.

1.6. Significance of the Study

The majority of research on newcomer health issues that demonstrates some areas of concern has been conducted with adult participants. The emerging body of research on health issues among newcomer children currently offers limited information on potential health concerns specific to this group. Therefore, it is important to undertake research focused on evaluating the health and nutritional status of newcomer children in association with their lifestyle habits to understand the potential underlying factors that may influence the development of poor health outcomes in childhood or later in adulthood. This information in association with

their healthcare utilization patterns can help to inform the development of pathways to understand how different factors inter-relate to create conditions that can either support or degrade health status.

2. REVIEW OF THE LITERATURE

2.1 Immigration

2.1.1 Global Perspective

In modern times the proportion of international migrants among the global population has been fairly static. Over the past 50 years the proportion of international migrants has remained at about 3% annually. Recent estimates of global migrants place the number of internal migrants at 740 million, while the number of international migrants is 200 million, including the 70 million international migrants who moved from a low or middle income country to a high income country (United Nations Development Program, 2009). These statistics indicate that migration within one's country of origin and migration from 1 low income nation to another or between high income nations is far more common than international migration from a low or middle income country to a high income country.

There are marked differences in emigration rates between global areas and countries. A recent Organization for Economic Cooperation and Development (OECD) report notes that emigration rates from Europe, Latin America and Oceania are more than double those of Africa, Asia and North America, while Mexico stands out as the country of origin of the highest number of global emigrants (Dumont, Spielvogel, Widmaier, 2010). The same report also notes that intra-regional emigration is fairly common with most destination countries receiving migrants from the same region (85% in Africa, 75% in Asia, 62% in Latin America and 60% in Europe).

Globally, emigration from one's country of origin appears to be more common among lower skilled groups. Recent analysis approximates that low-skilled migrants make up 43.6% of global migrants, while intermediate skilled migrants make up 35% and highly skilled migrants

make up 21.5%. Although low-skilled migration dominates in terms of absolute numbers, the emigration rate for highly skilled, tertiary educated citizens is higher than the total emigration rate in all regions (Dumont, Spielvogel, Widmaier, 2010). This finding demonstrates that highly educated persons may be more likely to undertake the migration journey.

Recent demographic trends may lead one to anticipate that international migration should be increasing. The aging population in high income nations alongside the increasing youthful population in low and middle income nations may create attractive employment opportunities in high income nations for young international migrants. However, government policy barriers appear to have limited the potential growth in international migration. Among high income nations, government policy generally favours the admission of professionals and skilled workers, while limiting the admission of unskilled workers, even though there may be a demand for this type of labour. In many high income nations jobs in the agriculture, construction, manufacturing and service sectors are often filled by migrants from low and middle income nations. As result of barriers to migration, an estimated 50 million people are residing as irregular immigrants in nations throughout the world (United Nations Development Program, 2009). Although some of these irregular immigrants may be able to access jobs with higher wages than in their home country, often they are not eligible for basic services such as health care and are always at risk of deportation. In addition, children of irregular immigrants born in the new host country are often eligible for health care services, but families may resist accessing services in order to avoid detection.

Labour market outcomes vary significantly across migrant-receiving countries, but there are some noteworthy trends. In general, there are sizable differences in employment rates between native-born and foreign-born persons among the highly-skilled with a greater difference

among highly-skilled women. (Dumont, Spielvogel, Widmaier, 2010). In almost all receiving countries included in the recent analysis, highly-skilled foreign-born persons have lower employment rates than native-born persons with the same education level and highly-skilled foreign-born women have the lowest comparable employment rate. This difference may be partially attributed to difficulties or delays with recognizing foreign qualifications within the labour market of the receiving country. Language proficiency is also more important for highly-skilled jobs so the lack of language fluency may hinder career advancement in these occupations. Conversely, there are smaller differences in employment rates between native-born and foreign-born among low-skilled workers of both genders. Low-skilled foreign-born persons have higher employment rates than their native-born counterparts in approximately half of the receiving countries included in the analysis (Dumont, Spielvogel, Widmaier, 2010). This analysis suggests that low-skilled migrants may be able to rapidly integrate into the labour market of migrant receiving countries better than highly-skilled migrants, and that highly-skilled women may experience extra barriers to successful labour market integration. This situation places highly-skilled immigrants at risk for extended periods of living on a low income.

2.1.2 Canadian Perspective

2.1.2.1 Legislation

Immigration to Canada is largely controlled by federal legislation. Canada's *Immigration and Refugee Protection Act, 2002*, states the eligibility criteria for prospective immigrants in each federal class: Economic; Family; and Refugees. The Economic Class includes professionals, skilled workers, businesspersons, individuals with Canadian work experience and provincial nominees. The Family Class includes family members of Canadian citizens or

permanent residents. The Refugee class includes government-assisted and privately-sponsored refugees, as well as individuals who claim refugee status once they have arrived in Canada (Department of Justice, 2002). Accordingly, prospective newcomers to Canada apply for immigration under 3 main federal classes — economic class, family class, or refugee, or through a Provincial Nominee Program.

In addition to federal legislation, Canada also has agreements with provinces and territories to grant them the opportunity to nominate potential immigrants to their jurisdictions. The *Canada-Saskatchewan Immigration Agreement*, 2005, outlines how the federal and provincial governments collaboratively work through the immigration process of prospective immigrants nominated by Saskatchewan (Citizenship and Immigration Canada, 2005). The Saskatchewan Immigrant Nominee Program (SINP) operates under the federal economic class and considers applicants under 7 admission categories: Skilled Workers, Family Members, Health Professionals, International Students, Long-Haul Truck Drivers, Hospitality Sector Workers and Entrepreneurs/Farmers. Most SINP applicants are required to have a permanent, full-time job offer from a Saskatchewan employer, except entrepreneurs and family member applicants. The SINP also requires that applicants meet several admission requirements related to education, work experience, and official language capability to ensure the admission of immigrants who are well prepared to adapt to life in Saskatchewan. SINP family member applicants must be supported by a close family member, who is a Saskatchewan resident, as well as having sufficient education and/or skills. Entrepreneurs must have a minimum net worth and be planning to make a significant investment in Saskatchewan (Ministry of Advanced Education, Employment and Immigration, 2009).

2.1.2.2 Canadian Immigration Trends

Canada's newcomer population is growing faster than any other segment of the Canadian population. Recent estimates peg the number of foreign-born persons in Canada at 6.8 million (Statistics Canada, 2013). The 2011 National Household Survey found that 1 in 5 (20.6%) of the Canadian population were foreign-born, which is the highest proportion since 1931 (Statistics Canada, 2013). Immigration accounts for a large percentage of Canada's population growth, as the foreign-born population increased by 17.2.6% between 2006 and 2011, while the Canadian population increased by 5.3% during this period. The arrival of newcomers was responsible for two-thirds of the population growth between 2006 and 2011 (Statistics Canada, 2013; Statistics Canada, 2013d). These statistics indicate that immigration is playing an increasingly significant role in Canada's population growth.

Recent immigration statistics demonstrate some noteworthy trends. Similar to immigration patterns over the last 10 years, the largest proportion of newcomers arrived from Asia and the Pacific (50.3%), Africa and Middle East (21.7 %) in 2012, while a smaller proportion immigrated from the United States (3.7%), Europe and the United Kingdom (13.9%) and South and Central America (10.4%) (Citizenship and Immigration Canada, 2012). These trends are a notable change from 1971, when European immigrants accounted for the largest group of newcomers (61.6%) to Canada (Statistics Canada, 2006). The 3 main countries of origin of foreign-born population in Canada over the age of 15 years are the United Kingdom, China and Italy (Dumont, Spielvogel, Widmaier, 2010). However, the 3 top source countries for recent immigrants who arrived between 2006 and 2011 are the Philipines, China and India (Statistics Canada, 2013). Although many newcomers settle in large metropolitan centers, an increasing larger proportion is settling in smaller metropolitan areas. Regina and Saskatoon

together accepted 3.2% of newcomers in 2012 as compared to 0.6% in 2003 (Citizenship and Immigration Canada, 2012). These changing immigration trends indicate immediate opportunities for planning appropriate settlement programs for newcomers and longer term opportunities that take into account that Canadians of European descent may make up an increasingly smaller percentage of Canadians on an annual basis.

2.1.2.3 Saskatchewan Immigration

Newcomers to Saskatchewan have made a significant contribution to recent population growth. Immigration has been credited with accounting for 65% of the provincial population growth between 2009 and 2011. In 2011 78% of newcomers arrived via the Saskatchewan Immigrant Nominee Program. This immigration program is administered by the Government of Saskatchewan and allows for the nomination of prospective immigrants that have skills and/or family connections that will help them successfully settle in the province and contribute to the economy. After successfully completing the SINP nomination process, prospective immigrants must apply for a permanent resident visa from the federal government under the federal economic class. The SINP is largely responsible for increased provincial immigration between 2006 and 2011 as SINP nominees increased by 624%, while immigration through the other federal categories increased by only 13% over the same period (Ministry of Economy, 2011). Since SINP operates under the federal economic class, the recent increase in immigration to Saskatchewan is largely due to the arrival of economic class immigrants.

The positive economic and social contributions of newcomers to Saskatchewan are widely recognized. The Government of Saskatchewan recognizes that immigration is an important tool to help fill the demand for labour in specific sectors, in addition to enriching the diversity of our population. Saskatchewan is currently investing in a comprehensive

immigration strategy that focuses on providing settlement and integration support for newcomers, attracting entrepreneur immigrants to support the economy, and attracting skilled workers to meet labour demands (Ministry of Economy, 2011). The immigration strategy includes a new settlement and integration model for the effective delivery of settlement and language services to ensure better integration. The immigration strategy appears to be largely successful in attracting and retaining newcomers as the majority (86.6%) of SINP nominees that arrived in Saskatchewan between 2000 and 2006 were still in the province in 2006 (data for more recent years not available) (Ministry of Advanced Education, Employment and Immigration, 2009). This appears to be a new trend as Saskatchewan had a net loss of international immigrants to other areas of Canada from 1993 to 2002, whereas an approximately equal amount of provincial in-migration and out-migration from 2003 to 2006, and a notable net gain of international immigrants in 2007 (Statistics Canada, 2011a). The SINP may be influencing this trend as there are some anecdotal reports that immigrants move to Saskatchewan to use the SINP to sponsor the immigration of their family members. Since the SINP program operates under the federal economic class, most of these newcomers have skills that allow them to become employed within a short period of time and/or family connections that provide a valuable social network to ensure successful integration into the Saskatchewan population.

2.2 Immigrant Health

2.2.1 Healthy Immigrant Effect

Since Canada's newcomer population makes up about 20% of the population and is growing faster than any other segment of the Canadian population it is important to understand their health issues and healthcare needs. Newcomers do not necessarily experience the same

health issues or interact with our healthcare system in the same manner as native-born Canadians (Young & Spitzer, 1999). A large body of research has repeatedly reported the existence of a “healthy immigrant effect” in which newcomers arrive in Canada in better health than that of the Canadian-born, but experience health declines with increasing years in Canada (Gushulak et al., 2011; Hyman, 2004; MacDonald and Kennedy, 2004).

Many cross-sectional studies have demonstrated the existence of the “healthy immigrant effect”. Newbold (2009) reported that adult newcomers aged 15 years and older experience significant health declines within as little as two years post arrival based on reports of self-assessed health status, while Zhao et al. (2010) observed the same effect within 4 years. MacDonald and Kennedy (2004) found a lower incidence of chronic diseases, including heart disease, cancer and diabetes, among recent newcomers compared to the Canadian-born and a slow increase in the incidence of chronic diseases among immigrants over 20 to 25 years until it converges with that of the Canadian-born. Similarly, Perez (2002) observed a lower incidence of chronic diseases, including heart disease, cancer and diabetes, among recent newcomers and that they were more likely to report a chronic condition with increased time living in Canada. More recent research based on age-standardized mortality rates¹ (ASMR) found that recent adult newcomers had significantly lower ASMRs than the Canadian-born, and that newcomer ASMRs increased with time spent in Canada, but newcomer ASMRs remained significantly lower than those of the Canadian-born (Ng, 2011). This finding is true for both cancer and circulatory disease mortality rates with 1 exception; female newcomers from South Asia had higher ASMRs for circulatory disease (Ng et al., 2011a). The main finding that newcomer ASMRs increased

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Age- and sex- specific mortality rates by 5-year age group were used to derive ASMRs for total population, Canadian-born population, and immigrant population,

with time spent in Canada did not hold true for all newcomer subgroups in the study (Ng, 2011). Women newcomers from Sub-Saharan Africa and the United States had similar ASMRs to Canadian-born women. Among newcomers from North Africa, Middle East, West Africa and South Asia, only men's ASMRs increased with time in Canada; while among newcomers from South East Asia, only women's ASMRs increased similarly. These cross-sectional studies provide ample evidence of a health differential between recent adult newcomers and the Canadian population and of a gradual convergence of newcomer health status towards the Canadian average.

The "healthy immigrant effect" is a complex phenomenon that does not manifest consistently across all groups of newcomers. Upon arrival refugees are commonly less healthy than other types of newcomers and they are more likely to transition to poor health (Beiser et al., 2002; Beiser, 2006; Rousseau & Drapeau, 2003; Wu et al., 2003). At all stages post arrival refugees are at higher risk of mortality, infectious diseases and mental health problems. In addition, certain newcomer sub-groups that appear to be healthy upon arrival, including women, seniors, individuals with low-income and visible minorities, are at higher risk of transitioning to poor health with subsequent years in Canada (De Maio and Kemp, 2010; Newbold, 2005; Ng et al., 2005; Vissandjee et al., 2004). These findings demonstrate the assumption that newcomers are a homogenous group is erroneous and that one must look beyond the label of newcomer to understand the diverse life experiences that interact to influence observable health outcomes.

Traditionally, the "healthy immigrant effect" has been conceptualized as the result of several social and health factors. Long standing hypotheses are based on the assumption that many newcomers emigrate from low and middle income regions where adverse lifestyle habits, such as poor diet and inactivity, that contribute to the development of chronic disease are less

prevalent and that newcomers gradually adopt adverse lifestyle habits that are more prevalent in high income countries after their arrival (Gushulak, 2007). The process of acculturation has been found to include changes in diet and physical activity level among newcomers (Mazur, 2003). These lifestyle changes can increase the risk of adverse health outcomes, including obesity and chronic health conditions. Secondly, it has been suggested that immigration selection and screening processes ensure that only the healthiest individuals are able to immigrate (Gushulak, 2007). High income nations often have complex immigration selection process that favour younger, well-educated immigrants who may be healthier and better able to cope with the initial stresses of immigration. Immigration selection processes also often involve a medical screening that screens out individuals with pre-existing health problems. Although there is a large body of research that supports the existence of the “healthy immigrant effect,” there is not total agreement on this point.

There is still some doubt concerning whether the “healthy immigrant effect” actually demonstrates real changes in health status or may be mediated by other phenomena. As many immigrant health studies are based on cross-sectional data the “healthy immigrant effect” may be the result of a cohort effect, whereby the cohort of long-term immigrants may have arrived in worse health than the cohort of more recent immigrants (Rotermann, 2011). Many studies also rely on self-reported health status as an important health status variable. It may be possible that self-reported declines in health are the result of changes in newcomer’s perception of their health rather than actual changes in health status (Newbold, 2005). As newcomers integrate into Canadian society they may change how they define health. In many cultures health is more related to the ability to accomplish daily tasks than the appearance of symptoms linked to disease (Kittler et al., 2012). In accordance with traditional health beliefs, individuals may only seek

healthcare when their sickness is disrupting their ability to work and to fulfill their social obligations. As individuals adapt to Canadian culture they are exposed to the dominant biomedical view of health in which poor health is caused by diseases that involve malfunctioning of body organs and systems to produce symptoms (Kittler et al., 2012). This scenario suggests that newcomers may change how they define health and illness and seek healthcare quicker in response to disease symptoms, although some research maintains that acculturation is not associated with increased use of biomedical health services (Douglas & Pacquiao, 2010). Newcomers may also have difficulty explaining their health concerns to a healthcare practitioner due to cultural shaping of illness that then leads to difficulties with timely diagnosis (Kirmayer et al., 2011). Newcomers may present with physical complaints that are actually linked to mental health problems, but this is difficult to determine unless they are asked about how their symptoms are affecting their activities of daily living or functioning in their daily roles. It has also been hypothesized that newcomers may have better access to health services in Canada than in their country of origin that facilitates increased diagnosis of pre-existing conditions within the first few years of residency in Canada (Newbold, 2009; MacDonald & Kennedy, 2004). Several studies have found that newcomers (Goel, 1994; MacDonald & Kennedy, 2007) or specific newcomer sub-groups, namely unmarried Vietnamese women, (Taylor et al., 2009) underutilize preventative healthcare services that screen for early stages of disease, so the disease may progress to an acute stage and result in the eventual access of health services several years later. These hypotheses cast some doubt on whether the “healthy immigrant effect” reflects real health status changes across the newcomer population.

In regards to newcomer children there is a smaller emerging body of evidence related to mortality risks, health status, and the “healthy immigrant effect.” In the United States, Perreira

and Ornelas (2011) found that newcomer children typically have lower mortality risks than children born to immigrant parents and children born to U.S. natives. In Montreal, Canada, Maximova et al. (2011) measured body mass index (BMI) of first generation newcomer, second generation newcomer and native-born children over a 5 year period. They found that BMI increased by 0.59, 0.73, and 0.82 kg/m² with each successive year among first generation newcomer, second generation newcomer and native-born children, respectively. This emerging evidence related to newcomer children's health status appears to indicate that the "healthy immigrant effect may exist among newcomer children.

2.2.2 Social Determinants of Newcomer Health

More recently, research on immigrant health has focused on the broader social determinants of health. Similar to all Canadians, newcomer health status can be affected by a broad range of social factors, including educational attainment, income level, social support and housing adequacy. Lower socioeconomic status is associated with a number of adverse health outcomes, including higher infant mortality, increased incidence of cardiovascular disease, reduced life expectancy and higher infant mortality (Mikkonen & Raphael, 2010). A clear socioeconomic gradient in health status is evident as disease prevalence increases and years of life lost to early death increases from the highest income quintile of the Canadian population to the lowest income quintile (Mikkonen & Raphael, 2010). Specifically with regards to immigrant health, Rivera et al. (2013) found that the health status of immigrants to Spain worsened with increased time in Spain and with advancing age. Each additional year of residence in Spain raises the risk of suffering from a chronic disease and experiencing limitations with daily activities. This study also reported that women experience poorer health than men, and good employment is associated with better health and decreased likelihood of suffering from a chronic

disease and experiencing activity limitations. The relationship between education and health status in this study is a little more complicated as higher levels of education are associated with better health, with the exception of completion of a university degree, which is not associated with better health. This may be related to problems that immigrants with a university degree encounter with finding work in their field in a new country.

With regards to children's health status, Case et al. (2002) report that the health of children from low income families declines faster than those with higher incomes, indicating that long-term average family income is a powerful determinant of children's health. In addition these children then grow to be adults with poor health and low socioeconomic status. Strong income gradients of child health have been observed in relation to both self-reported health status and chronic conditions (Case et al., 2007). This is a concern not only for the affected children, but also for future generations as the negative effects of poor childhood health can persist through generations. Poor childhood health can initiate the trajectory towards perpetual low socioeconomic status across generations (Palloni et al., 2009). This study concluded that the relationship between poor childhood health and later adult social class is largely mediated by the effects of early childhood health on the development of cognitive skills that then affect an individual's ability to engage in the labour market. Given that recent newcomers are vulnerable to poverty, the correlation between low socioeconomic status and poor health outcomes leads to concerns about newcomer health status. In 2011, 16.4% of recent newcomers were living in poverty, as measured by Statistics Canada's post-tax low income cut-offs, while 8.8% of the Canadian population were living in poverty (Employment and Social Development Canada, 2014). Given the impact of low socioeconomic status on the health of all Canadians and the high

incidence of low-income among recent newcomers, a significant number of newcomers are at risk for adverse health outcomes.

In addition to the standard social determinants of health, newcomers may be vulnerable to a variety of intersecting health risks related to their pre and post migration experiences. In one's country of origin individuals are enmeshed in a socioeconomic and physical environment that may engender specific health risks to the individual and the population. Newcomers may have been subjected to poverty and its associated health risks in their country of origin, which may have served to propel them into migration (Takenaka & Pren, 2010). The actual migration process may subject a migrant to a variety of health risks that may include prolonged exposure to poor living conditions in a refugee camp or specific disease exposures in secondary countries (Kamperman et al., 2007), such as tuberculosis (Arshad et al., 2010). Accordingly, pre-migration and migration experiences can influence early health/disease trajectories positively or negatively prior to arrival in Canada.

Once newcomers arrive in Canada they are confronted with the challenges of resettlement in a new country and adaptation to a different climate and customs. Since newcomers are not a homogenous group, they include many diverse groups with disparate experiences both pre and post migration that can impact health status. These diverse experiences then interact with national and provincial policies that regulate access to healthcare services to influence newcomer health outcomes. Many newcomers will have experienced the loss of extended family and community social supports upon arrival (Stewart et al., 2008), and refugees may have been exposed to additional stressors associated with the conflict or disaster that they were fleeing (Hauff & Vaglum, 1995). Social support networks for newcomers, both formal and informal, are vital to buffering the stresses of migration to ensure successful resettlement and favourable

health outcomes (Simich et al., 2005; Hansson et al., 2009). Although social support is a determinant of health for the broader population, it is particularly important to recent newcomers to buffer the stresses of migration and resettlement.

One of the challenges that newcomers face upon their arrival is the need to integrate into the Canadian labour market. Since Canada's immigration policies favour the selection of well-educated immigrants, it may be assumed that recent immigrants should be easily engaged in skilled labour. Unfortunately, despite their high educational attainment and skill levels, recent newcomers are experiencing increased difficulties with finding employment in comparison with newcomers who arrived prior to 2000 (Picot et al., 2007). Newcomers are also commonly underemployed, working at lower skilled jobs than expected based on their educational attainment (Gilmore, 2009). Recent newcomers often experience difficulties with finding employment or suitable employment that matches their skill level due to poor language skills, foreign qualifications that are not recognized in Canada, lack of Canadian work experience and/or discrimination (Xue, 2010; Li, 2001). The strong association between employment, income and health, as well as between downward class mobility and health, has been demonstrated among the broader population (Mikkonen & Raphael, 2010) and shows particular relevance among newcomers to Canada (Fleury, 2007). Newcomers of working age who have experienced downward class mobility are at higher risk for diabetes and heart disease than newcomers who have not experienced downward mobility (Spitzer, 2005). Among refugee newcomers, unmet expectations and unemployment have been associated with a higher risk for depression (Simich et al., 2006). These findings suggest that the migration experience and subsequent integration into the Canadian labour market commonly engender exposure to poor

socioeconomic conditions that put newcomers at higher risk for the development of poor health outcomes.

In addition to the more concrete social determinants of health, namely education, employment and income; race, or more specifically racialization, is an important social determinant of health. Racialization refers to the social processes through which groups are demarcated and subjected to unequal treatments, such as discrimination, based on social norms (Galabuzi, 2009). As previously indicated, newcomers are increasingly arriving from Asia and the Pacific, Africa and the Middle East, while immigration from the United States and Europe is trending downwards (Citizenship and Immigration Canada, 2012). Non-European newcomers are more likely to belong to visible minority groups that are subject to racialization. Among recent Asian immigrants, perceived discrimination has been found to directly affect erosion of positive mood and an increase in depressive symptoms, as well intersecting with other social determinants of health to impact health outcomes (Noh et al., 2007). Beiser (2009) found that southeast Asian refugees who experienced discrimination were more likely to become depressed at a later date, but this association was mediated by the strength of their ethnic identity. Those refugees with strong ethnic identities who experienced discrimination were more likely to become depressed, whereas those who were more integrated into mainstream society appeared to cope better with experiences of discrimination. Discrimination can also indirectly affect mental health through making it difficult to find and maintain employment and housing (Dunlop et al., 2003). Newcomers from visible minority groups, including refugees and non-European newcomers have been found to be at higher risk for transitioning to poor health over the first few years in Canada (Newbold, 2009a; Ng et al., 2005). These findings behoove researchers to adjust their lens to take into account that newcomers have experienced a forced or voluntary

translocation and subsequent adjustment to a new country when analyzing the determinants of newcomer health.

The research presented above clearly indicates that recent newcomer families are at risk for the development of poor health outcomes because they are more likely to experience poor socioeconomic conditions. As many Canadian newcomers are accepted through the skilled worker class, many middle class families may arrive in Canada with high hopes for a better future, but they are then confronted with the reality of living conditions that may not meet their expectations. Newcomer families may live on a low income for an extended period if they have difficulty learning English, finding employment that meets their skill level and/or experience discrimination. Newcomer families need support to integrate into Canadian society to ensure that they do not become entrapped in a negative trajectory that leads to enduring poor socioeconomic conditions. Newcomer children require special attention during their first few years in Canada to ensure that their health and development is monitored and protected during this vulnerable period, when families may be experiencing a number of environmental stressors such as poor working conditions, long work hours and/or pervasive media messages promoting fast food.

2.2.3 Determinants of Health among Newcomer Children

In addition to the social determinants of health discussed above, newcomer children experience additional vulnerabilities simply because they are children progressing through developmental stages and forming their long-term identities. Erickson (1968) has noted that newcomer children have migrated from one culture to another and may encounter difficulties as they go through the developmental task of forming a coherent and stable sense of identity during adolescence. Children are situated within families, schools and neighbourhoods that influence

their daily experiences and lifestyles that ultimately impact developmental outcomes (García-Coll et al., 1996). Accordingly, children may be exposed to stressors that reshape their developmental trajectory during migration and adaptation to a new culture.

Prior to migration, children are part of families that are situated within a socioeconomic environment that may affect their future health through a number of avenues. In low and middle income countries increased socioeconomic status is associated with a higher prevalence of overweight and obesity, while children from low-income families are at higher risk of malnutrition and stunting (Perreira & Ornelas, 2011). Van Hook and Balistreri (2007) found that this relationship persists among children after they immigrate to a high income country. Specifically, they found that low-income newcomer children from low and middle income countries have lower BMIs and BMI growth rates than high-income children from the same countries or from high income countries. Children from transitional countries appear to be more at risk of being overweight or obese. High rates of obesity have been observed among preschoolers in Kuwait (8.2%) and Saudi Arabia (9.9%) (Al-Isa & Moussa, 1997; El-Hazmi & Warsy, 2002). This situation is thought to be the result of a combination of factors including cultural norms that value high-fat foods and consider plumpness a sign of beauty (Kandela, 1999), low sports participation (Maybry et al., 2009), cultural norms that create barriers for women's participation in sports (Berger & Peerson, 2009), and the transition to a Western diet that encompasses increased fast-food and soft drink consumption, frequent snacking and low fruit and vegetable consumption (Musaiger & Abuirmeileh, 1998). Accordingly, pre-migration poverty puts children at risk for malnutrition and growth stunting during key growth periods that may permanently limit their future growth and development, while more privileged children may be at risk for the development of chronic diseases.

Sometimes family migration is due to unstable conditions in the country of origin. Families may have been separated and/or witnessed or experienced political violence prior to or during migration. Suarez-Orozco et al. (2002) found that up to 85% of the newcomer children she studied had been separated from 1 or both parents for an extended period during the migration process, and that family separations increased the likelihood of depressive symptoms among mothers and children. Refugee children are particularly vulnerable as some studies have found that 80 to 90% of refugee children have been exposed to harsh conditions including long-term hunger and violence (Lustig et al., 2004). These hardships put refugee children at increased risk for malnutrition, acute physical health problems, mental health problems, and development of chronic health problems after resettlement (Perreira & Ornelas, 2011). The migration process may expose newcomer children to extreme hardships that can have long-term impacts on their mental and physical health.

Families may encounter a number of stressors, including communication difficulties, changing family roles and discrimination, as they adapt to resettlement. Depending on the child's age or developmental stage and situated within the context of the broader social environment, stressors can elicit differential impacts on a child's health status (Perreira & Ornelas, 2011). Children who immigrate at younger ages have been observed to acquire better language skills and experience more success at school, leading to the assumption that they are successfully adapting to the host culture; however, they are also more likely to engage in risky health behaviours, including smoking, alcohol use and early sexual activity, that can have detrimental impacts on health (Tolbert Kimbro, 2009). Newcomer children's health may be impacted through a variety of conditions grounded in diverse family contexts. Strong family ties and mutual support are often evident among newcomer families, which can exert a positive

influence on children's emotional development (Love & Buriel, 2007). However, the resettlement process can also entail changing role expectations and parent-child acculturation gaps², which increase family conflict (Gonzales et al., 2009). Poor mental and physical health outcomes among newcomer children and youth have also been linked to racial discrimination. Youth who perceive that they have experienced discrimination report more depressive symptoms, anxiety, lower self-esteem, engage in more risky health behaviours and have reduced academic expectation (Gonzales et al., 2009). Poor health outcomes, including elevated blood pressure, high levels of glucocortisol hormones and insulin resistance have been linked with perceived discrimination among children of visible minorities (Sanders-Phillips et al., 2009). A newcomer child's developmental and long-term health outcomes can be shaped through a variety of intersecting pathways within the child's environment, including family dynamics and the acceptance of minorities in the wider community.

In addition to the social environment, children live in neighbourhoods that may enhance or inhibit the development of healthy lifestyles through access to resources such as grocery stores and safe recreational facilities. There is some evidence that low-income individuals' diet decisions may be influenced by more proximate sources of food due to limited transportation options (Paquet et al., 2010; Boone-Heinonen et al., 2011). Diet quality of low-income men appears to be particularly susceptible to the influence of proximate food sources, as those who lived closer to fast food outlets report increased consumption of fast food, while those who lived closer to grocery stores are more likely to report consuming a higher quality diet. However other factors, including working long hours or working in sedentary jobs like truck driving, may also

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Acculturation gap refers to the difference in the rate of acculturation of the parent as compared to their child.

affect diet quality. Since newcomers are more likely to be low-income their diet may be influenced by the presence of grocery stores or fast food outlets in their neighbourhood, as well their capacity to purchase high quality foods on a limited budget. Che and Chen (2001) found that 35% of low-income households experience food insecurity as compared to 14% of middle-income households. The Canadian Community Health Survey 2008 also found that recent newcomer families are more likely to be food insecure (12.6%) as compared to longer-term immigrant families (7.8%) and Canadian-born families (7.5%) (Health Canada, 2008). Newcomer dietary patterns may also be influenced by poor availability or high cost of traditional foods, lack of information regarding how to prepare food available in Canada, or the increased use of Western convenience foods (Kittler, Sucher, Nahikian-Nelms, 2012). Since newcomer children live in families their diet is largely influenced by the food that parents and other adults bring into the home.

The presence of safe recreational facilities in neighbourhoods may also influence healthy lifestyle choices. Cragg and Cameron (2006) found that children are more likely to participate in sports if they live in safe neighbourhoods that allow for outside play. As neighbourhood disorder tends to be associated with predominantly low-income areas, children who live in low-income families are less likely to participate in sports (Kohen et al, 2002). Since newcomer children experience an increased likelihood of living in low-income families it may be anticipated that they would report less participation in sports. This assumption is supported by a Canadian study completed in 2005 that found recent newcomer children are less likely to participate in sports (32%) than Canadian-born children (55%) (Clark, 2009). Although the gap is smaller, participation in the more internationally popular sport, soccer, is also lower for recent newcomer children (10%) than among the Canadian-born (23%). The lower participation of newcomer

children in sports may be associated with being part of low-income families living in unsafe neighbourhoods. There may be other factors that contribute to the lower participation of newcomer children in sports, such as parents having multiple jobs that do not allow time to take children to activities, lack of transportation to access recreational activities outside of the neighbourhood or lack of knowledge regarding how sports are organized in Canada, but there is not yet much research to support these possible factors. The currently available information suggests that neighbourhood conditions, such as the availability of grocery stores and fast food restaurants and the general feeling of safety, are some of the factors that influence the development of healthy lifestyles.

Table 2.1: Factors related to migration that affect children’s health

Premigration	Migration	Postmigration
Age and developmental stage at migration	Separation from family/caregiver	Stresses related to family’s adaptation
Poor access to formal education	Exposure to violence	Difficulties with education in new language
Separation from extended family and peer networks	Harsh living conditions with poor access to healthcare (e.g. refugee camps)	Acculturation (e.g. ethnic and religious identity, sex role conflicts, intergenerational family conflict, unhealthy lifestyle habits)
Poverty	Poor nutrition	Social exclusion and discrimination (at school or with peers)
	Communicable diseases	Prolonged family low-income
	Uncertainty about future	Insecure neighbourhoods

(Adapted from Lane et al., 2014)

This section demonstrates that the determinants of newcomer children’s health extend far beyond the social determinants of health that impact their parents’ health status. Prior to migration children are situated within families that are subject to the socioeconomic conditions

of their country of origin that may support or compromise their initial health status. During migration children may be separated from their primary caregiver and/or be exposed to harsh living conditions that put them at increased risk for the development of malnutrition, communicable diseases and mental health problems. Once settled in a new country, newcomer children must adapt to a number of changes that may be more or less stressful depending on the family's and community's socioeconomic context. Newcomer children may experience difficulties with adapting to a new school, learning a new language, and experiencing discrimination. However, depending on whether they reside in a supportive family environment or one that is characterized by role conflict, and their surrounding socioeconomic conditions, they may successfully meet challenges to develop into healthy adults. Newcomer children are immature beings in the process of forming their identities while situated in a complex web of intersecting factors including family class, family dynamics, schools and neighbourhoods that can enhance or impede the development of healthy lifestyles and ultimately, long-term health outcomes. Although the impact of many of these factors on health status is recognized, currently available research does not fully explain how these factors intersect to produce a variety of diverse individual experiences. Additional research is required to fully understand the diverse experiences of newcomer children and how this impacts health status.

2.3 Healthy Lifestyle Factors among Newcomers

2.3.1 Global Dietary Patterns

Over the last 20-30 years there has been a dramatic shift in global dietary patterns, often referred to as the “nutrition transition”. The nutrition transition has been described as major shifts in physical activity and dietary patterns that affect nutritional outcomes, including body

composition and the development of chronic diseases (Popkin, 2006). Popkin (2006) describes the nutrition transition as encompassing the process whereby hunter-gather societies with healthy diets, but high mortality due to infectious diseases then progress through a period of agricultural modernization that may include famine. Most countries have already passed through these stages. Then as income rises, famine recedes, physical activity decreases, lifestyles become more sedentary and diets become energy dense, which results in the increased incidence of chronic diseases and disability. Many transitional countries and some high income countries are immersed in this stage. It is then hypothesized that individuals will adopt healthier diets and lifestyles that will result in healthier ageing. Many transitional and high income countries are still struggling through the negative phase of the nutritional transition with a high prevalence of chronic diseases.

Existence of the nutrition transition is evident in the changing global dietary patterns. People around the world are increasing their consumption of sugar-sweetened beverages, and sweetened and processed foods, while reducing their consumption of fruits, vegetables and legumes (Popkin, 2006). One of the most dramatic shifts has been the increased consumption of sugar-sweetened beverages in place of milk and water. In many major countries, including the United Kingdom (UK), United States (US), and Mexico, the consumption of sugar-sweetened beverages has increased such that all age groups now obtain about 17-25% of their total caloric intake from these items (Popkin et al., 2010; Barquera et al., 2008; Rivera et al., 2008; Sanigorski et al., 2007; Duffey & Popkin, 2007). This dietary transformation has occurred gradually over the last few decades in higher income countries, but has been more abrupt over the last few years in transitional countries. In the UK, national dietary surveys demonstrate that all age groups obtain over 17% of their caloric intake from beverages and juices (Popkin et al.,

2010). In the US, adults increased their consumption of beverages by 222 calories per day, largely from sugar-sweetened beverages, between 1965 and 2002 (Duffey & Popkin, 2007). In Mexico, 2 national surveys found that individuals aged 2 years and older doubled their caloric intake of beverages over a period of 7 years (Rivera et al., 2008; Barquera et al., 2008). The global increase in the consumption of sugar sweetened beverages is a concern because it results in increased caloric intake that may upset an individual's energy balance. Multiple studies have demonstrated that when individuals drink a liquid that contains fat, carbohydrates or protein they do not compensate for the excess energy intake by reducing their caloric intake from food (Mattes, 2006) and that the increased caloric intake results in weight gain (Malik et al., 2006). Given the global increase in the consumption of sugar-sweetened beverages, newcomers may arrive in Canada with established poor dietary habits that include excessive energy intake.

Further to the dramatic increase in the consumption of sugar-sweetened beverages, there has also been a global shift towards the increased consumption of animal source foods and fried foods. In high income countries the transition to an animal source foods based diet occurred during the post World War II era due to the subsidization of animal source foods (Starmer et al., 2006), while more recent transitions to animal source foods-based diets have occurred in low- and middle-income countries (Delgado, 2003). The International Food Policy Research Institute has demonstrated that the declining price of beef from 1970 to 1994 was linked to increased consumer purchases of these products in low and middle income countries (Delgado, 2003). In addition to the impact of declining beef prices, increasing incomes have also been associated with the increased consumption of animal source foods in China (Du et al., 2004). Concurrently with the transition to an animal source foods-based diet, there has also been a global increase in the consumption of vegetable-based oils (Drewnowski & Popkin, 1997). Frying has replaced

other cooking methods in some transitional countries and has resulted in substantially increased individual energy intakes in Asia and the Middle East (Popkin et al., 2002; Wang et al., 2008). However this general finding may not hold true for all income groups. Wang et al. (2008) note that higher-income groups consumed more fried food than lower-income groups. In addition to the global increase in the consumption of animal source foods and vegetable-based oils, a concomitant reduction in the consumption of legumes, grains and whole grain products has been observed in some areas of Asia (Du et al., 2002; Popkin et al., 2001). This dietary change may be the result of the increased consumption of animal source foods displacing the consumption of other foods. The global increase in the consumption of animal source foods and vegetable-based oils and decreased consumption of legumes and grains in some countries may put immigrants at risk for excessive fat and energy intake in their country of origin so they may arrive in Canada with compromised health status.

In addition to the global changes in diet composition there is also a shift to increased snacking, increased consumption of fast food and larger fast food portion sizes in high income and transitional countries. From 1977 to 2006 the average number of eating occasions per day for children aged 2 to 18 years and older increased from 4 to 5 occasions in the US (Popkin & Duffey, 2010). The increase in the number of eating occasions is associated with increased energy intake American children have also qualitatively changed the composition of their snacks by increasing their consumption of salty snacks, candy, fruit drinks and fruit juices, while decreasing their consumption of fresh fruit (Piernas & Popkin, 2010). Snacking has also increased among all age groups in China in recent years (Wang et al., 2008). Between 1991 and 2004 the prevalence of snacking among Chinese children increased from 15.4% to 20.6%. However, this change was not consistent across all income groups as snacking prevalence

increased with increasing income. This research may indicate that snacking is becoming more common among higher income groups in transitional countries. In the US, children are obtaining a greater proportion of their energy from fast foods as consumption of fast foods increased from 10 to 13% of energy intake among children aged 2 to 18 years between 1977 and 2006 (Poti & Popkin, 2011). Portion sizes of key fast foods consumed by US children have also increased over the last 30 years. Pizzas, soft drinks, hamburgers and cheeseburgers increased in portion size and the total energy from meals containing these items also increased (Piernas & Popkin, 2011). Although the available evidence is limited to a few countries, it may indicate early trends in dietary patterns that may extend to transitional countries as incomes rise.

Several hypotheses have been proposed to explain the observed global dietary pattern shifts, including economic, marketing and social changes. Regional and global infrastructure to support the production and distribution of food has contributed to dietary changes through keeping the prices of animal source foods, fats and sweets relatively low (Popkin & Ng, 2008), and supermarkets have appeared in all urban areas to allow for efficient food distribution (Reardon et al., 2004). While supermarkets may assure access to a safe food supply they also allow increased access to fatty, sweet and processed foods (Popkin, 2011). Marketing may also be impacting dietary patterns in low- and middle-income countries as TV ownership becomes more common and Western content and advertising reaches the world (Weber, 2000). Television advertisements for food have been linked with increased snacking (Jackson et al., 2009). Hitchings and Moynihan (1998) have shown that children remember commercials and that the recalled commercials often impact their dietary consumption patterns. The enhanced availability of high-calorie foods along with their aggressive marketing across the globe will impact dietary patterns as individuals attain higher salary levels that allow them to purchase these foods.

Depending on their family's socioeconomic condition in their country of origin, newcomers to Canada may be arriving with already established poor dietary habits that predispose them to the development of poor health outcomes.

2.3.2 Global Food Security

Although the global dietary patterns described above provide a useful account of dietary habits of individuals in high income countries and higher-income groups in transitional countries, they do not hold true for many vulnerable populations. The Food and Agricultural Organization (2002) defines food security as, "...a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life". In low and middle-income countries, the poor spend between 50 and 80% of their income on food, while the middle class spend between 35 and 65% of their income on food. In many low and middle-income countries the poor and middle-class make up more than 80% of the population (Banerjee & Duflo, 2008). Given this large population who spend a high proportion of their income on food, they are especially vulnerable to food insecurity as food prices increase. A study in Bangladesh between 1992 and 2000 found that as rice prices increased families continued to purchase the same amount of rice and decreased their expenditures on non-rice food items, including animal source foods, lentils and vegetables, which resulted in decreased diet quality (Torlesse et al., 2003). Further analysis of this data revealed that child stunting and chronic energy deficiency among mothers was more common among families with higher expenditures on rice and lower expenditures on non-rice foods (Campbell et al., 2010). A study in Indonesia conducted from 1999 to 2003 observed similar results due to the economic crisis in the late 1990s. The risk of child stunting was greater among families who spent less on animal source foods (Sari et al.,

2010). In addition to these country-specific studies, a simulated risk analysis using global data sources found that energy consumption declined in most low and middle income countries during 2006-2010 (Henk-Jan et al., 2010). This simulated risk analysis estimates that an additional 457 million people are at risk of food insecurity due to the global economic crisis that resulted in increased food prices and job losses. This research suggests that there are a growing number of vulnerable families with reduced access to adequate nutrition to support normal child development and growth and adult health maintenance. Due to various crises some of these families may become refugees seeking asylum in other countries. As Canada has the mandate to “resettle refugees to save lives and to provide stability to people fleeing persecution with no hope of relief” (Citizenship and Immigration Canada, 2011) it may be anticipated that Canada will accept many refugees who have suffered through periods of food insecurity.

Chronic and short-term food insecurity can have acute and durable impacts on vulnerable populations, including children, pregnant and lactating women, and the chronically ill. As discussed above, vulnerable families reduce expenditures on expensive nutrient dense foods and reduce overall energy intake in response to reduced income and increased food prices. This reduction in dietary diversity causes widespread and severe micronutrient deficiencies (Fouéré et al., 2000; Gitau et al., 2005), which combined with energy insufficiency leads to deteriorating health that may involve increased susceptibility to infections, delayed cognitive development, stunted growth and reduced productivity (Victora et al., 2008; Black et al., 2008). In addition to the acute impact of inadequate nutrition, children under the age of 2 years who do not have access to adequate nutrition for as little as 6 months may experience irreversible effects that limit their potential physical and mental development (Victora et al., 2008). Given the high preponderance of food insecure families in low and middle income areas of the world, some

newcomers to Canada (particularly refugees) may have experienced food insecurity for variable periods over their life course prior to their arrival in Canada. These newcomers may already have compromised physical and mental health status and require specialized attention to their health and nutritional needs.

2.3.3 Newcomer Dietary Patterns

Upon arrival in Canada, newcomers may experience subtle or drastic changes in their food environment depending on their pre-migration living circumstance, which may lead to dietary acculturation. Many studies have demonstrated that immigrants' increasing exposure to a dominant host culture, as measured by time in the new country, host culture language use and family generation in the new country, is linked to dietary acculturation. Shifts in the food environment have been linked with shifts in individual dietary intake, but the direction of change is not always consistent. Among Puerto Rican immigrant women, time spent in the USA has been associated with increased consumption of sweetened drinks, but those with poorer language ability were not as susceptible to this change (Himmelgreen et al., 2005). Similarly, Liberian and Somalian immigrants have been found to consume more sugar and sweets, in addition to vegetables, oils and milk with increased time spent in the USA; while children among these groups were found to consume more fruits (Patil et al., 2009). Among Hispanic youth in the USA, the exclusive use of Spanish language in the home is associated with lower intakes of fat, protein and sodium and higher intakes of folate (Mazur et al., 2003). In Australia, Sub-Saharan immigrants commonly reported an increased consumption of breakfast cereals, pizza and fast foods after immigration (Renzaho & Burns, 2006). Batis et al. (2011) note that food acculturation among Mexican Americans includes both beneficial and deleterious diet modifications. They found that increased exposure to the US culture is linked with increased

consumption of low-fat milk, high-fiber bread and low-fat meat and fish, but also note the increased intake of French fries, pizza, salty snacks, dessert, sugar and saturated fat. Franzen and Smith (2010) observed that Hmong refugees in the USA increased their meat consumption and the following generation born in the USA reported that their diets included a larger proportion of American food and less traditional food. These studies demonstrate that immigrants to western countries experience some dietary changes, but it is neither linear, nor exclusively beneficial or deleterious to the health of immigrants.

It is important to consider the overall food environment both pre- and post-migration to understand how newcomer dietary intake may be affected by the new environment. Pre-migration, refugees may have spent time in refugee camps and experienced food shortages, which may result in abnormal dietary behavior after the period of deprivation has ended (Toole & Waldman, 1997; Polivy et al, 1994). Some research suggests that the episodic abundance of food, such as the monthly feast and famine cycle of social assistance or food stamps, may be linked to disordered eating and bingeing (Alaimo et al., 2001). Food deprivation may also lead to persistent food related issues such as excessive food storage, food cravings, and difficulty throwing away food (Sindler et al., 2004). Franzen and Smith (2010) have reported that some Hmong refugees in the USA own 2 to 4 freezers to store large quantities of meat so they would always have some available. The transition from a refugee camp with limited food supplies and no refrigeration to the USA where it is possible to store large amounts of frozen food appears to have shaped food-buying behavior to favour the purchase of meat, a high status food.

Immigrants from transitional countries may have been exposed to pre-migration environments involving a nutritional transition to westernized food that may be further facilitated by the move to Canada. As mentioned in the *Global Dietary Trends* section above, immigrants

from transitional countries may have already experienced substantial changes to their dietary patterns including increased consumption of sugar-sweetened beverages, animal-based foods and processed foods, and decreased consumption of fruits, vegetables and legumes (Popkin, 2006; Du et al., 2004; Delgado, 2003; Wang et al., 2008) prior to migrating to Canada. Many populations have also increased their consumption of vegetable-based oils, (Drewnowski & Popkin, 1997) as frying has replaced other cooking methods in some transitional countries (Popkin et al., 2002; Wang et al., 2008). These dietary changes have been associated with substantially increased individual energy intakes in Asia and the Middle East (Popkin et al., 2002; Wang et al., 2008). However, this general finding may not hold true for all income groups, as higher-income groups have been noted to consume more fried food than lower-income groups (Wang et al., 2008). According to these trends immigrants from transitional countries, especially those with higher incomes in their country of origin, may be arriving with already established poor dietary habits that predispose them to the development of poor health outcomes in Canada.

The availability of traditional foods, economic-constraints, time-constraints that lead to the use of convenience foods, children's demands and the ability to cook western foods can all influence newcomer dietary intake after migration to a new host environment (Patil et al., 2009). While some newcomers in rural areas may have difficulty locating familiar traditional foods (Kaufman, 1999), this does not appear to be a major issue for newcomers in most cities as only 12 % of Liberian and Somalian refugees reported difficulty with locating their preferred foods in a recent American study (Patil et al., 2009). However, the experience of the respondents indicates that they learn where to buy traditional and American foods from their case workers and ethnic peers who arrived earlier, so their social network can influence their food buying behaviour. In addition to the availability of traditional foods in stores, newcomer children's

access to traditional foods can be affected by the lack of a mother or other relative who prepares traditional food. Bowen and Devine (2010) found that Puerto Rican girls who migrated to the USA without their mother or grandmother experience significant dietary change due to lack of access to traditional foods. In contrast to the wide availability of traditional foods, many respondents report that economic-constraints often shape their food buying behavior (Patil et al., 2009). Respondents repeatedly mentioned the high cost of African food in comparison to American foods and how they ate African foods for the few weeks following receipt of their monthly allocation of food stamps and then relied on a more monotonous diet of soups for the remainder of the month. Time constraints due to newcomer work schedules or lack of transportation may also affect food-buying and preparation behaviour. Hmong refugees in the USA state that they are not able to access Asian/Hmong food stores frequently due to limited business hours; and they no longer make certain traditional foods because they can purchase those prepared foods at ethnic food shops (Franzen & Smith, 2010). Patil et al. (2009) report that newcomers commonly try to shop and prepare traditional dishes on their days off to last for a week. Only 25% of the respondents reported difficulties with getting to the store and cooking, but 45% also reported that they ate fast food at least once per week. Although the availability of traditional foods and time constraints may contribute to shaping food-buying behavior, economic constraints appear to exert greater influence on food purchasing decisions

In addition to the wider societal food environment that impacts newcomer food-buying behaviour as described above, food decisions are also being impacted by family dynamics and cooking skill limitations. Newcomer children food preferences may be influenced by exposure to new western foods at daycares or school food programs (Patil et al., 2009) and media advertising (Story & French, 2004). Indeed, in one study 75% of Liberian and Somalian

refugees felt it was important for their children to eat traditional foods, but often complied with their children's demands to purchase American food because they worried that their children were not eating enough (Patil et al., 2009). An additional nuance to this finding is that children of parents with poorer English skills consumed more sodas and salty snacks and less fruits, indicating that children with better English skills than their parents may have some influence on dietary decisions. Hmong refugees have also reported that they buy American foods for their children and traditional food for themselves (Franzen & Smith, 2010).

Dietary decisions may be impacted by knowledge translation of cooking skills among family members. Patil et al. (2009) found that over 40% of Liberian refugees interviewed agreed that their food habits are shaped by lack of knowledge concerning how to cook alternative foods. Respondents described how they liked some American foods and would like to prepare them at home, but they do not know how to cook them, nor do they have anyone to show them how to cook and/or they cannot read English cookbooks. One respondent noted that her teenage granddaughter knows how to prepare some American foods so children may teach their parents how to cook some American foods. Parents also play an important role in transmitting knowledge regarding how to prepare traditional foods to their children. Bowen and Devine (2010) observed that Puerto Rican girls learned how to cook traditional foods from watching their parents or other relatives. Migration and household changes may interrupt the cultural transmission of cooking skills such that a child's dietary intake pattern is permanently altered.

The available research illustrates the complex, multidimensional nature of newcomer dietary change mediated by a child's, parents' and family's environment. Although the available evidence indicates that economic and time constraints influence newcomers' dietary decisions, children also appear to influence food purchases, and as they mature, may teach their parents

new cooking skills. The cultural transmission of traditional cooking skills requires the involvement of both children and their parents or other relatives to ensure the long-term consumption of traditional foods by future generations. A break in the cultural transmission process may result in drastic dietary changes in one generation.

2.3.4 Newcomer Food Security

Food security emerges as a concern among newcomers to Canada, which is consistent with the economic constraints on food-buying behaviour noted above, in addition to employment difficulties faced by many newcomers. The Canadian Community Health Survey 2008 results indicate that recent newcomer families are at higher risk for food insecurity (12.6%) than longer-term immigrant families (7.8%) and Canadian-born families (7.5%) (Health Canada, 2008). Overall these findings indicate that recent newcomers are at increased risk for food insecurity; however, other research provides more details about the depth and breadth of food insecurity among specific newcomer groups. In a recent Canadian study, Vahabi et al. (2011) reported that 56% of Latin American newcomer households are food insecure, and 84% of very recent Latin American newcomer households (less than 1 year) are food insecure. This study used the same data collection tool as the Canadian Community Health Survey; however, bilingual research assistants interviewed study participants in their first language, which may have supported better comprehension of the questions and resulted in more accurate responses. The prevalence of food insecurity among recent newcomers is reported to range from 28 to 51% of households according to several American studies (Quandt et al., 2006; Kasper et al., 2000). These studies indicate that food security may be common among newcomers to Canada and the United States.

Several studies have described how low income affects food-buying behaviour and subsequent consumption patterns. Food insecure households often try to stretch the budget a little further by purchasing cheap and high calorie foods (Kaiser et al., 2003; Tarasuk & Beaton, 1999; Hamelin et al., 2002). Latino immigrant families have described how their diet changes with severity of food insecurity (Quandt et al., 2006). The Latino immigrants report that with mild food insecurity families try to keep the size of meals the same by relying on cheaper foods. Respondents describe how they cut back on unnecessary foods (snacks and soda) and expensive foods (fruit and meat) when they run short of funds. Respondents also report substituting less expensive foods like fruit drink powder for fruit juice. As food insecurity increases adults eat smaller portions to allow their children to eat enough. If food insecurity becomes severe, children's portions may be decreased and adults may not eat for a day (Quandt et al., 2006). Parents appear to try to cushion the impact of food insecurity on their children by absorbing the impact of scarce resources as long as they can.

Nutrient deficiencies and other poor health outcomes have been associated with food insecurity. A national Canadian study observed that food insecure adults and adolescents are more likely to have inadequate intakes of some nutrients (Kirkpatrick & Tarasuk, 2008). Children in food insecure families were not observed to be at higher risk for inadequate nutrient intakes; however, they consumed more energy dense diets. This can have long-term health consequences as children may establish unhealthy eating patterns during long periods of household food insecurity (Matheson et al., 2002), which persist through to adulthood and contribute to excessive weight gain (Sarlio-Lahteenkorva & Lahelma, 2001). Indeed, food insecurity has been linked with excess energy intake and subsequent weight gain among children and adults (Adams et al., 2003; Dinour et al., 2007), although the results are not consistent for

children (Gundersen et al., 2009). Among American adults food insecurity has been associated with clinical evidence of hypertension and diabetes (Seligman et al., 2010), while food insecure children are at increased risk for iron-deficiency anemia, acute infection, chronic illness, and developmental and mental health problems (Weinreb et al., 2002; Rose-Jacobs et al., 2008; Slack and Yoo, 2005; Whitaker et al., 2006; Kursmark and Weitzman, 2009; Skalicky et al., 2006; Gundersen & Kreider, 2009a). Specifically among adult immigrants, food insecurity has been linked with emotional and physical health problems, including depression, anxiety, and gastrointestinal and respiratory problems (Marin-Leon et al., 2005; McIntyre et al., 2000; Lee and Frongillo, 2001), while food insecure child immigrants are more vulnerable to the development of learning disabilities (Weigel et al., 2007). According to the available evidence experiencing long-term food insecurity during childhood increases the risk of adopting unhealthy eating habits, which increases the risk of excessive weight gain and chronic health problems.

The impact of low-income on the development of food insecurity among newcomer children may be mediated by level of acculturation. In a study involving Hispanic children, limited acculturation was associated with higher intakes of folate, lower intakes of sodium, energy and percentage of energy from fat and saturated fat; while low-income was correlated with higher intakes of sodium, protein and energy (Mazur et al., 2003). Limited acculturation was defined as limited use of English in the household. These results indicate that limited acculturation may protect traditional healthy dietary habits, and thereby compensate for socioeconomic disadvantage. Similarly, the impact of household food insecurity on young children may be mitigated by the maintenance of traditional breastfeeding practices. Among a sample of American newcomers, breastfed infants were less likely to have a history of hospitalizations and more likely to be in good health and have higher weight/length for age

scores (Neault et al., 2007). When household food insecurity was brought into the analysis the positive association between breastfeeding and child health was strongest among food-insecure families. This research indicates that the maintenance of traditional cultural dietary practices can protect newcomer child health by reducing the impact of low-income on food security.

Newcomer dietary practices may be significantly influenced by both dietary acculturation and food insecurity. Many newcomer families are at risk of acculturating to an unhealthy diet characterized by high levels of sodium, fat and increased energy density due to living on a low-income for an extended time period. This risk may be mitigated by maintaining traditional healthy eating habits, which would support optimal child development. The impact of low-income and food insecurity may be minimized through maintaining traditional healthy dietary practices, such that children have access to nutritious food to support optimal growth and development during their early years and develop healthy eating habits that may persist into adulthood.

2.3.5 Physical Activity

Physical inactivity is among the top 5 leading causes of global mortality and is estimated to be responsible for 6% of global deaths (World Health Organization, 2009). As part of the nutrition transition there has been a global decrease in physical activity. Among children, physical activity through organized sports, school physical education programming and active transport is declining, but this trend is not consistent in all countries (Dollman et al., 2005). There is a lack of consistent baseline data on children's physical activity levels in many countries so many conclusions are based on proxy measures including fitness and sedentary behaviours. Several studies in high income countries, including Canada, United States and the United Kingdom, have found that leisure time physical activity levels among youth have remained

constant or increased slightly from the 1980s to 2003 (Eisenmann et al., 2004; Pratt et al., 1999; Schools Health Education Unit, 2004). However, certain subgroups may be at increased risk for decreased leisure time physical activity as Irving and colleagues (2003) observed that Canadian girls and both boys and girls in the 11th grade reported decreased levels of physical activity in 2001 as compared to 1997.

As physical activity can occur in a variety of contexts it is important to consider types of physical activity beyond leisure time activities. Children's participation in organized sports has decreased substantially in some high income countries, including Australia and Sweden (Norton et al., 2001; Westerstahl et al., 2003), while it has remained stable in others such as the United Kingdom (Rowe, 2000). Increasing registration and uniform costs are thought to be major barriers to participating in organized sports (Kirk et al., 1997). In some instances high school physical education classes have been cut back in order to accommodate more vocationally orientated classes in the curriculum (Dollman et al., 2005). Substantial decreases in active transport levels have also been observed among American and British Children between the early 1980s and mid 1990s (Tudor-Locke et al., 2001; Roberts, 1996). Children's declining use of active transport may be linked with parental safety concerns that prevent children from walking or cycling alone to school. In addition to changes in physical activity patterns, there has been an explosion of electronic and screen-based entertainment, especially in high income countries (Jeffery & Utter, 2003). The average western adolescent is estimated to spend about 5 hours per day on electronic entertainment (Biddle et al., 2004), while American children may spend up to 8 hours per day (Sturm, 2005). Although most screen-based entertainment is sedentary in nature, some video games are designed to encourage physical activity. According to the literature cited above, children's decreasing physical activity levels may be linked with decreased participation

in organized sports, decreased use of active transport and increased use of sedentary electronic entertainment.

Although it may be difficult to unequivocally state that children's physical activity is decreasing according to the above research, there is evidence that children's aerobic fitness has decreased between 1980 and 2000 (Tomkinson et al., 2003). This global meta-analysis found that children's aerobic fitness declined by 1% a year over 20 years. Similar declines in overall fitness levels have been observed among Canadian youth between 1981 and 2009 (Tremblay et al., 2010). This study found that Canadian children and youth aged 7 to 19 years attained less favourable fitness scores in 2007-2009 as compared to a 1981 cohort. Both sexes in all age groups demonstrated lower flexibility and muscular strength, and higher BMI, waist circumference and sum of 5 skinfolds in 2007-2009 as compared to the 1981 group. In addition to the measures that can be compared to 1981 data, the 2007-2009 study measured maximal aerobic power in children and youth aged 8 to 19. Among both boys and girls, maximal aerobic power decreased with age. The decreasing fitness levels since 1980 likely indicate that children's overall physical activity levels are dropping.

There are regional variations in physical activity patterns that may be related to regional stages of development. Although the evidence is limited to adults, a survey of worldwide variability in physical inactivity that included 51 middle and low-income countries found 17.7% of the pooled sample was inactive, but the variation ranged from a low of 1.6% for men in Comoros to a high of 71.2% for women in Mauritania (Guthold et al., 2008). This study also found that inactivity was generally higher among women, older age groups and the urban population. A similar international study on physical activity using the same questionnaire that included 20 middle to higher-income countries observed that the prevalence of physical

inactivity ranged from a low of 6% among women in China to a high of 49% among women in Belgium (Bauman et al., 2009). This study noted some gender differences that included young adult males commonly being more active than females and that increasing age was associated with decreasing physical activity levels among males in over half of the countries, but not among females in most countries. There is also evidence that physical activity performed at work makes up a large proportion of overall physical activity in low and middle income countries (Shepard, 2003). The 2 global studies indicate that variability in inactivity levels is substantially higher in middle to low-income countries, as compared to higher-income countries, possibly due to the increased variability in level of nutrition transition. The higher level of inactivity observed among the urban population in the middle to low-income countries is consistent with the transition to more sedentary lifestyles with less occupational physical activity that is part of the nutrition transition. These 2 studies also indicate several subgroups that are at risk for inactivity, including women and older people.

Immigrants in high income countries may be a subgroup at risk for physical inactivity. Adult immigrants have been found to engage in less physically active leisure time than the native population in Spain, Australia and Canada (Gonzalez-Solanellas et al., 2011; Dassanayake et al., 2011; Tremblay et al., 2006). Leisure time physical activity levels are not consistent across immigrant groups as more recent immigrants, non-European women and immigrants from Asia and the Middle East have higher risks for inactivity (Dassanayake et al., 2011; Tremblay et al., 2006). Women's dominant role in domestic and child raising activities is thought to contribute to their lower participation in leisure time physical activities (Juarbe et al., 2002). Among female immigrants from the Middle East, high levels of physical inactivity have been linked with poor language ability, religious constraints, avoidance of co-ed activities, and discomfort of attending

without family members (Farooqi et al., 2000). Immigrants from Southern and Eastern Europe, the Middle East and Asia to Australia have been noted to have high levels of physical inactivity during leisure time, but levels of leisure time physical activity increase with longer residency in Australia (Bennett, 1993). The study did not explore possible explanations related to level of leisure time physical activity.

Although immigrants may be less engaged in leisure time physical activities, they may have jobs that entail a higher level of physical activity. Higher levels of occupational physical activity have been observed among Mexican Americans (33%) and Black Americans (30%), as compared to White Americans (22%) (Physical Activity and Health Branch, CDC, 2000). Similarly, Korean immigrant women more commonly report job-related physical activities (37%) and household physical activities (33%), as compared to leisure-time physical activities (24%) and active transportation (10%) that met the criteria for weekly moderate or vigorous physical activity (Choi et al., 2011). Although there is evidence that immigrants are at risk for physical inactivity, there is some question whether the relationship between immigrant status and physical activity is confounded by socioeconomic status. A Swedish study in a deprived neighbourhood with a population of immigrant Iraqis and native-born Swedes found a high prevalence of sedentary leisure time activities among both groups as compared to Swedes in other areas (Bennet et al., 2011). This study also found that sedentary leisure time was independently associated with type II diabetes. Children with migrant or socially disadvantaged backgrounds, or both, have also been found to experience disproportionately high levels of low aerobic fitness (Okely et al., 2010; Lasserre et al., 2007). This research suggests that the broader social determinants of health may have a greater impact on physical activity levels than immigration

status, but since immigrants are disproportionately represented among socioeconomically disadvantaged groups they are also at high risk for low levels of physical activity.

In Canada children and youth are at risk for physical inactivity. According to physical activity guidelines children and youth aged 5 to 17 years should participate in at least 60 minutes of moderate-to-vigorous physical activity on a daily basis (Canadian Society for Exercise Physiology, 2011). The most recent CHMS data indicates that only 7% of children and youth achieve the recommended level of activity (Statistics Canada, 2011c). There is a notable sex difference with 9% of boys and 4% of girls attaining the recommended level of physical activity. The CHMS also found that children and youth spend 62% (8.6 hours) of their waking hours on sedentary activities and that this average increases with age, such that teenagers aged 15 to 19 spend over 9 hours per day on sedentary activities.

Some Canadian research observed that newcomer children may be at increased risk for physical inactivity as a study completed in 2005 found recent newcomer children are less likely to participate in sports (32%) than Canadian-born children (55%) (Clark, 2009). Although the gap is smaller, participation in the more internationally popular sport, soccer, is also lower for recent newcomer children (10%) than among the Canadian-born (23%). Clark (2009) speculates that cost may be a barrier to participating in sports for recently arrived immigrant families who have limited financial resources. Although newcomer children are less likely to participate in sports, the evidence is not unequivocal that they are less physically active than Canadian-born children overall. The *Healthy Immigrant Children Pilot Study* found that 87.5% of participants meet the Canadian physical activity guidelines of 60 mins/day of physical activity. The study also observed a high level of sedentary activity among newcomer children with 33.3% of immigrants and 48.7% of refugees engaged in more than 2 hours of sedentary activity per day

(Nisbet, 2011). There may be multiple factors that contribute to the lower participation of newcomer children in sports, such as parents having multiple jobs that do not allow time to take children to activities, lack of transportation to recreational activities outside of the neighbourhood or lack of knowledge regarding how sports are organized in Canada.

International research provides more in-depth information on physical activity among specific ethnic groups. A Swedish study reported that Vietnamese immigrant children tended to watch an abundance of television when their mothers were at work and thus not able to engage their children in physical activity (Babington & Patel, 2008). Since children who live in low-income families are less likely to participate in sports (Kohen et al, 2002), recent newcomer children may also be less likely to participate in sports as their families are commonly low-income for a number of years. Specific ethnic groups of newcomers may be at risk for physical inactivity due to perceived social or gender norms. A qualitative study that explored dietary acculturation among Mexican immigrants in the United States found that perceived American norms related to activities that families normally engaged in Mexico, such as biking and dancing, were barriers to their participation in similar physical activities in the United States (Colby et al., 2009). Study participants also reported low participation in organized sports because they were not accustomed to being involved in organized sports and because of low Latino representation on sports teams. Immigrants from the middle-east have been noted to engage in less leisure physical activities than other ethnic groups in Canada and the United States (Tremblay et al., 2006; Kahan, 2011). American college students from the middle-east recalled childhood experiences in which parents did not encourage their children, particularly daughters, to engage in physical activity. Female participants described how their brothers played on soccer teams, while they were not allowed to participate in sports that involved wearing shorts or to swim in

public pools. Participants noted that their cultural norms allow men to be more involved in activities outside the home, while women are expected to stay at home and care for the children and the house. This research indicates that there is a variety of intersecting economic, social and cultural factors that can serve as barriers to participation in physical activities, although there are still many uncertainties that need to be further investigated to arrive at definitive conclusions. Once concluded, the current study may be used to inform the development of gender and culturally sensitive physical activity programs that better meet the needs of the immigrant population.

Lack of physical activity and increased sedentary activity is a concern because it contributes to the development of poor health outcomes. Physical inactivity is among the leading risk factors for global mortality and is estimated to contribute to 6% of worldwide deaths (World Health Organization, 2009). Physical activity helps to protect against the development of cardiovascular disease, type II diabetes and some cancers, while also contributing to body weight control and improved musculoskeletal health among adults (World Health Organization, 2009) and is associated with the maintenance of beneficial cardiovascular risk profile in children (Kriemler et al., 2010). Among children, the link between increased levels of sedentary activity and adverse health outcomes has been demonstrated. A Canadian study reported that 36% of Canadian children aged 6 to 11 years who engage in more than 2 hours of “screen time” per day are twice as likely to be overweight or obese than children with 1 or less hours per day (Shields, 2005). The importance of children’s physical activity for long-term health is evident in the finding that children’s aerobic fitness positively predicts future physical activity (Lopes et al., 2010). Researchers suggest that we should focus our attention on the development of healthy physical activity patterns during the preschool years to support the establishment of a healthy

lifestyle (Puder et al., 2011) and to prevent the development of excess adipose tissue during this critical period to protect against the future development of obesity (Rolland-Cachera et al., 2006). This research highlights the importance of establishing healthy lifestyle habits during childhood years to ensure long-term positive health outcomes.

The physical activity research summarily suggests that children's physical activity levels are decreasing across the globe, but there is high regional variability. Canadian newcomer children may come from a variety of situations in which they may have been exposed to high levels of occupational or transport related physical activity or a privileged lifestyle in which they focused on academic pursuits and were discouraged from engaging in physical activity. Upon arrival in Canada, newcomer families may attempt to maintain traditional practices that may constrain or promote physical activity. Newcomer parents may also experience numerous lifestyle changes, such as both parents having to work long hours, which limits their capacity to engage their children in physical activities. Successful intervention efforts to support healthy physical activity among newcomer children must consider the variety of intersecting factors, including economic, social, gender and cultural factors, that impact participation.

2.4 Health Conditions among Newcomers

2.4.1 Chronic Health Conditions

Globally, chronic diseases are the leading cause of death accounting for approximately 63% of deaths worldwide. Diabetes, cancers, cardiovascular diseases and chronic respiratory diseases are responsible for the majority of these deaths (63%) (Alwan et al., 2010). Among high income countries, the proportion of deaths attributable to these causes increases to more than 70%, including Canada at 88% (World Health Organization, 2011 & 2014). Similar to other

high income countries, Canada faces many lifestyle and chronic health condition challenges that contribute to the development of chronic diseases. The World Health Organization (2009) states that the leading risk factors for global mortality are raised blood pressure (responsible for 13% of deaths globally), followed by tobacco use (9%), raised blood glucose (6%), physical inactivity (6%), and overweight and obesity (5%). There appears to be some regional variation in the leading risk factors for global mortality related to income level. The most prevalent risk factors in high-income countries include total fat consumption, raised total cholesterol, and physical inactivity among women; while in middle-income countries the most prevalent risk factors are tobacco use among men and overweight and obesity (World Health Organization, 2011).

Among the Canadian population the most common risk factors reported in 2014 are overweight/obesity (53.6%) (Statistics Canada, 2013a), obesity (26.2%), raised blood pressure (17.4%) and smoking (18%) (World Health Organization, 2014). The profile of Saskatchewan residents is similar with provincial statistics indicating the most common risk factors are overweight (61.1%) and raised blood pressure (17.8%) (Statistics Canada, 2013 a & b).

Saskatchewan specific statistics on raised cholesterol and obesity separate from overweight are not available. Although many of these risk factors become clinically detectable in adulthood, they are associated with lifestyle choices that begin to be established at a young age.

Unfortunately, 20.7% of Canadian youth, including 22.0% of Saskatchewan youth, between the ages of 12 and 17 years are already overweight or obese prior to adulthood (Statistics Canada, 2013c). As all of these risk factors are associated with lifestyle choices, newcomers may arrive in Canada in good health or with a range of established risk factors related to lifestyle habits in their home countries. The adoption of some common Canadian lifestyle habits may also put newcomers at further risk for developing chronic diseases.

Given the existence of the ‘healthy immigrant effect’, it is important to understand the pattern of chronic disease development among newcomers to Canada. A recent analysis of the 2007-2008 Canadian Community Health Survey data observed large differences in the prevalence of self-reported chronic diseases among immigrants as compared to the Canadian-born, as well as an increasing prevalence of chronic diseases among immigrants associated with longer residency in Canada (Betancourt & Roberts, 2010). The analysis found that immigrants are 40% less likely than the Canadian-born population to have 1 or more of 7 chronic diseases including arthritis, cancer, diabetes, heart disease/stroke, a chronic disease of the digestive system, a chronic respiratory disease, or a mood disorder/anxiety. In addition to this apparent immigrant health advantage, immigrants are also 30% less likely to be overweight or obese as compared to the Canadian-born. However, further analysis of the individual chronic diseases revealed that immigrants are at increased risk (20%) for diabetes as compared to the Canadian-born, and immigrants and the Canadian-born experience similar rates of high blood pressure and heart disease/stroke. Other Canadian research also suggests the rate of type II diabetes among immigrants is increasing (Public Health Agency of Canada, 2005), with notable ethnic differences (Misra & Ganda, 2007). Creatore et al. (2010) have observed that newcomers from the Caribbean, Latin America, South Asia and sub-Saharan Africa are at 2 to 3 times higher risk for developing type II diabetes than those from western Europe and other countries within North America. Age differences were also observed among the immigrant population at high risk for developing type II diabetes in the same study. Newcomers from the Caribbean, Latin America, South Asia and sub-Saharan Africa tend to develop type II diabetes between 20 and 40 years of age, while those from Europe and North America tend to develop the disease much later, between 35 and 49 years of age (Creatore et al., 2010). However, research based in a deprived

Swedish neighbourhood that included both Iraqi and Swedish residents concluded that country of origin did not account for differences in the prevalence of type II diabetes, impaired fasting glucose or impaired glucose tolerance among the residents (Bennet et al., 2011). Rather, this study concluded that being obese or having a pattern of sedentary leisure activities is associated with increased risk of having type II diabetes and economic difficulties are associated with impaired fasting glucose and impaired glucose tolerance. These findings suggest that the social determinants of health may play a more substantive role in the development of type II diabetes as opposed to ethnicity or immigrant status. Overall, the above research highlights that adaptation to life in Canada can result in rapid health declines for some groups of immigrants. It is important to describe newcomer children's lifestyle changes in Canada to more fully understand their potential early vulnerability to develop type II diabetes.

In agreement with the 'healthy immigrant effect', immigrant health advantage appears to decrease over time. An analysis of the 2007-2008 CCHS data observed that newcomers who have lived in Canada for 5 years or less are 60% less likely to report having 1 of 7 chronic diseases than the Canadian-born, while longer term immigrants only enjoy a 30% decreased risk as compared to the Canadian-born (Betancourt & Roberts, 2010). Similarly, recent newcomers are 60% less likely than the Canadian-born to be overweight or obese, while longer term immigrants are at a 20% decreased risk as compared to the Canadian-born. Goel et al. (2004) also observed that rates of obesity among immigrants increase with length of residency in the United States. A similar pattern emerges with regards to other cardiovascular risk factors as recent newcomers are at a 30% decreased risk of hypertension, but this health advantage disappears after 5 years of residency in Canada (Betancourt & Roberts, 2010). Other studies have observed that some ethnic groups may be at higher risk for developing hypertension with

longer residency in Canada as has been observed among immigrants from South Asia, with women being at higher risk than men (Chiu et al., 2010; Kaplan et al., 2002). Lear et al. (2009) have also observed that immigrants have a lower risk of atherosclerosis, a risk factor for cardiovascular disease, but this risk increases in direct relation to length of residency such that after 20 years immigrants are at increased risk of atherosclerosis in comparison to the Canadian-born. As poor dietary behaviours and low levels of physical activity have been associated with all of the above cardiovascular risk factors in general populations (Andersen et al., 2006; Lichtenstein et al., 2006), it is important to explore whether the same factors are at play among the immigrant population.

2.4.2 Childhood Risk Factors for Chronic Health Conditions

Lifestyle patterns that often originate in childhood have been associated with the development of chronic disease. According to several sources the world is experiencing a global childhood obesity epidemic (Katzmarzyk, 2001; WHO, 2000). The Public Health Agency of Canada (2011) estimates that 8.6% of Canadian children and youth aged 6 to 17 years and 6.3% of children aged 2 to 5 years are obese according to measured height and weight data. The prevalence of childhood obesity has increased exponentially over the last 30 years with obesity increasing by 2.5 times among children aged 2 to 17 between 1978 and 2004 (Shields, 2005). Shields (2005) reports that the increase was even more pronounced among youth aged 12 to 17 years with their rate of obesity tripling from 3.0% to 9.4% during the same time period. The Community Health Measures Survey results suggest that these increases in weight relative to height (i.e. body mass index) reflect increases in adiposity as opposed to increases in muscularity (Tremblay et al., 2010). Since obese children and adolescents are more likely to become obese adults, rising obesity among children is of particular concern (Popkin & Udry, 1998, The et al.,

2010). Obese children and adolescents are more likely to develop early health concerns including hypertension, high triglycerides, hyperlipidemia, high cholesterol, type II diabetes, increased growth during puberty followed by stunting, early onset of puberty in females including early menarche, asthma, pancreatitis, gall bladder disease, polycystic ovary syndrome, low self-esteem, depression and behaviour problems related to bullying (Babington & Patel, 2008). It is unclear whether children or their parents are aware of the health risks associated with obesity. A European study reported that 44% of overweight children and 23% of obese children rated their health as average (Magnusson et al., 2005). In addition, an American study on overweight among immigrant Hispanic children observed that 47% of parents believed that overweight children are unhealthy (McArthur et al., 2004). In light of these findings it is possible that obese Canadian and newcomer children and their parents are not aware of the future health issues that may impact their lives if they continue with their current lifestyle habits.

Weight gain and the subsequent development of an overweight or obese body is the result of an imbalance between caloric intake and energy expenditure. Although there are many possible determinants that impact the weight gain equation, including nutritional intake and physical activity patterns as discussed in past sections, it is notable that obesity coincides with lower fruit and vegetable consumption in both children and adults (Shields, 2005; Tjepkema, 2005). Garriguet (2007) observed that 70% of children aged 4-8 years and 62% of girls and 68% of boys aged 9-13 years did not consume the recommended number of servings of fruits and vegetables in 2004 according to the Canadian Food Guide. In addition, Garriguet (2007) noted that Canadian children aged 5-11 years consumed approximately 2,000 calories per day in 2004, which is not significantly different from 1970-1972 data. Furthermore, the 2004 data indicate that the diet of Canadian children and adolescents (<18 years) includes an acceptable level of fat

intake within the Acceptable Macronutrient Distribution Range (AMDR) of 25 to 35% of total caloric intake (Garriguet, 2007). Given these dietary observations, it appears that the only dietary link to increasing obesity among children and adolescents may be inadequate fruit and vegetable consumption combined with the consumption of other primarily carbohydrate-based foods to fill the void left by the lack of fruits and vegetables. Although the CCHS 2.2 (2004) presents self-reported nutritional intake data on the general population including immigrants, there does not appear to be published data specifically on patterns of food and nutrient intake among immigrant children in relation to obesity.

Increasing childhood obesity may also be linked with the trend towards lower ages of adiposity rebound (AR)³ among children. Deheegar and Roland-Cachera (2004) have observed that the mean age of AR among Parisian children born in 1955 was 6.2 years, while it decreased to 5.6 years among those born in 1985. They also noted that an early AR is associated with subsequent high fatness. A second study focused on the prevalence of obesity among children of Maghrebian origin in the Paris area had similar findings (Roville-Sausse, 1998). This study found that obesity was more common among children of Maghrebian origin as compared to the French population for 2 cohorts born in the early 1970s and 1990s. Overall, the prevalence of obesity increased from 8% to 13% among children aged 0 to 4 years over the 20 year period. The increased prevalence of obesity was accompanied by an increased prevalence of early AR with 45.5% of children born in the 1970s experiencing AR by age 48 months, while this figure increased to 66.0% among those born in the 1990s. Rolland-Cachera et al. (2006) report that obese participants have an earlier AR (3 years) as compared to non-obese participants (6 years), thus an early AR appears to be linked to obesity. The authors suggest that the growth pattern of children of recent generations that more commonly encompasses an early AR may be attributable

3 Adiposity Rebound is the point of minimal BMI value after age 1 prior to a steady increase.

to a high-protein, low-fat diet during infancy, a period of high energy needs. High protein may trigger increased height velocity at an early age, while low-fat would decrease energy density that may program a thrifty metabolism that could have adverse effects if the body is exposed to over nutrition at a later point. In contrast, the high-fat, low-protein content of human milk may provide the balanced nutrition required to support normal growth processes. There is also evidence that rapid growth in infancy or early childhood can predispose children to subsequent weight gain (Freedman et al., 2001), the development of a central body fat pattern (Rolland-Cachera et al., 2000), diabetes (Fewtrell et al., 2000), cardiovascular disease (Singhal et al., 2004), and cancer (Gunnell et al., 1998). Given the trend towards a decreasing age of AR and the link between early AR, obesity and other health conditions among the general population as well as the immigrant population it is important to ensure that nutritional intakes meet nutritional needs at various stages of growth to facilitate a healthy growth pattern. With respect to the immigrant and refugee populations it is also important to consider that children may have been exposed to under nutrition during early pre- or postnatal life that may increase their vulnerability to an early AR and subsequent weight gain in an obesogenic environment.

Several studies on the relationship between breastfeeding and childhood overweight lend further support to the link between early childhood nutrition, early AR and obesity.

Breastfeeding has been found to protect against childhood overweight (Grummer-Strawn & Mei, 2004, Gillman et al., 2001, Bergmann et al., 2003), but others have failed to observe the same effect (Hediger et al., 2001, Zive et al., 1992). Although there are conflicting results, a review article concluded that breastfeeding has a small but persistent effect against the subsequent development of overweight (Arenz et al., 2004). A study focused on the relationship between breastfeeding and overweight among Latino preschoolers found that increased duration of

breastfeeding is associated with a linearly decreased risk of overweight (Kersy et al., 2005). Among the study population the prevalence of overweight ranged from 35% for those never breastfed to 12% for those breastfed for at least 1 year. Each additional month of breastfeeding was associated with a 10% decreased risk of overweight between ages 2 to 5 years. These studies suggest that prolonged breastfeeding may play an important role in promoting optimal early childhood growth that provides protection against the development of obesity and other associated chronic disease risk factors.

In addition to impacting high income countries like Canada, the childhood obesity epidemic extends to transitional countries that are experiencing rapid economic growth and associated lifestyle changes. The prevalence of overweight and obesity among children and youth in the Gulf countries appear to be among the highest in the world (Ng et al., 2010). High rates of obesity have been observed among Kuwaiti children 0 to 5 years old (8.2%) (Al-Isa & Moussa, 1998) and Saudi children 1 to 6 years old (9.9%) (El-Hazmi & Warsy, 2002). Obesity has been associated with higher systolic and diastolic blood pressure among children and adolescents in the United Arab Empire and Bahrain (Moussa et al., 1994). In general, children and adolescents in the Gulf States appear to be at risk for the development of chronic disease with the prevalence of type II diabetes increasing from 0.1% to 0.5% between 1995 and 2001 in Kuwait (Abdella et al., 1996; Moussa et al., 2008) and the notable prevalence of elevated high risk cholesterol (1.6%) and triglyceride levels (1.2%) observed among young Saudi children aged 1 to 6 years (Kuitrovich, 1989). Al-Shehri and colleagues (2004) have observed that girls aged 9 to 12 years are at higher risk for elevated lipid levels than boys. These findings may indicate a gender difference with socio-cultural or biological underpinnings.

Prior to migrating to Canada or other high income countries newcomer children may have experienced a variety of living conditions, which put them at risk for weight gain in an obesogenic environment. Studies focused on weight gain among immigrant children in various countries have not obtained consistent results. In a Canadian study Maximova (2011) found that first generation immigrant children experienced smaller BMI increases (0.59 kg/m^2) with each year of age, in comparison to second generation immigrant children (0.73 kg/m^2) and native-born children (0.82 kg/m^2) among a sample of multi-ethnic children. In agreement with this trend, results from the National Longitudinal Study of Adolescent Health in the United States indicate that first generation immigrant children are less likely to be obese compared to subsequent generations, particularly among Asians (Popkin & Udry, 1998). However, it is not clear whether the trend is more related to immigration status or ethnicity, as pooled data indicates the highest rate of obesity at 30.9% among black non-Hispanics, followed by Hispanics (30.4%), white non-Hispanics (24.2%) and Asians (20.6%). In addition, obesity was more common among males than among females, with the exception of blacks. These results appear to indicate that first generation immigrant children may be somewhat protected against excessive weight gain; however, ethnicity may also be a factor.

In contrast to the above studies, other research has observed that first generation immigrant children are at increased risk for overweight/obesity. In a study on overweight and obesity among immigrant children in Austria, Kirchengast and Scholar (2006) found that the prevalence of overweight and obesity was significantly higher among children and adolescents from the former Yugoslavia and Turkish girls. The authors hypothesize that cultural and religious factors may be the cause of high levels of overweight among Turkish adolescent girls. Turkish post-menarcheal girls are subject to strict cultural and religious expectations that include

not participating in physical activity outside the household. The authors were not able to pinpoint reasons why immigrant children from Yugoslavia had a higher risk of overweight/obesity because the comparison group of Austrian children had similar socio-demographic characteristics. A second study involving an analysis of data from the Early Childhood Longitudinal Study Kindergarten Cohort in the United States revealed some gender differences in weight gain among the children of immigrants (Van Hook & Baker, 2010). Boys whose parents immigrated to the US as adolescents or adults weigh more in kindergarten and experience faster weight gain than the sons of parents who immigrated as children and sons of natives. However, sons of parents with low English proficiency gained weight slower in comparison to the sons of English proficient parents. The authors did not note any association between generational status and weight gain among girls. The authors hypothesize that 2 dimensions of parents' acculturation – foreign place of socialization, and social isolation, as indicated by level of English proficiency, are impacting weight gain among the sons. Foreign place of socialization may reduce immigrant parents' ability to identify an obesogenic environment and to take steps to reduce the risks; whereas parents with low English proficiency may be somewhat sheltered from the advertising and dietary norms that contribute to obesity in high income countries. The authors suggest that they did not find any relationship between overweight and acculturation among girls because daughters routinely have more restrictions on their activities. Across all ethnic groups sons are usually given more freedom to choose their activities, while daughters are typically not allowed to participate in programs outside of school (Suárez-Orozco & Qin, 2006). Immigrant daughters may also have additional family responsibilities that restrict involvement in other activities (Suárez-Orozco & Qin, 2006). The above research provides contradicting evidence that first generation immigrant children are at

lower risk than subsequent generations and the native-born for developing obesity, possibly due to increasing acculturation among subsequent generations. However, some groups of first generation immigrant children appear to be at high risk for becoming obese. These diverse results indicate that a variety of environmental and social conditions may be impacting the development of overweight/obesity among newcomer children.

In addition to the focus on overweight/obesity among newcomer children, it is important to explore the extent of other risk factors, including metabolic syndrome⁴ among the population. Although not directly related to immigration status, Casazza et al. (2009) have studied the components of metabolic syndrome in a multi-ethnic sample of children in the United States. The prevalence of metabolic syndrome was highest among Hispanics (20.0%), followed by whites (5.9%) and African-Americans (2.5%). The study results indicate that diet has a greater influence on metabolic syndrome than physical activity. Greater waist circumference and higher triglyceride concentrations were positively associated with greater intake of energy from carbohydrate. Although it did not reach significance, there was also a trend towards a positive association between waist circumference and intake of simple sugars among study participants. Since there is evidence that metabolic syndrome tracks into adulthood (Jolliffe & Janssen, 2007) and predisposes an individual to develop cardiovascular disease and type II diabetes (Wilson et al., 2005), it is important to recognize that newcomer children from some ethnic groups may be at higher risk for developing metabolic syndrome and require appropriate interventions.

The above research indicates that childhood obesity is a global issue and that immigrant children and children from some ethnic groups may be subject to some additional environmental and social factors that influence weight gain. An inadequate or deprived diet during infancy and

4 Metabolic syndrome is a cluster of metabolic and cardiovascular risk factors that include central adiposity, dyslipidemia, elevated blood pressure, and impaired glucose metabolism.

early childhood and the adoption of a Western lifestyle appear to predispose newcomer children to excessive weight gain. However, level of acculturation or maintenance of traditional customs may have positive or negative impacts on weight gain, depending on whether the children are supported to maintain a healthy diet and engage in appropriate physical activity.

2.4.3 Nutrient Deficiencies

Newcomers to Western countries, such as Canada, appear to be at risk for selected micronutrient deficiencies that may be related to low income, traditional dietary practices and/or lifestyle habits that limit exposure to sunlight. Immigrant children may arrive with pre-existing micronutrient deficiencies from their country of origin. Zinc deficiency is thought to be widely prevalent throughout the world and to affect approximately 2 billion people in low and middle income areas of the world (Prasad, 2012). A Mexican study observed that iron deficiency (13-26%) and zinc deficiency (23-27%) were relatively common among Mexican children of all ages in 2006 (Shamah-Levy et al., 2012). A similar pattern was noted among Vietnamese children in 2000 (Laillou et al., 2012). High levels of zinc deficiency (52%), iron deficiency (13%) and marginal vitamin A status (47%) were observed among the Vietnamese children (Laillou et al., 2012). The authors found that the youngest age group (6-17 months) and poorest groups were at higher risk for micronutrient deficiencies.

Upon arrival newcomer children are immersed in a new physical and social environment that may impact nutritional status. As discussed in previous sections, many of these children may live in low income families for extended periods and/or experience dietary changes that limit access to healthy, nutrient-dense foods. In addition to these socio-demographic and cultural changes, many newcomer children are also dealing with the change of moving to a northern latitude that can impact exposure to sunlight. Canadian studies that focus on micronutrient

deficiencies or inadequacies among immigrant children have found that they are at higher risk for folate inadequacy (D'Ambrosio et al., 2012) and zinc inadequacy (Nisbet, 2011), while immigrants with dark skin are also at higher risk for vitamin D deficiency (Ward et al., 2007). In a study that involved toddlers from a Mexican Mennonite community in Ontario, D'Ambrosio et al., (2012) observed that the prevalence of nutrient inadequacies was below 10% for all nutrients with an Estimated Average Requirement except folate, which was 18%. This may be cause for concern as folate deficiency can result in macrocytic anemia (Lindenbaum et al., 1988). However, Tamura et al. (1997) have demonstrated that commonly used food composition databases may underestimate the folate content of foods as traditional methods only allow for the incomplete release of folate from the food matrix prior to analysis. Improved extraction procedures can double the folate concentration obtained from some foods, including green peas and liver, as compared to the older procedure (Tamura et al., 1997). Accordingly, it is questionable whether a high prevalence of folate inadequacy based on food composition databases may accurately reflect the presence of folate deficiency. Biochemical measurements may be required to more accurately assess folate deficiency among immigrant children.

As discussed above, zinc deficiency appears to be a concern in low and middle income countries and may extend to the immigrant population in high income countries. The Healthy Immigrant Children Pilot Study in Saskatoon (Nisbet, 2011) observed zinc inadequacy in 27% of the participants, but boys had a significantly higher rate of inadequacy than girls (41.7% versus 16.7%). Zinc deprivation among children is a concern because it can result in stunting and poor development (Panel on Micronutrients, 2000). Among children the primary clinical feature of mild zinc deficiency is impaired growth that can be improved with zinc supplementation (Walravens et al., 1989). Several dietary factors have been shown to impact zinc absorption.

Zinc absorption is impeded by high dietary phytate consumption (Oberleas et al., 1966), while it is enhanced by a diet high in animal protein (King and Keen, 1999). Thus, vegetarian diets with high phytate content reduce the bioavailability of zinc (Gibson, 1994) and are associated with low zinc status (Freeland-Graves et al., 1980). The relative risk of zinc deficiency appears to increase when daily phytate-to-zinc intake and calcium X phytate/zinc molar ratio is greater than 15 and 200mmol/1000kcal, respectively (Bindra et al., 1986). Research suggests that specific population groups are at risk for zinc deficiency due to diets with high phytate content, including some groups in the Middle East who consume predominantly unleavened bread (Prasad, 1991), Asian Indian immigrant vegetarians in the United States (Ellis et al., 1987) and East African preschoolers with cereal-based diets (Ferguson et al., 1989). This research suggests that some immigrant populations in Canada who consume traditional diets high in phytate may be at risk for zinc deficiency.

In northern countries such as Canada, immigrant children with dark skin appear to be at risk for vitamin D deficiency and rickets. A survey of Canadian pediatricians found 104 cases of rickets among children under the age of 18 years were recorded between 2002 and 2004 (Ward et al., 2007). A vitamin D level of <25-27.5nmol/L is said to be representative of rickets (Ward et al., 2007). Ward et al. (2007) reported that 89% of the children with rickets had dark skin and 24% were immigrants. The patients ranged in age from 2 weeks to 6 years with an average age of 1.4 years. Ninety-four percent had been breastfed and none had received vitamin D supplementation according to current recommendations (400IU/day). This study also noted that the incidence of vitamin D deficiency was highest in the Yukon, Northwest Territories and Nunavut, which suggests that Children who live north of 55 degrees latitude are at higher risk for vitamin D deficiency. In light of concerns related to the re-emergence of rickets in Canada, the

Canadian Pediatric Society (2002) recommends that breastfed infants residing above the 55th latitude in Canada or in other areas with a high incidence of vitamin D deficiency be supplemented with 800IU/day during the winter months.

There is also evidence that seemingly healthy immigrant children are at risk for vitamin D deficiency. A Toronto-based study observed that non-Western immigrant children have a 1.9 times higher risk of having low vitamin D status (12%) (< 50nmol/l) than Western-born children (5%) (Omand et al., 2013). However, once cow's milk intake, vitamin D supplementation, season and age were taken into account the relationship is no longer significant leading to the conclusion that these variables are the explanatory factors that mediate the relationship between immigration status and vitamin D status. Similarly, the Healthy Immigrant Children Pilot Study in Saskatoon (Nisbet, 2011) found that 29% of participants were vitamin D deficient (<30 nmol/L), and another 44 % of the children had serum Vitamin D levels below 50 nmol/L, the amount required for optimal bone health (IOM, 2010). As Regina and Saskatoon are situated at latitudes 50 and 52 degrees, respectively immigrant children with dark skin in these cities may be at greater risk for vitamin D deficiency, compared to those closer to the equator.

Studies based in the United States and Europe have reported similar findings in alignment with the Canadian studies. In a study of all published cases of rickets among children in the United States between 1986 and 2003, Weisberg et al. (2004) identified 166 cases of rickets. The patients were young (4-54 months) and largely African-American (83%). Most of the children were breastfed (96%) and only 5% of the breastfed infants received supplemental vitamin D. A study of the cases of rickets among children in Catalonia, Spain over a 10 year period observed that 61% were black, 36% were dark-skinned, and 6.4% were white (Yeste & Carrascosa, 2003). The vast majority of these children were immigrants from Sub-Saharan Africa (60%), Morocco

(34%) and Pakistan (2%), with the remainder being native to Catalonia (3%). The children diagnosed with rickets ranged in age from 3 to 36 months with the average age being 10 months. At the time of diagnosis 72% of the children were on an exclusive milk diet without vitamin D supplementation, while 48% were only consuming breastmilk. A German study that examined the vitamin D status of immigrant children in comparison to the native-born found that among the 1 to 2 year old cohort 17% of immigrant girls and 11% of immigrant boys were deficient in vitamin D, compared to 7% of both native-born boys and girls (Hintzpeter et al., 2008). Interestingly there was more variation among the 3 to 17 year old cohort with 31% of immigrant girls and 29% of immigrant boys being deficient in vitamin D, compared to 17% and 18% of native-born girls and boys, respectively.

Specific groups of immigrant children may be at higher risk for vitamin D deficiency. A Danish study that focused on vitamin D status of healthy Pakistani immigrants found that 81% of Pakistani girls aged 10 to 15 years old were vitamin D deficient ($<25\text{nmol/l}$), while 46% of the girls were severely deficient ($<10\text{ nmol/l}$) (Andersen et al., 2008). Only 5% of the girls had sufficient vitamin D status ($>50\text{nmol/l}$). Due to the small sample size, this study was not able to explore relationships to possible explanatory variables. An Australia study with healthy East African immigrant children reported similar, but less severe findings related to vitamin D status (McGillivray et al., 2007). Eighty-seven percent of the children had insufficient vitamin D levels ($<50\text{ nmol/l}$) and 44% were vitamin D deficient ($<25\text{ nmol/l}$). Higher risk of vitamin D deficiency was linked with being younger than 5 years, female gender, longer residence in Australia, less daylight exposure and winter/spring seasons. According to a review by Misra et al. (2008) “The re-emergence of vitamin D-deficiency rickets in northern Europe and North America is primarily associated with dark-skinned children on strict vegetarian diets, cult or fad

diets, dark-skinned infants exclusively breastfed beyond 3 to 6 months of age, premature infants, and infants born to vitamin D-deficient mothers.” It is concerning to note that Somali women living in Sweden, who were either pregnant or had recently given birth, have been found to have very low levels of vitamin D (Kalliokoski et al., 2013). Thirty-five percent of the Somali women had vitamin D levels below 10nmol/l, while 90% had levels below 25nmol/l, meaning that only 10% were not deficient. This study also observed that the Somali women commonly had impaired muscle strength, which can be related to vitamin D deficiency. The authors concluded that low grip strength was strongly associated with low vitamin D levels. Given that the Somali women in this study were either pregnant or had recently given birth, their infants are likely to be born with low vitamin D stores and may be at risk for vitamin D deficiency if they do not receive supplements.

The available evidence appears to indicate that newcomer children are at risk for micronutrient deficiencies, most commonly zinc and vitamin D. These deficiencies are most likely related to traditional dietary practices that impede micronutrient absorption, low income that limits healthy nutrient-dense dietary choices, and/or lifestyle habits that limit exposure to sunlight such that the dermal synthesis of vitamin D is reduced. These concerns suggest that newcomer children and pregnant women should be screened for micronutrient deficiencies, and diagnosed micronutrient deficiencies should be further investigated to understand the contributing factors and to develop a culturally appropriate treatment plan to promote long-term success. The development of culturally sensitive health education materials on these topics may also be helpful if they do not already exist.

2.4.4 Communicable Diseases

Although many newcomers to Canada and other high income nations arrive in good health as demonstrated by the ‘healthy immigrant effect’, they are disproportionately affected by communicable diseases that are endemic in certain countries of origin. Prior to migration, newcomer children may have been exposed to urban crowding and underdevelopment, which favours endemic malnutrition due to the interaction between malnutrition and infection. Malnutrition and infection affect health in a synergistic manner such that the pre-existence of malnutrition reduces an individual’s ability to mount an immune response to an infecting organism, and the contraction of an infectious disease is detrimental to an individual’s nutritional status (Scrimshaw & SanGiovanni, 1997). Children who live in urban slums often experience poor housing conditions, crowding, high exposure to disease vectors, and a lack of adequate water and sanitation, which increases their likelihood of contracting an infectious disease (WHO, 2002). Accordingly, a child may be under nourished and more likely to contract an infectious disease in an urban slum, which may then further compromise his/her nutritional status and result in poor health outcomes as discussed in section 2.3.2 Global Food Security.

Among the newcomer population in Canada, those from sub-Saharan Africa and the Caribbean are at highest risk for being affected by HIV/AIDS and tuberculosis (TB) infections (United Nations Programme on HIV/AIDS (UNAIDS) & World Health Organization (WHO), 2009; Houde et al., 2010). The rate of new HIV infections among immigrants from HIV-endemic countries has been estimated to be about 9.0 times higher than the rest of the Canadian population (Public Health Agency of Canada, 2012a). In 2011, 17% of all new HIV cases were immigrants from HIV-endemic countries (Public Health Agency of Canada, 2012a), while approximately 2.2% of the overall Canadian population are from HIV-endemic countries

(Citizenship and Immigration Canada, 2012; Statistics Canada, 2012). Similarly, African-American males in the United States have a 6.5 times higher risk of contracting HIV as compared to Caucasian males, while African-American females have a 19 times higher risk as compared to their Caucasian counterparts (Hall et al., 2008). These statistics point out the need to understand HIV transmission routes among newcomers to develop effective HIV prevention programming.

Newcomers with HIV may have acquired the infection in their countries of origin or in their new host country. A considerable number of newcomers may have been infected in their countries of origin as 77% of individuals who were newly diagnosed with HIV through heterosexual transmission in the United Kingdom in 2007 are estimated to have acquired the infection outside of the UK (Health Protection Agency, 2008). However, the proportion of newly diagnosed HIV infections among immigrants from HIV-endemic countries that are acquired prior to migration is questionable as a modeling exercise in Ontario concluded that 20% to 60% of new infections take place after migration (Remis & Merid, 2004). Similarly in the United States, a survey of immigrant patients at an STD clinic concluded that immigrants most often contracted HIV after their arrival in the United States (Harawa et al., 2002). Youth may be at increased risk of contracting HIV in Canada due to a false sense of security related to Canada's mandatory HIV testing immigration policy. A study in Ontario found that African youth thought they were less vulnerable to HIV in Canada because Canadian immigration service only grants visas to healthy applicants (Omorodion et al., 2007). This misperception may result in increased risk taking behaviours that could result in HIV infections.

Similar to HIV, tuberculosis (TB) infections are a concern among newcomers who have arrived from countries with endemic TB. Houde et al. (2010) estimated that 80% of newcomers

to Canada, who arrived within the last decade, came from countries with a high incidence of TB. As may be anticipated with immigration from countries with endemic TB, 65% of reported TB cases in Canada in 2008 were among the foreign-born, while 13% were among the Canadian-born non-Aboriginal population and 21% were among the Aboriginal population (Public Health Agency of Canada, 2012). Among the foreign-born population, active TB infections are commonly associated with reactivation of latent TB infection acquired prior to migration. Surveillance of latent TB cases among the foreign-born over a 10 year period concluded that active TB disease more commonly occurs within the first 2 years after immigration; however, a small number of cases were still being diagnosed with active TB disease after being in Canada for 30 years (Public Health Agency of Canada, 2012). Given the prevalence of TB among the foreign-born and the potentially long latent period, it is important to screen newcomers for TB and to recognize and respond to the emergence of symptoms that may be associated with active TB disease among the longer-term immigrant population.

Hepatitis B infection also appears to be fairly common amongst newcomers to high income countries. The World Health Organization has estimated that 70 to 90% of the population in high endemic areas is infected with Hepatitis B prior to the age of 40 years (WHO, 2002a). A study of newcomers, primarily from West Africa and Central America, who attended an immigrant health clinic in New York observed that 51% were positive for Hepatitis B antibodies and that older patients and Africans had a higher risk of testing positive (Asgary et al., 2011). However, a second American study that involved an analysis of patients with chronic Hepatitis B infection in 1 county in Minnesota found that Asian-born patients comprised 53% of the sample, while the African-born comprised 29% (Kim et al., 2004). A Spanish study involving newcomers who attended an infectious disease clinic found that 10% were positive for

Hepatitis B antibodies and that those from Eastern Europe and sub-Saharan Africa were at higher risk for testing positive (Ramos et al., 2011). The high prevalence of Hepatitis B among newcomer populations indicates the importance of screening newcomers and ensuring access to treatment when necessary.

The high prevalence of certain communicable diseases among newcomer populations and the risk to their personal health, as well as overall population health, that these diseases entail emphasize the importance of newcomers' access to health services in Canada. Pottie et al. (2011) have developed clinical preventive care recommendations for newcomers that include recommendations related to screening and/or treatment of HIV, tuberculosis, and hepatitis B, as well as other health problems commonly observed among newcomers to Canada. These recommendations emphasize the importance of obtaining migration health histories to better estimate health risks and inform clinical care. The importance of developing accessible healthcare services that meet the needs of newcomers is further discussed in section 2.5 *Access to Healthcare*.

2.4.5 Mental Health/Social Adjustment

Upon arrival a newcomer family needs to adapt to a variety of changes in a new country, such as children's integration into school environments or adults' engagement with employment that can impact mental health status. Initially families are often filled with hope and optimism about their resettlement, but as the family encounters integration difficulties and barriers to advancement, they can easily become disillusioned or depressed (Kirmayer et al., 2011). The prevalence of some types of mental health problems appear to be influenced by stress experienced during resettlement, such as difficulty finding employment, communication difficulties and loss of social status; as well as cultural influences, such as the cultural shaping of

illness presentation (Kirmayer et al., 2011). Despite resettlement struggles, the literature suggests that Canadian newcomers initially have a lower risk of experiencing depression or anxiety than the Canadian-born; however, after 10 years long-term immigrants have a similar risk as compared to the Canadian-born population (Ali, 2002).

Although overall, newcomers may be at less risk for experiencing mental health problems, certain groups appear to be at increased risk. The 2005 Longitudinal Survey of Immigrants to Canada (LSIC) suggests that newcomer women, refugees, newcomers with lower incomes and newcomers who were not satisfied with the settlement process are at higher risk for emotional problems and/or high levels of stress (Robert & Gilkinson, 2010). Gender is a critical global determinant of mental health outcomes as women are at higher risk of experiencing domestic and sexual abuse and mental health problems, including depression and anxiety (WHO, 2010a). Refugees who have been exposed to especially harsh experiences, such as war and torture, commonly experience elevated rates of post-traumatic stress disorder, depression and chronic pain (Kirmayer et al., 2011). Newcomers with low incomes somewhat overlap with the refugee population, as 79% of refugees were in the 2 lowest income quartiles, along with 49% of other immigrants in the LSIC study (Robert & Gilkinson, 2010); however, the low income dimension adds another potential determinant of poor health. Simich et al. (2006) observed a significant positive association between economic problems and symptoms of psychological distress among Sudanese refugees and immigrants in Ontario. LSIC data also indicates that newcomers who were not satisfied with the resettlement process are at higher risk of experiencing high stress levels and emotional problems (Robert & Gilkinson, 2010). Similarly, Simich et al. (2006) noted that unmet expectations of life in Canada are linked with poor self-reported health among Sudanese refugees and immigrants. As may be expected from the

information on high risk groups, a Canadian study found that female, low-income, long-term immigrants are 4 times more likely to experience depression in comparison with their male counterparts (Smith et al., 2007). Given the higher risk of mental health problems among some groups of immigrants it is important to ensure the availability of mental health services to meet their needs.

Similar to adults, newcomer children usually enjoy good mental health status. Compared to the Canadian-born, newcomer children often experience better mental health status (Beiser et al., 2002; Georgiades et al., 2007); however, some newcomer groups may be at higher risk. Families and children may experience a variety of pre-migration stressors, such as poverty, family separation and violence, as well as post-migration stressors, such as adjusting to a new school, learning the host language and coping with changing family roles (Perreira & Ornelas, 2011). Adolescent Cuban and Cambodian refugees in the United States have been noted to be at high risk for both post-traumatic stress disorder and depression up to 2 years post arrival (Lustig et al., 2004). The New Canadian Children and Youth Study (NCCYS) found that immigrant parents' positive perception of schools is inversely associated to children's emotional problems; while there is a higher risk of mental health problems among children of parents who exhibit depressive symptoms and lack linguistic fluency (Beiser et al., 2011). Several authors have offered possible explanations for the link between parents' low linguistic fluency and their children's mental health problems. Ying and Han (2008) suggest that children's socialization can be impeded by parental language limitations. In addition, some children with advanced language fluency are expected to represent their parents' interests within the larger society, which may ensnare parents and their children in complicated role reversals (Mesch, 2003). Given the positive association between parents' depressive symptoms and their children's

emotional problems in the NCCYS, parental depression may be affecting parenting practices or similar stressors are impacting both the parents and children. The NCCYS findings suggest that healthy child development can be supported by welcoming newcomer parents into schools to strengthen home-school ties.

Newcomer children's success with dual language development may be highly relevant to their mental health and adaptation to a new environment. Toppelberg and Collins (2010) argue that balanced bilingualism offers cognitive and other advantages that help to ensure successful adaptation and lower the risk for psychopathology. They suggest that competence in the first language is important for emotional regulation and family cohesion, while competence in the second language supports successful academic achievement and favourable education outcomes. Conversely, poor first language fluency may result in family communication difficulties and dysfunction, while poor second language fluency may interfere with academic performance and initiate a cycle of maladjustment and poor emotional and behavioural outcomes. Thus, efforts to support balanced bilingualism among newcomer children may contribute to their ability to develop competence and function well in both cultures, which assures the healthiest outcomes.

In addition to mental health concerns related to newcomer children's successful adaptation to life in a new country, infants born to newcomer parents with dark skin pigmentation within the first few years of resettlement appear to be at risk for developing autism. Maternal birth outside of Europe, North America and Australia was associated with a higher risk of autism in the offspring (Hultman et al., 2002; Lauritsen et al., 2005; Haglund & Kallen, 2011; Williams et al., 2008), while a California-based study did not find a similar risk (Croen et al., 2002). However, if dark skin pigmentation is the actual risk factor masked by maternal birth outside the U.S., the American study may be confounded by high numbers of third generation or

higher ethnic minority immigrants in California. In a review of studies on ethnicity and autism, Dealberto (2011) concludes that black ethnicity is strongly associated with an increased risk for autism and autism associated with intellectual disability.

The pathway through which immigrant or dark skinned mothers may be at higher risk for having an infant with autism is still the subject of debate. Several authors have proposed that vitamin D deficiency during pregnancy leads to foetal or infant deficits that result in autism (Cannell, 2008; Dealberto, 2011). It is possible that vitamin D deficiency may activate autism in an individual with a genetic susceptibility to autism given the mounting evidence that calcitriol, the active form of vitamin D, is involved in gene regulation and expression (Pike & Meyer, 2010; Eyles, 2010). Vitamin D deficiency could lead to higher mutation rates due to its role in DNA repair (Kinney et al., 2010). Dealberto (2011) also suggests that vitamin D deficiency may potentiate the damaging effects of maternal infections or obstetrical complications on the developing brain owing to vitamin D's neuroprotective properties. Becker (2011) has proposed an alternative hypothesis to explain the association between maternal immigrant status, ethnic origin and increased autism rates. He suggests that this association is mediated by early differential exposure to pathogens in the mothers' or neonates' environment since autism often involves immune system dysregulation and autoimmune components (Goines & Van de Water, 2010; Becker, 2007). The vitamin D and pathogen-based hypotheses are not necessarily contradictory. A vitamin D deficit may create an environment that mediates the development of immunological abnormalities, which result in immune system dysfunction in response to pathogens that leads to the development of autism. Clearly, further work is required in this subject area to elucidate the possible multiple pathways to autism.

The above research indicates that overall newcomer children enjoy good mental health status. However, there are indications that some groups may be at higher risk for mental health problems, such as newcomer children whose parents have difficulty with the host language and/or have depressive symptoms. Schools can also support newcomer student mental well-being by thoughtfully considering how to engage with newcomer parents. In addition to the mental health concerns noted among some groups of first generation newcomer children, second generation infants born to newcomer parents appear to be at higher risk for the development of autism, possibly due to maternal vitamin D deficiency and/or differential exposure to pathogens.

2.5 Access to Healthcare

Access to healthcare is a central component in the promotion of health and wellbeing among all Canadians, including newcomers. An essential part of the healthcare system is consistent primary healthcare delivered by a family physician or nurse practitioner, which includes regular physical check-ups, preventive care and screening. Wen et al. (1996) suggest that Canadian newcomers access primary healthcare less frequently compared to the Canadian-born. Newcomers with less than 15 years in Canada had 5-24% fewer physician visits than longer-term immigrants and the Canadian-born according to a Canadian study situated in British Columbia, Quebec and Ontario (McDermott et al., 2010). The study observed that newcomer healthcare service use varied with length of residency in Canada. Healthcare use tended to decrease over the first few years in Canada and then increase in later years. However, the study also observed that several sub-groups visit physicians more often than the Canadian-born, namely refugees and female family class immigrants. Another Canadian study found that newcomers with less than 5 years in Canada make fewer physician visits than the Canadian-born, but longer-term immigrants with 6 to 9 years in Canada visit physicians as frequently as the

Canadian-born (McDonald & Kennedy, 2004). In contrast to the above mentioned studies, an analysis of National Population Health Survey data demonstrated that newcomers and the Canadian-born had similar rates of physician visits when socio-demographic factors were taken into account (Newbold, 2009a). These findings in the Canadian context may indicate that newcomers may be making efforts to address health problems that began prior to migration through frequent visits to physicians shortly after their arrival (McDermott et al., 2010) and/or they are supported to access health services soon after arrival by settlement agencies. Over the next few years of residency, newcomers may be preoccupied with the demands of resettling in Canada, including taking English classes and engaging in the labour market, such that they use less physician services; however, longer-term newcomers may develop chronic disease conditions and increase their use of physician services to a similar level as the Canadian-born.

Some of the research findings discussed above indicate that there may be gender implications related to healthcare seeking behavior. McDermott's (2010) findings that female refugees and female family class immigrants visit physicians more often than the Canadian-born may indicate that the social roles of men and women shape how they perceive health and access the healthcare system. Men may be reluctant to seek healthcare if they are conforming to the hegemonic ideal of masculinity (O'Brien et al., 2005); while women may have increased contact with the healthcare system due to their multiple roles that include seeking healthcare for their children and elderly relatives (Abraido-Lanza et al., 2005). This study suggests that women's increased contact with the healthcare system may make them more aware of their health conditions and provide opportunities for them to readily seek healthcare services. Indeed, Donnelly (2006) has shown that gender roles, social support networks, socioeconomic status, and

cultural knowledge and values intersect to influence newcomer women's healthcare seeking behavior.

Preventive care is a key component of primary healthcare that facilitates the prevention and early detection of disease. Preventive care includes immunizations against communicable diseases and screening for early signs of chronic disease development. There is evidence that some newcomer groups do not access selected types of preventive care at the same rate as the Canadian-born. A Canadian study observed low cervical cancer screening rates among newcomer women who had recently arrived in Canada and that screening rates increase with length of residency in Canada, except among immigrant Asian women (McDonald & Kennedy, 2007). Glazier (2006) identified older newcomers (woman aged 50 and older and mean aged 70 and older) as being at high risk of not accessing preventive healthcare in Ontario. Recently arrived newcomer women are less likely to access breast cancer screening than longer-term newcomers and the Canadian-born (Mercer & Goel, 1997). However, McDermott et al. (2010) did not observe any variation in the rates of annual check-ups or immunizations among recent newcomers, longer-term newcomers and the Canadian-born. A study on immunization coverage in Ontario found that 2-year old children with immigrant mothers are more likely to have received all recommended immunizations compared to children of Canadian-born mothers (Guttmann et al., 2008). However, this study also noted that refugee children are less likely to have up-to-date immunizations than other immigrant classes. Access Alliance (2011) reports that newcomers with undocumented status are at high risk for poor access to preventive care, possibly due to lack of provincial healthcare coverage. A study of uninsured newcomer patients in Toronto found that the average gestational age at which pregnant women first access healthcare is 26 weeks, while some did not access care until shortly before their due date (Access

Alliance, 2011). In the United States lack of health insurance is strongly associated with delays in accessing medical care among Hispanic immigrants (Talavera-Garza et al., 2013). This research indicates that some groups of newcomers are at increased risk of not accessing recommended preventive care; however newcomer mothers appear to be vigilant in ensuring that their young children receive available preventive healthcare services.

2.5.1 Barriers

As mentioned above, the health and well-being of all Canadians, including newcomers, depends on equitable access to healthcare. Sanmartin & Ross (2006) note that while Canadian newcomers may not encounter additional difficulties with accessing routine healthcare compared to others; recent immigrants (43%) experience more difficulties with accessing immediate healthcare compared the Canadian-born (15%). Newcomers may experience a variety of barriers to accessing healthcare services including low health literacy (Renfrew et al., 2013), lack of familiarity with the healthcare system (Neufeld et al., 2002; Wu et al., 2005), cultural competency (Hansson et al. 2009), cost (Access Alliance, 2011), traditional beliefs (Council of Agencies Serving South Asians, 2008; Renfrew et al., 2013), language preference (DuBard & Gizlice, 2008; Renfrew et al., 2013), limited appointment times available (Renfrew et al., 2013) and lack of childcare (O'Mahony & Donnelly, 2007; Sethi, 2013) or transportation (Kilbride, 2010).

When newcomers first arrive in Canada they are usually unfamiliar with the healthcare system and need information that explains how to access various health services. Several studies have found that recent newcomers do not always understand how or where to access healthcare services (Neufeld et al., 2002; Wu et al., 2005; Son, 2013). Settlement agencies and ethno-cultural organizations/networks usually provide this type of information to newcomers and

support their initial efforts to navigate the healthcare system, but immigrants who do not engage with these organizations may not have easy access to this information.

Newcomer focus groups have stressed that cost and lack of provincial healthcare insurance coverage are strong deterrents to seeking healthcare in some instances (Access Alliance, 2011). In some provinces newcomers must endure a 3-month waiting period before they are eligible for provincial healthcare insurance, while undocumented immigrants are not eligible for provincial healthcare insurance in any province. In these cases newcomers would be responsible for covering the entire cost of any healthcare service that they required, which can be extremely difficult with limited financial resources. Although provincial health insurance covers the cost of many healthcare services for eligible residents, not all services are fully covered, including prescription drugs, medical supplies and vision care. Newcomers have described the challenge of paying for hospital care when they lack provincial healthcare insurance and the burden of paying for user fees and prescription drugs on meager incomes (Access Alliance, 2011; Young et al., 1999). These challenges can impact children's health, as an American study found that children of undocumented or temporary immigrants were more likely to have experienced delays with accessing preventive health care than other classes of immigrants (Yun et al., 2013). In Saskatchewan newcomers are eligible for provincial healthcare insurance as soon as they apply for coverage and low-income families are eligible for supplementary healthcare benefits that assist with prescription drug and other healthcare costs. Thus, as long as newcomers are aware of the available healthcare benefits, cost and lack of provincial healthcare insurance are not noticeable barriers to accessing healthcare in Saskatchewan, except for undocumented immigrants.

Newcomers and service providers have noted that culture and language limitations can impact access to healthcare. Newcomers often prefer to access healthcare from service providers who are from the same culture and speak their language and will travel farther to see them (Son, 2013), but find that this ideal is not always possible (Munger et al, 2010). Newcomers have described how difficult it is to explain their mental health problems to, and receive culturally appropriate treatment from a healthcare provider who is not familiar with their language or culture (Hansson et al. 2009). Similarly, Korean mothers have described their frustration with trying to explain their child's serious illness English and feeling like they are not able fully express the symptoms (Son, 2013). Language barriers can result in misunderstandings that lead to misdiagnosis, poor treatment plans and unnecessary referrals (Goggins, 2008). An American study on nursing care found that hospitalized patients from all minority groups reported poorer communication with nurses than Caucasians (Otani et al., 2010). A second American study found that patients who spoke a language other than English at home perceived that their nurses were less responsive (Radwin et al., 2013). In addition, some newcomers have never had the opportunity to learn to read so lack the basic literacy skills required to understand printed materials often utilized in patient education sessions (Access Alliance, 2011, Renfrew et al., 2013). These poor healthcare experiences can have detrimental impacts on health status, create inefficiencies in the healthcare system and influence the misunderstood patient to avoid seeking healthcare in the future.

In addition to cross-cultural communication difficulties, some newcomers may be reluctant to access certain types of healthcare services due to cultural beliefs about health, illness and treatments. Some newcomers may prefer to access traditional healthcare approaches instead of Western healthcare based on the biomedical model (Council of Agencies Serving South

Asians, 2008). Other newcomers may forgo access to preventive care because they do not recognize the importance of preventive care to maintain good health (Vargas Bustamante et al., 2010) or manage chronic conditions (Renfrew et al., 2013). Renfrew et al. (2013) observed that Cambodian immigrants with diabetes did not understand the concept of chronic disease and that there was not an instant cure for diabetes. They appeared to have a limited understanding of the relationship between diet and blood sugar. Similar to the Canadian population in general, several newcomer groups have identified the existence of significant stigma to accessing mental health services, HIV/AIDS services, addictions treatment and problem gambling treatment (Council of Agencies Serving South Asians, 2008; Karago-Odongo 2008; Ethnoracial Coalition: Access to Addiction Services, 2003; Planned Parenthood Toronto, 2009). These diverse cultural beliefs may result in delaying access to healthcare services for the treatment of a minor problem until it reaches an acute condition that requires more intensive treatment.

Immigrant women appear to be at risk for not accessing health care due to a number of intersecting factors. Among some ethnic groups there are cultural or religious practices that do not allow their members to seek mental health services from providers of the opposite sex (Nur et al., 2005). Muslim women have been noted to prefer receiving all healthcare services from female providers (Weerasinghe & Mitchell, 2007). In general, immigrant visible minority women have indicated reluctance to attend health or mental health appointments due to the lack of culturally appropriate services (Sethi, 2013). Immigrant women with insecure immigration status and/or emotional and economic dependence on their spouse or other male relative may experience additional challenges in accessing health care, including mental health services (O'Mahony & Donnelly, 2013). In a study involving immigrant women in Calgary, women reported not seeking mental health care as it may negatively affect the family's immigration

status because the husband only had a work visa; or not seeking post partum care because her work visa had expired (O'Mahony & Donnelly, 2013). Some women in the same study who were sponsored by their husbands to immigrate to Canada felt totally dominated by their husbands, who controlled everything they did, including accessing health care. A few women described delays in seeking assistance with domestic violence. Overall, this research indicates that immigrant women's access to health care is impacted by immigration policy that exerts a gender-biased structural barrier, traditional gender roles that limit women's ability to interact with community services and health services that do not respond to culturally needs.

Once a decision is made to access healthcare services, newcomers may need to overcome several practical barriers to attend an appointment. They may find it difficult to take time off work to attend medical appointments or they may have difficulty arranging transportation to the appointment (Council of Agencies Serving South Asians, 2008; Sanmartin & Ross, 2006). Newcomer women may work long hours in jobs without sick leave or have childcare responsibilities that make it challenging to access healthcare services (O'Mahony & Donnelly, 2007). Temporary residents on work visas, whose legal status may be dependent on their employer, may be reticent to take time off work to access medical care (Yun et al., 2013). Newcomer seniors appear to be an especially vulnerable group likely to experience challenges with arranging transportation to appointments (Kilbride, 2010). Newcomers experiencing these types of barriers may require additional support to identify healthcare services with extended hours or more convenient locations that allow for easy access.

An abundance of research has described the numerous barriers that newcomers may experience in their attempts to access healthcare. Some of these barriers, such as unfamiliarity with the healthcare system, highlight the importance of standardized processes to ensure the

provision of information on how to access healthcare, healthcare benefit programs to newcomers, as well as a contact number to provide further information if needed. Other barriers, including lack of cultural sensitivity or competency, suggest the need to reflect on whether current services are designed to meet newcomers' healthcare needs. In addition, consideration could be given to offering extended hours and decentralized services to address practical access barriers experienced by newcomers. The current documentation of ongoing barriers to healthcare exposes service gaps and suggests various improvement options to support equitable access to healthcare among Canadian newcomers.

2.5.2 Supports

In light of the barriers that impact newcomer access to healthcare, it is evident that consideration should be given to the design of healthcare systems to meet newcomer health needs. Since newcomers' ability to access healthcare can be impacted by cultural, religious, linguistic and health status differences, healthcare systems need to be designed to equitably accommodate newcomers (WHO, 2010). A variety of options are available to support newcomer health, including the use of basic English and other languages in public health information, engagement with immigrant communities to advise on program development, offering culturally competent health services, interpretation services, and through creating space to collaborate with traditional practitioners (Young et al., 1999; Anderson et al., 2003). All of the inter-related initiatives that may support newcomer health appear to revolve around the provision of culturally competent health services.

The Western biomedical model has been described as invalidating immigrant spiritual and religious beliefs, familial context and their understanding of health through universalizing the human experience; and is subsequently an ineffective approach to culturally sensitive care

(Jhangiani & Vadeboncoeur, 2010). Culturally competent care has been defined as “a dynamic, fluid, continuous process whereby an individual, system, or health care agency finds meaningful and useful care delivery strategies based on knowledge of the cultural heritage, beliefs, attitudes, and behaviours of those to whom they render care” (Douglas & Pacquiao, 2010). Moving towards culturally competent care entails a critical examination of institutional policies and procedures to identify how they may be contributing to the disempowerment of vulnerable groups (Douglas & Pacquiao, 2010). Culturally competent healthcare services have the potential to increase health system efficiency, client satisfaction and improve newcomer health outcomes (Brach & Fraser, 2000), as well as build a link between the often mismatched traditional beliefs and practices with those of Western medicine (Renfrew et al., 2013). The overall objective should be to bridge diverse cultural perspectives with Western medicine to facilitate better understanding on both sides without forcing anyone to supplant their beliefs with new ones. Although culturally competent health services can be theoretically linked to better newcomer health outcomes by alleviating some barriers, there is limited evidence that culturally competent health services results in improved health outcomes. Anderson et al. (2003) published a systemic review of 5 types of interventions focused on improving cultural competency. The interventions reviewed include the recruitment of culturally diverse staff, provision of interpreter services, cultural competency training, use of translated health education materials and provision of culturally specific clinics. The authors concluded that there were insufficient comparative studies and the available studies did not use standard outcome measures that allowed for comparability to support any strong conclusions about the efficacy of any of the interventions.

In contrast to the above conclusion other research suggests that the use of culturally and linguistically appropriate health education materials can produce positive results. For example,

exposure to a health promotion video designed to emphasize culturally relevant values has been associated with an 18% increase in self-reported HIV testing among African-American women shortly after the intervention (Kalichman et al., 1993). Other studies have measured client satisfaction with the cultural relevance of the videos. Target groups have reported increased satisfaction with the culturally relevant educational video (Stevenson et al., 1994), credibility of content, and attractiveness of announcer (Herek et al., 1998). Furthermore, a literature review focused on the costs of not providing interpretation in healthcare summarized that lack of interpretation services results in healthcare inefficiencies such as unnecessary tests, longer hospital stays, adverse events, non-attendance at appointments and excessive physician time and concluded that hiring interpreters may result in cost savings (Access Alliance, 2009). Thus, the evidence is building that culturally competent healthcare can increase client satisfaction, improve healthcare efficiency and positively impact health outcomes among newcomers.

Immigrant communities can play a leadership role in the development of culturally competent health services. Research has consistently demonstrated the importance of engaging the community of interest in the development of health promotion initiatives using community-based participatory methodologies (Andrews et al., 2007). Using a community-based participatory research approach Andrews et al. (2007) formed an advisory group made up of African American women to inform the development of a culturally sensitive smoking cessation program. The advisory group was made up of long term neighbourhood residents who were able to use their insider knowledge to inform the development of a culturally sensitive and ultimately successful smoking cessation program. The collaborative process engages community members as experts and true partners in the process, which serves to strengthen problem solving capacity and to maintain focus on cultural relevance (Israel et al., 2005). Purposeful community

engagement also helps to establish long-term partnerships that are vital to the development of successful population-based intervention strategies. In addition to collaborating with specific immigrant communities, it is important to facilitate opportunities for both men and women to participate in defining their health concerns and ideas for improvements. Newcomer women's lived experience may include being subjected to patriarchal power and control, especially if they are financially dependent on a male family member (Weerasinghe & Mitchell, 2007). Mental health counselors have noted that sometimes when a woman needs long-term psychiatric care, her family may not agree with this recommendation, possibly because the woman is needed at home to attend to her caregiving duties (O'Mahony & Donnelly, 2007). When asked about their perspectives, immigrant women have expressed their desire for culturally appropriate outreach health programs that employ immigrant workers who understand the culture (Sethi, 2013). Given this situation, community engagement must include culturally acceptable activities that facilitate the attendance and inclusion of vulnerable women to allow for a better understanding of their health needs and preferred service modalities.

Several studies have focused on the evaluation of healthcare services that target immigrant women. In Toronto, a mobile health clinic that provided primarily reproductive healthcare services to immigrant women demonstrated some positive results (Guruge et al., 2009). Immigrant women perceived that they had their care needs met through a highly accessible, holistic, and culturally and linguistically appropriate healthcare service. Thus, the mobile clinic addressed several practical and cultural barriers to healthcare mentioned in the previous section. In addition to providing cultural and accessible care, a study focused on the experiences of Cape Verdean women health promoters found that creating relationships with their clients was key to successful health promotion (De Jesus, 2009). The health promoters

described that being culturally responsive was only the first step in creating relationships with their clients. They also needed to establish trust, demonstrate respect and engage in reciprocal learning with their clients in order to successfully engage them in health promotion activities. Similarly, an intercultural health mediation project in Spain focused on reaching the immigrant population found that their approach was successful in the provision of preventive care and health promotion, especially in relation to sexual and reproductive health, prevention of domestic violence and the identification of social problems that may require other assistance (Quevedo et al., 2014). These studies demonstrate that innovative programming can be developed to support immigrant women's access to healthcare. However, it is important to recognize that specialized programs developed for a specific target population may unintentionally isolate the program and its target population from the healthcare system. It is important to ensure that any specialized program is embedded throughout the healthcare system to ensure that access to culturally sensitive care is enhanced throughout the healthcare system.

The community health centre (CHC) model in Toronto appears to be successfully reaching immigrant populations. In a study of self-managed care and health service use among Black Caribbean immigrants in Toronto, Hyman et al. (2014) observed that Black Caribbean immigrant participants were more likely to access care at the CHCs and receive diabetes care from a nurse educator than the Canadian-born. The Black-Caribbean immigrants were also significantly more likely to engage in positive diabetes self-management practices and attend to regular A1C testing and eye screening as recommended by their health care practitioner, as compared to the Canadian-born. The CHC health care model appears to be a promising best practice for the provision of health care to immigrants with chronic conditions.

The research on healthcare access demonstrates that newcomers more frequently visit physicians when they first arrive in Canada, make fewer physician visits over the next few years, but this rate increases after about 6 years in Canada to match the Canadian-born. Several sub-groups, including refugees and female immigrants, visit physicians more often than the Canadian-born. These healthcare usage patterns may indicate that newcomer men are not accessing recommended preventive care and/or refugees and newcomer women have intensive healthcare needs that are not being adequately addressed through routine healthcare. The existing research provides extensive information on the barriers, including lack of familiarity with the healthcare system, cost, cultural competency, traditional beliefs, and lack of transportation or childcare to healthcare, experienced by a variety of immigrant communities and provides some insight into how to address healthcare inequities. Gender sensitive community engagement with immigrant communities and attention to a women-centered approach in some instances appears to play a key role in the development of culturally competent healthcare programming. Overall, existing research provides a wealth of information on the barriers and supports to healthcare access, which could inform the implementation of model programs to comprehensively address newcomer healthcare needs.

2.6-Assessment Methods

2.6.1 Dietary Assessment Methods for Individuals

Several dietary assessment methods for individuals are used in epidemiological studies. Common dietary assessment methods include the 24-hour recall, dietary record, weighed dietary record, dietary history and food frequency questionnaire. The 24-hour recall involves the use of an open-ended questionnaire to determine the individual's food intake during the previous 24

hours or the day before the interview. Participants are asked to recall all the foods eaten in a 24 hour period and to estimate quantities, often with the assistance of food models or portion size diagrams (Gibson, 2005; Shim et al., 2014). The questionnaire is administered by a trained interviewer directly to the individual or to their caretaker in the case of young children under 8 years of age (Livingston & Robson, 2000) or the elderly. When administering the 24-hour recall to young children it can be useful to use the consensus approach in which the parent helps the child to recall foods and quantities consumed (Eck et al., 1989). An individual's nutrient intake is then calculated using food composition data. A single 24-hour recall administered to each individual in a sample population is useful for assessing the average usual intake of that population; while multiple 24-hour recalls administered to each individual can be used to determine the estimated usual intake of individuals (Gibson, 2005; Shim et al., 2014). Individual variation in food intake can impact the number of 24-hour recalls required to assess an individual's usual intake (Basiotis et al., 2002). The 24-hour recall has many strengths including being easy to administer and requiring about 30 minutes to administer, which helps to ensure respondent compliance. In addition, the 24-recall can be used with illiterate individuals and is less likely to modify the individual's food consumption because it is administered after the food was consumed (Gibson, 2005; Shim et al., 2014). Limitations may include respondent error due to memory, difficulty with estimating portion size or intentionally misreporting their intake (Acheson et al., 1980; Gibson, 2005; Shim et al., 2014). It can also be expensive to administer multiple 24-hour recalls to a large sample.

The dietary record requires that participants keep a food diary of all foods, and their respective quantities, consumed over a defined period of time, usually 1 to 7 days. The weighed dietary record is similar, except that food is weighed by the participant or other designated

individual prior to consumption (Gibson, 2005; Shim et al., 2014). Food composition data is then used to calculate nutrient intake. Similar to the 24-hour recall, the dietary record allows for the assessment of actual or usual individual intakes, depending on the number of days assessed. Accuracy of the data depends on participant's ability to estimate quantities and compliance with data recording over a number of consecutive days. Individuals must be literate to enter their own data, which can be a limitation with some populations (Gibson, 2005; Shim et al., 2014). Individuals may also modify their eating habits as they become more aware of their diet or to avoid complicated responses (Margetts & Nelson, 1997). The weighed dietary record may be more accurate, but requires the use of specialized equipment (Gibson, 2005).

The dietary history method involves administration of a 24-hour recall and food frequency questionnaire, as well as gathering some information on the participant's usual eating pattern by a trained interviewer. Similar to the other methods, nutrient intake is calculated using food composition data. This method can be used to characterize an individual's usual nutrient intake over a longer time period (1 month to 1 year). This information can be useful to determine the prevalence of inadequate nutrient intake and link inadequate nutrient intake with specific food intake patterns (Gibson, 2005; Shim et al., 2014). It is questionable whether dietary histories that attempt to cover the whole year are accurate unless seasonal variations in food intakes are accounted for (Gibson, 2005). Limitations with this method include high costs due to the amount of labour and time involved (Slattery et al., 2000) and possible over estimation of food intake in comparison to weighed dietary records (Livingstone & Robson, 2000).

Administration of the food frequency questionnaire involves recording how often an individual consumes predefined foods on a list over a specified time period (day, week, month, year). Participants may also be asked to quantify their usual portion sizes of the listed foods.

The questionnaire can be either self administered or done by an interviewer (Gibson, 2005; Shim et al., 2014). This method can be used to collect data on the consumption of specific groups of foods that serve as predictors for the intake of certain nutrients, such as dairy products as predictors of calcium intake (Barr et al., 2001). This method is useful for the collection of data on usual individual intakes of food or classes of food, and categorizing participants into low, medium and high consumers of specific foods or nutrients in order to compare with the prevalence of some chronic diseases (Masson et al., 2003). Advantages include the ease of administration and low respondent burden; however, it is not as accurate as other methods due to recall bias (Ambrosini et al., 2003). The option of a dish-based food frequency questionnaire appears to be preferable for ethnic groups that eat mainly mixed dishes, as food-based questionnaires may under estimate intake of nutrients found in the seasonings and oils (Yun et al., 2009; Keshteli et al., 2014).

Given all the strengths and weaknesses of the various dietary assessment methods, it is important to carefully consider how to measure the dietary intake of immigrant children to meet study objectives. Shim et al. (2014) suggest that using a combination of methods, such as food frequency questionnaire with 24-hour recall, may be the preferred methodology to obtain accurate estimates of dietary intakes.

2.62 Bone Health

Optimal bone development during childhood and adolescence is recommended to ensure long term bone health. The attainment of optimal peak bone mass (PBM) by the third decade of life has been linked to a decreased risk of osteoporosis in later life (Hui et al., 1990) and assures an adequate storage of calcium to support healthy pregnancies among women (Schoenau, 2006). Increases in bone mineral content (BMC) occur primarily during the first 3 years of life and

during the puberty growth spurt, with PBM being achieved early in the third decade of life (Henry et al., 2004). Approximately 86% of BMC accrual occurs during adolescence, with 26% acquired during the 4-year peak height velocity period and up to an additional 60% during the remaining peripubertal years (Bailey et al., 2000; Bonjour et al., 1991).

Genetics and gender are primary determinants of PBM, explaining up to 80% of the variance of adult bone mass (Eisman, 1999; Vanderschueren et al., 2004). Ethnic differences in bone strength have been noted among children. Wetzsteon et al., (2009) found that African-American and Hispanic children demonstrated significantly higher bone strength than European-American children. In addition, lifestyle habits, including physical activity and diet have been linked to impacts on bone health. Regular exercise during childhood and adolescence has a positive impact on bone accrual and maintenance extending into later life (Hara et al., 2001; Strong et., 2005); while sedentary activity in the prepuberty period has been associated with decreased bone mineral density (BMD) in young adults (Wang et al., 2003). Physical activity before pubertal maturation appears to have a greater impact on BMC accrual, as compared to exercise during or after pubertal maturation (Bass et al., 2002).

An adequate calcium intake and supply of vitamin D, either through synthesis or food intake, play important roles in ensuring adequate bone mass gain to achieve optimal PBM. A positive correlation between dietary calcium and bone mineral mass during childhood and adolescence has been observed and suggest that calcium intake before pubertal maturation may play a more important role (Bonjour & Rizzoli, 2001). Similarly, intervention studies have noted higher bone mass gains in response to calcium supplementation before pubertal maturation as compared to during the peripubertal period (Wosje & Specker, 2000). In addition, vitamin D serum levels are noted to be positively associated with bone mass gain among adolescents

(Clemens et al., 2005). Adequate vitamin D intake during key growth periods may be particularly important, as infants who received a vitamin D supplement during the first year of life were observed to have significantly higher areal BMD at 7-9 years of age as compared to controls (Zamora et al., 1999).

A synergistic relationship between calcium intake and physical activity on bone mass accrual has been suggested by some research. Greater bone mass gains have been observed among children aged 3-5 years and 8-9 years who took calcium supplements and engaged in moderate physical activity as compared to those who only took calcium supplements or exercised (Specker & Binkley, 2003; Juliano-Burns et al., 2003). It appears that higher calcium intake helps to potentiate the impact of physical activity on bone growth.

In addition to the above positive impacts of diet and exercise on bone health, other lifestyle habits can negatively affect bone health. High consumption of carbonated soft drinks has been negatively associated with bone mass accrual among adolescent girls (Whiting et al., 2001). Carbonated beverages likely replaced the consumption of nutrient dense milk and milk-derived beverages. Overall the available research indicates that it is prudent to ensure the development of healthy diet and physical activity habits during childhood and adolescence to ensure the attainment of optimal PBM to reduce the likelihood of fractures in later life.

2.6.3 Bone Assessment Methods

Dual X-ray absorptiometry (DXA) appears to be the most commonly used tool for measuring bone acquisition during childhood and adolescence. Several sources have proposed that the best outcome measure for bone mass status during childhood and adolescence is total body BMC assessed by DXA (Horlick et al., 2004; Mølgaard et al., 1999). DXA BMC has been found to be a more accurate and reliable measure for assessing bone acquisition in the pubertal

period then DXA BMD (Tisya et al., 2005). The DXA technique involves a 2-dimensional projection of 3-dimensional bone structures to yield BMC in grams for specific bones. The areal BMD is then calculated as BMC/bone projected area. DXA offers several research advantages, including low cost, easy use, speed, precision and low radiation exposure (Perez-Lopez et al., 2010, Tisya et al., 2006). In addition, age standardized norms are available for DXA measurements (Bachrach, 2005).

However, the DXA also has several limitation related to its dependence on 2-dimensional projections. The DXA's major limitation is that it cannot measure the third dimension of the bone in the direction of the x-ray beam so it cannot provide true volumetric density (Tishya et al., 2006). Accordingly, the DXA may calculate a higher areal BMD for a large bone, even though it has the same volumetric BMD as a smaller bone. The DXA's second limitation is its assumption of homogeneous soft tissue surrounding bone. Since fat has different attenuation properties than lean tissue DXA measurements may not be accurate for overweight/obese individuals and for those who have undergone large weight changes (Svendsen et al., 2002). In addition the DXA is not able to separately analyze cortical and trabecular bone or provide other information on bone quality (Gelfand & DiMeglio, 2005).

An alternative to the DXA is quantitative computed tomography (QCT). The QCT allows 3-dimensional imaging, which makes it possible to measure volumetric BMD, bone size and geometry, as well as make separate measurements of cortical and trabecular bone (Mora et al., 2003; Hangartner & Gilsanz, 1996). The main advantage of QCT is the lack of distortion due to bone size or body weight that can occur with DXA measurements (Gelfand & DiMeglio, 2005). The limitations of QCT include cost, higher radiation exposure and lack of pediatric norms (Gelfand & DiMeglio, 2005). Peripheral QCT (pQCT) has been developed for use on the

appendicular skeleton. pQCT offers good precision, while minimizing cost and radiation exposure (Gelfand & DiMeglio, 2005). A pQCT for children, youth and adults has been established (Schoenau, 2006).

Quantitative Ultrasound (QUS) is another available technique for assessing bone at peripheral sites, although it does not directly measure bone mass. QUS measures bone quality, which is assumed to be based on bone size and density, and trabecular architecture (Vignolo et al., 2003). Although lack of radiation and portability of technology make QUS an attractive option, lack of standardized QUS measurement techniques and inability to correlate QUS measurements with other bone measurements, such as DXA or QCT, currently limit the usefulness of QUS (Halaba et al., 2005).

Magnetic Resonance Imaging (MRI) has recently emerged as a promising tool for quantitative bone measurements. The MRI can be used to analyze a number of microarchitectural parameters; however, bone measurement techniques have not yet been standardized (Wren & Gilsanz, 2006). The lack of radiation may make the MRI a promising bone assessment tool once it is ready for clinical use.

Taking into account the advantages and limitations of the above bone assessment methods, the DXA appears to be the preferred method for research. The availability of age standardized DXA values for multi-ethnic groups of children is a major strength that supports the use of the DXA for research purposes. In addition, the DXA's low radiation dose makes it an ethically appealing research method for children.

3. METHODOLOGY

3.1 Study Objective

To characterize the health and nutritional status of immigrant and refugee children aged 3 to 13 who have been in Canada for less than 5 years.

3.1.1 Specific Objectives

As indicated in the literature review, newcomers may be at risk for inadequate intake of nutrients to support optimal growth and development. Existing research indicates that newcomer children may be at risk for inadequate intakes of vitamin D, zinc and folate, among others.

1. To characterize the nutritional status of newcomer children and the prevalence of suboptimal intakes of important nutrients (i.e. vitamin D, calcium, protein, zinc, sodium and energy) among them.

Hypothesis: Newcomer children who have been in Canada for less than 5 years are at risk for suboptimal intake of important nutrients, particularly vitamin D, calcium, zinc and protein and refugee children are at higher risk than immigrant children.

The existing body of research indicates that newcomers are at risk for food insecurity, although there is limited information that compares immigrants to refugees. Vulnerable families may reduce expenditures on expensive nutrient dense foods, resulting in micronutrient deficiencies, which can result in poor growth and development.

2. To assess income-related household food insecurity of newcomer children's families and its impact on children's health and nutritional status compared to Canadian children and to explore the determinants underlying food insecurity.

Hypothesis: Food insecurity is more common among refugee children as compared to immigrant children and the Canadian population. The nutritional status of newcomer children living in food insecure households is worse than those living in food secure households.

Recent research has noted concerns related to poor vitamin D status among newcomer children with dark skin. It is unknown whether refugee children are at higher risk than immigrant children.

3. To determine serum vitamin D status in newcomer children and relate to dietary intake.

Hypothesis: Newcomer children are at risk for vitamin D insufficiency with refugee children being at higher risk than immigrant children.

There is some evidence that newcomer children may experience barriers to physical activity, including limited financial resources, cultural expectations, safety concerns and the influence of technology.

4. To evaluate physical activity patterns in newcomer children.

Hypothesis: Newcomer children have a low level of physical activity comparable to Canadian children.

There appears to be little information that links dietary intake, physical activity and food security with health outcomes among newcomers. Research indicates the existence of a healthy immigrant effect, whereby immigrants usually arrive in good health and experience health declines with year spent in Canada. However, this research mainly involves adults and does not clearly identify links to diet and physical activity. This study will provide data to allow exploration of these links among children.

5. To evaluate the association between dietary intake, physical activity, food security and poor health outcomes, including overweight and obesity, elevated blood pressure, high blood glucose, abnormal lipid profile and suboptimal bone mineral content.

Hypothesis: Poor dietary intakes of important nutrients, low levels of physical activity and food insecurity among newcomer children are associated with poor health outcomes.

Lifestyle changes related to diet and physical activity, as well as food insecurity among newcomers has been noted; however, a rich explanation of the lived experiences behind these changes is lacking, especially among children. Many barriers and supports to healthcare access have been documented among newcomers. However, studies that focus on children and the Saskatchewan perspective are lacking.

6. To help understand newcomer children's lived experience of lifestyle changes, food insecurity and access to healthcare services using a qualitative methodological approach.

3.2 Research Approach and Design

3.2.1 Approach

This study provides a synthesis of quantitative and qualitative research that adheres to the critical realist methodological approach. Critical realism considers reality as being arranged in levels that are structured, differentiated, stratified and changing. Actual mechanisms in underlying levels trigger observable events located in the superficial levels. According to this approach our conceptual reality may not be the same as the factual reality, partially due to the common reduction of reality to observable events that does not take into account the effect of underlying mechanisms and powers located in deep structures (Danermark *et al.*, 2002). Within the current study, the use of qualitative interviews facilitates reaching deeper layers and

complexities that the quantitative measurements alone would not permit. Summarily, whether or not we choose to acknowledge it, reality exists, but it is continually changing and not wholly accessible through empirical means.

In alignment with this understanding of reality, Danermark *et al.* (2002) emphasize that scientific conceptualization is the crucial starting point in social science investigations. Everyday knowledge related to the social phenomena under study needs to be considered during the conceptualization of research directions. Everyday knowledge is a constituent of mechanisms that generate observable events, although it may be associated with an interpretation of reality based on factual reality or falsehoods. In addition to being grounded in the contents of everyday knowledge, conceptualization should also consider systems of domination that define social relations in that context to contribute to a more explanatory theory that may inform new knowledge.

Conceptualization is the initial step to engage in a causal analysis through abstraction involving structural analysis (Danermark *et al.*, 2002). Abstraction involves developing a description of the social structure and possible mechanisms that may be linked to the social phenomena under study through an examination of social relations. Abstract concepts can provide explanations about possible mechanisms behind concrete observable phenomena. A complex web of mechanisms that reinforce or retard the impact of each others' manifestations interact to produce concrete events so it may not be possible to attribute an event to a specific mechanism. Trigger mechanisms may not always produce the same effect among all individuals as an individual's actions are only conditioned by social structures. According to the critical realist perspective both agency and social structures exist as qualitatively different objects in

society. The underlying conditions for peoples' lives are entwined in social structures, while individuals' actions cause events to take place in society.

Research in alignment with the critical realist approach considers both abstract and concrete research findings along with generalizations that apply to a variety of constitutive structures, mechanisms and events to explain system functioning (Sayer, 1992). To identify and understand possible mechanisms that generate observable events, it is important to look beneath factual events. Abstract research involves a theoretical analysis of social structures and possible mechanisms that may impact events; while concrete research involves examining observable events that could be of interest as a result of abstract research (Danermark *et al.*, 2002). The critical realist perspective also allows for the development of generalizations through the search for regularities and common properties among observable events that manifest as a result of social structures that make up the constituent properties of social relations (Danermark *et al.*, 2002; Sayer, 1992). Overall, the critical realist approach supports the identification of structures and mechanisms which generate tendencies in the behaviour of phenomena/events. Chapter 4 contains the quantitative results, while qualitative results are presented in chapter 5, and chapter 6 provides an integrated discussion of all findings to inform a comprehensive understanding of the possible structures and mechanisms that influence newcomer children's health.

3.2.2 Research Design

This study employs a cross-sectional analysis of 300 immigrant and refugee children aged 3 to 13 years who had been living in Regina or Saskatoon, Saskatchewan, Canada for less than 5 years at the time of the study. This design supports a focused evaluation of the health status of newcomer children within the critical first 5 years of arrival as this is when diet changes

are hypothesized to occur. Only healthy children, not currently being treated for malnutrition or other serious medical problems, were recruited to avoid any outliers that would skew the results.

The study design is informed by an analysis of the current level of knowledge concerning newcomer children health as research designs vary according to the existing level of knowledge and theory about the topic under study. When a substantial amount of knowledge is already available on the topic, highly controlled research designs, such as experimental studies, may be an option. However, due to the limited knowledge base regarding the health status of newcomer children and the underlying mechanisms involved, an exploratory-descriptive design was selected as the most appropriate design for this study. The exploratory design supports in-depth, qualitative data collection methods that contribute to a deeper understanding of the salient factors that impact the outcomes of interest. The descriptive design adds additional depth by supporting the use of both qualitative and quantitative data to provide a thorough description of a given variable in a specific population that has not yet been widely studied (Brink & Wood, 1989).

The combined use of quantitative and qualitative methods in the same study is referred to as mixed method design with methodological triangulation serving as one of the main approaches (Denzin & Lincoln, 2000). According to Denzin and Lincoln (2000) the use of triangulation approaches encourages an improved understanding of the relationships between and among variables, and enhanced data validity. Qualitative and quantitative data collection methods were employed in this study to provide complementary data that allows for a more complete description of the health status of newcomer children and the underlying mechanisms or pathways to health outcomes. The exploratory phase of the study involved the collection of qualitative data through in-depth interviews with the parents of newcomer children regarding their family lifestyle habits and their experiences with accessing healthcare. The descriptive

phase involved the collection of quantitative data through the administration of questionnaires concerning socio-economic status, food security, physical activity, and diet to the parents and completion of physical exams on the children. Information gathered through the questionnaires primarily informed the development of a comprehensive description of newcomer children's health status, while the in-depth interviews facilitated the identification of lifestyle trends and healthcare access issues that may impact health status.

3.3-Recruitment Strategies and Sample Size Calculations

3.3.1 Recruitment Strategies

A purposefully selected sample of study participants that reflects the current Saskatchewan newcomer population was recruited with the assistance of several organizations that have regular contact with immigrant and refugees. The following organizations were contacted to request their assistance and support with recruiting study participants:

Regina Community Clinic

Regina/Saskatoon Open Door Society

Saskatchewan Institute of Applied Sciences and Technology English as a Second Language Program

Saskatchewan Intercultural Association

Ethno-cultural Groups

Regina/Saskatoon Public School Boards

Regina/Saskatoon Catholic School Boards

International Student Associations

University Faculty and Staff List Serves

Initial contact was established with these organizations and formal requests for assistance with participant recruitment were completed when requested. Participant recruitment posters were also placed in accessible public locations including the universities, public libraries, health care facilities and commercial locations.

3.3.2 Sample Size Calculation

The study sample needed to be sufficiently large to support the planned statistical analyses, while small enough to manage within the resources available to the study. In order to determine sample size, appropriate values were selected for confidence, power and effect size to be inputted into the equation. The medical literature often refers to the use of 95% confidence and 80% power as being suitable values to use, although it may be desirable to have a higher power if possible (Riffenburgh, 2006). Cohen (1988) has developed effect size measures of 0.02, 0.15 and 0.35 that correspond to small, medium and large effects, respectively. Effect size corresponds to the size of detectable differences among measured variables that are clinically relevant. Because the estimated sample size represents the minimum allowable sample, Riffenburgh (2006) supports the addition of a safety factor to account for possible sources of error in the hypothetical equation.

Since the study's quantitative data analysis involved the use of several statistical tests, including multivariate regression analysis with up to 7 variables the *G Power* program was used to determine minimum sample size. *G Power a priori analysis* computes sample size as a function of user-specified values for significance level, statistical power and the population effect size (Faul et al., 2009). Values of 0.15 for effect size, 95% confidence, 95% power and 7 predictors were inputted into *G Power*, which then calculated the minimum sample size to be 153 participants. This minimum sample size has a 95% probability of detecting a medium effect

difference between immigrants and refugees when present and a 95% probability of rejecting such a difference when it is absent. In order to add a safety factor while managing within the resources available to the study, the minimum sample size was set at 250 participants.

3.4-Measurements

3.4.1 Quantitative Measurements

Demographics and Socio-economic status

Socio-demographic information was collected using a modified version of the CCHS 2008 socio-economic and demographic questionnaire to ensure its relevance for this study population. The use of this questionnaire allows for comparisons with other national and provincial data sets that include information on specific ethnicities and immigrants. Questions include child's age and sex, parents' ages, education, income and other socio-demographic characteristics (Appendix E). The collection of this data facilitates the categorization of study participants according to household income and education level to allow for comparisons among the groups and with other comparable studies.

Food Security

Income-related food security was evaluated using an adapted version of the United States Department of Agriculture (USDA) Income-related Household Food Security Questionnaire (Appendix F). Statistics Canada has adopted and used the USDA questionnaire for CCHS surveys since 2004. The USDA questionnaire has been validated in 19 countries including Canada (Health Canada, 2010). Participant households were categorized as food secure, moderately food insecure, and severely food insecure.

Anthropometrics

Anthropometric measurements included height, weight and waist circumference. A digital scale was used to measure each child's weight while s/he wears light clothing without shoes. Weight was recorded in kilograms to the nearest gram. A second measurement was taken and if the 2 results were similar ($SD=\pm 0.5$ kilograms), the average of those 2 numbers was calculated and recorded. If there was a large variance between the 2 values, a third measurement was taken and the average of the 2 closest numbers was calculated and recorded as the final weight.

A Stadiometer was used to measure each child's height without shoes. The child stood on the Stadiometer platform with her back to the scale and contact points (heels, buttocks, and shoulder blades) lightly contacting the scale. The headpiece was positioned so that it lightly touched the child's head. After taking a deep breath in and out, the child stepped off the platform and height was recorded in centimetres to the nearest millimetre. A second measurement was taken and if the 2 values were similar ($SD=\pm 0.5$ centimeters), the average of the 2 numbers was calculated and recorded. If there was a large variance between the 2 values, a third measurement was taken and the average of the 2 closest numbers was calculated and recorded as the final height. Each child's height and weight was used to calculate their BMI (kg/m^2). Height, weight and BMI were assessed using the World Health Organization age- and sex-specific standards (WHO, 2007).

While the participant was in the standing position, waist circumference was measured to the nearest 0.1cm using a flexible measuring tape around the waist at the high point of the iliac crest at minimal respiration (Li et al., 2006). Height and waist circumference was used to

calculate the waist-height ratio. All anthropometric results were compared to standardized reference data.

Dietary Assessment

Three 24-hr dietary recalls were administered to each child. A single 24-hour dietary recall demonstrates a participant's actual intake, while the administration of 3 24-hour dietary recalls allows for an assessment of a participant's usual intake (Gibson, 2005). The 3 24-hr dietary intakes were averaged to obtain the participant's usual intake (Appendix B). The first 24-hr recall was administered in person on the participant's first measurement session, while the 2 subsequent 24-hr recalls were also usually administered in person due to language barriers and difficulties with describing portion sizes. However, the option of completing the 2 follow up 24-hr recalls over the phone was explored. The follow up 24-hr recalls were completed at intervals of at least 10 days on different days of the week when possible. This methodology is similar to the pilot study, as well as other studies by the principal investigator (Vatanparast et al., 2005).

The participants' dietary information was entered into a diet analysis program *Food Processor Nutrition and Fitness Software version SQL 10* (Esha Research, Salem OR) to determine their intake of food group portions and specific nutrients. This program includes more than 5000 Canadian food items; however, if a specific food is not included in the Canadian food list, the American food item most similar in nutrient content was substituted. The results were analyzed to determine whether the children consumed the *Eating Well with Canada's Food Guide's* recommended servings for fruits and vegetables, grain products, milk and alternatives, and meat and alternatives. These results were compared between the groups of refugee and immigrant children. The participants' dietary intake of energy, vitamin D, protein, sodium and calcium was also analyzed in the same way.

The Canadian version of the Healthy Eating Index (HEI) was used to assess overall dietary adequacy (Garriguet, 2009). The HEI was originally created by the United States Department of Agriculture (National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents, 2004). The Canadian version of the HEI has been validated and is based on the *Eating Well with Canada's Food Guide* recommendations. The Canadian HEI includes 11 components categorized as either adequate or moderate. The adequacy components include vegetables and fruit, whole fruit, dark green and orange vegetables, grain products, whole grains, milk and alternatives, meat and alternatives, and unsaturated fats. The moderate components include saturated fats, sodium, and other food. The scoring system attributes a certain number of points for each component and points are distributed proportionately based on meeting the *Eating Well with Canada's Food Guide* recommendations. The points are then totalled to provide a score out of the ideal score of 100. A score of <50 is classified at a “poor” diet, while a score of 50–80 is classified as “needs improvement”, and a score of >80 is classified as “good”.

Blood Pressure

Participants' blood pressure was measured up to 3 times in accordance with the National High Blood Pressure Education Program standards and guidelines (2004). The child was seated quietly for 5 minutes with his/her back supported, feet flat on the floor, and the right arm supported so the cubital fossa is at heart level prior to measurement. The cuff was placed on the right arm and covered 80%-100% of the circumference of the child's arm. The stethoscope was positioned over the brachial artery, proximal and medial to the cubital fossa, just below the bottom edge of the cuff. The first blood pressure measurement was taken on the participant's first measurement session. If a child's blood pressure was $\geq 95^{\text{th}}$ percentile, additional blood

pressure measurements were taken when the second and third 24-hr recalls were administered. Children with a systolic or diastolic measurement $\geq 95^{\text{th}}$ percentile on all 3 occasions were classified as hypertensive, while those with blood pressures $\geq 90^{\text{th}}$ percentile, but $< 95^{\text{th}}$ percentile were classified as pre-hypertensive (NHBPEP, 2004). Any hypertensive children were advised to seek medical attention.

Body Composition

Participants' body composition was assessed using a dual energy x-ray absorptiometry (DXA) machine to measure bone mineral content and density of total body, hip and lumbar spine. The child lied down on the DXA platform for approximately 20 minutes to complete the test. DXA measurements were conducted by qualified radiology technicians. Participants' total body bone mineral content (TBBMC) was the primary measure of interest as it has been found to be the most accurate DXA bone mineral measure in children (Fewtrell, 2003). Participants' TBBMC values were compared to age, sex and ethnicity-based standards developed through 4 longitudinal studies (Baxter-Jones et al., 2010). Participants' percent total body fat and trunk fat mass were also be recorded and compared with the same standards, as well as bioelectrical impedance analysis standards that have been validated with DXA measurements (McCarthy, 2006).

Physical Activity Assessment

Participants' general physical activity was assessed using Statistics Canada's children's physical activity questionnaire (CPA) (Appendix D). The CPA is based on a 7-day recall of physical activity sufficiently intense to increase an individual's heart rate, making that person occasionally out of breath (Statistics Canada, 2007). The CPA was selected because it has been tested for validity and reliability, is cost and time efficient, includes questions about the child's

sedentary activities, and the data collected may be compared to other studies (Statistics Canada, 2007).

Serum Biomarker Measurements

A single finger prick was used to gather participant blood samples to assess serum glucose, total cholesterol and serum vitamin D. Serum glucose was measured on site during the first participant measurement session using an Accu-Chek® Aviva Nano glucometer (Roche Diagnostics, Mannheim, Germany). Random serum glucose levels >7.8 mmol/L were classified as high according to current standards (Pearson et al., 2007).

After collecting the first drop of blood to check serum glucose, several blood drops were collected on blood filter cards to be sent to ZRT laboratory for non-fasting total cholesterol and serum vitamin D analysis. The cards were dried for 30 minutes and stored according to protocol until they are sent to ZRT Laboratory. Cholesterol assessment is included in the study to provide some initial data on cholesterol levels in newcomer children as universal cholesterol screening is not currently recommended (National Cholesterol Education Program Expert Panel on Blood Cholesterol Levels in Children and Adolescents, 1992). Cholesterol levels of <4.4 mmol/L were considered acceptable, levels between 4.4-5.1 mmol/L were borderline and ≥ 5.2 mmol/L was considered high (American Heart Association, 2011).

Participants' serum vitamin D levels (total 25-hydroxyvitamin D) were assessed using liquid chromatography-tandem mass spectrometry (ZRT Laboratory, 2009). Vitamin D status was defined using the Institute of Medicine dietary reference intake panel on vitamin D's guidelines (2010). Serum vitamin D of >50 nmol/L was considered sufficient, 30-50 nmol/L was inadequate and < 30 nmol/L was deficient.

3.4.2 Qualitative Measurements

Newcomer Families: In-depth Interviews on Health Care Access Issues and Family Lifestyle

A purposive sample of the participants' parents was invited to participate in in-depth interviews to better understand newcomer health care access issues and family lifestyle practices that may impact children's health status. A diverse selection of 19 refugees and immigrants of various ethnic and socio-economic backgrounds were invited to participate in in-depth individual or household interviews to ensure the inclusion of diverse viewpoints. In many cases the parents and other members of the family, including children, participated in the interviews. The first section of the in-depth interviews focused on awareness/understanding of the Canadian healthcare system, linguistic, cultural, gender, personal and economic barriers, and discriminatory experiences that may affect access to healthcare services. The second section of the in-depth interviews focused on family lifestyle practices, including dietary changes, and linguistic, cultural, gender, personal and economic barriers to children's participation in physical activities. The interview questions were modified from existing questionnaires when possible (Groleau & Kirmayer, 2004; Young et al., 1999; Weerasinghe & Mitchell, 2007). Open-ended questions were used to facilitate the collection of rich, descriptive narratives from participants (Morse & Field, 1995) until further interviews did not appear to contribute any significant information beyond that already collected.

A purposive sample involves the deliberate selection of a heterogeneous sample that may allow for the observation of commonalities in their experiences if they exist (Morse, 1994). In-depth interviews were selected instead of focus groups as it was assumed that many of the participants would require the support of translators that could limit the number of questions that

could be addressed during a typical 2-hour focus group session. It was also anticipated that some participants might have experienced adverse healthcare events that they would not be comfortable sharing in the presence of others from their community. Interviews were conducted with the assistance of translators when required. The use of translators ensured that participants understood the questions and could provide the fullest possible responses. In recognition of the possibility that translators might stifle responses or shape the conversation to their liking if they were in a position of power over the respondent, translators were carefully selected with the assistance of the Open Door Societies to minimize any influence on participant responses.

Service Providers: In-depth Interviews on Health Concerns and Healthcare Access Issues

In-depth interviews were also conducted with a purposive sample of newcomer service providers, healthcare providers and policy makers to understand their perspectives on newcomer health and healthcare access issues. In-depth interviews were selected instead of focus groups as it is often difficult to schedule a focus group at a mutually agreeable time for 5 to 7 professionals with busy schedules. A purposive sample of 24 participants was selected from a variety of organizations that interact with newcomers in a variety of settings and at different levels to illuminate the diversity of perspectives. The sample included 22 service providers from settlement agencies, community schools, English-as-a-Second-Language programs and healthcare organizations, as well as 2 policy and program consultants from government departments. The interviews focused on prominent health concerns among immigrants and refugees and factors that may be impacting healthcare system access. The interview questions were modified from existing questionnaires when possible (Young et al., 1999; De Jesus, 2009;

O'Mahony & Donnelly, 2007). Similar to the newcomer's in-depth interviews, questions were open-ended to support the collection of rich, descriptive data.

3.5 Data Analysis

3.5.1 Quantitative Data Analysis

Descriptive data is presented as means \pm standard deviation for the sub-groups of interest, including immigrant/refugee status, sex, age groups, ethnicity and length of residency as the available data allows. Dietary Reference Intake approaches were used to determine the prevalence of inadequacy of nutrients of interest and the Canadian Healthy Eating Index scores were used to evaluate overall dietary adequacy. Data was tested for normal distribution using Shapiro-Wilk test, and when found to be not normally distributed data was either transformed or subjected to equivalent non-parametric tests (Mann Whitney U-test), depending on the situation. A 2-sided independent Student's t test and Fisher's Least Significant Difference Test was used to evaluate differences between refugees and immigrants. Possible correlations between variables of interest were examined through the use of Pearson's correlation, including post hoc analysis when indicated. Bivariate and multivariate linear and logistic regression models were used to investigate associations between health outcomes, dietary adequacy, physical activity level, socio-economic status, food security and other possible confounders. Statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS 24). Alpha was set at 0.05 for all tests.

3.5.1.1 Model Building

Stage 1 Univariate Analysis: Meaningful multivariate analysis involves the selection of an economical subset of the explanatory variables that accounts for maximum variability in the outcome (University of Sydney, 2010). After selecting relevant variables, univariate analysis was conducted to exclude statistically non-significant variables ($p\text{-value} > 0.2$). Important variables may be missed if the traditional $p\text{-value}$ of 0.05 is used (Mickey & Greenland, 1989).

Stage 2 Multivariate Analysis: After excluding non-significant variables by univariate analysis, the remaining variables were entered into a regression model. The Wald test was used to develop the best fitting regression model. The Wald test systematically eliminates variables that do not contribute to the fit of the model; generally those with a $p\text{-value} > 0.05$. Variables with a $p\text{-value} \leq 0.05$ indicate that the coefficients for those variables are not equal to zero; therefore, those variables improve the model fit and are kept in the model.

Stage 3 Interactions: Interactions between variables involve differential effects of variable A on an outcome across the range of values for variable B. (UCLA Statistical Consulting Group, 2007a). Interactions can be interpreted 2 ways: using an additive scale and a multiplicative scale (Buis, 2010); however, most studies rely on multiplicative interpretation. Interactions between each pair of variables included at the end of stage 2 were added to the model one at a time and retained in the model if they were deemed significant ($p < 0.05$).

Stage 4 Confounding variables: The association between independent and dependent variables can be distorted by confounding variables (Frank, 2000). Variables previously excluded from the model at earlier steps are added back in 1 at a time and retained in the model if the coefficient of any variable changes by more than 10%.

Stage 5 Best Fit Model: After all significant variables, interactions and confounding variables have been identified the best fit regression model can be built using the enter function in SPSS regression.

3.5.2 Qualitative Data Analysis

The in-depth interviews data were analyzed in accordance with thematic content analysis, while using some elements of the grounded theory approach. Thematic content analysis involves comparing respondents' accounts to develop common themes (Green & Thorogood, 2007), or more specifically it is a method to identify, analyze and report themes within data (Braun & Clarke, 2006). Interviews were taped and transcribed verbatim following the sessions. To ensure accuracy transcripts were rechecked against the audiotapes a second time, at minimum, and the final hard copy was used for analysis. This process allowed the researcher to develop familiarity with the data. Consistent with the grounded theory approach, an inductive approach with open coding of early data was used to generate categories embedded in the data (Green & Thorogood, 2007). In addition, close attention was paid to deviant cases to capture the diverse experiences of the sample population. Although it did not become necessary, the researcher was prepared to employ theoretical sampling if needed to interview additional participants from a specific population to test whether a deviant case may not be deviant and to check the relevance of emerging themes (Green & Thorogood, 2007). This process supported high level data conceptualization and the development of broader theoretical formulations. Early interviews and data analysis occurred concurrently in an iterative process whereby initial results served to open up additional lines of investigation or further finetune participant questions and probing. This process supported the transformation of individual experiences and perceptions into a critique of social processes and structures that organize lived experiences.

Initially the researcher identified salient data extracts corresponding to the research questions in order to generate coding categories across the entire data set. Then all code categories were reviewed to identify main themes and collate relevant code categories together. The identification of themes did not always rely on the number of similarly coded data extracts, but also took into account their importance in responding to the research questions. Themes were then reviewed to determine if any could be combined or discarded and whether the themes accurately reflect the data set as a whole. Themes were further refined by organizing sub-themes under them and ensuring the theme titles accurately represent the content. The most vivid extracts under each theme were selected for inclusion in the results section. Qualitative data analysis was supported using NVivo11.

3.5.3 Data Triangulation

The interview results were triangulated with the quantitative data to explore areas of convergence as described by Ratcliff (1995). The combination of quantitative and qualitative data can provide a broader context to more fully explain the research results and enhance the study's validity. Qualitative data provides rich insight into lived individual experiences, but it has been critiqued as having limited generalizability to the larger population (Young et al., 1999). Young also describes how quantitative methods may impose unwarranted categories and priorities that lead the research down a reductionist path. Thus, the triangulation of quantitative and qualitative data can support the development of valid theories, as well as policy and practice recommendations, based on lived experiences supported by descriptive quantitative data.

4. QUANTITATIVE RESULTS

4.1 Introduction

The quantitative results from the cross-sectional study are presented in this chapter. Data gleaned from the socio-demographic, physical activity and food security questionnaires; 24 hour dietary recalls; anthropometric measurements; blood sample analysis and DXA bone scans are presented below.

4.2 Study Sample Group

A total of 300 children aged 3-13 years participated in the cross-sectional study. Thirty-seven participants declined to participate in all parts of the study, either by formally rescinding consent or by becoming unreachable to the researcher. Some parents did not report their income, complete the food security questionnaire, or complete all 3 24 hour recalls, and some children experienced difficulties with providing blood samples and/or with lying still for DXA bone scans. As a result the data contains missing values above 5% for some variables, including income (10.0%), food security (5.7%), usual intake of food and nutrient values (3 - 24 hour recalls) (12.3%), measures derived from blood samples (8.0%) (glucose, cholesterol, serum vitamin D), and DXA measurements (7.3%) (bone mineral content and body fat). Cases with missing values are not included in analyses that use that particular variable.

4.3 Demographics and Socio-economic Status

Study participants commonly came from Asia (49.3%), the Middle East (28.2%) and Africa (11.7%). Table 4.1 presents socio-demographic information about the participants. Refugee and immigrant children differed significantly in terms of age, region of origin, parents'

Table 4.1 Demographics and socio-economic status of participants

Characteristics	Immigrants n=134 (44.7%)	Refugees n=166 (55.3%)	All participants n=300 (100%)[^]
Age (Mean±SD)	8.3±2.9*	7.8±2.7	8.0±2.8
Sex			
Male	75 (56.8%)	102 (61.4%)	177 (59.4%)
Female	57 (43.2%)	64 (38.6%)	121 (40.6%)
Region of origin			
Middle East (E.g. Iran, Iraq, Pakistan)	65 (49.2%)*	19 (11.4%)	84 (28.2%)
Asia (E.g. Burma, India, Philippines)	33 (25.0%)*	114 (68.7%)	147 (49.3%)
Africa	13 (9.8%)*	22 (13.3%)	35 (11.7%)
Latin-America	2 (1.5%)*	11 (6.6%)	13 (4.4%)
Eastern Europe	11 (8.3%)*	0	11 (3.7%)
Western Europe/ US	8 (6.1%)*	0	8 (2.7%)
Education			
Neither parent has high school diploma	7 (5.3%)*	128 (80.0%)	135 (46.2%)
At least 1 parent has high school diploma, some university or other education	27 (20.5%)*	19 (11.9%)	46 (15.8%)
At least 1 parent has university degree	98(74.2%)*	13 (8.1%)	111 (38%)
Main source of income			
Wages and salaries	114 (86.4%)*	88 (53.7%)	202 (68.2%)
Social assistance & Government Payment	4 (3.0 %)*	75 (45.7%)	79 (26.7%)
Other (Scholarship, savings, none)	14 (10.6%)*	1 (0.6%)	15 (5.1%)
Income Category (Adjusted for # of family members as per CCHS**)			
Lowest	37 (30.3%)*	58 (41.4%)	95 (36.3%)
Middle	42 (34.4%)*	71 (50.7%)	113 (43.1%)
Upper-middle	29 (23.8%)*	10 (7.1%)	39 (14.9%)
Highest	14 (11.5%)*	1 (0.7%)	15 (5.7%)
Low Income Cut Off (LICO**)			
Income below LICO (Using # persons per household)	66 (54.5%)*	108 (77.1%)	174 (66.7%)
Income above LICO	55 (45.5%)*	32 (22.9%)	87 (33.3%)
Length of stay in Canada in years (Mean±SD)	2.0±1.6*	2.6±1.5	2.3±1.6

* indicates significant difference between immigrants and refugees through chi squared at P<0.05

[^] n may be less than 300 in rows with missing data.

**CCHS (Canadian Community Health Survey). LICO (low income cut-off).

education level, main source of income and income level. A large majority of the refugees in the study are from Asia; while the greatest proportion of immigrants is from the Middle East.

Refugees appear to be disadvantaged in comparison to immigrant participants on many variables,

such as being less likely to have finished high school, more likely to receive social assistance and more likely to be in the lower income categories. Refugees are concentrated at the lower income levels; while immigrants are somewhat more distributed among all income levels.

4.4 Food Group Intake and Healthy Eating Index Canada (HEIC)

Table 4.2 Food group intake and the HEIC scores of participants

Characteristics	Immigrants n=132 (46.3%)	Refugees n=153 (53.7%)	All participants n=285 (100%)
Meat and alternatives			
Mean intake (servings/day)	1.8 ±1.0*	1.5±0.9	1.6±1.0
Meeting Canada's Food Guide recommendations	107 (82.3%)*	103 (68.7%)	210 (75.0%)
Milk and alternatives			
Mean intake (servings/day)	1.6±1.1*	1.3±1.0	1.5±1.1
Meeting Canada's Food Guide recommendations	31 (23.8%)	25 (16.3%)	56 (19.8%)
Grains			
Mean intake (servings/day)	5.4±2.5	4.9±2.0	5.2±2.2
Meeting Canada's Food Guide recommendations	71 (55.0%)	74 (49.0%)	145 (51.8%)
Whole grains			
Mean intake (servings/day)	1.2±1.6*	0.7±1.1	0.9±1.4
Meeting Canada's Food Guide recommendations	25 (18.9%)*	15 (9.8%)	40 (14.0%)
Vegetables and fruit			
Mean intake (servings/day)	3.8±2.0	4.1±2.0	4.0±2.0
Meeting Canada's Food Guide recommendations	23 (17.7%)	40 (26.1%)	63 (22.3%)
Dark green and orange vegetables			
Mean intake (servings/day)	0.3±0.4*	0.4±0.5	0.4±0.5
Meeting Canada's Food Guide recommendations	1 (0.8%)	5 (3.3%)	6 (2.1%)
Healthy Eating Index Canada			
Mean Score	73.7±7.5	72.0±8.3	72.8±8.0
Good Diet	29 (22.3%)	22 (14.4%)	51 (18.0%)
Diet Needs Improvement	101 (77.7%)	131 (85.6%)	232 (82.0%)
Poor Diet	0 (0.0%)	0 (0.0%)	0 (0.0%)

* indicates significant difference between immigrants and refugees through chi squared at P<0.05

Table 4.2 presents food group intake data and Healthy Eating Index Canada scores.

Mean intakes of meat and alternatives, milk and alternatives, whole grains and dark green and

orange vegetables vary significantly by immigrant status with immigrants having the higher mean intake in all cases, except the dark green and orange vegetables category. Immigrants are also significantly more likely to consume sufficient servings from the meat and alternatives and whole grains food groups. There is not a statistically significant difference between immigrant and refugee children in terms of their Healthy Eating Index scores and the proportion that consume a good quality diet.

4.5 Nutrient Intake

Table 4.3 Nutrient intake of participants

Nutrient intake/day (Mean ±SD)	Immigrants n=133 (46.5%)	Refugees n=153 (53.5%)	All participants n=286 (100%)
Total caloric intake in kcal	1722±549*	1447±472	1575±527
Caloric intake from fat in kcal	527±199*	441±199	481±203
Caloric intake from saturated fat in kcal	178±74*	150±69	163±73
Protein intake in g	63±21*	51±20	57±22
Prevalence of intake inadequacy [n (%)]	2 (1.5%)	7 (4.6%)	9 (3.2%)
Carbohydrate intake in g	243±86*	203±63	221±77
Prevalence of intake inadequacy [n (%)]	2 (1.5%)	4 (2.6%)	6 (2.1%)
Fibre intake in g	14±7*	11±4	12±6
Prevalence of intake inadequacy [n (%)]	122 (93%)*	153 (99%)	275 (97%)
Sugar intake in g	89±36*	68±34	78±36
Fat intake in g	59±22*	49±22	54±23
Saturated fat intake in g	20±8*	17±8	18±8
Vitamin B12 intake in mcg	4±5*	3±2	4±4
Prevalence of intake inadequacy [n (%)]	9 (7%)	19 (12%)	28 (10%)
Folate intake, DFE**	323±196*	244±125	281±166
Prevalence of intake inadequacy [n (%)]	29 (22%)*	57 (37%)	86 (30%)
Calcium intake in mg	723±353*	596±321	655±342
Prevalence of intake inadequacy [n (%)]	103 (79%)	123 (80%)	226 (80%)
Vitamin D intake in IU** (Mean±SD)	236±226*	157±119	194±181
Prevalence of intake inadequacy [n (%)]	116 (87%)	142 (93%)	258 (91%)
Iron intake in mg	12±5*	8±7	10±6
Prevalence of intake inadequacy [n (%)]	0 (0%)*	28 (18%)	28 (10%)
Sodium intake in mg	2278±1058*	1988±1251	2117±1177
Prevalence of intake inadequacy [n (%)]	20 (15%)	31 (20%)	51 (18%)
Sodium intake above UL** [n (%)]	67 (51%)	74 (48%)	141 (50%)
Zinc intake in mg	8±4*	6±3	7±3
Prevalence of intake inadequacy [n (%)]	28 (21%)	48 (31%)	76 (27%)

* indicates significant difference between immigrants and refugees through chi squared at P<0.05

**DFE (dietary folate equivalents). IU (international units). UL (upper limit).

Information on nutrient intakes is presented in Table 4.3. Nutrient intakes were calculated from the usual intakes of participants as recorded in 3 24-hour recalls. However, for the 23 participants who only completed 1 or 2 - 24 hour recalls, this data was used to calculate intake.

4.5.1 Macronutrient Intake

In terms of mean daily intake of macronutrients, immigrants consume significantly more in all categories, including total calories, fat calories, saturated fat calories and protein (g) as indicated in Table 4.3. Only 3% of participants have an inadequate intake of protein and 2% have an inadequate intake of carbohydrate. Overall participants consume a low daily amount of fibre (mean = 12g), with only 3% of participants consuming sufficient fibre to meet the daily requirement.

4.5.2 Micronutrient Intake

Prevalence of micronutrient inadequacy is calculated based on the Dietary Reference Intakes for age and sex categories. In terms of mean daily intake of micronutrients, immigrants consume significantly more vitamin B12, folate, calcium, vitamin D, iron and zinc as indicated in Table 4.3. As may be expected from these results, higher levels of inadequate micronutrient intakes were observed among refugee children, which included a significantly higher risk of having an inadequate intake of folate and iron. Both immigrant and refugee children are at high risk of inadequate vitamin D (87% and 93% respectively) and calcium intakes (79% and 80% respectively). This is consistent with the low consumption of milk and alternatives (good sources of vitamin D and calcium) by all participants. Only 24% of immigrants and 16% of refugees consume sufficient milk servings according to Canada's Food Guide. Inadequate vitamin D and

calcium consumption may explain the high rate of insufficient/deficient serum vitamin D among both immigrants (53%) and refugees (72%). About half of immigrants and refugees are at risk of consuming too much sodium above the upper limit (51% and 48% respectively). This may be a concern as high sodium consumption has been linked with hypertension among study participants.

4.6 Food Security Status

Table 4.4 Food security status of participants

Characteristics	Immigrants n=127 (44.9%)	Refugees n=156 (55.1%)	All participants n=283 (100%)
Household Food Security			
Food Secure	73 (57.5%)*	60 (38.5%)	133 (47.0%)
Marginally Food Insecure	29 (22.8%)	42 (26.9%)	71 (25.1%)
Moderately Food Insecure	19 (15.0%)*	43 (27.6%)	62 (21.9%)
Severely Food Insecure	6 (4.7 %)*	11 (7.1%)	17 (6.0%)
	Immigrants n=127 (44.7%)	Refugees n=157 (55.3%)	All participants n=284 (100%)
Child Food Security			
Food Secure	88 (69.3 %)*	79 (50.3 %)	167 (58.8%)
Marginally Food Insecure	16 (12.6%)	29 (18.5%)	45 (15.8%)
Moderately Food Insecure	21 (16.5%)*	46 (29.3%)	67 (23.6 %)
Severely Food Insecure	2 (1.6%)*	3 (1.9%)	5 (1.8%)

* indicates significant difference between immigrants and refugees through chi squared at P<0.05

Food security status was determined at both the household and child level. As per Table 4.4, 53% of participant households experience some level of food insecurity; while 41.2% of child participants are food insecure. Recent newcomers are significantly more likely to be food insecure at both the household and child level according to regression analysis presented in Table 4.5. Significant predictors of household food insecurity include length of residence in Canada and parents' education level. Recent newcomer families and families that include parents with lower education levels are at higher risk for household food insecurity. At the level of child food

insecurity, the significant predictor is length of residence. Children who are part of families who have recently arrived are at higher risk for food insecurity.

Table 4.5 Predictors of food insecurity

Variable	Odds Ratio	95% Confidence Interval	p-value
Household food insecurity			
Length of residence	0.584	0.462-0.739	<0.001
Parents' education level			
Base: < high school diploma			
High school diploma or some university	0.324	0.034-3.068	0.326
University degree	0.049	0.006-0.379	0.004
Constant	3.291		0.151
Food secure (0) vs. food insecure (1) best fit logistic regression model. Other confounders that remained in the final logistic regression model include the number of children in the household, region of origin, immigration status and income category. No excluded variables.			
Child food insecurity			
Length of residence	0.688	0.548 -0.864	0.001
Constant	1.267		0.746
Food secure (0) vs. food insecure (1) best fit logistic regression model. Other confounders that remained in the final model for child food insecurity include number of children in the family, region of origin, parents' education level, immigration status and income category. No excluded variables.			

4.7 Health Status

4.7.1 Anthropometrics

Various health status measurements, including anthropometrics, physical activity and sedentary activity levels are presented in Table 4.6. Refugee children are significantly shorter than immigrants in terms of percentile height for age. Regression analysis results presented in

Table 4.6 Health status of participants

Characteristics	Immigrants n=131 (44.3%)*	Refugees n=165 (55.7%)	All participants n=296 (100%)
Height in cm (Mean±SD)	130.9±18.5*	123.3±16.1	126.7±17.6
Percentile Height (Mean±SD) (WHO)	52.5±31.2*	32.0±29.7	41.1±32.0
Stunted Growth (≤5 th percentile)	6 (4.6%)*	38 (23%)	44 (14.9%)
Weight in kg (Mean±SD)	32.1±14.2*	26.9±9.9	29.2 ±12.2
Percentile BMI (Mean±SD)	61.9 ±30.8	58.5±29.3	60.0±30.0
WHO criteria			
Underweight	3 (2.3%)	1 (0.6%)	4 (1.4%)
Normal	87 (66.4%)	131 (79.4%)	218 (73.6%)
Overweight	25 (19.1%)	19 (11.5%)	44 (14.9%)
Obese	16 (12.2%)	14 (8.5%)	30 (10.1%)
Waist circumference (Mean±SD)	61.9±11.5*	57.6±9.0	59.5±10.4
Waist circumference (11-13 years old, Canadian standards)			
≥90 th percentile	18* (54.5%)	5 (20.0%)	23 (39.87%)
<90 th percentile	15* (45.5%)	20 (80.0%)	35 (60.3%)
Waist circumference (All ages, American standards)			
≥90 th percentile	14 (10.8%)	10 (6.1%)	24 (8.2%)
<90 th percentile	116 (89.2%)	153 (93.9%)	269 (91.8%)
Physical activity in hrs/wk (Mean±SD)	11.6±5.3*	10.4±4.2	10.9±4.7
Recommended level(≥60mins/d 5- 13yrs; ≥180mins 3- 4yrs)	91 (70.5%)	117 (72.2%)	208 (71.5%)
Less than recommended level	38 (29.5%)	45 (27.8%)	83 (28.5%)
Sedentary activity in hrs/d (Mean±SD)	3.4±2.4	3.2±1.9	3.3±2.1
High level (>2hrs/d 5- 13yrs; >1hr/d 3-4yrs)	75 (58.1%)	95 (58.6%)	170 (58.4%)
Acceptable level (≤2hrs/d 5-13yrs; ≤1hr/d 3-4yrs)	54 (41.9%)	67 (41.4%)	121 (41.6%)

* indicates significant difference between immigrants and refugees through chi squared at P<0.05

Table 4.7 confirms that immigration status and the interaction of immigration status with region of origin appear to influence percentile height. Refugees, and especially refugee children from Asia, appear to be at greater risk for lower percentile heights as illustrated in graph 4.1. In accordance with this finding, refugee children are significantly more likely to have stunted growth.

As per Table 4.6, there is not a significant difference in terms of percentile BMI; however, a larger proportion of immigrant children are in the overweight and obese categories as compared to refugee children. Further logistic regression analysis presented in Table 4.8 showed that older children, those with better educated parents, and those who consume a poorer quality diet are at higher risk for being overweight/obese.

Table 4.7 Predictors of percentile height

Outcome variable	Constant	Regression coefficient		Total R ²
		Immigration status (Immigrant = 0)	Status by Region (Asia = 0)	
Percentile height	47.70±9.65	-25.97±5.38	7.48±3.49	0.18
Partial R ²		-0.29	0.13	
p-value		0.00	0.03	
Outcome variable	Confounding variables in final model			
	Food insecurity	Region of origin (Asia = 0)	Calories	Serum vitamin D
Percentile height	2.51	0.57	<0.01	-0.15
Partial R ²	0.04	0.02	0.10	-0.09
p-value	0.51	0.77	0.10	0.15

Best fit regression model. Excluded variables include age and sex.

Graph 4.1 Interaction of immigration status and region of origin on percentile height

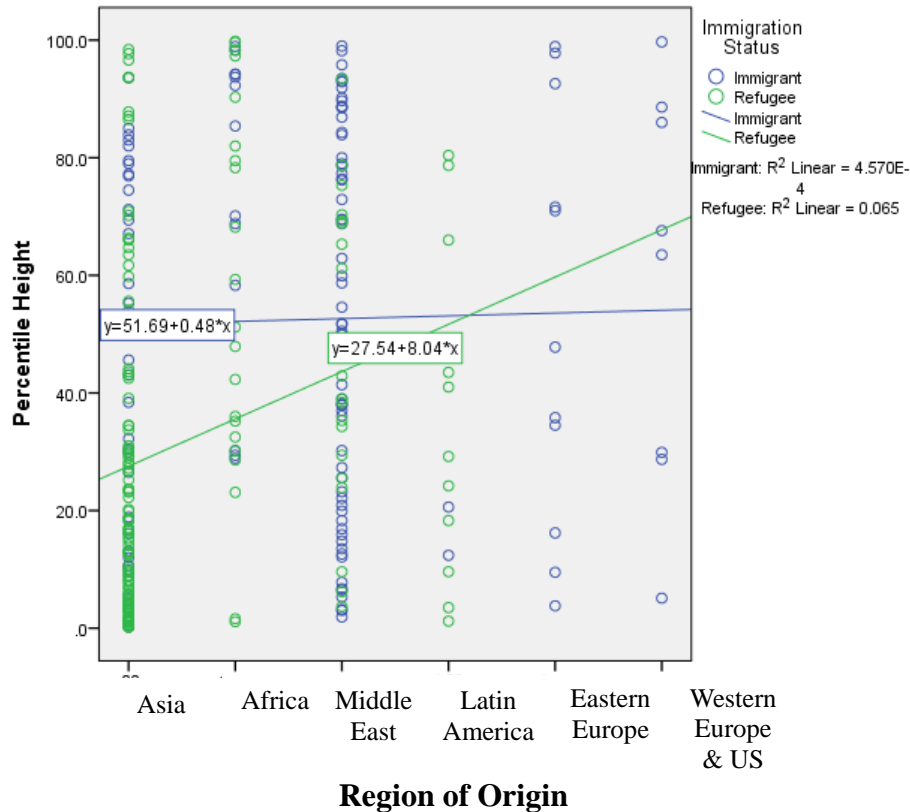


Table 4.8 Predictors of percentile BMI

	Odds Ratio	95% Confidence Interval	p-value
Percentile BMI*			
Age	1.180	1.031-1.351	0.017
Parents' education level			
Base: < high school diploma			
High school diploma or some university	2.589	0.862-7.781	0.090
University degree	5.164	1.638-16.280	0.005
HEI diet quality score*	0.944	0.900-0.991	0.020
Constant	2.136		0.702

Normal (0) vs. overweight/obese (1) best fit logistic regression. Confounders remaining in the final model include immigration status, region of origin, food security, sedentary activity, physical activity, serum vitamin D, and calories. Excluded variables: sex. *HEI (healthy eating index). BMI (body mass index)

Waist circumference percentile data is presented for all participants aged 5 and older compared to American standards (Fernandez et al., 2004) in Table 4.6. In addition, waist circumference data for children aged 11-13 years old is presented separately because Canadian standards are available for this age group (Katzmarzyk, 2004). Immigrant children aged 11-13 years appear to be at significantly higher risk of having waist circumference ≥ 90 th percentile according to chi squared analysis. However, no significant predictors were identified through logistic regression analysis that adjusted for region of origin, age, sex, parents' education, duration of residence, food security, sedentary activity, physical activity, serum vitamin D, calories and healthy eating index measure as possible predictors.

4.7.2 Physical Activity

Although a significantly higher mean level of physical activity is observed among immigrant children in Table 4.6, there is not a significant difference between immigrant and refugee children in terms of the percentage who engage in at least the recommended amount of physical activity per day. In addition, there is not a significant difference between immigrant and refugee children in regards to hours of sedentary activity per day.

4.8 Biomarkers of Disease

Health indices that can be considered biomarkers for the development of chronic diseases are presented in Table 4.9. No significant differences are noted between the refugee and immigrant children in terms of blood pressure or blood glucose; however, refugee children are at significantly higher risk of having high blood cholesterol. According to regression analysis presented in Table 4.10, refugee children and children with higher saturated fat intakes are at

higher risk for high blood cholesterol. Being female may be a protective factor against higher cholesterol levels as sex remained a confounding variable in the final model.

Table 4.9 Biomarkers of disease

Characteristics	Immigrants n=130 (44.7%)	Refugees n=161 (55.3%)	All participants n=291 (100%)
Systolic Blood Pressure (SBP) (Mean±SD)	101.5±11.2	100.0±10.3	100.7±10.7
At risk percentile SBP			
Hypertensive (≥95)	7 (5.4%)	7 (4.3%)	14 (4.8%)
Pre-hypertensive (≥90-<95)	8 (6.2%)	18 (11.2%)	26 (8.9%)
Normal	115 (88.5%)	136 (84.5%)	251 (86.3%)
Diastolic Blood Pressure (DBP) (Mean±SD)	63.9±10.6	64.6±9.2	64.3±9.8
At risk percentile DBP			
Hypertensive (≥95)	12 (9.2%)	18 (11.3%)	30 (10.3%)
Pre-hypertensive (≥90-<95)	14 (10.8%)	19 (11.9%)	33 (11.4%)
Normal	104 (80.0%)	123 (76.9%)	227 (78.3%)
Random capillary blood glucose mmol/L (Mean±SD)	5.6±0.9	5.6±0.8	5.6±0.9
High random capillary blood glucose (≥7.8 mmol/L)	2 (1.6%)	4 (2.5%)	6 (2.1%)
Blood cholesterol (mmol/L) (Mean±SD)	4.3±0.63*	4.7±0.85	4.5±0.78
Normal	72 (57.6%)*	60 (40.0%)	132 (48.0%)
Borderline High ≥4.4 mmol/L	43 (34.4%)*	48 (32.0%)	91 (33.1%)
High ≥5.2mmol/L	10 (8.0%)*	42 (28.0%)	52 (18.9%)
Hrs/d spent in the sun during peak times (Mean±SD)	1.7±1.3	1.9±1.2	1.7±1.3
Sunscreen use			
always	6 (4.6%)*	14 (8.6%)	20 (6.8%)
often	24 (18.5%)*	5 (3.1%)	29 (9.9%)
sometimes	25 (19.2%)*	49 (30.2%)	74 (25.3%)
rarely	8 (6.2%)*	10 (6.2%)	18 (6.2%)
never	67 (51.5%)*	84 (51.9%)	151 (51.7%)
Total serum vitamin D (nmol/L) (Mean±SD)	50.8±19.9*	42.3±16.4	46.1±18.5
Deficient and insufficient<50nmol/L	67 (53.2%)*	112 (72.3%)	179 (63.7%)
Sufficient ≥50nmol/L	59 (46.8%)*	43 (27.7%)	102 (36.3%)
Total body bone mineral content (TBBMC) in grams (Mean±SD)	1023.3±367.0*	896.1 ±264.7	953.7±320.9
Low TBBMC	39 (37.9%)	63 (44.1%)	102 (41.5%)
Normal TBBMC	64 (62.1)	80 (55.9%)	144 (58.5%)

Total body fat (grams) (Mean±SD)	9513.3±5868.2*	7458.5±4039.0	8389.8±5048.0
Percent total body fat (Mean±SD)	28.8±7.7*	26.7±7.4	27.7±7.6
Weight Categories (8-13 years American DXA standards)			
Obese ≥95 th percentile	3 (3.9%)*	0 (0%)	3 (1.8%)
Overfat ≥85 th percentile	10 (13.0%)*	3 (3.5%)	13 (8.0%)
Normal 5 th >85 th percentile	55 (71.4%)*	71 (82.6%)	126 (77.3%)
Underfat <5 th percentile	9 (11.7%)*	12 (14.0%)	21 (12.9%)
Weight Categories (5-13 years American anthropometric standards)			
Obese ≥95 th percentile	22 (20.6%)	30 (21.9%)	52 (21.3%)
Overfat ≥85 th percentile	45 (42.1%)	40 (29.2%)	85 (34.8%)
Normal 5 th >85 th percentile	40 (37.4%)	67 (48.9%)	107 (43.9%)
Underfat <5 th percentile	0 (0%)	0 (0%)	0 (0%)
Trunk fat (grams) (Mean±SD)	3441.9±2513.7*	2846.3±1901.9	3116.2±2219.2
Percent trunk fat (Mean±SD)	25.2±8.3	23.4±7.8	24.2±8.1

* indicates significant difference between immigrants and refugees through chi squared at P<0.05

Table 4.10 Predictors of serum cholesterol level

Outcome variable	Constant	Regression coefficient		Total R ²
		Immigration status (Immigrant = 0)	Saturated fat intake	
Serum cholesterol	4.32±0.24	0.47±0.09	<0.01±<0.01	0.11
Partial R ²		0.29	0.12	
p-value		<0.01	0.05	
Outcome variable	Confounding variables in final model			
	Sex (Male = 0)	Carbohydrate intake		
Serum cholesterol	-0.15	<0.01		
Partial R ²	-0.10	-0.03		
p-value	0.11	0.59		

Best fit regression. Excluded variables include age, region of origin, kilocalories, serum vitamin D, transfat intake, food security, fat intake, fibre intake, sugar intake, and soluble fibre intake.

4.8.1 Vitamin D Status

A significantly higher percentage of refugees (72.3%) have insufficient/deficient serum Vitamin D as compared to immigrants (53.2%) as indicated in Table 4.9. Since serum Vitamin

D can be impacted by sun exposure, several sun exposure indices were measured, including hours spent in the sun and sun screen use. Refugee and immigrant children appear to spend a similar amount of time in the sun on a daily basis. Although sun screen use by immigrant and refugees is significantly different, the actual trend is not clearly identifiable since both refugees and immigrants more commonly report never or sometimes using sun screen. As indicated in Table 4.11, younger newcomer children, those with higher intakes of vitamin D and those from certain regions appear to have higher serum vitamin D levels; however sunscreen usage was a mediating factor associated with region of origin as indicated by regression analysis. Being male may be a supportive factor for achieving higher vitamin D status as sex remained a confounding factor in the final model.

Table 4.11 Predictors of serum vitamin D level

Outcome variable	Constant	Regression coefficient				Total R ²
		Vitamin D intake	Age	Region of origin (Asia=0)	Region of origin by Sunscreen use	
Serum vitamin D	55.42±6.48	1.23±0.41	-1.96±0.40	6.69±1.95	-1.04±0.52	0.28
Partial R ²		0.19	-0.30	0.21	-0.13	
p-value		<0.01	<0.01	<0.01	0.05	
Outcome variable	Confounding variables in final model					
	Caloric intake	Hours in Sun	Sunscreen use (Always=1)	Length of residence	Sex (male=0)	Calcium intake
Serum vitamin D	<-0.01	0.93	-0.33	1.11	-2.86	<0.01
Partial R ²	-0.65	0.07	-0.02	0.11	-0.09	0.06
p-value	0.31	0.25	0.73	0.09	0.18	0.37

Best fit regression. No excluded variables.

Newcomer children from Middle East, Asia and Africa more commonly have insufficient serum vitamin D compared to the other regions, but only the Western Europe/United States group was significantly different from other regions according to chi squared post hoc analysis (Table 4.12).

Table 4.12 Region of origin as a predictor of serum vitamin D

	Region of origin (n=281)					
Serum vitamin D	Middle East	Asia	Africa	Eastern Europe	Latin America	Western Europe/ United States
Sufficient ≥50nmol/L	22 (27.8%)*	47 (33.6%)	12 (35.3%)	6 (54.5%)	7 (77.8%)	8 (100%)**
Insufficient <50nmol/L	57 (72.2%)*	93 (66.4%)	22 (64.7%)	5 (45.5%)	2 (22.2%)	0 (0%)**

* indicates significant difference among regions through chi squared analysis at P<0.05

**Chi squared post hoc analysis indicates that only the Western Europe/United States group is significantly different than other regions.

4.8.2 Total Body Bone Mineral Content

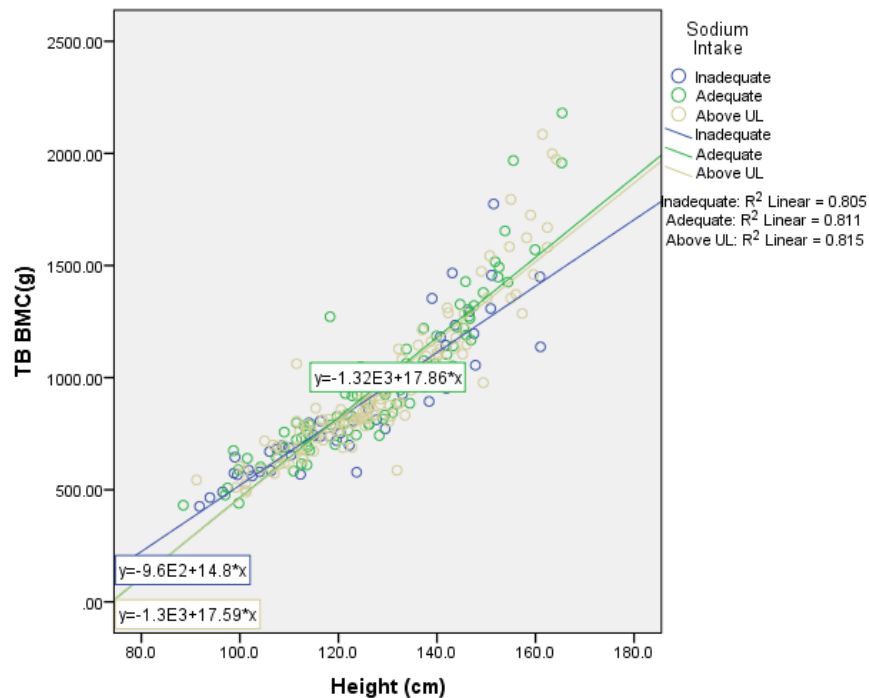
As may be expected from the serum Vitamin D results, immigrants have a significantly higher mean total body bone mineral content than refugees; however, the percentage of immigrants and refugees with low TBBMC is not significantly different (Table 4.9). According to regression analysis presented in Table 4.13, newcomer children who are taller and those who have higher serum vitamin D levels have higher TBBMC levels, although many confounding variables remained in the final model, including interactions between height and intakes of phosphorous and sodium (Graph 4.2).

Table 4.13 Predictors of total body bone mineral content (TBBMC)

Outcome variable	Constant	Regression coefficient		Total R ²			
		Height	Serum vitamin D				
TBBMC	-991.26±204.91	14.09±1.73	3.78±1.34	0.84			
Partial R ²		0.47	0.18				
p-value		<0.01	<0.01				
Outcome variable	Confounding variables in final model						
	Mg intake	P intake	Na intake	Height by P	Height by Na	Serum vitamin D by Na	Food security (0=food secure)
TBBMC	-0.35	-0.27	-0.07	<0.01	<0.01	<-0.01	-31.27
Partial R ²	-0.11	-0.09	-0.05	0.10	0.07	-.10	-0.11
p-value	0.09	0.19	0.43	0.13	0.29	0.15	0.09
	Region of Origin (0=Asia)		Age		Ca intake	Kilocalories	Hours daily activity
TBBMC	-9.32		3.52		0.05	0.05	-10.86
Partial R ²	-.08		0.03		0.07	0.11	-0.05
p-value	0.21		0.66		0.29	0.10	0.45

Best fit regression model. Excluded variables include sex and immigration status.

Graph 4.2 Interaction of height and sodium consumption on TBBMC



4.8.3 Overfat

Immigrants appear to be at higher risk for having too much body fat as evidenced by the significantly higher mean total body fat and mean trunk fat in comparison to refugees through chi squared analysis (Table 4.9). In addition, among children aged 8 to 13 years old, immigrants are at significantly higher risk of being overfat according to their percentage body fat. However, no significant predictors were identified through logistic regression analysis that also included region of origin, age, sex, parents' education, duration of residence, food security, sedentary activity, physical activity, serum vitamin D, calories and healthy eating index measure as possible predictors (no table). Table 4.9 includes weight categories based on percent total body fat for all participants compared to American anthropometric standards (Laurson et al., 2011) and separately for those aged 8 to 13 years old because American DXA standards are available for this age group (Ogden et al., 2011). It is more accurate to compare percentage fat measurements obtained through DXA to the DXA standards available (Laurson et al., 2011).

4.8.4 Hypertension

The existence of hypertension or prehypertension among newcomer children can be predicted based on level of sodium consumption according to the current study data. As indicated in Table 4.14, newcomer children who consume more sodium than the upper limit are at 2.7 times higher risk for hypertension than others.

Table 4.14 Predictors of prehypertension/hypertension

	Odds Ratio	95% Confidence Interval	p-value
Prehypertensive/hypertensive			
Level of sodium consumption			
Base: Adequate			
Inadequate	0.986	0.370-2.632	0.978
Over upper limit	2.700	1.348-5.408	0.005
Normal (0) vs. prehypertensive/ hypertensive (1) best fit logistic regression model. Other confounders in the final logistic regression model include immigration status, region of origin, length of residence, age, sex, serum vitamin D, and overweight/obesity. No excluded variables.			

4.9 Summary

Immigrant and refugee children share some common nutritional and health concerns; however, each group also exhibits some divergent concerns that highlight the need for targeted interventions. Overall immigrant and refugee children are at high risk for inadequate consumption of milk products, which puts them at risk for low intakes of vitamin D and calcium, and subsequently low levels of serum vitamin D, which may not support age appropriate bone growth and development, among other potential health concerns. In addition, immigrant and refugee children commonly do not consume sufficient daily servings of fruits and vegetables, which may indicate that they are filling that gap with too many foods that offer little nutritional value. Both groups also appear to be at risk for too much sedentary activity.

Health concerns for refugee children include food security, poor diet, low height for age and high blood cholesterol levels. In terms of food security refugee children are at significantly higher risk of being food insecure than immigrant children. This finding is consistent with the high prevalence of refugee families in the lowest income category as compared to immigrant families. In general refugee children consume a lower quality diet than immigrant children, and

are more likely to have an inadequate intake of several micronutrients. Refugee children are significantly shorter for age than immigrant children, which may be a result of stunting prior to arrival in Canada. Refugee children are also at significantly higher risk for high blood cholesterol. These dietary concerns indicate the need for tailored interventions to support healthy growth and development among refugee children.

In comparison to refugee children, immigrant children are more at risk for overweight, obesity and at-risk waist circumference. Although it was not significant, both BMI and DXA percent body fat indicate trends toward higher rates of overweight and obesity among immigrant children aged 3-13 years. However, older immigrant children aged 11 to 13 years are at significantly increased risk of having a waist circumference > 90th percentile (55%) as compared to refugees (20%). Similarly older immigrant children aged 8 to 13 are at significantly higher risk of being overweight/obese (17% vs. 4%) according to their percentage of body fat as measured by DXA. This may indicate the need for interventions to address weight concerns among older immigrant children.

5. QUALITATIVE RESULTS

5.1 Introduction

The qualitative results from the in-depth interviews are presented in this chapter. Data from the interviews related to health and nutritional status, social determinants of health and healthcare access are presented below.

5.2 Study Sample Group

A purposively selected sample of 19 families consented to take part in in-depth interviews to better understand newcomer healthcare access issues and family lifestyle practices that may impact children's health status. Interviewees included a diverse group of 10 immigrants and 9 refugees from various ethnic and socio-economic backgrounds. Approximately half of the interviewees lived in Saskatoon and the other half lived in Regina. Interviews usually took place at the families' homes so in addition to the parents, other members of the family, including children, often participated in the interviews.

In-depth interviews were also conducted with a purposive sample of 24 service providers to understand their perspectives on newcomer health and healthcare access issues. The sample included participants from a variety of organizations that interact with newcomers in a variety of settings and at different levels to illuminate the diversity of perspectives. Service providers from settlement agencies, community schools, English-as-a-second-language programs, healthcare organizations, as well as policy and program consultants from government departments and senior administrators from health regions participated. In 4 cases, organizations chose to assign 2 or 3 staff to attend the interview together.

5.3 Main Themes

The process of thematic analysis revealed 5 main themes within the data-set that correspond to the research questions. The main themes include dietary acculturation and emergence of western chronic health concerns, social determinants of health as experienced by newcomer families, physical activity limitations, barriers to healthcare and accessible healthcare services.

5.4 Main Theme 1:

Dietary Acculturation and Emergence of Western Chronic Health Concerns

Table 5.1: Main Theme 1: Dietary Acculturation and Emergence of Western Chronic Health Concerns					
Sub theme	Interviewee Type				
	Health care provider	Immigrant service provid	Policy maker	Immigrant	Refugee
Chronic disease, overweight concerns	12	9	0	2	6
Food security concerns	12	18	1	1	6
Newcomer dietary acculturation	15	10	0	30	26
Emergence of vitamin deficiencies	11	7	0	2	3

*Each individual occurrence of data extracts coded to sub themes across the data set stratified by interviewee type

5.4.1 Newcomer Dietary Acculturation

5.4.1.1 Newcomer Perspectives

Many newcomer parents talked about the challenges of trying to maintain a traditional diet for their family in the midst of a busy schedule and their children’s demands to eat more fast foods and sugar sweetened beverages. Some parents also mentioned that their families are consuming more meat.

Comparing to back home it (diet) has changed a lot...My kids here they prefer to eat junk food, like they want to go to McDonalds and eat something very quickly. They don’t want to eat vegetables...they will make something like waffles and they will eat very quickly without thinking about any kind of vegetables...I usually cook beans for the protein every evening for the supper. I am usually very busy in the morning so I have no time to cook. In the morning ...we all go to work, my husband works in the morning and me too so we just eat something light and send some lunch for them, but in the evening when we get together we’ll have supper...I compel them to drink milk...I started drinking it from my childhood so I feel it is good for them. (Regina refugee)

We buy Asian food mainly. Like rice we use everyday in our home... We eat more meat here... In Thailand meat was very expensive and we could eat it only once or twice a month... but here we can eat it everyday... We have a lot in Canada... They (children) eat pizza, sandwich, rice, vegetables, meat, oranges and apples, and drink milk and orange juice. It's a different diet here... The kids want to buy pop to drink. We sometimes buy pepsi, coca cola... They still eat traditional food, but they usually in Canada like to eat pizza, burgers and sandwiches... But now they don't like rice too much. (Regina refugee)

...when you compare diet with our back country and here, here is better food... According to our culture we eat rice, lentils and curry. He (son) usually drinks coke and water. We have juice and milk. He doesn't like milk at all, but sometimes he drinks. Yogurt sometimes... We didn't have milk back in our country. Sometimes he eats fruits and vegetables... He likes grapes, apples, oranges, mango, strawberries... He eats traditional food... Here in Canada we eat more meat. Here it is cheaper for meat, more affordable... He (son) drinks coke almost everyday, chips once in a while. This is different than back home. We didn't have coke very much there. (Saskatoon refugee)

Parents are trying to balance providing a healthy diet to their children, while also responding to their expressed needs for snack foods and sodas. Some parents spoke about the primacy of ensuring that their children's needs are met and that they don't feel deprived. Others expressed concerns about maintaining a healthy diet for their children.

The middle son eats coke, chips and chocolate... everyday, whenever he is hungry... We are eating it more here and more food in general... The children ask for those things so if dad does not buy them they get angry, so he buys it. (Saskatoon refugee)

We people are very closely associated with our kids and we think that this is my responsibility to help them in every aspect forever because we don't have that concept that after 18 they will become separate from me, so this is like our responsibility to take care of our kids so everything as far as food is concerned... just once or twice a week I bring them these sandwiches from KFC or McDonalds, etc., mostly their mother prepares (food) for them. (Saskatoon immigrant)

I am a little bit concerned with her (daughter)... I tell them whenever you are going in the morning first have a good breakfast, whatever you want, there are fruits, vegetables, but they just want the routine... she likes pizza, ... Here they are very much fond of chocolates, fast foods, chips, fries, ice cream, what they want is that very easy thing, just take-out pizza, put it in the microwave and there it is, ready to eat... they don't eat vegetables, they don't eat fruits, only once in a while. (Saskatoon immigrant)

In contrast some immigrants from higher income countries appear to be more attuned to dietary problems and better equipped to handle these challenges, perhaps due to having nutritional knowledge about the Western diet and greater financial resources.

They (children) drink their milk in the morning...twice a week they have yogurt...They love cheese...Once in a while, chips are for us a treat, may be for a movie night once a month, I don't buy them regularly. And we do not have pop in the house, only lemonade from the powder once in awhile. We drink mainly water and tea and some juice...We do our own quark, type of yogurt, that's what we do ourselves because we can't find it or it is very expensive in the store. (Regina immigrant from Germany)

They do eat loads of fruit and vegetables, we do push that on them. (Daughter) wouldn't have milk products, but now she started having a cup of milk each night...We are getting a bit further with her...She won't eat eggs, but she will eat cheese on toast if I melt it...We give her a protein shake in the mornings with milk as well, with strawberry powder...so she is getting a supply of milk. She won't eat red meat so she will eat it in a lasagna or meat balls so we offer that once or twice a week...we gave her supplements to make sure she is getting the right amounts. (Regina immigrant from the UK)

We do have chips and pop. I only stay for lunch twice a week and I take a mini bag of chips in my lunch. We have a box of pop, but I have it once a week may be, not that often. (daughter of Regina immigrant from the US)

5.4.1.2 Service Provider Perspectives

Healthcare providers commonly noted that among the newcomer families they see, many eat a high carbohydrate and meat-based diet and do not consume many milk products.

Immigrant service providers focused on the cultural aspect to dietary practices that continue in Canada, as well as the possible overconsumption of meat in response to experiencing deprivation in refugee camps.

Most of the families that I see have a diet based on carbohydrate, whether it is rice or cassava or maize...a family here not too long along, older children, teenagers, but the diet recall was, I could not believe the lack of vegetables and fruit. It was purely all carbs, like macaroni. (Saskatoon healthcare provider)

...when they came they were craving meat so they buy nothing but meat. They don't eat fruits or vegetables, and...those children like pop, they drink a lot of pop because it's cheap number 1 and accessible. (Saskatoon healthcare provider)

...some cultures they never saw milk, they were in camps and...they don't have that good source of milk so none of them drink milk except when they were breastfed...they continue on the same path and they were not giving milk to their children here...a big challenge with some families because up to now if you are not used to something when you grow up you don't want to add it now. (Regina healthcare provider)

It's a cultural thing (dietary practices), for example in Bangladesh teenagers don't drink milk, only drink milk when they are babies, young children up to 5 or 6 years...(and)...After refugee camps and coming here they buy a lot of meat because they didn't get it. Also a lot of bread. (Saskatoon immigrant service provider)

5.4.1.3 Summary Reflection on Newcomer Dietary Acculturation

The data extracts from parents demonstrate that all newcomer families do not experience the same dietary challenges in Canada. Refugees and immigrants from less Westernized countries are trying to maintain healthy traditional diets for their children, but they are challenged by children's demands for fast foods and sugar sweetened beverages. Perhaps their cultural perspectives that place a priority on meeting the needs of their children, combined with previous experiences of deprivation and/or lack of nutritional knowledge concerning the Western diet influence families to comply with their children's expressed needs to bring snack foods into the house. However, families from more Westernized areas have likely already experienced these challenges and appear to be better prepared to set limits and not purchase unhealthy foods. The comments from the American child suggest that she has been raised on a generally healthy, never deprived, diet and has embodied the spirit of dietary moderation, such that she self-regulates consumption of snack foods.

A body of research has demonstrated that immigrants' increasing exposure to a dominant host culture is linked to dietary acculturation to a more Western diet (Patil et al., 2009; Renzaho & Burns, 2006). However, the change is not always consistently related to time in the new host country, as increased English language proficiency has been linked with increased consumption of sweetened drinks (Himmelgreen et al., 2005) and the exclusive use of Spanish language in the home has been associated with maintenance of healthy traditional diets (Mazur et al., 2003). In addition, beneficial dietary changes have been observed among some immigrant groups, including increased consumption of vegetables, milk and fruit (Patil et al., 2009); and low-fat

milk, high-fiber bread and low-fat meat and fish (Batis et al, 2011). Increased meat consumption has also been noted among Hmong refugees in the USA (Franzen & Smith, 2010). These research findings align well with participant comments relating to Westernization of diet, but it is neither linear, nor exclusively beneficial or deleterious to the health of immigrants.

In accordance with critical realism, the newcomers' comments about their children's diets suggest that there is a structure to the Canadian food environment that is setting the stage for the development of overweight, obesity and other chronic health problems among newcomer children. Snack foods and sugar-sweetened beverages are widely available, advertised and desired by children. Not all parents understand that consumption of these foods can lead to health problems so they exert varying levels of agency with regards to setting limits on their children's consumption of these foods.

Summarily, available research suggests that dietary intake changes may be affected by the availability of traditional foods, economic-constraints, time-constraints that lead to the use of convenience foods, children's demands and the ability to cook western foods (Patil et al., 2009). Newcomer children may develop Westernized food preferences due to exposure to new western foods at daycares or school food programs (Patil et al., 2009) or through media advertising (Story & French, 2004). One study found that although parents wanted to maintain a traditional diet, they complied with their children's demands to purchase American food because they worried that their children were not eating enough (Patil et al., 2009). This study suggests that children may have a high degree of influence over dietary decisions in some families as children of parents with poorer English skills consumed less fruits and more sodas and salty snacks. Overall newcomer dietary change is a complex, multidimensional process impacted by a child's, parents' and family's environment.

The service providers' comments are generally consistent with the comments from newcomers from less Westernized cultures. Some of the service providers work in targeted programs that would only see this type of clientele, while others may not think of immigrants from the US or UK as newcomers as they tend to integrate quite well into Canadian culture. The in-depth interviews expose a social structure where, perhaps unintentionally, racialized groups appear to be viewed as the newcomers, or the 'other' that does not fit into the Canadian mold. Service providers appear to have internalized the Canadian social structure that generally views Caucasian people as being part of the core, while racialized groups are recognized as different. Although unconscious, these assumptions may give rise to bias in the health and social system structure and lead to compartmentalized planning that fails to fully meet the diverse needs of newcomers.

5.4.2 Food Security Concerns

5.4.2.1 Impact of Low Income

Although many newcomers were reluctant to comment on not having sufficient access to food, a few refugees mentioned changes in food buying habits related to decreases in income and trying to stretch food a little further.

Before they gave us a few hundred dollars for food so it was pretty good...we bought good things...the government gave us an allowance when we first came, but then after it is done some people have problems with having enough money for food. When we came they gave us a good amount to buy what we needed for the house, furniture. Only the first 2 months felt like we had enough money and then after that it was difficult. After that we only had a small monthly amount. (Saskatoon refugee)

...they (children) do drink milk and when we used to get assistance from the government we used to buy big gallons, now we are on our own so we buy in 1 liter cartons (Saskatoon refugee)

The family shops mostly weekly...and the children eat whenever they want...and dad cannot provide the amount they want to eat. It is expensive and dad's budget is \$600 to

\$700 per month so dad tells kids it is OK to eat, but make it available for the next day also, so eat in a controlled way. (Saskatoon refugee)

...some families can't afford to have red meat. They may afford to buy pasta, white bread and potatoes, things that are cheap to cook for them. (Regina healthcare provider)

5.4.2.2 Competing Household Demands for the Food Budget

For some newcomers, food security is balanced by the need to make prescription drug and hygiene product purchases not covered by benefit programs. In some cases insufficient prescription drug benefits impact food security over the long-term for those with chronic health conditions. Although refugees can generally depend on some support through social assistance and drug benefit programs, immigrants do not have the same access to these supports. When they arrive they are expected to have enough money in their bank account to support them for at least 6 months until they can find work so they are not eligible for social assistance and they are often not aware of drug benefit programs when they first arrive.

When the ear pain was really bad we had to buy the medicine after 2 days when the child tax credit came. My mom never ever uses our money except for food, but it was really important, she had to because it hurt a lot. (son of Saskatoon refugee)

I have a client, mother and son with HIV. HIV medication is very expensive and she has to pay 2% and the 2% for her and her son she was paying \$149 every month...so she is paying from her food allowance \$74 and her son is paying from the child tax benefit \$74 every month. The price of the drug is close to \$1,400, very expensive medication...the doctor is always telling her healthy food and activity. She says if I pay \$75 every month from my food budget, where I will get the money to eat healthy food? She is eating lentils and enjera...Also chick peas, all vegetarian, cabbage, potato, because there is not enough money...She gets \$40 extra for food, and only if the doctor writes a note for good nutrition. I told her (social worker) just put her in plan B (SAID)...And she told me 'no she is not the only one, many people are living with that.' From \$1,400 she is paying not even 2%, its 1%, but 1% according to the scale of amount is a lot for her. Why they don't forgive 1%? (Saskatoon immigrant service provider)

...the child gets the maximum child tax benefit is \$250...So what they do, they can save from child tax benefit, like to save from their living allowance...they can't save from that because even it doesn't have \$5 extra, \$255 living allowance...a female she needs feminine stuff, she cannot buy anything extra...even if she needs to buy Tylenol, Advil, \$9, \$10, \$11 from this, she wants to buy lotion, shampoo, everything comes from this \$255. So they have to use at least 1 of the child's tax benefit to buy those things, so they

want to feed the children to fill their stomach, not vitamin C and D...they cannot. (Saskatoon immigrant service provider)

With immigrants...if they are coming through the economic class they are expected to have about \$12,000 to \$15,000 for a couple and 1 child in their bank account. This is about enough for surviving about 6 months, but the reality is there is always the fear of running out of money...I see a lot of parents...who sacrifice their physical activity, going to gym, eating healthy, because...they have a very limited bank account and they are scared of running out of money. (Saskatoon immigrant service provider)

5.4.2.3 Repayment of Transportation Loans

In addition to prescription medicine, refugees encounter financial pressures related to repayment of transportation loans that impact the food budget.

On top of that they have to pay back their transportation loan. All my families, I have a family of 4, for 2 children and husband and wife its costs them close to \$7000...and they have to pay that out of their food, the \$255 living allowance. The government starts taking that back right away, 3 or 4 months after they arrive. (Saskatoon immigrant service provider)

5.4.2.4 Summary Reflections on Food Security Concerns

Refugee parents' comments related to income appear to indicate that they feel well supported when they first arrive and receive a fair sum of money to purchase all of their initial household needs. After this initial period they receive a smaller monthly amount to cover food and other monthly expenses, which some families do not perceive as adequate. Then once they start working at low wage jobs some families find they have less money for food and try to stretch their food dollar a little further. These findings are consistent with other research that describes how food insecure households often purchase cheaper and higher calorie foods that stretch the budget a little further (Kaiser et al., 2003; Tarasuk & Beaton, 1999; Hamelin et al., 2002).

According to comments related to other expenditures cutting into the food budget, food security is not just about having enough money to purchase healthy food. For refugees, access to

adequate prescription drug benefits and having some control over the timing and amount of transportation loan repayments could have a substantial impact on food security. While immigrants could benefit from being informed about benefit programs like the rental housing supplement and family health benefits. Much of the available research on food security does not provide details about how other financial pressures may be impacting food security.

All of the participant comments related to food security came directly from or were concerning racialized individuals. None of the participants from the US or Western Europe mentioned any concerns about having sufficient funds to purchase healthy food. This finding is consistent with Patricia Hill Collins' (1990) web of oppression that describes an interlocking structure of domination that encompasses all identity variables. Hill Collins describes how the variables of race, class, gender, age, sexual orientation, religion and ethnicity form an interlocking system that bestows varying amounts of privilege and oppression on individuals. This matrix of domination creates groups that possess different levels of privilege and penalty. Ability to speak the official language could also be added as an identity variable that impacts privilege. Most refugees and many racialized immigrants arrive in Canada with very limited resources and have a long struggle ahead of them as they seek to overcome the many obstacles to establishing safe and comfortable lives for their families.

5.4.3 Emergence of Vitamin Deficiencies

5.4.3.1 Service Provider Perspectives

Healthcare providers commonly noticed that newcomer children are often deficient in iron, vitamin B12 and vitamin D. These vitamin deficiencies were often associated with vegetarian diets and low consumption of meat, fortified grains and milk products. In addition,

they noted that newcomer children often do not consume the recommended quantities of fruits, so may be lacking vitamin C. In regards to vitamin D deficiency, an immigrant service provider stressed that the risk of deficiency among newcomers is related to the change in environmental conditions experienced by moving to a northern country, not poverty. However, some newcomers may not have sufficient resources to purchase vitamin supplements.

...85% of children and women who come to this office are anemic...iron deficiency anemia because these people lived in camps and there were times when they were never given meat to eat...some of them were born and raised in a camp...Vitamin D is another one, even adults are vitamin D deficient...I have patients who are deficient in vitamin B12, but not in a very high number...more deficient in the people who don't take a lot of grains (fortified) and...some of them didn't eat that much egg so it depends what they have. (Regina healthcare provider)

...the most common health issues would be iron deficiency ...meat is too expensive, they don't seem to be having the iron fortified foods like cereals and breads...and not a lot of vitamin C because of the lack of fruits and vegetables. (Regina healthcare provider)

Vitamin D deficiency in everyone. I have even stopped testing them for it and I just supplement them...Vitamin B12 deficiency to some degree in certain categories of migrants. I think the Bhutanese refugees have it a little bit higher than others. In children, not so many, but it does happen, iron deficiency anemia for sure. (Saskatoon healthcare provider)

...obviously the cultural thing where women cover themselves and don't go out in the sun a lot and in the winter time there is not much sun exposure so vitamin D deficiency becomes (an issue). (Regina healthcare provider)

Coming from Africa ...the skin type we have it doesn't store...vitamin D, because it's always there in Africa, so when you move here it changes...For me this vitamin D issue should not be linked to poverty because when you are in your own environment, your physique...it's adapted to that environment so you really don't need to go drink milk to get your vitamin D, you get it from other sources...When people come they should be given the education that now you have changed your environment...you need to be consciously (seeking vitamin D). (Saskatoon immigrant service provider)

Usually when you want extra vitamins you have to buy them and they are not prescribed...even if you have insurance, you have to buy them yourself. When you talk about the immigrants or refugee family who do not have enough income even if they need some of those complementary vitamins or minerals they can't afford that. (Saskatoon immigrant service provider)

5.4.3.2 Newcomer Perspectives

Some newcomers are also concerned about specific nutrient deficiencies among their family members, mainly iron and vitamin D.

...she (daughter) has the blood, the hemoglobin is very low and my husband and mother-in-law, they have the same thing. My son has dark circles under his eye which can be iron deficiency sometimes. For me I am not so anemic. (Regina vegetarian refugee)

She (daughter) had some blood tests done and they said her iron is a bit low...we gave her supplements to make sure she is getting the right amounts. (Regina immigrant)

All winter no sun, no vitamin D. (Saskatoon refugee)

5.4.3.3 Summary Reflections on Vitamin Deficiencies

Many of the nutritional deficiencies noted above are in alignment with previous research, which indicates newcomer children to Western countries may be at risk for selected micronutrient deficiencies related to low income, traditional dietary practices and/or lifestyle habits that limit exposure to sunlight. Specific nutrient deficiencies noted among newcomer children include iron, zinc, vitamin A, folate and vitamin D (Shamah-Levy et al., 2012; Laillou et al., 2012; D'Ambrosio et al., 2012; Ward et al., 2007; Omand et al., 2013). Omand et al. (2013) suggest that vitamin D deficiency is likely related to intake of cow's milk intake, vitamin D supplementation, season and age as these variables appear to be explanatory factors that mediate the relationship between immigration status and vitamin D status.

The specific nutritional deficiencies observed among newcomer children indicate the importance of access to healthy food and the need for nutritional screening, as well as nutrition education tailored to newcomers. According to the comments above, nutrition education materials need to explain the link between environmental changes and vitamin deficiencies, as well as how diets can be modified to include more iron, vitamin D and B12 while still respecting cultural and religious dietary practices. The Saskatoon immigrant service provider who stressed

the importance of the link between environmental change and vitamin D deficiency appeared to be inferring that it is important not to portray a culturally defined diet as deficient because it is not in the home country. In other words we need to stop looking at everything from a Western standpoint and adopt other viewpoints to fully understand the issue and respond appropriately.

5.4.4 Chronic Disease, Overweight Concerns

5.4.4.1 Obesity and Overweight

Healthcare providers observed that many newcomer children are gaining too much weight and that this is linked to dietary changes in Canada. Some parents even commented that their children are gaining too much weight

...obesity is a big problem...Obesity and iron deficiency anemia often together...I am not sure if it is actually a real trend, but obesity is a real problem...lots of them, between 25 and 50%, even if it's just their BMI is at the 85th percentile or between 80th and 85th, which is still up there. (Saskatoon healthcare provider)

...the kids are gaining a lot of weight...they were tiny, normal weight, but then they all gain weight, majority is too much, more than ordinary. I can tell you about 50% gain a lot of weight...I know a lot of people change the way they eat, that's why they gain so much weight...there is have abundance of food here. (Regina healthcare provider)

When we came here my son was just 5 years old and she was just 3 and a half and they were in the range of normal weight, but now they are overweight, may be because of the lack of physical activity and good food. (Regina immigrant)

5.4.4.2 Diabetes

Healthcare providers noted that many newcomer women develop diabetes within their first few years in Canada, which could be an indication of their children's future health status due to too much weight gain. Newcomers themselves have noted that the number of people diagnosed with diabetes in their community is growing and this is likely linked to poor dietary habits and lack of exercise. Among newcomers there is the added dimension of how children with advanced literacy levels support their parents to manage chronic disease.

I see some of my patients double their size in a couple of years because they all came skinny...a lot of those patients develop diabetes...1 in 4 of the Burmese and Bhutanese women are diabetic...Because of the changes in their lifestyle they gain weight and they are genetically predisposed to it like the First Nations. (Regina healthcare provider)

...most of the people in our community have issues with sugar diabetes...we never had this issue back home, but after coming here people don't have any kind of physical exercise, they have nothing to do, they sit and watch TV or eat and get diabetic...many immigrants and refugees they have this issue of sugar diabetes, it has increased. I am always worried, is that the food product or is that the exercise part. (Regina refugee)

...they (parents) are diagnosed with diabetes as soon as they get here...Children are helping the parents cope, living with medication, managing that...it is the kids who are helping with disease management because the medication literacy piece around chronic disease is challenging for people with low levels of English or literacy. (Saskatoon immigrant service provider)

5.4.4.3 Disturbed Eating Patterns

In addition to the general adoption of a Canadian lifestyle, other factors such as mental health problems, lack of knowledge about chronic health conditions, and previous food deprivation that failed to support learning how to eat healthily, may play a role in the excessive weight gain of some newcomer children.

Mental health also is challenging...I see children who are bullied and they can't fit in and they deal with their grief by eating. I have this family and most of their children have gained tons of weight and a couple of them are not feeling well, and because they get bullied more they suppress that feeling with eating. (Regina healthcare provider)

...they think their children can have whatever they like, they don't think about healthy eating behavior...because they are already healthy. They don't see eating as a problem and...it can come to be trouble of a chronic condition. (Regina healthcare provider)

Sometimes children coming from a refugee camp with very little to eat come here and eat too much. (Regina immigrant service provider)

5.4.4.4 Summary Reflections on Chronic Disease, Overweight Concerns

Many newcomer children appear to be at risk for excessive weight gain and poor health outcomes down the road. This is consistent with the healthy immigrant effect observed among adult newcomers whereby they experience more chronic health problems with increased length of time spent in Canada (Gushulak et al., 2011; Newbold, 2009; Betancourt & Roberts, 2010).

However, inconsistent results have been observed among children by some researchers (Maximova, 2011) and suggest that excessive weight gain among newcomer children may be influenced by ethnic and religious cultural practices relating to physical activity and parents' English language proficiency as it relates to ability to make healthy choices in the supermarket (Austria, Kirchengast & Scholar, 2006; Van Hook & Baker, 2010).

Participant comments align with previous sections related to poor dietary habits and challenges with accessing healthy food due to economic difficulties, as well as with the social determinants of health literature. The health of children from low income families declines faster than those with higher incomes, and they subsequently become adults with poor health and low socioeconomic status (Case et al., 2002). Newcomer families need adequate support to access existing benefit programs and to successfully integrate into Canadian society and avoid the downward health trajectory.

5.5 Main Theme 2: Social Determinants of Health as Experienced by Newcomer Families

Table 5.2: Main Theme 2: Social Determinants of Health as Experienced by Newcomer Families					
Sub Theme	Interviewee Type				
	Healthcare provider	Immigrant service provider	Policy maker	Immigrant	Refugee
Difficult adaptation to life in Canada	25	10	3	7	16
Western Food environment	31	28	0	20	21
Newcomer population growth	18	8	2	1	4
Health promotion program supports	11	28	4	3	4
Poverty, income challenges	25	14	2	8	5
School culture impacts diet	16	9	0	7	9

*Each individual occurrence of data extracts coded to sub themes across the data set stratified by interviewee type

5.5.1 Western Food Environment

5.5.1.1 Food Abundance

Many newcomers experience drastic changes to the food environment when they come to Canada. Some come from rural areas with open air markets where they purchased fresh, reasonably priced, locally sourced produce; while the temptation of fast food was nonexistent or

too expensive to be purchased. Upon arrival in Canada they are thrust into the totally foreign concept of shopping at large supermarkets for food that is not as fresh as they were accustomed to, and includes a wide array of snack foods. In addition, fast food is readily available at numerous supermarkets and restaurants. Many newcomer parents are not prepared to make informed decisions about food purchases when they are faced with a wide array of unfamiliar foods, such as the family who were confused about which milk to buy for their children. Although there are many negative aspects of the Canadian food environment that can be obesogenic, we do have a consistent supply of safe healthy food to support a healthy lifestyle for those who have the resources and knowledge to do so.

...when I went inside (supermarket) nothing was the same as back home, we have to make our own selection of food and I couldn't imagine that it was such a big store and where we have to look, I couldn't. I just got a few things and she picked everything, like you might need this, you might need this, then I came home. It was an unusual experience for me and then I came with all these vegetables and they didn't smell like same as back home...even while cooking it was so different. (Regina refugee)

At the market whatever you see is good food (in home country), we don't have junk food. Newcomers, when they come here they don't know chips are bad because it is potato so what is wrong with it, my child is eating potato, but it's not, it's a junk food. (Saskatoon immigrant service provider)

...the sugary drinks (are more common), the healthier foods being more expensive. Also...their diet seems to be very limited because they stick to what is familiar and those foods may not be as available here, just because they are sometimes not aware what to do with the foods they are not familiar with. (Regina healthcare provider)

I saw this Iraqi family and he said 'my children don't like milk' and I said 'they need milk'... and he said 'we went and bought that powder Nido and I gave that to all the children.' I said 'no, if they don't drink milk get them something called chocolate milk, give them yogurt with fruit.' It's quite expensive, that bottle of Nido is about \$25.00 and the children take that mixed with tea and they don't drink the real milk...powdered milk is cheaper in some countries that's why some people give their children powdered milk instead of buying fresh milk. (Regina healthcare provider)

... in some countries healthy food is more available and cheaper to get, but junk food, like chips, pop and chocolate bars, tend to be more expensive so they don't have a chance to get to that until they come to Western countries where the junk food is cheaper and more readily available and the healthy food is a little more expensive. (Regina immigrant service provider)

...children tend to lean towards the fast food. Back in their countries...fast food is seen as something for the privileged, it is out of reach, so coming here, seeing it in abundance would make them to lean more towards that. (Saskatoon immigrant service provider)

...when you are deprived from certain kinds of nutrition and...you are poor...when you come here and there is so much abundance here...sweets, desserts, cakes, junk food that they were not exposed to before...these people they eat more because they have the money to buy it and it is around them, easy accessible. (Regina healthcare provider)

The food environment is a little bit different because always we were using...it has become our permanent ingredient, milkshake...strawberry and apple we...grind it in the juicer and add milk and drink it... we are getting more fruits than we were getting in Pakistan, but not necessarily fresh. (Saskatoon immigrant)

5.5.1.2 Children's Influence on Food Purchases

Sometimes newcomer parents are guided by their children to make certain food purchases. In addition newcomer children are susceptible to peer pressure, and may guide their parents to buy food products that other children are consuming.

They (children) tell their parents 'The teachers say we should eat this pop and chips'...I didn't realize this until this mom shared this with me and she said she felt like not a good mom so she went to the store, she knew no English, the children were learning some, and...the balance of power shifts...and their kids are telling them what to buy or how to navigate the supermarket or whatever because they have more experience with it. They are giving her erroneous information. (Saskatoon healthcare provider)

Newcomer kids will eat lots of chips and may take chips to school...Some of them will think because other children eat like that, they have to eat like that, some of them really don't know what is the appropriate food to take to school. (Regina immigrant service provider)

...some of them are starting to build muscles, copying the other kids, especially the teenagers and they start to buy those protein products...Not all products are safe...And they take energy drinks like the other children these days, which is not good. (Regina healthcare provider)

5.5.1.3 Accessibility to Supermarkets

Another concern for some newcomer families is not having easy access to a supermarket that sells healthy food or the types of food that they traditionally eat. One immigrant mentioned her desire to purchase fresh food from the farmers market, but she has heard that the food there is

expensive. Newcomers often seek advice from more settled community members to find out where to buy their ethnic foods.

...there is a lot of people living in...an area of city where there is no grocery store around and there is lots of places like the Giant Tiger...where people shop for food where there are not a lot of cheap fresh food available readily, and also lots of people have been telling me they have trouble finding food like they were eating before. (Saskatoon healthcare provider)

The availability of grocery stores is a big one depending on where someone is living, there is the grocery store at Station 20. I think the majority of our clientele who live there do not access the grocery store there... A lot of people don't know the grocery store at Station 20 exists, it is perceived as fairly costly... but mostly that comes down to a lot of issues in perceived conflicts with First Nations, that is a population that utilizes and lives in that space ...when I ask people (why they don't go) they say I don't know it exists or it is not really for me. (Saskatoon immigrant service provider)

I would like to go to Farmer's Market, I have heard of it, but I have never had a chance to go there...I was wishing to go to farmer's market to see if I can buy some fresh fish, I like to get that. In our country we have the fresh fish from the sea and the river, fresh, so that is what we like the most, but I didn't have a chance to go to that farmer's market. But you know it is a little bit expensive so that is the thing that usually people don't go there. (Saskatoon immigrant)

...after a few months we met with other people from our community and they showed us we have an Indian store where we can buy our spices and we went there. (Regina refugee)

5.5.1.4 Fast Paced Lifestyle

Upon arrival in Canada, the new lifestyle can be very hectic for newcomer families leading them to use some convenience foods. Several newcomers also noted that their families now consume food from fast food restaurants, which is a shift from their previous eating patterns.

In the area of food, lifestyle changes as parents become busy with school or work, they tend to make...the easier to make foods or even buy sandwiches and things like that that are not necessarily healthy for children. (Regina immigrant service provider)

Here most of the kids like those fast foods, they are very much fond of chocolates, fast foods, chips, fries, ice cream...what they want is that, very easy thing, just take-out pizza, put it in microwave and there it is, ready to eat. (Saskatoon immigrant)

...unhealthy lifestyle like attraction towards fast food...because there is lots of stress in the family and not much attention to healthy eating habits so people adapt to processed food. (Regina healthcare provider)

When we were back home we were not used to...going to McDonalds...or even going to restaurant, we never did it, here they are growing up seeing those things around and they want to go to McDonalds...At McDonalds they like fries...They sometimes go to Denny's, they say that they get really good fries over there. It is so different, back home children used to be more dependent, and here they make a group by themselves and they go out. (Regina refugee)

In Pakistan I never felt the need to go there...McDonalds and KFC. It is easy to go there everyday it is available here, but in Pakistan no it is not available everywhere. There we have our traditional foods...like kabob is very common there...It was very rare to go to McDonalds and KFC, it was only in the big cities; in the smaller cities, towns not available. (Saskatoon immigrant)

5.5.1.5 Physical Environmental Change

Another change in the newcomer food environment relates to moving to a northern climate with colder weather and less sunlight. The colder weather can decrease the sensation of thirst and lead to insufficient intake of liquids. In addition, moving to a northern climate reduces the body's exposure to sunlight so there is decreased capacity to make vitamin D, especially for darker skinned newcomers.

...most of these people are from warmer countries and they drink a lot of liquid because it is hot...The minute they come here they don't get thirsty and every single child and woman is constipated...I tell him what is happening, you need to drink liquids, you need to take fibre...Fibre is in these things, drink a lot of water. (Regina healthcare provider)

Coming from Africa ... when you move here...you now have to make the effort to go get the vitamin D supplements and take them. (Saskatoon immigrant service provider)

5.5.1.6 Breastfeeding

An important component of the food environment for young children is breastfeeding behaviour, which can be impacted by the move to Canada. Unfortunately the pervasive availability of infant formula in Canada can influence breastfeeding behaviour. In addition breastfeeding behaviour may be impacted by cultural influences from the newcomers' home

countries, which can vary widely. Similar to many Canadian women, newcomers can encounter problems with breastfeeding, such as feeding difficulties or doubts that they are not producing sufficient milk for their baby that can hasten the transition to bottle feeding.

99% of these (newcomer) children are breastfed. I do run into the odd child that is not breastfed and they are 2 and still sucking on a bottle and the mom is reluctant to stop that so we talk about that and I try to encourage them to stop it, or if they are going to give a bottle just put water in it. (Saskatoon healthcare provider)

...an exclusively breastfed baby would be a determinant of their health. Unfortunately there are messages sent by our culture that formula is better and there is one mom in particular who came into the office here who was giving her baby formula. I said 'why, you breastfed the rest of your babies.' 'Well this is a Canadian born baby and the messages I get is that he is going to be healthier if he drinks formula'. So although we are able to put that into perspective as Canadians knowing that breast is best, people from other countries get a strong formula message and that undermines their ability to nurture and care for their child. (Saskatoon healthcare provider)

I had a lot of Philippino mothers that just didn't try breastfeeding. After I had seen a few I told myself may be I should start a Philippino mother breastfeeding group because they all had trouble latching and kind of abandoned breastfeeding really quickly. (Saskatoon healthcare provider)

We are trying to break the young son off breastfeeding. He is almost 3 (years)...He breastfeeds about every hour and in the night about 3 times he wakes up. (Saskatoon refugee from Middle East)

I was still breastfeeding (daughter) when we arrived in Canada and I breastfed both until they were about 1 year old, then it was enough for me a year was good for them. It was normal practice from Germany. Some women in Germany even breastfeed longer, but I was good with a year. (Regina immigrant from Germany)

I have lots of mothers who are coming because they are worried their babies are not feeding well. I see lots of babies who are failure to thrive, babies are not able to gain weight properly, sometimes it's related to an actual physical illness, but that is actually rare, most common cause is poor intake and often times that's due to breastfeeding failure. I find that when mothers are supported well through breastfeeding and can access services in the community then it gets better, but sometimes you have to transition them with formula supplementation, which is unfortunate, but it happens. (Saskatoon healthcare provider)

...they don't continue because at one point they start thinking I don't have enough milk so they start feeding the bottle, also they think if I want to go to work what will happen, I have to start the bottle. The maternity unit is so good now, the lactation consultant is teaching them before they come home. We are showing them what to do and the lactation consultant comes here. (Saskatoon immigrant service provider)

5.5.1.7 Summary Reflections on Western Food Environment

Participant comments about the Canadian food environment are consistent with the global nutrition transition in which people around the world are reducing their consumption of fruits, vegetables and legumes and increasing their consumption of sugar-sweetened beverages, and sweetened and processed foods (Popkin, 2006). Comments are also in alignment with Patil et al. (2009) findings that newcomer dietary intake changes can be impacted by the availability of traditional foods, economic-constraints, time-constraints that lead to the use of convenience foods, children's demands and the ability to cook western foods. However, some service providers also noted that the actual physical environmental change to living in a northern climate impacts nutritional requirements such that many newcomers need to be consciously ensuring that they are consuming enough water and vitamin D.

Participant comments related to breastfeeding lend credence to many of the factors that have been shown to deter breastfeeding over the years, including: the commercial promotion of infant formula (Howard *et al.*, 1994), media portrayal of bottle-feeding as the norm (World Health Assembly, 1981), lifestyle changes associated with urbanization (Gussler and Briesemeister, 1980), lack of broad societal support (Spisak and Gross, 1991), and some types of maternal employment (Gielen *et al.*, 1991). Participant experiences also indicate variation among different cultural groups that may be rooted in cultural norms in their countries of origin.

5.5.2 School Culture Impacts Diet

For children, their school culture has a substantial impact on their food environment as they spend many daytime hours at school and often consume lunch and snacks at school. Some schools are highly inclusive and make efforts to provide a welcoming environment that supports

newcomer children. W.P. Bates is an example of a school that actively sees things through the lenses of newcomers and other vulnerable populations to provide a supportive environment that sets the stage for the development of healthy eating habits. The school has developed a culture of acceptance that welcomes difference, while also promoting equity and supporting children to develop healthy eating patterns. Similarly, Regina schools located in areas where there is a large newcomer population appear to have developed an inclusivity culture. However, not all schools appear to have successfully developed such a supportive environment leading to some children not consuming their home made lunches and some parents' frustration with the lack of school support to encourage healthy eating. Public health nutritionists have noticed poor food environments in Regina schools and are considering how to address it.

About 47% of students (at W.P Bates) are newcomers and...about 44% are First Nations or Metis students...We are wonderfully rich in relationships, we have business partners who actually give donations...we provide a breakfast program, morning snack, universal snack and a lunch program...Care and Share is a huge partner...they do everything from giving us money for dignity fund (to buy) lice shampoo, underwear, socks...A couple years ago we got some Africa drums ...great culturally responsive material. (Saskatoon service provider)

...initially, there is a lot (newcomer kids) that do not like vegetables and fruit, they might not eat it right away, but they love it off the lunch cart after they figure out, because they do like that and we give milk. (Saskatoon service provider)

There was a family...the mother is always giving him (son) sandwich and she tells him 'did you eat the food' and he says 'yes,'...and after a year or year and a half, under the stairs of the apartment it was smelling bad...when he was coming home from school...he was losing the container everyday ...and then they found it under the stairs, the food was there for the whole year...Finally...he told them 'I don't want to eat lunch because the sandwich is not good. When I taste it from other kids it tastes so good, I don't know what is the difference so I don't like your sandwich.'...so the teacher suggested 'just give me his lunch and I will hide it and I will tell him I brought food for him to eat' and he was eating it. (Saskatoon immigrant service provider)

...my daughter takes chocolates sometimes...and they don't say that you don't eat chocolate at school...they should have some rules about what is allowed at school...they should stop them from eating things at school like chocolate and chips...(daughter) tells me that my friends take all these things so why can't I take them, she insists me to give

some chocolates, crackers, chips...So if these things are prohibited at school...for a limited time in the day children are away from these things. (Saskatoon immigrant)

I fry chick peas...boil the chick peas and fry them and mix in some vegetables and send it to them. Two of my daughters they like to take fruits and juice. My kids usually eat the foods they take for lunch. They are not worried about what other kids think of their food. They don't complain...my youngest one he goes to Judge Bryant (elementary school). Lots of kids from different countries go that school so I think it is more common for kids to bring lots of different foods. My daughter she says she will like to take more fruits and some kind of drinks, but whereas my son he takes whatever I send. (Regina refugee)

We ask them to take sometimes rice and vegetables to school and they eat it at school, but sometimes they bring it back too, they just eat a snack at school and they come hungry. Because their friends are not used to eat rice at school so may be they are shy to take rice to school. They prefer sandwich, vegetables, juice, fruit and chips to take to school for lunch. (Regina refugee)

...at LeBoldus there are a lot of Philippino immigrants and he (teacher) was saying at lunch time one of the students was saying they are embarrassed to take out their lunch in front of peers because it would smell in some way, may be the cold cuts, so they would see their lunch, with carrots or whatever and no junk food and see their friends lunch with lots of chocolate and candies. (Regina healthcare provider)

...they (Regina Public Health Nutritionists) were coming up with some sort of poster campaign on 'All foods are welcome here' so I think may be more education and exposure for the rest of the population so if that is better accepted then they can continue eating in their healthy way, rather than turning to the processed stuff that they would throw in their lunch...(also) looking at...giving welcome packages including a hot thermos...because a lot of these cultures will bring their hot soups or stews or foods, that's what they tend to eat, and so they may not be able to do that because a lot of the elementary schools don't have microwave access. (Regina healthcare provider)

The school-aged years are a pivotal time in the development of eating patterns so it is important to pay some attention to ensuring supportive food environments in schools. A healthy diet is widely recognized as essential for children to achieve their full potential, including physical and mental development and lifelong health (Joint Consortium of School Health, 2008). In alignment with this thinking, the Saskatchewan Ministry of Education (2012) has acknowledged that it is a shared responsibility among family, school and other health and social services organizations to promote and support the healthy growth and development of children. Schools can play a pivotal role in supporting the development of healthy eating practices through

implementing nutrition education and health food policy, as well as modeling healthy lifestyles. The *Healthy Foods for my School* tool (Government of Saskatchewan, 2014) includes nutrition standards and other resources to support schools. It is also important to apply a cultural lens to the school food environment to ensure an inclusive approach.

5.5.3 Poverty and Income Challenges

Living in poverty or on a low income for an extended period poses some serious challenges to health, both in terms of maintaining good health through attention to diet and lifestyle, as well as with accessing health and community services. Many newcomers are working in a patchwork of low-wage jobs to try to make ends meet and are only earning enough to cover the basic necessities, with no allowances for spending on health or recreational expenses. Due to these financial struggles involving insufficient funds to support children's activities, free school-based activities emerge as an important resource for children's activities. It can also be difficult to connect with some newcomer families to provide health or social programs due to limited phone access. In addition, the treatment of some health conditions is best managed through the use of over-the-counter medicines, which are not covered by most insurance or benefit programs. As a consequence, some newcomers may not be able to continue with treatment regimens due to lack of funds.

It's really very fluid, things move quite quickly...I feel like we are doing triage so whatever is very urgent or obvious we are trying to deal with it, but how much prevention? There is a lot of transiency, people move, they get settled and they move again so it seems like you get some things in place and then they are gone. (Saskatoon service provider)

Employment, meaningful employment, not just any employment, immigrants do come with skills and if they are meaningfully employed and they can work at just 1 job to maintain the family that would also help families. With the mother going to work at night families break down because of this lack of interaction, it is either the man is going to

work during the day, by the time he comes the mother is running off to go, or the man is working 2 or 3 jobs. (Saskatoon immigrant service provider)

...families don't even have phones...or if they do they often have to change, may be they have a card for a certain amount of time because they don't have a lot of money, or may be they missed some bills so they had it cancelled and they get a different phone number...I have learned to text, it's less costly...I contact people that way. (Saskatoon service provider)

...their (refugees) rent (allowance) is always less than the actual rent from the landlord, the government doesn't pay them (enough), if it is a family of 4 or 5 they get paid \$700 or \$730 and the rent is \$900 or \$995. Even privately sponsored refugees and immigrants they are in survival mode because the doctor, engineer, professor are pushing shopping carts so they are in survival mode...they are workaholics. On top of that they have to pay back their transportation loan. (Saskatoon immigrant service provider)

...for many newcomer families...paying for your children's piano lessons, paying for their children's extra curricular activities is not considered a priority as they are starting to establish themselves. The priority is getting the house, vehicles and the things that they need to get to work...not a lot of children participate in those kinds of activities. (Regina immigrant service provider)

...most of these people are poor, they cannot pay for children to do physical activities or exercise or participate in particular sports. (Regina healthcare provider)

...unless it is at the school, exercise or basketball or anything, to put them into another physical activity like football or soccer or anything would cost too much money. (Saskatoon immigrant service provider)

...they (newcomers) go buy it (over-the-counter medicines) and then they quit because it's expensive...they have to pay for it...for example one of the vomiting medications for pregnancy and vomiting is \$172.00 and we have patients who vomit and this medication is not covered, everybody has to pay for it. There are people who don't have money...We have a lot of women that suffer with that. (Regina healthcare provider)

The impact of poverty on newcomers' health is a concern as Mikkonen & Raphael (2010) have identified a clear socioeconomic gradient in health status as disease prevalence increases and years of life lost to early death increases from the highest income quintile of the Canadian population to the lowest income quintile. Specifically with regards to immigrant health, Rivera et al. (2013) found that good employment is associated with better health and decreased likelihood of suffering from a chronic disease and experiencing activity limitations. Similar to adults, Case et al. (2007) have observed strong income gradients of child health in relation to

both self-reported health status and chronic conditions. Poor childhood health can initiate the trajectory towards perpetual low socioeconomic status across generations largely due to the effect of early childhood health on the development of cognitive skills that then affect an individual's ability to engage in the labour market (Palloni et al., 2009). Participant comments indicate a relationship between low income among Saskatchewan newcomers and difficulties with accessing children's recreational programming, as well as meeting some health needs not covered by the public health insurance system, which could lead to the development of chronic diseases and poor health outcomes over the long-term.

5.5.4 Difficult Adaptation to Life in Canada

5.5.4.1 Isolation/ Loss of Status

Adaptation to Canadian life is not easy for all newcomers, and is sometimes associated with loss of status and feelings of isolation. Some newcomers arrive with high expectations for life in Canada, only to be highly disappointed and regretting their decision to come to Canada. Some older newcomers may feel marginalized for the remainder of their lives due to difficulties with achieving Canadian citizenship, which entails an English proficiency test. Many newcomers experience challenges with maintaining their previous lifestyle due to challenges with recognition of qualifications or with engaging in employment that requires a high level of English language skills, which can impact their mental health status. The sense of loss of dignity also came through in many comments. In contrast to their parents' problems with successful integration into Canadian society, children are often resilient and adapt to Canadian life quite quickly. However, the speed with which children adapt can create challenges with family dynamics.

...they gave us pamphlets, papers that said after 3 years we can get citizenship, we train you according to your trade and skills...and we give you work. But when I was here it is not like that. I went to the Open Door...and I say I want to go back, within 1 month I did not want to stay here...the only skill to learn here is English...middle aged (people)...we have to take care of our family...we have to earn the money, have independence and it is very hard. (Saskatoon refugee)

...more than 60% of people are uneducated...and the criteria for citizenship is level 4 English...they are at the grassroots level...there are people here the age of 40, if they are waiting for age 55 (to get citizenship without the language requirement), may be he has 15 years still here to wait...those 60% of people are below the criteria, these people are suffering and they think in my own life I won't have any citizenship, neither in Bhutan, Nepal, neither in Canada. They have to wait for the age of 55 now. (Saskatoon refugee)

It is a huge adjustment and if you don't have family members. It is very lonely and so how you deal with that loneliness defines whether you are successful or not and continue to live here. The first 5 years are the hardest even if you have family to adjust. (Regina healthcare provider)

There is social isolation for new moms...trying to encourage them to seek out activities, and give them options like come to the parent group here on Wednesdays, go to Global Gathering Place. (Saskatoon service provider)

...a gentleman who was in a deep depression because he was not able to provide for his family in a meaningful way. He was an engineer in his home country and couldn't get a part time job at McDonalds because his language was not as clear as an 18 year old Canadian born person. (Saskatoon healthcare provider)

...my husband was so depressed when we came here, he used to think that his education will not be counted...he did his Ph.D. from back home in philosophy and here he is working at Walmart. It is a big change. (Regina refugee)

I have taught physics to higher secondary levels for 15 years in Pakistan...Here, I am working at FasGas, it's not bad, I am working, but I was expecting a little bit better...I have come here in a fair way. I was having excellent qualifications and education, excellent service...Also I have not come here empty handed...that is not my nature to beg. (Saskatoon immigrant)

Education to them is number 1 important, school, university, a good job. They want to get out of the refugee thing that they have been thrown into through no fault of their own they lose everything...I see a lot of them are really well adjusted. They take a lot on. They are quite mature for their age...very focused on school and being successful...For them when they are in high school their English may not be so great so that is a bit of a struggle for them, but they tend to pick it up quite fast and they make friends easily. When I see them months later they are doing well. (Saskatoon healthcare provider)

I don't know how I learned this much English. (son of Regina refugee)

...one of the primary things that I have observed...is a change in role dynamics in the family, often children seem to be quite resilient when they come in terms of integrating into the school, and integrating socially and they seem to be able to quickly adapt to language...often children then step into that role of responsibilities for information and things that come from the school and it does really change the power dynamic between the child and the parent. (Saskatoon healthcare provider)

...there has been some challenges around people from different faith backgrounds and how that impacts socially between kids on the playground, if there are squabbles that happen, often they happen around cultural lines or faith based lines so that is a big adjustment...learning a whole new way of life and adapting to a new way of doing things...stress sometimes manifests itself in kids may be acting out in the playground...or some kids can kind of shut down too from the overwhelming nature of the transition. There are many kids also who do very well and thrive. (Saskatoon service provider)

The better and faster the immigrants...and refugees integrate into society and get a job and settle down, the better they can make sure that they are also thoughtful about their health. Any attempt to make that procedure easier will directly or indirectly relate to healthy living. (Saskatoon immigrant service provider)

I (newcomer) need to grow, I want to learn, I want to fit into society because my children are growing here and it's not easy. (Saskatoon immigrant service provider)

...they come to Canada with so many hopes and sometimes when those dreams and hopes are not met there is a lot of heartaches and frustrations so that if they are able to supported through those transition years in whatever way possible to actually make connections, learn the language, learn how to navigate the system, all the systems, the education system, the health system, they will be able to succeed...they will be awesome citizens if they were coached and were able to be helped in those first formative 3 years for sure to embrace the new culture. (Regina healthcare provider)

5.5.4.2 Parental Attitudes/ Healthy Weight Perception

Healthy weight perception emerged as an issue as healthcare providers spoke about newcomer children they have seen who were either normal or overweight, and yet perceived by their parents as being skinny or a healthy weight, respectively. The comments of some newcomer parents appear to support the healthcare providers' perception; however, some parents recognize that their children have gained too much weight, but they don't know what to do about it. In addition to becoming overweight, children may also develop feeding difficulties due to over feeding if they are perceived as thin by their parents. This can set the stage for the

development of disordered eating and unhealthy weight over the long-term. The difference in healthy weight perception among newcomer parents may be associated with having previously lived in an environment where overly thin children became sick more often than chubby children so chubby children are viewed as healthy, or with the central focus of the family being the commitment to ensure all of the children's needs are well met.

I see a lot of happy newborns who are feeding well and growing well, but the parents have concerns about their growth and their feeding as well. Lots of...toddlers that may be a little bit picky, but are eating enough and growing well and the parents are very concerned. (Saskatoon healthcare provider)

...perhaps there are some cultural differences in how we see healthy weights and how having nice chubby children is often seen as a good thing; chubby is fine, but obese is not OK. Often times I have trouble convincing my families that their child is obese or they are a nice healthy weight and they are seen as very skinny. That happens a lot. I am not sure if it is related to stress of migration or comparing their child to other children that they see around them or if their habits around eating changes dramatically when they come here. (Saskatoon healthcare provider)

...very perfect...according to me he is fine...he does not deny whatever we give. (Saskatoon refugee) (child had a normal weight during his health assessment 2 years earlier, but he appeared to be overweight, if not obese, during the in-depth interview)

...doesn't eat too much and she is skinny, and she never puts on weight, I don't know why...she doesn't like to eat too much and I am always insisting some more food and eat this and she doesn't like some things. (Saskatoon immigrant) (child had a normal weight according to her health assessment and current appearance).

After 5 years there are not a lot of children that gain too much weight, but there is a few...The parents think the children have gained too much weight, but they don't know how to help their children. (Regina immigrant service provider)

I have noticed some newcomer children with feeding difficulties. Lots of oral aversion. I think some of that stems from parental stress and concerns about a child not eating enough and then there is a little force feeding going on and the child develops an oral aversion and things get worse. (Saskatoon healthcare provider)

They are gaining weight and may be they are happy about it because they were so underweight in their own countries...They don't realize the challenges. (Regina healthcare provider)

...here kids are loved and they take care of their kids, but for us our association and bond is, I am very sensitive about my kids...I will provide everything to them I can. (Saskatoon immigrant)

5.5.4.3 Summary Reflections on Difficult Adaptation to Life in Canada

Upon arrival newcomers often face challenges with integrating into the Canadian labour market. Newcomers are often under-employed or work at lower skilled jobs than expected based on their educational attainment (Gilmore, 2009). Poor language skills, foreign qualifications that are not recognized in Canada, lack of Canadian work experience and/or discrimination are often barriers to finding employment or suitable employment that matches the newcomer's skill level (Xue, 2010; Li, 2001). There is a strong association between employment, income and health, as well as between downward class mobility and health (Mikkonen & Raphael, 2010), which has also been observed among newcomers (Fleury, 2007). Newcomers who have experienced downward class mobility are at higher risk for diabetes, heart disease and depression (Spitzer, 2005, Simich et al., 2006). Participants' comments clearly demonstrate difficulties with integration into the Canadian labour market leading to downward class mobility that put newcomers at higher risk for the development of poor health outcomes like depression within the first 5 years in Canada.

Although children who immigrate at young ages appear to adapt well in terms of language development and academic achievement, they may be at risk for early sexual activity, smoking and alcohol use in their teenage years that can have long-term health impacts (Tolbert Kimbro, 2009). As suggested by some participant comments, newcomer families may experience conflict due to changing role expectations and parent-child acculturation gaps⁵ (Gonzales et al., 2009). A child's social environment is the structure that supports a newcomer child's healthy growth and development.

5

Acculturation gap refers to the difference in the rate of acculturation of the parent as compared to their child.

Newcomers are emigrating from countries at various stages of the nutrition transition, so many of them may not be familiar with the risk of obesity associated with the Western diet, while others may have already started the transition to a Western diet prior to emigrating. Some newcomers emigrate from populations with healthy diets, but high mortality due to infectious diseases, while others are from transitional countries characterized by decreased physical activity, sedentary and energy-dense diets, which results in the increased incidence of chronic diseases and disability (Popkin, 2006). In addition there may be some cultural norms that value high-fat foods and consider plumpness a sign of beauty (Kandela, 1999). Comments from newcomer parents also appear to indicate cultural expectations regarding children's appetite.

Although only noted by more specialized healthcare providers, the development of oral aversion in response to force feeding as a result of having a distorted perception of their child's weight can lead to seriously disturbed eating patterns. If children progress through their preschool years without developing age appropriate healthy eating habits, behavioural treatment may be required to address the issue. Various feeding programs have been developed to address oral aversion, including the Sequential Oral Sensory Approach to Feeding, which recognizes the importance of improving family understanding and functioning during mealtimes for the development of healthy eating habits, among other components (Toomey & Ross, 2011).

5.5.5 Newcomer Population Growth

There is a growing recognition that Saskatchewan's demographic landscape is changing due to the arrival of newcomers, but the healthcare system has not totally grasped the magnitude of the change and responded accordingly. However, there is a willingness on the part of healthcare providers to respond to newcomer needs, which can work synergistically with supportive ethnic groups to create an environment conducive to community building. In regards

to current work on the development of the Providing Access to Healthcare (PATH) program to better respond to the healthcare needs of newcomers in Saskatoon, healthcare providers recognize opportunities to develop programs and services that build on newcomer strengths. Several service providers offered examples of how newcomers could be engaged to address common health issues among certain ethnic populations, as well as opportunities to build bridges among vulnerable populations that are co-located in the same areas.

More of a focus on the First Nations population, which is really important, but we have a whole other population as well...Somebody was telling me the other day...‘About how many refugees do we have like maybe 100 or so?’ They have no idea, annually 350 refugees go to Saskatoon alone... There are about 2,500 refugees living in Saskatoon alone. (policy maker)

...certainly there is recognition that the landscape of our population is changing and nursing students need to be very open to different cultural backgrounds and practices and experiences, regardless of the clinical setting that they are working in...it is woven more throughout the course of the program. (Saskatoon healthcare provider)

Majority of our clients (at inner city health centre) are First Nations...98-99% of our population that comes to the programs we offer are First Nations...now that the demographic around the health centre is changing we are seeing more immigrants coming in to access immunizations, child health clinics and to see the nurse practitioner. The number of immigrant population attending child health clinics has really increased. I would say on a daily basis we would see out of the 12 (clients), we could see 3 to 4 and sometimes 5 immigrants, it is growing. (Regina healthcare provider)

...the community is very supportive over here. The people in the community they are great, not just the people from the same community, but people around here in Regina, they are so helpful and supportive. People from our community who have been here for a while help newcomers. (Regina refugee)

...some situations where newcomers are extremely resilient and they are creative and they engage the support of other newcomers who may have been here for some time before them, people who can speak the same language they share stories and they are able to help one another. (Saskatoon healthcare provider)

...the Filipinos are a very strong community and they do know who is coming in and they do support each other. They look after them...they know when a family comes in and they go and hover with them, tell them what they need to do...Those community bases are what really does it; those ethnic associations that they have. (Regina healthcare provider)

We have 1 immigrant couple that have come the last 2 or 3 months...they drop in for our homework help centre...It's been really exciting for us because they routinely come every Wednesday and will help clean up afterwards and help set up, they are very helpful, enthusiastic. (Saskatoon healthcare provider)

If I can have translators, a refugee clinic and some allied health workers in there who have lots of experience working with newcomers that would be great. And a network of family doctors who know how to care for that population that would be very nice. Slowly we are going to get there (through PATH); the situation in Saskatoon and Saskatchewan in general is fairly new so people are just trying to get organized now so it will come. (Saskatoon healthcare provider)

...somewhere central in the city, even just once a week these people have a chance to meet...run by volunteer students...we will offer physician volunteers...the kids can have a program to play, they will teach them how to cook healthy meals, they will cook them a healthy meal that day...they can learn from each other about resources, know where to go, what to do, where to buy...the groceries they need from their home country. At the same time there will be program for young children so the moms can get a break...a women's group so they can sit and talk about their challenges...people from their own community who can speak English could facilitate it. (Regina healthcare provider)

...a Somali refugee that's been here for years and adapted to the lifestyle in Canada, ...and has a healthy diet do a group led by someone from their community, I have always thought that would work well...I really think if it comes from the community themselves then that would help a lot. (Saskatoon healthcare provider)

Both First Nations and immigrants live at the Appleby Drive complex. It would be good to have a program that allowed women from these 2 communities to come together and build bridges. Programming could include health, access to employment and literacy. (Saskatoon immigrant service provider)

The demographic shift occurring in Saskatchewan due to immigration is changing the underlying structure of society. As more newcomers arrive they are better equipped to provide social support to those who come after them. The loss of extended family and community social supports is common to many newcomers (Stewart et al., 2008) so social support networks need to be rebuilt after arrival to support resettlement and favourable health outcomes (Simich et al., 2005; Hansson et al., 2009). The overwhelming presence of newcomers is also pushing our health system to evaluate how to more appropriately to their health needs as demonstrated by the PATH planning.

5.5.6 Health Promotion Program Supports

5.5.6.1 Existing Programs

Several immigrant service agencies and healthcare organizations are providing nutrition and cooking skills educational programs, either in-house or in partnership with another organization, to help newcomers develop skills that promote healthy diets. Some examples include Global Gathering Place's Creating Healthy Economic Food (CHEF) program and the Regina Community Clinic's Kids Active Living and Cooking Club. In the past there has also been some provincial support for the development of health promotion programming resources in collaboration with healthcare providers.

...(CHEF) cooking class is once a month...It is usually 2 half days...Day 1 is menu planning together, talking about the balanced diet...They go to the grocery store together, learn about reading nutrition labels, comparing costs, going through a self check-out...On the second day all of the food is prepared together and they eat together and take some home for their family...and the recipes are very clearly explained so they can recreate the meal. It is a variety of participants, 80% are women, sometimes we will target single males and do cooking for 1 session. (Saskatoon immigrant service provider)

...(GGP offers) life skills program that works exclusively with our refugee families, will also do their own cooking classes, may be with preparing meals for children in mind, sending lunches to school, healthy breakfasts for kids. (Saskatoon immigrant service provider)

(The Regina Community Clinic offers) The Kids Active Living and Cooking Club...for any child...every summer for at least 10 years now. It is 1 week, although runs 2 different weeks for different age groups. It focuses on healthy eating and active living, not exercising, but just fun movement. (Regina healthcare provider)

...sexual health...family violence, and...nutrition and healthy choices (culturally sensitive health education kits)...intended to enhance delivery of health information to the newcomer population. (policy maker)

5.5.6.2 Partnerships

In recent years some health promotion programs have experienced resource scarcity that threatened programming sustainability. In response, some immigrant serving organizations have explored how to partner with other organizations to extend programming to newcomers. Often, partnerships can be key to overcoming lack of specific resources to ensure program success.

...sometimes health education for newcomer parents is not available so we use our existing resources to provide nutrition classes, but providing nutrition classes itself is not sufficient, we need some cooking classes...resources are very scarce for those kind of programs. With REACH we have offered cooking classes, we have been able to do that, but very limited resources...The parents have barriers to participate in those programs, like transportation, language and the service providers really support each other to provide it. (Regina immigrant service provider)

A lot of great resources in the community and we need to connect them better, CHEP being one of them, but there are others. In some ways it is not really starting from scratch, there are programs to be built upon, things like the Food for Thought Program. (Saskatoon immigrant service provider)

MEND, Mind, Exercise, Nutrition and Do It...A U of S program...1 session of MEND is only for Open Door clients, ...our funding is for transportation so they have transportation...They give the kids 1 vegetable or fruit... First they touch it, then they smell it, then they can put it in their mouth, but they don't push them to do it. Just put it back if you don't like it. Kids like it that way...The moms talk about the food groups, how the screen is affecting their kids. (Saskatoon immigrant service provider)

5.5.6.3 Culturally Appropriate Programming

There appears to be some common elements to successful health promotion programs for newcomers, including experiential hands on learning and integration with ethnic food practices. Immigrant serving organizations have recognized that the Canada Food Guide cannot support nutrition education for newcomers as a stand along resource and must be supplemented with other resources. Some newcomers who consume ethnic diets have indicated their confusion concerning how to consume a healthy diet in Canada. In addition, the importance of social

interactions during programs was mentioned.

...we were given the Canadian Food Guide...a foreign concept for the parents because that is not the food they are used to eating. Take 3 slices of bread, this vegetable, people like to eat their cultural food...we need to strive for how do we make the food they eat healthy and balanced...take the newcomers' cultural food recipe and modify that to make it healthy, like reduce the oil. (Regina immigrant service provider)

We are used to eating Asian food, different kinds of food, but we need to know what kind of food is better for kids to grow up healthy and for us too, so what kind of food we should eat? May be we shouldn't eat too much rice. (Regina refugee)

...important to have discussions and talk about peoples' food in their home countries so it is not just coming here and starting from scratch with this is what a Canadian diet looks like because often a Canadian diet is pretty unhealthy so we should start from their knowledge and what they have learned, they have a lot of really good knowledge that they have come here with so sometimes that gets lost because there is the assumption that I need to adapt and change my ways from back home, but actually my ways from back home were healthy. (Saskatoon immigrant service provider)

...they learn by doing with their hands, there has to be a person come in and teach them physically to do things with their hands and they will remember how to do it...hands on, do it practically, take them grocery shopping because sometimes even though they shop they don't know what is what. (Regina immigrant service provider)

...newcomers were asking for some sort of cooking classes...they would rather be taught over video...on what to do with these Canadian foods and even what to do in a Canadian kitchen with these certain utensils. (Regina healthcare provider)

...knowledge of hygiene, how to freeze (meat) and how to defrost it and after defrost not to put it back in the freezer because it poisons the food...if they buy a big meat, have to buy sandwich bags because you have to cut it up and put it in bags, take 1 piece and cook it with okra, cook 1 piece with potato...but if they cook it all at once...they can feed their tummy only. (Saskatoon immigrant service provider)

They have so many youth programs, canoeing, really fun stuff they offer, teach you rowing for free and cooking classes, playing some sports, doing dances like hip hop...It is good because when you are here and missing back home it is good thing to engage in...the youth know each other and have interaction with other kids coming from different areas and have friendships. (daughter of a Saskatoon immigrant)

5.5.6.4 Access

Although existing nutrition and cooking skills programs are beneficial to participants, not all newcomers have access to this programming. Given this limitation, it is important to consider how to make programs accessible and build awareness among the newcomer community.

...not all immigrants participate in those programs. So there is still quite a few that are missed, like those who go to the university, they don't have time to go or seek out those programs. (Saskatoon immigrant service provider)

...we can't catch everybody, we are limited, there are many families isolated from our services. (Saskatoon immigrant service provider)

5.5.6.5 Summary Reflections on Health Promotion Program Supports

Participants' comments highlight that there is a demand for culturally competent, experiential, health promotion programming based on the central idea that ethnic diets can be healthy, and accomplished through strategic partnerships. Culturally competent healthcare services have been shown to increase health system efficiency, client satisfaction and improve newcomer health outcomes (Brach & Fraser, 2000), as well as build bridges between traditional beliefs and practices with those of Western medicine (Renfrew et al., 2013). Research has also demonstrated the importance of partnering with the immigrant community in the development of successful health promotion initiatives (Andrews et al., 2007). Not only does the collaborative process engage community members as true partners in the process, which serves to strengthen the focus on cultural relevance (Israel et al., 2005), but it can also contribute to program sustainability through accessing resources from several partner organizations. This process can lead to the establishment of long-term partnerships, which are the basis for successful population-based intervention strategies.

5.6 Main Theme 3: Physical Activity Limitations

Sub Theme	Interviewee Type				
	Healthcare provider	Immigrant service provider	Policy maker	Immigrant	Refugee
Limited awareness of sports and leisure activities	9	7	0	5	5
Impact of culture and gender on physical activity	4	7	1	6	3
Desirable and usual physical activity for newcomer children	7	7	0	25	18
Safety, security, weather and transportation barriers	14	17	0	23	19
Sedentary lifestyle and technology trends	2	5	0	8	10

*Each individual occurrence of data extracts coded to sub themes across the data set stratified by interviewee type

5.6.1 Desirable and Usual Physical Activity

5.6.1.1 Boys' and Girls' Activities

Newcomer families often expressed a desire to have their children involved in sports and activities that are typical in their cultures. Many children, primarily boys, mentioned playing soccer with friends at school or near their homes. In contrast girls more commonly engaged in quieter play and participated in cultural dance activities.

...soccer, cricket are 2 good activities. In the school field by our house...there are so many kids to play...my son he plays outside and he bought a new pair of roller blades so now he tries his best on them and they play cricket in the playground...behind our area. (Saskatoon immigrant)

The children play soccer most of the time...There are about 26 refugee families from Bhutan so the eldest son plays with the other kids from those families in a team. Eldest son is 20 years old and more organized so he plays in a team, but the middle son is 10 years and he just plays outside the home, doesn't go too far. (Saskatoon refugee)

...sometimes plays outside, sometimes no, she wants to play with her toys, quieter play. (Saskatoon immigrant)

I was doing baton twirling when I was young in the Philipines and I do some dancing. Dancing I do sometimes with our youth group. It is a Filipino youth group in the Catholic Church. We go sometimes to Winnipeg to dance with the group. (daughter of Regina immigrant)

5.6.1.2 Organized Activities

Many newcomer families and service providers mentioned the central role of the school

in providing opportunities for physical activity, while a few immigrants with higher incomes placed their children in organized sports and leisure programs.

Physical activity is a big problem. The only physical activity they get is at school if they have a gym class. What I wish is gym class was for everybody from daycare until grade 12 as part of their academics, they would get an hour of physical activity a day. (Regina healthcare provider)

I think everything is available in the school, like studying, playing games, extracurricular activities, everything is there so I am satisfied from there...In school they are participating in soccer and different activities, basketball, etc. Not on any teams right now. (Saskatoon immigrant)

I have a long list, soccer, highland dance, archery and riflery occasionally...I am in track and field, cross country running, swimming lessons occasionally, I bike outside a lot, walking or biking or roller skating to school...Hiking during the summer...I have a Wii downstairs, I have Outdoor challenge, extreme outdoor challenge, Wii Fit and a bunch of other active games, which is why I prefer a Wii...I did climbing once or twice a week in the winter. I climb trees now...We all went cross country skiing this year. We have soccer tonight. (daughter of Regina immigrant from US)

5.6.1.3 Use of Public Recreation Spaces

Some newcomer families occasionally go to parks or leisure centres to go swimming or play sports as a family.

I take them to the park sometimes when it is nice outside when they can play, ride a bike or play something over there, take a ball with them and then play over there. In the winter I take them over there to slide. (Regina refugee)

Sundays my Dad...drops us off at Lakewood Civic Centre and we get to pick swimming or basketball and every time we take turns because I like basketball and he likes swimming for about 3 hours. (son of a Saskatoon refugee)

5.6.1.4 Role of Cultural and Religious Organizations

Some immigrant service organizations and ethno-cultural groups provide youth programming that includes physical activities.

Open Door ...the youth programs they were offering, me and my sister mostly got into that, she even volunteered. They have so many youth programs...canoeing, really fun stuff they offer, teach you rowing for free and cooking classes, playing some sports, doing dances like hip hop. (daughter of Saskatoon immigrant)

...they have an evening class for 2 hours at the mosque...At the mosque they learn religion, praying, reading and after a half an hour they play together, may be 25 children, they play for half an hour so they don't have to stay home to watch TV. It is good for them. (Saskatoon refugee)

5.6.1.5 Summary Reflections on Desirable and Usual Physical Activity

In alignment with participant comments, some Canadian research observed that recent newcomer children are less likely to participate in sports (32%) than Canadian-born children (55%) (Clark, 2009). Although more newcomer children participate in the more internationally popular sport, soccer, participation by recent newcomer children (10%) is lower than among the Canadian-born (23%). Cost is likely a barrier to participating in sports for recently arrived immigrant families who have limited financial resources (Clark, 2009), which is consistent with participant comments in section 5.5.3 Poverty and Income Challenges. Furthermore, there is a concerning trend to reduce high school physical education classes to make room for more vocationally orientated classes in the curriculum (Dollman et al., 2005) when many newcomer children depend on school activities for their physical activity.

5.6.2 Impact of Culture and Gender on Physical Activity

5.6.2.1 Culturally Foreign Concept

Organized physical activity is a foreign concept to some newcomers when they first arrive in Canada. Newcomers come from a variety of circumstances where they may have been physically active over the normal course of their day or from an already sedentary lifestyle, but

only newcomers from the United States, Western Europe and Latin America mentioned regularly engaging their children in organized physical activity.

...children...in their home countries...physical activity is not like organized, it is spontaneous... in Africa you don't necessarily have to consciously go and do physical activities, the environment, the climate, the social activities like working, going to visit here, going there, it's enough exercise. (Saskatoon immigrant service provider)

...the health benefit of being physically active, sometimes culturally that is a practice that is a new concept for people. If they have been involved in being very physically active just in the course of surviving their day or, getting access to food for their family, the idea of going for walk for exercise is something new. (Saskatoon healthcare provider)

I don't really do anything unless it is school stuff. (daughter of a Regina immigrant)

That is the regular lifestyle...they stay at home after school just like in the Philippines also, from school then to the house, they don't go in the neighbourhood, they don't go anywhere else. They didn't walk to school in the Phillipines, they got driven, there was a service that would pick them up and take them home. It is the same here, her dad drives her to school because she doesn't yet have car. (Regina immigrant)

5.6.2.2 Gender Limitations

Some cultural norms limit women's and girls' participation in activities, such as swimming in an area with men present. However, one participant noted that could be changing for some families. Another gendered impact related to access to physical activity for newcomer children centres around newcomer women not having a driver's license. Although many women mentioned they were in the process of getting a driver's license, their husbands usually had one already. In order to get to organized physical activities children often need transportation, which can be a challenge if they are dependent on the father to drive them when he may be working multiple jobs.

They (children) know already how to swim. Only me I can't. They are swimming by themselves...I just watch them, don't go in. Usually men and women don't swim together...I might go if only women are allowed, not a problem...I am not sure 100%, but it looks like my friend's girl goes swimming Saturday or Sunday sometimes, even now that she studying high school, she doesn't have school some Fridays and I see many

times she goes swimming. I didn't ask yet how it is if she is with men or girls, I didn't ask yet. In our country it is not with a man, but in here I am not sure. I have only boys here. (Saskatoon refugee with only male children)

It's harder for some women of certain cultures/religions to be physically active simply because of the cultural role that they play, the religion they belong to...in some of these households you can't go to the gym or can't go to an aquacise class or you can't participate in a walking program because it's just not done...a lot of Muslim women I see are very overweight, and sedentary so they are like time bombs, something is going to happen to them. Selfcare...is not something that is given a high priority. (Saskatoon healthcare provider)

...their mother is not knowing how to drive, now she is learning driving so I am everything for them. (Saskatoon immigrant)

5.6.2.3 Summary Reflections on Impact of Culture and Gender on Physical Activity

Consistent with participant observations, perceived social or gender norms may be impacting physical activity among some ethnic groups. A qualitative study found that perceived American norms related to biking and dancing, activities that families normally engaged in in Mexico, were barriers to their participation in these activities in the United States (Colby et al., 2009). This study also linked low participation in organized sports with not being accustomed to being involved in organized sports and low Latino representation on sports teams. Female immigrants from the middle-east have been noted to be subject to specific limitations regarding participation in sports activities (Kahan, 2011). In this study, female participants shared that they were not allowed to participate in sports that involved wearing shorts or to swim in public pools. There is a variety of intersecting economic, social and cultural factors that can serve as barriers to participation in physical activities.

5.6.3 Safety, Weather, Transportation and Schedule Barriers

While many newcomer parents recognize the importance of physical activity for their children, they described many challenges to ensuring their children are physically active.

Newcomer parents often have a demanding schedule involving work and English classes, and do not have sufficient resources to address challenges associated with engaging their children in organized physical activities. Sometimes parents' demanding schedules combined with safety concerns leads to children staying in the house watching television. Overall, newcomers from countries outside of the United States and Europe are often struggling to integrate into a foreign culture and job market to meet their families' basic necessities, so engaging their children in physical activities has not emerged as a priority in the early years of settlement.

I don't drive so I cannot take my kids to different activities...Taking them to physical activity is something we need to be acclimated to and I am still taking classes and my husband is busy too and it is some sort of sad thing that we cannot give time to the kids as we are struggling ourselves to finish up the classes. We don't have time to take them places and waiting for the bus is not easy...here in Canada the winters are so long like if we cannot take them out for other activities they have nothing to do outside, that is what is happening with most of the immigrant and refugee kids who came to this cold place. It is too cold and most of the parents cannot drive. (Regina refugee)

The weather is so extreme here we feel it is difficult to go outside and move. It is difficult for me to take the bus. Because my son was putting on weight we decided to take him to the MEND program, but the weather was so harsh those days so I could not continue the program. We went once and I would be willing to continue this in summer. (Saskatoon immigrant)

In winter they don't play outside. We don't allow them to play outside in winter because of the snow...In winter I am a little concerned about the kids getting their legs fractured. (Saskatoon refugee)

...the feedback I got was that they would not be interested in any group programming during the winter months. (Regina healthcare provider)

So the weather is going to keep you indoors more in the winter, but she plays indoor soccer so that meets her needs. (Regina immigrant from the United States)

We ask him to stay all day in the house and sometimes just go out sometimes a few hours. Most of the time they are in the house, I have no time to go out with them. If we are at home then we allow him to go outside and play around, but if we are not home then they stay all the time inside the house to be safe. (Regina refugee)

Not everything is safe...Sometimes we hear (things) on the news...so we don't go outside. They tell us that at school, make sure you listen to the news before we go outside to see if it is safe. (Saskatoon refugee)

Saskatchewan holds a special place among Canadian provinces as we endure some extreme winter weather conditions that, combined with limited public transportation options, mold physical activity patterns. According to study participants, with their busy schedules they do not have time to wait for buses, nor do they want to be subjected to the cold weather to take their children to optional activities. In alignment with participant comments regarding their busy work schedules and keeping their children in the house to ensure their safety when the parents are at work, a Swedish study reported that immigrant children tended to watch an abundance of television when their mothers were at work (Babington & Patel, 2008). The 2015 ParticipACTION Report Card on Physical Activity also reports that Canadian parents are increasingly keeping their children inside to keep them safe from harm (ParticipACTION, 2015). Saskatchewan's climate and newcomer families' living conditions intersect to create many challenges with accessing physical activity programming.

5.6.4 Limited Awareness of Sports and Leisure Activities

Language difficulties and lack of knowledge about how organized physical activities work in Canada are barriers to engaging newcomer children in physical activities beyond activities organized by schools. Even when newcomers make the effort to seek out opportunities to engage their children in physical activities, they do not always fully understand how to participate. Some immigrant serving agencies have developed programs to help newcomer families develop an awareness of community activities. In contrast to the experience of many racialized newcomers, immigrants from Western countries did not note any difficulties with finding activities for their children.

Newcomer families are not aware of organized activities here because some parents don't speak and read English and don't understand how to find out what is available in the

community...They have no ideas and just go work, work, work and not having time to find things that are available for the children, unless the children are going to school and play and have the chance to do things in school. (Regina immigrant service provider)

...my son likes to join karate or tae kwon do. He really loves that. Haven't been able to do that yet, not any idea about those kind of activities, where is it, how can you find it? (Saskatoon refugee)

...if they ask me to do something I can't find anything for them. At Cosmo I had the leisure card last year, but I didn't know how to use the card, but it is expired. They can go for any program, but I don't know really. Some of the programs have a cost so would be hard to afford. (Saskatoon immigrant)

...family fun and fit program (at Global Gathering Place) is every weekend and it is for single people and the whole family, take people to sporting activities, recreational events, cultural activities in the community to introduce our clients to what there is to do in the community with the hope that then they could access those on their own, or if cost is a barrier then they can have the experience. (Saskatoon immigrant service provider)

I had good friends and they told me about the leisure guide and the internet is helpful. (Regina immigrant from Germany)

Whether newcomers are able to find out about how to access physical activities for their children may depend on their connections with established residents of the area or immigrant serving agencies that offer recreational opportunities. This issue relates back to the need for newcomers to rebuild their social support networks in Canada highlighted in section 5.5.5 Newcomer Population Growth.

5.6.5 Sedentary Lifestyle and Technology Trends

Similar to Canadian children, newcomer children are drawn to sedentary activities like playing video games or watching television. Many participants note the links between technology use, snacking on junk foods, lack of awareness of the dangers of screen time and using television as a caregiver. A combination of factors such as cold weather and safety concerns that keep children inside, parents' demanding work schedules, and the pervasive

availability of technological entertainment devices appear to set the stage for the development of sedentary lifestyle habits among newcomer children.

All the children like all these kinds of video games...they do not do enough physical exercise. That is a big concern for us...when we are not home they play on video games all day and they can stay all day doing that...I don't think they will have the growth of the brain...We always encourage him to go out and play. As soon as I came home I asked him to give me that video game and go out and play and he did...how we can change this technological thing into a physical game. (Regina refugee)

In winter they are sitting down, one is on the x box, another one on the computer or mobile. I bought a tablet and I noticed both of them were just sitting down for the tablet then I returned it...because I noticed they didn't want to get up from that one all the time both of them sitting down, sitting down...in winter they can't do anything outside so they are sitting down on the TV or x box so it is really bad for them. (Saskatoon immigrant)

...we are getting into the screen time too much with ipads...We have computer games and TV and children sitting there eating junk food so kids are getting obese now. It's lack of awareness, we don't see it that way where I come from, they think that's OK, my child is OK sitting there watching TV learning something, they don't see it like screen time not good for kids...Also for some families the screen time television is, if the husband and wife are working in the day time, and in the evening...so the children are sitting at home, not to go out and to be safe at their home...they leave the television on. (Saskatoon immigrant service provider)

In recent times there has been a sharp increase in the availability and use of electronic and screen-based entertainment, especially in higher income countries (Active Healthy Kids Canada, 2014). Western adolescents may spend between 5 and 8 hours per day on electronic entertainment (Biddle et al., 2004; Sturm, 2005). In Canada only 24% of 5 to 11 year old children meet Canadian Sedentary Behaviour Guidelines for Children and Youth (ParticipACTION, 2015). Newcomer children's use of electronic entertainment appears to align with Canadian children in general.

5.7 Main Theme 4: Barriers to Healthcare

Main Theme 4: Barriers to Healthcare					
Sub theme	Interviewee Type				
	Health care provider	Immigrant service provider	Policy maker	Immigrant	Refugee
Difficult access to health benefits	25	29	0	21	17
Limited awareness of healthcare services	3	2	1	5	1
Gender and cultural concerns	16	23	3	6	1
Health attitudes and beliefs	14	20	2	1	0
Health care service limitations, stigma	10	5	1	11	8
Interpreter and translation Issues	16	21	4	1	9
Language difficulties, low literacy	27	38	6	7	14
Navigation difficulty	31	27	1	23	19
Work, school, childcare, transportation demands	21	22	2	4	4

*Each individual occurrence of data extracts coded to sub themes across the data set stratified by interviewee type

5.7.1 Navigation Difficulties

Overall, the greatest barrier to accessing healthcare services appears to be health system navigation difficulties according to responses from both service providers and parents.

Participants talked about difficulties with understanding how and where to access care, as well as problems with how the health system interacts with patients, which creates confusion and delays.

5.7.1.1 Referrals/ Specialist Care

Some newcomers experience difficulties with following through with referrals as they may not fully understand the process or recognize the importance of the appointment, and the healthcare system does not always fully explain the process for following through with a recommended appointment, which results in fragmented care. The healthcare system does not always recognize or empathetically respond to the additional challenges newcomers may face when trying to access care. In addition, some immigrants are used to having choices about which specialists to access in their countries of origin and struggle with accepting the specialist referral system in Saskatchewan.

...(an individual) was having some gastrointestinal problems...she was referred to see a specialist...she was not able to connect and she ended up back in hospital, 2 or 3 times

she was back in the emergency department, but nobody seemed to move away from that paper based system. Someone could pick up the phone and could call and say you need to see this person, what's the appointment, write it down for the lady, make sure she had instructions and knew how to get there...Either she wasn't aware of who she was supposed to see, she was waiting for that letter to come, and I think there was also a move involved there as well. (Saskatoon healthcare provider)

And also for coordinating care, even if a patient comes with a translator in my office, you still need a translator to go with them to do the blood work, do the chest x-ray, go with them to see the counselor, etc. and that doesn't necessarily happen. So there is that coordination that gets lost when people have to go to different places for health care. It would be nice to have a 1 stop shop to be able to do all these things in 1 place with good translation services available. (Saskatoon healthcare provider)

...if there was a (health) need and someone will not understand clearly they will not follow through or sometimes may be the hospital will make a call, 'Oh you need to come to the clinic and they may not take it very seriously and I can go anytime I like' and they go at a time they want and they are not taken care of. Also not enough counsel, when you are called to come for surgery...surgery is a big deal, so just calling and leaving a message that you need to come this day for surgery, some people panic and they don't go. (Saskatoon immigrant service provider)

...if it's not just the GP they are going to see it can be difficult to articulate why it's important and what the benefits are if they do go and what they are trying to help with...if they are a newcomer...you get the same kind of basic spiel as someone who has been going to the dentist every year for 50 years. (Saskatoon healthcare provider)

That doctor referred me to an obstetrician when I was pregnant. This was not the system in our country, in Pakistan I didn't need to book an appointment before, because whenever we feel fever we go to doctor, obstetrician or anything, we didn't have to book an appointment for 15 days (in advance). Here that is the system, to see a doctor you need an appointment. (In my country) if you are pregnant and you want to see an obstetrician you just go there, because she is good, people say she is a good doctor, we go to that doctor. Here there is no direct entry...when my family doctor referred me to the obstetrician I had no choice. (Saskatoon immigrant)

5.7.1.2 Accessing Appropriate Healthcare Services

Many newcomers experienced situations in which they did not understand where to go to access appropriate care for specific health issues. Although they often received care, sometimes they went through several unnecessary steps because they did not understand how to access the most appropriate healthcare service or they went to emergency departments for care that could have been provided by a family practitioner. In some cases newcomer families may be accessing

emergency departments because their language difficulties prevent them from easily accessing other after-hours services. Even an immigrant from the United Kingdom experienced some frustration with navigating the healthcare system, although she had the language skills to cope with the situation and seek out appropriate healthcare services.

We called our doctor's office and she said we can't see you right now, it will be 8 days and we said it was an emergency so we thought we could just go there because it is an emergency... My arm got broken at the night and I can't wait 8 days, but in the morning we just went to the family doctor's office and they sent me to the walk in clinic, then to x-ray, walk in clinic and they gave me a sling. (son of Saskatoon refugee)

They (newcomers) go to emergency despite us telling them our services are 24/7, we have a doctor on call after hours, but the problem is they don't speak the language so how are they going to talk to the doctor after hours. We have 24/7 services here, we close at 5:30, but there is always a doctor on call on the evenings, weekends, holidays to talk to them and advise them what to do until the next day. (Regina healthcare provider)

Also we have that service called 811, health line...A family did get interpreter services, but they asked too many questions so they were in a hurry because my child has a 102 degree temperature, and they are asking all these questions so they say I will call 911 it is better, but we are teaching them no you don't call 911 unless it is emergency. If you can manage it just call 811. The family got frustrated, but they got some translation during phone call. (Saskatoon immigrant service provider)

In the UK you phone the after-hours phone line, phone your own general practitioner and get the after-hours and they would assess you and then send the doctor out if needed. No comparable service here. When walk in center was closed I just waited, decided to delay accessing services because the queues are so long you wait there for 6 hours at Emergency. You just have to phone up the Health line (811) to find out what to do to assess whether it was serious enough. (Regina immigrant from the UK)

5.7.1.3 Miscommunication with Healthcare Providers

There can be communication breakdowns between healthcare services and newcomers due to the way information is conveyed that result in delayed or suboptimal care. Sometimes healthcare providers may not fully understand the newcomer's entire situation or take the time to check with the newcomer's family physician to ensure an accurate medical history, which can have tragic results in urgent situations.

Glucose 6-Phosphate Dehydrogenase Deficiency (G6PD) that's a condition (where) there is an enzyme deficient in the walls of the red blood cell walls so if these people are exposed to certain medications or food like fava beans they could develop severe hemolysis and kidney failure and a lot of people from the Burmese group and Bhutanese group have G6PD, so...we made alert cards for this people...put the names of all the medications they could have trouble with and fava beans, ...and we told them...any time you get medication from a pharmacy, you see a different physician... you have to show it to them...I gave the card to parents who were very young and their child was very sick and end up the hospital and they gave him something, may be prophylactic treatment for TB, the pediatrician gave him something and the kid almost died...they didn't even call and ask me...they didn't show the card to the pediatrician...and he got hemolysis from the medication (Regina health care provider)

I went to the...clinic, someone had an appointment there and I went as an interpreter and then on the way while walking back...to receptionist house...there was a nail and it poked my foot and then I went back to the clinic thinking that they might give me something like a tape or bandage, but they didn't give me anything...I knew only that clinic...the lady said that you have to go to walk in clinic...and I didn't know how to call a taxi cab, I didn't have a cell phone. She could have suggested to me, take a cab or she could have called a cab for me, I could have paid for it, but I didn't know what to do. I asked where can I get it and she said go to Broad street and you will be at the clinic, then I walk all the way...to the walk in clinic...she took me in immediately. I felt... so bad on that day, like not treated right...It was so confusing ...No orientation to the health system, I knew only the clinic...later on that was the first day I knew that we could go to walk in clinic. (Regina refugee)

5.7.1.4 Finding a Family Physician

Similar to many Canadians, some newcomers experience difficulty with finding a family physician. Some newcomers did not understand that a person could just make an appointment to see a physician who was accepting new clients and then she would be a patient of that physician. In addition, it was not only the more vulnerable minority groups who had difficulty with finding a family physician.

On health region website there is 1 doctor... and 2 times I tried to call her, her office talked with me and she was not there, so I didn't try again. I thought I need to talk with the doctor. (Saskatoon immigrant)

To choose a family doctor we went into many offices and one said yes I accept new patients. We walked into the closest in our area where we lived when we came here and many turned us down, but there was one in the south end...that said yes we accept new

patients and we stayed with them. That is how we ended up to find 1 family doctor.
(Regina immigrant from Germany)

5.7.1.5 Summary Reflections on Navigation Difficulties

Newcomers to Canada are often unfamiliar with the healthcare system and need assistance to understand how to access healthcare services. The parents of the child with G6PD likely did not fully understand the implications of not making all healthcare providers aware of their son's condition and probably did not feel empowered to address healthcare providers in that manner. As well, perhaps the emergency department staff could have obtained a better medical history by asking specifically about G6PD, using reliable interpretation and checking with the family physician. Although the refugee who struggled to find care for her foot had a good grasp of the English language, she had some serious difficulties with accessing appropriate healthcare due to not understanding the system, and the system not fully understanding her predicament and how to respond appropriately at first contact. It is not always the newcomers' lack of English language that creates communication difficulties, but sometimes healthcare providers do not take the time to fully assess the client's condition, which results in miscommunication and poor treatment.

In alignment with participants' comments, other research has demonstrated that recent newcomers do not always understand how or where to access healthcare services (Neufeld et al., 2002; Wu et al., 2005; Son, 2013). Settlement agencies and ethno-cultural organizations and networks may play a key role in supporting newcomers' initial efforts to navigate the healthcare system, but some immigrants may not be engaged with these organizations.

5.7.2 Limited Awareness of Healthcare Services

A few service providers and newcomers specifically mentioned that not being aware of available healthcare services is a barrier to access. Many newcomers do not expect that some healthcare services would be available because they are not familiar with them in their country of origin so don't even think to ask. For example, newcomers with special needs do not know about home care services that may be useful to them. Newcomers spoke about relying on family members, friends, neighbours or their settlement counselors for advice on where to seek healthcare when the need arose. In addition, they are very busy with the basic tasks of finding housing and adapting to daily life when they first arrive so they often reported being unprepared for knowing where to seek services when an illness struck the family.

We find that we are trying to work more on getting...name out in the community so people know they can come to us for resources...They (newcomers) just happened to stumble across us and I think we have a had a couple people who have just stumbled across us, coming in for 1 service and then realized we offer multiple services and have come back because of that. (Saskatoon healthcare provider)

Some (newcomer) children have cerebral palsy, 3 girls in the community and they are getting bigger...and hard for the family to carry them around...the mothers have to take care of them at home. The family does not get home care, doesn't even know about home care...Not being aware of service is a barrier. Those parents need to get some information...how do they know? Unless the doctors tell them they don't know forever. Newcomers don't even know to ask. (Regina immigrant service provider)

...when we just arrived I didn't know how to go anywhere and when my family is sick I had to run to Open Door to talk to the case worker. (Regina refugee)

When the newcomer comes here they don't know where they have to go, what they can get for their problem...mostly they are not aware of all these things, until one day they have problem and they start knowing after having the problem. (Saskatoon immigrant)

...we don't have any of our family members or relatives or any family friends when we come to Regina, we had no contacts, it takes time to know your community centres. (Regina immigrant)

...at Open Door they have a better system for the refugees, but not all immigrants go there. So refugee families have access to them, but lots of immigrants don't know where

to go to find health care access for them. Immigrants rely heavily on community members. (Regina healthcare provider)

In order to access healthcare newcomers need to be aware of services, and there does not appear to be a consistent orientation to healthcare services for all newcomers. Previous research has identified lack of familiarity with the healthcare system as a significant barrier to healthcare (Neufeld et al., 2002; Wu et al., 2005), which is also illustrated in participants' comments. While refugees are able to access their case managers to ask for information, immigrants do not get the same service and often rely on other community members and neighbours for information. With no consistent orientation to healthcare services, it is questionable whether everybody is getting the correct information. This suggests the need for protocols regarding the consistent provision of information to newcomers on how to access healthcare and healthcare benefit programs.

5.7.3 Language Difficulties, Low Literacy

5.7.3.1 Language Difficulties

Language difficulties were mentioned by services providers with the same frequency as navigation difficulties and were the third most common barrier (tied with healthcare service limitations) named by newcomers. Service providers described their difficulties with both making appointments with newcomers and having good communication that results in shared understanding of health issues. Communication difficulties can also result in service avoidance when newcomers find it too difficult to communicate with healthcare providers. Some service providers link newcomers' language difficulties with long-term failure of the system to either support newcomers to learn English or respond appropriately by providing services in other languages.

They don't answer the phone many of the times that I phoned them. I just drop in because they don't answer because they don't know what to say because they can't speak. They find it hard to talk on the phone. (Saskatoon healthcare provider)

...get notification of upcoming appointment, but nobody in the family understands that information and makes sure they have that appointment on this particular day and time. (Regina immigrant service provider)

They have to go with interpreter to learn about diet, if they don't they don't understand what to do, they keep eating what they have been eating...If there is a very complicated health issue... high blood pressure, cholesterol and blood sugar, many need help to go see doctor very often... frustrating for families...Especially if they end up to be hospitalized...they can't be alone on their own in the hospital...for our immigrant clients it is hard for them to be alone, not understanding anything. If you don't have lots of family members then it will be hard to have someone at the hospital all day. (Regina immigrant service provider)

A lot of new immigrants they even avoid getting into a clinic because they cannot communicate and that fear of communication makes them stay away from receiving the services. The other thing that I hear very often is, it takes for a person that does not speak English, it takes them time to explain their situation. (Saskatoon immigrant service provider)

...(for) the majority of them there is a language barrier, and the mother, she can't afford, both father and mother to work and children to be at the daycare, we know the cost of daycare. So the mother is insisted, she will be forced, except the 3 hours at the Open Door Society, she has to stay home. And I can't take it, the system we have is not encouraging the mother to go out and to have more time to learn because it's investment to bring those immigrants here. (Saskatoon immigrant service provider)

I ask the health region why can't you create a directory of the physicians that speak different languages so newcomers can go and see them if they need to. OK, and then it doesn't go anywhere. Even having the directory of which physicians speak a second language and asking if they would be willing to take patients that speak that language it can help a little bit. The newcomer population is not enough in focus, for some reason I don't see that. (Regina immigrant service provider)

5.7.3.2 Coping Strategies

Despite the impact that language barriers can have on healthcare, many newcomers stressed how they cope by relying on the assistance of family and friends who spoke English. They seem to accept some responsibility for fitting into the English speaking healthcare system. In addition some newcomers found physicians who can speak their language.

When we were new language was an issue. My brother in law helped interpret for us. Then I started language class. I had to depend on my brother in law at the beginning. (Saskatoon immigrant)

My daughter and husband understand everything and I understand it more or less, a little. We go the doctor together so if I don't understand my family helps. (Regina refugee)

...now still my tongue is still tied, but I understand, may be not everything, but I understand what someone says...It is not easy, but I can make myself. I can't catch everything...sometimes it is hard, it is life. (Saskatoon refugee)

Immigrants find people to help them. Teachers often help clients. They may get a letter from the government that they don't understand so they get the teacher to explain it or they may get the teacher to talk to their doctor. (Saskatoon immigrant service provider)

Someone here before us (from Ethiopia), they show us a family doctor from Ethiopia...It is not that he is good or bad, but his language is close to ours, then he knows my language and I know his language...It is too hard to speak English for me, I don't understand anything, now it is a little bit better, but at that time never. I still go to that doctor and I will never change." (Saskatoon refugee)

5.7.3.3 Low Literacy

Many service providers note that some newcomers have lower literacy levels, often linked to language difficulties, which can impact the effectiveness of health education utilizing printed material. When health information is not relayed to individuals with lower literacy levels in an appropriate way, misunderstandings can result in poor follow up with referrals and poor treatment compliance. Healthcare providers noticed that the typical approach does not always work with newcomers. For example, diabetic newcomers with lower literacy skills may not fully understand how to match their consumption of carbohydrates with their medication dose to maintain a healthy weight and the best health outcomes. Sometimes children develop literacy skills faster than their parents and their parents rely on them to interpret health information. In addition, lower literacy levels make it difficult to comply with reporting requirements for benefit programs available to low income families that contribute to better health.

...82% have a health literacy rate of 2 or below (at an inner city clinic, which indicates) capacity to deal with only simple, clear material involving uncomplicated tasks. (Saskatoon healthcare provider)

...the kids...help with disease management because the medication literacy piece around chronic disease is challenging for people with low levels of English or literacy. (Saskatoon service provider)

They got to change the word on the forms, when it says 'hospitalization' or they call it 'hospitalization card' they haven't a clue. They say I haven't been to the hospital...They don't understand hospitalization card or HSN number...The other thing is many people don't read period, so they might speak the language, so we need to use a spoken word translation. (Saskatoon service provider)

Dependent on their literacy levels even just understanding the different appointments, why they are necessary, especially for referrals...it can be difficult to articulate why it's important and what the benefits are...you get the same kind of basic spiel as someone who has been going to the dentist every year for 50 years (Saskatoon healthcare provider)

I don't know if they get printed material (at diabetes education sessions)...it would be good to include food they can eat if there are visuals for people who can't read and write, visuals of things they can eat and can't eat and the symbols. (Regina immigrant service provider)

She (wife) eats normally, just avoids sweets. The ...nutritionist talked to her about food also, but we forget, only remember eat healthy food, vegetables, milk, sandwich. She takes pills and she needs to check her glucose test...She loses weight all the time because she doesn't want to eat a lot, just eat a little bit to lose weight. (Regina refugee)

...the housing supplement program. Many newcomers join it and the (benefit) will stop because every month they need to do reporting and they don't know how to read, write so if they don't report they don't get that benefit...Services are moving on line, but there are people who cannot access computers or don't know who to read. We need to think about how to provide access. (Regina immigrant service provider).

5.7.3.4 Summary Reflections on Language Difficulties, Low Literacy

These experiences underline the importance of reviewing policies, programs, processes and resource material with consideration given to the needs of individuals with limited English skills and low literacy levels. Low health literacy (Renfrew et al., 2013) and language preference (Renfrew et al., 2013) have been identified as barriers to healthcare access. Especially when programs are being designed to meet the needs of vulnerable populations, it is vital to allow for a variety of communication methods to ensure access by the targeted population.

5.7.4 Interpreter and Translation Issues

Closely linked to language difficulties are interpretation issues, as suggested by both service providers (third most common barrier) and newcomers (fifth most common barrier).

5.7.4.1 Telephone Interpretation Services

Several healthcare service providers stressed how access to telephone translation has been very helpful; however, it is not consistently used or available in all healthcare facilities. Both the Regina Qu'Appelle Health Region (RQHR) and the Saskatoon Health Region (SHR) have policies that support the use of telephone interpretation services and staff volunteers when needed; however, it is unclear whether it is consistently used in all departments. In addition, private practice physicians are not able to access this service. From the perspective of newcomers, although phone interpretation services can be useful, there are limitations.

The health region subscribing to the language line was a huge one because really public health nurses would not be able to do their job effectively; I wouldn't be able to help these folks very well. A lot of the SHR services rely on this and unfortunately physicians' offices don't have this service. (Saskatoon healthcare provider)

Saskatoon health region employees can use it (phone interpretation service)...like I use it all the time, but I find people don't know about it so they don't use it. (Saskatoon healthcare provider)

There are cases where clients are denied services because of language even though there is this access to language line. I have some documented cases, but it probably happens much more. It is only available to health region staff in health region facilities. Some clinicians don't understand, they are in that region, but they need to be in a regional facility. Hospitals are covered by that, and various programs are covered by that; private clinics are not. (Saskatoon immigrant service provider)

...for us we didn't know about it until just recently that we have that opportunity to do that (use phone interpretation). RQHR subscribes, but there is the cost factor. We have a policy on how to use it...That is a well utilized line. Because it is different divisions and we all have our own budgets it just gets accessed (as needed), each division has their own contract. The RQHR is supportive, it is so easy and it has worked when we utilized it to make sure the client was aware of the immunizations and side effects for the child. It's a

nice one to have easy access...if they have someone we can talk to, a family member we can call we would rather do that because then it is a family member and they will be able to explain it much better, but if there is nobody available then we call that line. (Regina healthcare provider)

I find lots of walk in clinics and even in the hospital we don't use the resources that exist for finding translators. Either people think it's too long (a wait) or it costs too much money and they don't know where to access the services so that is a big problem. (Saskatoon healthcare provider)

Once I took my child to university hospital and there was an interpreter available by phone and the phone got disconnected and it would be easier if the person was available right in front of us. (Saskatoon refugee)

5.7.4.2 Access to Appropriate Interpretation Services

Many participants talked about difficulties with accessing appropriate interpretation services. Although refugees are able to access some Citizenship and Immigration Canada (CIC) funded interpretation services for healthcare appointments during their first year in Canada, immigrants do not share this benefit. Newcomer families often recounted how they try to cope with interpreting for family members' appointments. Sometimes children learn English faster than their parents and are relied on as interpreters for healthcare appointments, which is not necessarily appropriate for the child or the parent's care.

...they have to rely on family members or community members to translate for them and you can imagine how difficult that can be if you are trying to talk to a woman about birth control or trying to talk to a man about some delicate subject and they have a translator that either they don't know or they are related to. (Saskatoon healthcare provider)

Immigrants are not getting interpretive services, even refugees are only getting the service their first few months, after that there is no service available. We have volunteers that are paid a little bit to help with interpretation (for refugees), but that is only available for the first 6 months while they are going through the health partnership. (Regina immigrant service provider)

...the first year CIC will send a translator for a couple of visits the first year; after that those people are on their own and after a year, even 7 years later, I have tons of patients who don't speak English. (Regina healthcare provider)

Mostly doctor things she finds it really difficult because there are really scientific words. Sometimes she calls her friend to go with her or my dad because he knows pretty good

English, sometimes she takes me (son). This makes it too hard to access health care. She feels really shy with someone translating for her, she feels embarrassed. Sometimes things are very personal and not comfortable with a translator. (son of Saskatoon refugee)

Our family we have to manage...Hospital did not offer any help with interpreter... Sometimes it is very hard with appointments for everybody, I have to go to work, even my brother went, my wife is busy with the kids and she can't speak better English, it's a problem that nobody helps in the appointment, we don't have time to take, so for that if you can't speak English, can't go alone. I had to take time to do it. (Saskatoon refugee)

...they often use their older children as interpreters, which to me is not the best case scenario. This is a little bit problematic; for example we have a grade 8 student, her mom had to go to the doctor and she recently had a baby and has some personal medical things and so she doesn't feel comfortable there without family so she takes her daughter with her all the time. She pulls her out of other things like school to go to these appointments to help and I don't know if it is always in the best interests of the child for them to be in medical appointments and hear it all. (Saskatoon healthcare provider)

(child interpretation) can create psychological impact in the family, if the close family member knows some fact on health of mom or dad, so as an organization we discourage the use of close family member as interpreter. (Regina immigrant service provider)

(sometimes) translation doesn't go well and this is important medial stuff so it is challenging. I see the dynamic of a child that is 10 who comes with the mom to translate for the mom and they fight because the mom thinks he is not saying the whole thing and we don't accept that anymore. (Regina healthcare provider)

Children are acting as interpreters as well as navigators, cultural liaison; they are having to explain to providers beyond just language, this is something different for us. (Saskatoon immigrant service provider)

5.7.4.3 Poor Interpretation Services

In some cases the interpreter understands the language and is able to literally interpret, but does not share the same cultural understanding as the client and misunderstandings arise. Some newcomer children who grow up here don't develop some of the complicated cultural nuances of their language, which inhibits them from being effective interpreters. For example there was a case in which a newcomer went to the doctor with a concern about swollen joints using language that did not seem to make sense to the interpreter or the doctor as the word being

used was literally translated to mean 'tiger'. In addition some interpreters may not correctly understand their role to interpret exactly what is being said.

...in our language it is called 'sin bage', if you say in direct translation to English, 'bage' means tiger, and they went to the hospital and the doctor asked what happened to the person and the person say to the translator 'sin bage' and the translator did not have enough knowledge...and he just translate 'tiger' and doctor was surprised, he was not understanding...Swollen we know in our terms...to describe and give symptoms in medical terms it is very difficult. (Saskatoon refugee)

...they can't interpret into their own language because they forgot their language...Because when they come to Canada for several years they went to school and learn more English; they are expert in English now the children, but they cannot explain back to the parent. Like my 2 daughters, the oldest one is very good to interpret things, but the youngest one no, complicated things, she can't do that. (Regina immigrant service provider)

...sometimes I feel what I am asking the interpreter to interpret may not always be happening...I can tell they are imposing their beliefs on the clients...I was counseling someone regarding diabetes and trying to talk about...carb counting, but the interpreter instead was saying 'no sukra, no sukra', and I was not wanting them to avoid all sugar...He oversimplified it. (Regina healthcare provider)

In the hospital often there are volunteers, but I found this wasn't working so I called MCIS (phone interpretation). Sometimes they are not health care trained or even trained so you have to tell them what to do a little bit, but some are very good, it varies by language. (Saskatoon healthcare provider)

You don't have a formally trained health interpreter program, certainly not in Saskatoon and I don't believe in Saskatchewan too. It's a challenge to have the right formal training. (Saskatoon immigrant service provider)

5.7.4.4 Poor Outcomes

Lack of access to an interpreter or poor interpretation can also lead to delayed healthcare access, inappropriate treatments, poor health outcomes and ethical dilemmas. Some newcomers may not be able to access specific services, such as domestic violence groups, or have potentially unnecessary surgery due to poor interpretation. The availability of quality interpretation services in the provision of mental health services to ensure accurate assessment has been emphasized. There was also the sad case of a little Ukrainian boy who died in Saskatoon a few years ago.

Although the Ukrainian community helped the family, they were not supported by an interpreter at the hospital at the time of death so there was confusion about what was going on.

A mother who barely speaks English language will think twice before going to see a doctor. She has to find an interpreter first so she may not go to the doctor unless the child is so sick. (Regina immigrant service provider)

...in domestic violence...support groups, some clients can't participate because of language barrier. I have been told by some that it is disruptive to have an interpreter present during a support group. So there is a gap for those clients to access a support group in their situation. (Regina immigrant service provider)

I sent my mother in law with an interpreter for her eye appointment, then the doctor said that her eye has to be operated...I requested can we see her another check up...The second time I went with her, he said that she had nothing, her eyes were fine. It might have been there was some sort of...misunderstanding between the interpreter and the client...thereafter I always trust it would be good to have something where the patient could explain her difficulty with the doctor, rather than using interpreter so I am always concerned. How can we make the people rise to the position where they can explain their sickness to the doctor. (Regina refugee)

When we do it face to face the (psychiatric) doctor can read even the facial expressions and body language it is better...the doctor was talking and I was interpreting for the patient and he said this is the first time I saw her talking to somebody... before only her husband was telling me...when the doctor saw how she was interacting with me he said it made a big difference on how to prescribe the medication...Her husband was not actually translating, just speaking on behalf of her...When she is talking in Bengali language to the interpreter the doctor can read all the expression of the body language and (it) helped his assessment. (Saskatoon Immigrant service provider)

We lean on people to kind of merge and become Canadians, sometimes we forget that officially we do have another culture and sometimes we forget people, when they first come, are not Canadians. They are immigrants that have very little family support here, they may speak some of the language on the job, but they don't always understand the context so if they are in a healthcare situation and are asked a question they might understand the words, but not the context. (Regina policy maker)

5.7.4.5 Summary Reflections on Interpretation and Translation Issues

The types of interpretation issues noted by newcomers and service providers underscore the growing importance of using medically trained interpreters to overcome interpretation difficulties. Juckett and Unger (2014) have reported that the use of professional interpreters is

superior to the common practice of using family, friends, or untrained staff as interpreters. According to this study the use untrained interpreters increases the risk for errors, violation of confidentiality, and poor outcomes. In addition, they recommend that children should never be used as regular interpreters, except in the case of emergency. The availability of trained interpreters in many of the above situations shared by newcomers and service providers would likely have better supported newcomers to experience improved health outcomes.

5.7.5 Difficult Access to Health Benefits

When newcomers arrive in Saskatchewan they are covered by a variety of federal and provincial healthcare benefit programs depending on their permanent resident status and the role of the federal government in their sponsorship process.

5.7.5.1 Saskatchewan Health Card

All newcomers with permanent resident status are immediately eligible for a Saskatchewan health card upon arrival in Saskatchewan. This card provides full access to physician, diagnostic and hospital services. It may take a few weeks for permanent residents to receive their health card in the mail so they may be limited to accessing care from primary healthcare sites and emergency departments until their card arrives. Refugee claimants or individuals who are here on a temporary worker visa or visitor's visa with plans to transition to a temporary worker visa may have to endure some additional processing time to get a health card. In addition temporary workers can experience some gaps in health card coverage when their visa expires. Although there are gaps in Saskatchewan Health card coverage for some individuals due to visa issues, the Ministry of Health appears to expediently process applications from permanent residents and refugee claimants.

...for a while I am a good fit for them because if they don't have a health card yet...it doesn't matter to me. Once that health care comes it is much easier for them to access any walk in clinic...Until they get their health card sometimes that is a bit of an issue for some people because they just don't want to deal with the paperwork involved in recovering payment. (Saskatoon primary healthcare provider)

We were not permanent residents when we arrived and they gave us a letter to use to access health services temporarily for 2 or 3 months and then the health cards arrived and they are good for a year and then they send us a new one. With the letter we could go see whatever doctor we needed. (Regina refugee claimant)

Temporary workers get health cards. Sometime spouses don't have status when they come...They give them a visitor's visa, which they should not have done...a visitor's visa with a long...period of time and tell them to go apply from there. She doesn't have any coverage, the children are not covered. (Regina immigrant service provider)

I met a temporary worker and unfortunately his permit was expired and he was waiting for the application process (for) a new permit and...his health card was expired...his application was in process. He could only go to Emergency, which is not a good use of Emergency; they can't deny him access, but they can bill him if they provide service. (Regina immigrant service provider)

5.7.5.2 Interim Federal Health Benefits

When government-assisted (GA) refugees arrive they are eligible for Interim Federal Health Benefits (IFHB), which includes a number of covered health services and products for a 1 year period in addition to the universal health benefits available to everyone in Saskatchewan. IFHB includes coverage for medical supplies and appliances, prescription drugs, hearing services, dental services, optical services, basis eyeglasses, chiropractic services and medical transportation. However, due to the recent IFHB policy changes and court challenges around eligibility for IFHB some healthcare providers were reluctant to provide covered services during the study period. Service providers described how they had to find service providers who were willing to work with the IFHB billing process. Some service providers went beyond expectations and assisted with the purchase of prescriptions that should have been covered under IFHB. In addition, some refugees do not fully understand the IFHB services and end up regretting that they did not use the service when it was covered during their first year in Canada

or receive an unexpected bill at the end of an optometrist appointment for the tests that are not covered by IFHB. Although IFHB appears to cover a fairly comprehensive package of healthcare services on paper; in practice it appears to be much more difficult for GA refugees to understand the services available to them and where they can actually access the services.

Now the government has been very confusing saying who is covered, what is covered exactly. Providers are so confused that they think no one is covered and so lots of people, even though they do have coverage have been refused access to care in either pharmacies, walk in clinics, for different types of service. (Saskatoon healthcare provider)

What I did, I just paid for it myself. I went to the pharmacy and if things came up that weren't covered this is my donation. You need eye drops and can't afford it. Is there any coverage? Well no because the government has not paid us back what we have given to clients. Until the government pays us back we are not prepared to give anybody any medication at a reduced cost, so I just paid for it. There is lack of coverage for prescriptions so I paid for it. (Saskatoon healthcare provider)

There are some dentists and pharmacies who are reluctant to do IFHB work because of the paper work and uncertainty of getting paid and the time it takes to get reimbursed for payment. (Saskatoon immigrant service)

Some pharmacies don't want to deal with the government paper work...the health facilitator at Open Door... finds...which pharmacies are accepting the IFHB paper and...when clients need to use to submit their prescriptions, they just go to the one that accepts IFHB papers...there used to be (a dentist)...we sent clients there, but they are not accepting IFHB now. Now the health facilitator found another (dentist). (Regina immigrant service provider)

...we had IFH coverage, it covered benefits. They said that it was just basic services, and until now I haven't done my eye check-up. So I would have gone, they could have said that you could go because from my understanding it is covered through IFHB,...but I didn't know that until I started working as a healthcare facilitator...They said it is especially for the kids and elderly people so we thought it might cover them, but not adults, but it usually covers for all. (Regina refugee)

Government sponsored refugees...will have very limited dental and very limited optometric. If they want to do check-up for their eyes they have to pay \$58.40 after they finish their check up, they are paying part of it, what IFHB is not paying. (Saskatoon immigrant service provider)

5.7.5.3 Provincial Health Benefit Programs

Newcomers frequently spoke about their concerns with accessing health services that are

covered by provincial health benefits programs for individuals with lower incomes (second most common barrier) such as Family Health Benefits and Special Support Program for Drug Coverage, while service providers did not seem to be as aware of these barriers.

5.7.5.3.1 Refugee Perspective

After 1 year GA refugees who are not employed may continue to receive income through the Saskatchewan Assistance Program and similar health coverage will be maintained through the provincial Supplemental Health Program. Alternatively, GA refugees may start to work; however, they may still be living on a low income and could benefit from Family Health Benefits or Special Support for Drug Coverage, but in many cases they are not aware of how to access these programs. Family Health Benefits supports low-income families by providing coverage for common children's health services and some adult health services. Children's coverage includes most dental services, annual eye examinations, basic eyeglasses, ambulance, medical supplies, chiropractic services and prescription drugs. Eligibility for Family Health Benefits is determined through an income test based on the most current income tax assessment. Families who are already receiving the Saskatchewan Employment Supplement or the Saskatchewan Rental Housing Supplement are also deemed eligible for Family Health Benefits. Families with high drug costs in relation to their income can also apply to the Special Support for Drug Coverage Program in order to receive assistance with drug costs.

Although Family Health Benefits cover many children's health services, this level of coverage does not extend to adults. While some refugees are well supported by case workers to access health benefits, not all refugees experience a smooth transition to Family Health Benefits. Some refugees are not prepared for the abrupt loss of Supplemental Health, and may experience financial pressures from high drug costs or serious difficulties with accessing dental care for their

children due to misunderstandings about how to access Family Health Benefits. In addition, sometimes provincial health coverage programs appear to be insufficient for individuals on low incomes who require high-cost drugs. Families with high drug costs may be accessing all available provincial health coverage programs and still spend a substantial portion of their food budget on prescription drugs, which is likely to negatively affect their nutritional status.

...the Family Health Benefit...helps the children...Saskatchewan does have a good program...the children qualify for some kind of care, but for the adults the eye care, dental and all those things are very basic coverage. (Regina immigrant service provider)

...our case worker showed us a lot of service providers, and health care and...we applied for Regina Rental Housing that includes health benefit plan... From that time we are getting some benefits that cover some drugs for us...Open Door worker helped us apply for Family Health Benefits. From that time we have not paid anything much...And the dentist for (daughter) is covered, they did it for free. (Regina refugee)

Initially...we were guided by the Open Door Society, now...we are not new we have been here for a long time so we need to be able to do by ourselves...but I do not know how to apply for Family Health Benefits. (Saskatoon refugee)

...when I was on social assistance no big charges sometimes when I buy drugs, \$1, \$2 or \$3, it is good. But I start to work...and after that whatever I have to buy I pay full charge. I didn't know about Family Health Benefits. When we were on social assistance we paid \$2 for whatever the medicine...now I have to pay for the amoxicillin for \$20 or \$40...no more supplementary health benefits. (Saskatoon refugee)

I don't know the system...according to my understanding those who are below 18 get free medical...but I don't know which place is free for children...and I went to every place I know. Even I took the first tooth and I pay \$200 for 1 tooth. I saw that one (family health benefits) on the computer for (those with income under) \$43,000...These programs I don't know how to apply for. University hospital called me...and they sent me a letter and charged me \$3000 and only he is working, how can we pay \$3000, I could not afford it so I denied it. (Saskatoon refugee)

I have a client mother and son with HIV, HIV medication is very expensive and she has to pay 2% and the 2% for her and her son she was paying \$149 every month, that is \$74 each so she is paying from her food allowance \$74 and her son is paying from the child tax benefit \$74 every month. The price of the drug is close to \$1,400, very expensive medication. How do they come to that 2%?...I applied for her under Saskatchewan Drug program, still they said only she will pay the 2%, this is mandated. From \$1,400 she is paying not even 2%, its 1%, but 1% according to the scale of amount is a lot for her. Why they don't forgive 1%? (Saskatoon immigrant service provider)

5.7.5.3.2 Privately Sponsored Refugee and Immigrant Perspective

Privately sponsored refugees are only covered by the universal health coverage offered by the Saskatchewan health card upon their arrival. Their sponsors are responsible for all other healthcare costs, like dental and optometric services, until eligibility can be confirmed for provincial health benefit programs. However, when immigrants arrive they are expected to be self-supporting and often lack the guidance of a settlement counsellor or host family to advise them of all the health benefit programs that require application to determine eligibility. Many immigrants mentioned difficulties with accessing dental and optometric services associated with lack of knowledge about health benefit programs. In addition there is often confusion around how to maintain eligibility in Family Health Benefits. In contrast to comments by racialized immigrants, a Regina immigrant from the United Kingdom indicated she was very aware of provincial health benefit programs.

Privately sponsored refugees don't qualify (for IFHB)...if a woman comes here and becomes pregnant and she doesn't have the healthcare system imagine what that she has to go through to deliver. (Regina immigrant service provider)

If a person comes sponsored by family member or group they don't have the IFHB coverage. The sponsor will take the children to the dentist and pay for it in emergency situation. The prevention doesn't happen. It will take 4 to 5 months to get the Family Health Benefits. (Regina immigrant service provider)

Last month my son's eye sight is a little bit affected...Last year...I paid for eyeglasses, they told me I had to pay for that. I made those glasses for him in Pakistan because my brother-in-law was going to Pakistan so I gave him the prescription...Here for my glasses I paid around \$700, very expensive and there it is very cheap..., maximum around \$10. It was big money...You know nothing (as new immigrant), until now I am not knowing about family health benefits. (Saskatoon immigrant)

Family Health Benefits, we didn't know that from any organization, we come to know by one of our family friends, somebody told us why are you not applying for this program. So if we knew that from the beginning we could save some money... After a long time, I think it took 6 months, more than that...We applied for special support for drug coverage and then they determined we were also eligible for Family Health Benefits...if this program is told to newcomers at the start it will be good because they have no job or

anything so the first few 6 months are difficult... nobody was telling us so we were late, everybody was late...Somebody from our community they told us, there was not...guidance. There are many programs for low income support, the housing support, but nobody will tell you, you have to talk to friends nearby in your community, your neighbours. (Regina immigrant)

...we are just new and don't have jobs, nobody tells us that we are eligible for anything like free dental for children...(My daughter) did not go to the dentist in the first few years in Canada because we didn't have money for that and nobody tells us about the benefits. Just recently she went to the dentist, about 2 years ago. We delayed it because it costs money. We didn't know about the free dental care for children. (Regina immigrant)

Before we got help from health benefits, but from last year we didn't get...We used to have family health benefits, may be we missed some mail. Before whenever we got prescription I usually paid a less amount, but last year I noticed I have to pay the full amount, they told me after I pay \$60 it will be OK, but after \$60 I have to pay it every time. (Saskatoon immigrant)

I am aware of that (drug coverage) and we get that through my husband because he gets expensive medication, so we are aware it is partly covered by certain allowances on prescriptions. Drugs costs covered by Special Support and extended workplace health plan. (Regina immigrant from UK)

5.7.5.4 Cost of Dental and Optometric Services

Somewhat related to difficulties with accessing existing healthcare benefit programs is the specific barrier of the cost of dental and optometric services among newcomers living on a limited income. Sometimes children have fully used up a specific benefit under Family Health Benefits and they still have an unfulfilled health need due to a variety of intersecting circumstances and need to access additional charitable sources. For example, children sometimes break their glasses and need new glasses before they are eligible for a new pair or require expensive dental work beyond basic coverage. In contrast to the experiences of many newcomers, the experience of a Regina immigrant from the United States is interesting. As a white middle class, English speaking male, he did not hesitate to approach a dentist when he needed care, and he was treated fairly with consideration given to his lack of dental insurance.

...I have spent probably an hour yesterday and another 45 minutes or more today trying

to get a child a pair of glasses. I have the Lions Club willing to pay for them...this child has significant vision problems that's impairing his learning, broke his glasses...because may be mom missed a couple of appointments ...and they want payment, they won't release this (prescription) because...mom owes \$100. His mom can't pay \$100...He is not due for another pair of glasses, that's the problem. I know that they are covered. (Saskatoon community service provider)

Nowadays he has a tooth ache and is sometimes swollen here on the upper tooth and sometimes doctor gives him the same antibiotic for that and the swelling goes down. I went several times to the dentist. I am not understanding everything. I took him every place for the check up...I went to the doctors and some doctor they have a charge and I could not afford that much money. One time they sent papers for \$4000 because we have to do anesthesia so your son will be unconscious...but I didn't have that much money...this is very tough for me. (Saskatoon refugee)

...I had broken a tooth, but when I first joined (my employer) when we first got here I was a consultant so didn't have supplemental insurance...The dentist figured out what the insurance was and then asked me how much I could pay and wrote off all the rest and I had just met the man...He could have probably charged twice what he did. (Regina immigrant from the US)

5.7.5.5 Summary Reflections on Difficult Access to Health Benefits

Although most newcomers have good access to basic healthcare through their Saskatchewan Health cards, participant comments indicate many concerns with accessing healthcare services covered by IFHB and provincial extended health benefits programs. Refugees do not always understand IFHB services available to them and there are a limited number of service providers who will provide services under IFHB. Comments from both refugees and immigrants demonstrate limited awareness of how to access Family Health Benefits or Special Support for Drug Coverage. In some cases, provincial health coverage programs do not appear to provide sufficient coverage for individuals on fixed low incomes. Many participants mentioned difficulties with paying for prescription drugs and accessing dental and optometric services associated with lack of knowledge about their eligibility for health benefit programs or coverage limitations. These findings appear to be consistent with research indicating that lack of familiarity with the healthcare system (Son, 2013), low health literacy

(Renfrew et al., 2013) and cost (Access Alliance, 2011) are barriers to care. Participant comments also allude to some structural barriers within the healthcare system. For example, refugees may not find many healthcare providers registered with IFHB in some parts of Saskatchewan. In addition there does not appear to be a consistent process through which refugees and immigrants are made aware of provincial health benefits programs.

5.7.6 Healthcare Service Limitations, Stigma

5.7.6.1 Appointment-based Care

Service providers and newcomers both recognize some limitations with healthcare services, such as appointment-based care or short appointment time slots, which can result in suboptimal care and reduced client satisfaction. Many newcomers mentioned difficulties with trying to make time in their busy schedules to attend healthcare appointments, as well as with fully addressing their health issues at an appointment due to time constraints. Some healthcare providers also recognize that they don't have enough time to spend building relationships with clients. Some comments appear to indicate a lack capacity to provide appropriate services to newcomers or to recognize when additional support needs to be offered.

Refugee families who come to see me don't usually see any other healthcare provider here at the same time because most of the time everybody has appointments...the physicians that are here aren't accepting new patients so even if I see somebody who has lots of needs...I can't send them next door. I have to try and figure out something else. (Saskatoon healthcare provider)

I go to the...walk in clinic when they are sick because it is closer to our area. Usually getting an appointment over at the...(primary care) clinic is not easy so that's why we usually go over here (the walk in clinic). (Regina refugee)

All these things take a lot of time...you can't expect them to go to the clinic and run through things like, snap, snap... Nurses have this script they have to go through, put in so many clients...you can't really do that because this is about relationships... You have to put the human individual first and the relationship develops, then you move forward

because once you have that relationship going the people are open and you can work better and everyone knows that but that takes time. (Saskatoon healthcare provider)

...a person that does not speak English, it takes them time to explain their situation...I have had a lot of immigrants and refugees who are involved in our program saying that their family physician only accepts 1 matter at time...It is prohibiting the patient from communicating all the problems that they have...So normally what happens is they either quit going back for the second matter because they have to take off from their job, they have to make sure they have child minding services available for children if they are going back, or they find another solution. (Saskatoon immigrant service provider)

...we need to chat and talk and then in the conversation things will come out. Oh this is how I am feeling, but...It's like a factory line, no time, they put you in a room, then move you to another room, then the doctor comes, then he doesn't even sit down, he is sitting on the edge of the table writing diagnosis. (Saskatoon immigrant service provider)

We have an added counselor who is willing to see the newcomers with the translator because the previous 2 said we don't have any experience and we don't want to try that. (Regina healthcare provider)

SLP services is 1 of my big ones, so many of my kids have speech delays and it's really hard to do speech and language therapy with someone who does not speak English at all with an English speaking therapist. There is a general lack of resources...for these services anyways so for newcomers it is even worse. (Saskatoon healthcare provider)

Before he went to the dentist too many times, but he is scared to see the dentist because there is too many injection needles. First time we went to the (dental clinic) and then after that it didn't complete because needed to go 3 or 4 times, but he only went 2 times, he is not doing good when he go there, he does not follow what the doctor says. He goes there and comes back without doing anything. And then after 2 or 3 months they again sent a letter and said that ...they recommend (another dental clinic). We make the appointment and then we went there 4 times and also there not complete because he did the same thing, not cooperating with the doctor. (Saskatoon refugee)

It (healthcare) is good, but sometimes when we have to go to the doctor we wait a long time even if we have an appointment. (Regina immigrant)

I have day off on Friday, but for refugee there is not any TB check clinic on Friday for refugees. (Saskatoon refugee)

5.7.6.2 Stigma

Some service providers mentioned that accessing some healthcare services carries a stigma for newcomers that may prevent optimal access to appropriate care. For example, individuals with mental health needs may be reluctant to attend a designated mental health clinic.

An added dimension is that newcomers may not attend specific clinics if they are viewed as being designated for First Nations people.

...sending these people to mental health was a big challenge and with the stigma they wouldn't show up for their appointments. We have a psychiatrist who comes once a week to see our patients and for those families it is good to say that I am going to the (primary healthcare clinic), their husband will accept, community and society accept that because they are seeing the physician. We are having good success with that, patients are coming and going to counseling. (Regina healthcare provider)

...they don't see mental health as a disease. They are not going to go to mental health because of the social stigma. There is a psychological stigma so they don't go and see the mental health (therapist). We need a place where they can see their family physician, their own psychologist or counselor, nutrition therapist available there, it would be really helpful. A multidisciplinary clinic where there is no stigma. (Regina healthcare provider)

Newcomers don't like going to (clinic) because they hear negative things about First Nations people attending that clinic. They adopt these stereotypes. They also don't go to the (clinic) for the same reason. (Saskatoon immigrant service provider)

5.7.6.3 Summary Reflections on Healthcare Service Limitations, Stigma

In general, the way that the healthcare system is designed to efficiently address healthcare concerns through an appointment-based system does not appear to fully meet the needs of newcomers who may need additional time to explain their concerns, convenient or flexible appointment times, and additional support to access treatments. This is similar to the findings of Renfrew et al. (2013), who observed that limited appointment times are a barrier to care. These issues also relate back to many of the language and navigation barriers discussed in sections 5.7.1 Navigation Difficulties and 5.7.2 Language Difficulties, Low Literacy, as well as indicate structural barriers in the healthcare system that give higher priority to efficiency as opposed to being client-centered. Previous research has also identified significant stigma among newcomers associated with accessing mental health services, HIV/AIDS services, addictions treatment and problem gambling treatment (Council of Agencies Serving South Asians, 2008; Karago-Odongo 2008; Ethnoracial Coalition: Access to Addiction Services, 2003; Planned Parenthood Toronto,

2009). In addition, current participant comments appear to indicate that healthcare system attempts to create a First Nations client centered environment may be alienating newcomers from accessing those services.

5.7.7 Gender and Cultural Concerns

Although many service providers perceived that gender and cultural concerns can be a common barrier to healthcare access (fourth most common barrier), it was less commonly mentioned by newcomers themselves (sixth most common barrier).

5.7.7.1 Healthcare System Capacity

Healthcare providers indicated that they perceive the healthcare system lacks capacity to respond to healthcare needs of newcomers. They may not be trained or feel prepared to invest the additional time and effort to really understand and address newcomer healthcare needs.

...the health care system workers...are not necessarily trained in working with newcomers so that puts up barriers also, we are clearly unprepared to care for that population. (Saskatoon healthcare provider)

...the capacity of our health care providers in recognizing and understanding the needs of newcomers and being able to adjust their practice in a way to support what those might families need, requires additional time and resources and not everybody is comfortable with that process or willing to invest in that time and energy that it takes to come alongside the needs that our newcomers arrive with. (Saskatoon healthcare provider)

5.7.7.2 Cultural Beliefs and Attitudes

Cultural beliefs and attitudes of both healthcare providers and their newcomer clients can influence the process and outcomes of healthcare delivery. For example, misunderstandings can occur when individuals differentially describe or exhibit symptoms of pain that do not fit with Canadian expectations. Healthcare providers may not even realize when they hold biased

culturally influenced opinions that influence how they provide care. Some immigrant service providers described situations in which they were cultural buffers to assist clients with verbalizing their healthcare concerns. Specifically with regards to nutritional counseling, some healthcare providers do not understand the cultural significance of dietary habits and subsequently do not recognize the need to modify their dietary advice to take this into account. Specifically with regards to children's behavioural management issues, differing cultural beliefs can result in disjointed treatment plans across different environments.

Cultural differences between here and where they are coming from creates a lot of problems...the directness of the health care service providers here about an issue is a total difference from...their own country. (Saskatoon immigrant service provider)

In the 1990s a doctor said openly, before I check your wife I want to make sure do you have AIDS...I was so mad for this mother...I told my clients don't answer any questions until the supervisor comes here and I told the doctor we will not talk to you, bring your supervisor here. (Saskatoon immigrant service provider)

...women in some cultures are very worried about their personal or private issues and even with the pain, the way that they are trained in their culture, they should not say they are in pain, even if they are in labour pain. If somebody asks them what is the level of their pain, they are like 'I am OK' and they are suffering. We have had cases even they do not communicate their real pain to physicians. (Saskatoon immigrant service provider)

...a woman...with a severe pain in her abdomen area and she was Muslim and it was fasting month, Ramadan and when she went to the hospital only 1 doctor assessed her...and said the pain you are feeling is because you have been fasting and she was sent home. The same night she was sent back to the hospital with severe pain...and it happened to be that her appendix had burst and she was too close to losing her life over this. (Saskatoon immigrant service provider)

Here they expect husbands to go in the delivery room, but in most of our cultures husbands never go in the delivery room. This lady is new to that and never even think that her husband would go in the delivery room. They feel shy too...Sometimes they ask questions, why they want husband here, and I say it is OK husband can wait in other room, but they don't ask because of shyness. (Saskatoon immigrant service provider)

...the doctor told her not to eat rice, just to eat brown bread and she said (to me) even...if she ate 10 bags of brown rice she would still feel hungry for rice. If rice is 1 big plate it would make her full, but not brown bread. (Regina immigrant service provider)

Often I see kids for behavior trouble at school, so the school is trying to insert their methods... and you talk to the parents and they are doing something completely different at home and often I haven't seen that these methods are necessarily working. My views are based in the ways I was trained and my cultural views. What I suggest is based on my training, culture so is also unacceptable to parents, so difficult for parents to accept that, so I have to work on the long run, compromise and accept that a child might not be having perfect behaviour. (Saskatoon healthcare provider)

5.7.7.3 Mistrust

There may be some cases where newcomers believe that their perception of their health issue is not taken seriously by healthcare providers or they are not treated with dignity due to bias or lack of trust, especially in cases involving immigrant physicians. Perhaps newcomers have a higher expectation of healthcare providers from their own country to treat them in a culturally appropriate manner and they are disappointed when it does not occur.

60% of our immigrant doctors don't trust their patients... especially if he is from your own country they don't trust the patient, they don't think it is a serious thing. They don't trust the mother. I am sorry to say the mother has intuition, sensitive to internal feeling, if the mother says I am feeling this and this, my dad would say the husband have to follow, otherwise the family is lost. How come the doctor won't listen to the mother? They do it all the time. (Saskatoon immigrant service provider)

I was almost 4 months (pregnant) and I asked to see a physician so Open Door at that time could help me to see a physician...and when I went there he (immigrant physician) knew I was a physician...and when I went in I saw he was covered with a mask and wearing a gown and gloves and I think may be he is sick and he is protecting me...but then I went back...we saw the same picture. Oh I am not seeing that doctor, or may be doctors here in Canada cover when they see newcomers, but that was not the picture...I went and saw another doctor and she was not covering with gloves and mask. (Regina healthcare provider)

5.7.7.4 Mental Health

Newcomers who are experiencing mental health issues may have different culturally-dependent presentations than Canadians. Some newcomers described ongoing health concerns that never seemed to result in a diagnosis or effective treatment, which may be related to high

stress due to integration problems, but healthcare providers either didn't recognize the possibility of a mental health issue or they were uncomfortable with bringing up the topic.

...they don't tell you they are depressed, they come with different psychosomatic symptoms every single time so I start with them. When I know my patients and I know I investigated them and I know there is nothing going on, then I face them with mental illness, that there is a problem here and we have to deal with that and then those other symptoms will disappear. (Regina healthcare provider)

...he took some medicine for his headache that our family doctor prescribed for him, an antibiotic, but he got reaction from that medicine and he got a stomach flu, it was very bad, like 2 months it was continuous and he was getting sick, like sometimes his back was sore, his whole body was sore, then headache, he was getting tired and tired. He went there again to the...walk in clinic and they gave him some medicine. It helped a bit, but not that much, I told him to go last week to (another clinic) because now he sometimes gets chest pain also so doctor advised him that if he gets really bad then he can go to emergency. He doesn't know what's wrong. That's why we try to figure it out what is going on, where we can go for that? (Saskatoon immigrant woman)

5.7.7.5 Gender Issues

5.7.7.5.1 Gender-based Care

Many service providers and newcomer women mentioned the importance of gender-based care to many cultures and the challenges that this can entail, such as incomplete examinations, resulting in poor assessment and outcomes. Both service providers and newcomer women spoke of their challenges with finding a female physician for their primary care needs. In contrast, an American immigrant was not at all worried about seeing a male physician.

(in) some...cultures the female is not comfortable to see a male service provider or the male person is not comfortable to see a female physician so for newcomer families this affects service. At the time of emergency it is hard to find the gender based care provider. (Regina immigrant service provider)

...a client...from the Middle East. I see her and I ask her why you are white...She told me, I am bleeding and it doesn't stop...for 4 months...he (physician) told her when the period comes it will stop. I sent her to a very respectful doctor, an immigrant doctor...I told him she is covered so you can't see her, so please prepare a gynecologist female. In his building, he talked to the female Indian gynecologist and she told him she would

come and see her. When they did a check up inside the blood clot was full...right away they sent her to the hospital and they did a clean up and that doctor was saying she would be fine. She didn't have any blood in her body...She told me I don't want to see him (the old doctor). (Saskatoon immigrant service provider)

I am trying to find a new doctor for a client...there is a shortage of family doctors to accept new patients...Not only lack of doctors, but female doctors. Most of the time they need female doctors. According to religion...they can't open their body to a male, not only religion, just how comfortable they feel. (Saskatoon immigrant service provider)

I want a female doctor for me because I am not comfortable to see a male doctor, for me and my daughter...I have not found a female doctor yet. (Saskatoon immigrant)

One of my friends told me about my current doctor. She is her doctor too, she said that is a nice doctor you can go and see her, and 1 of the things is she is a lady doctor that is why I prefer her to go. (Saskatoon immigrant)

I have been very impressed with the doctor. You can tell they are little less worried about being sued here because when I had my gynecological test once a year, in the States they would always bring a nurse in to witness that, but they did not worry about it here...I have confidence that if I had asked him to, that he would have had a nurse come in. (Regina immigrant from the United States)

5.7.7.5.2 Vulnerable Circumstances

Some women live in vulnerable circumstances that impact their capacity to access care or to follow recommendations from healthcare providers. Lack of awareness of these types of issues on the part of healthcare providers or the inability to respond to the need for additional supports creates serious barriers to the provision of optimal care.

There was an issue with a woman wanting counseling, but the husband was forbidding it. And so if they there were able to arrange transportation, she has the right to have that access without the husband knowing because it would be quite dangerous if her husband knew. (Regina healthcare provider)

...(a) woman... from Africa, from a country that... if she couldn't have a boy, the husband had the right to go and remarry again and be pregnant. The woman had in a matter of 1 year...4 pregnancies that failed...she was so worried for her life she kept getting pregnant...we eventually sent her to a social worker. (Saskatoon immigrant service provider)

5.7.7.5.3 Reproductive Choices

Conversations about contraception and abortion between healthcare providers and newcomer women can be problematic if the healthcare provider does not carefully present the information in an unbiased and objective manner and the newcomer woman holds culturally-based views on the topic that don't necessarily get revealed in the conversation. Contraception and abortion are deep-rooted issues in some cultures so it is important to be open to understanding the client's perspective to have a balanced discussion and support the client in whichever decision they make.

...a women here with an unwanted pregnancy and she happened to see a nurse in the hospital who was against abortion and with her broken English she figured that she should not do it. Women from different countries may or may not have abortion in their back home countries, but here they feel that they are safe and can ask for it if they want to...but the way that they treated the woman she figured from her perspective that it was wrong. (Saskatoon immigrant service provider)

I have some major issues with contraception in some cultures, like no matter what I explain to them they bring children after children, which is not good on the health of the women...they don't want to due to religious or cultural reasons. Even though I tell them there is nothing written in the religion that tells them that, it is more of a cultural thing...1 of these women has 7 children and 1 of them has cerebral palsy already and there was a translator who is from her own culture and she is covered like her and she just has 3 children and she told her, you have 7 children and a sick one at least let's do something for you with this pregnancy...3 times in a row she is still telling me she will think about it. (Regina healthcare provider)

5.7.7.6 Summary Reflections on Gender and Cultural Concerns

Participants' comments are consistent with previous research that noted newcomers often prefer to access healthcare from service providers who are from the same culture (Son, 2013), but find that this is difficult to achieve (Munger et al, 2010). Also similar to participants' experiences, research has observed that some newcomer women are bound by specific cultural or religious practices that behoove them to seek healthcare from female providers, which can make

it difficult to access services when there is a lack of culturally appropriate services (Sethi, 2013). An additional dimension to newcomer women's experiences is their sometimes insecure immigration status as the spouse of a temporary worker or economic dependence on their spouse, which can create challenges with accessing services (O'Mahony & Donnelly, 2013). In alignment with previous research, participant comments indicate that immigrant women's access to health care is impacted by traditional gender roles that limit women's ability to access services and healthcare services that do not respond to cultural and gender specific needs. Newcomers' experiences demonstrate that there is room to grow the healthcare system's capacity to offer care in a culturally and gender sensitive manner.

5.7.8 Health Attitudes and Beliefs

5.7.8.1 Preventative Care

Some newcomers come from environments in which they had little access to preventative or long-term treatment of chronic conditions so they have gotten into the habit of only going to see the physician when they are so sick they cannot work or engage in their normal daily activities. This viewpoint of healthcare as only acute care can impact healthy child development if children are not monitored with regards to growth and achieving developmental milestones.

...they don't have much knowledge about health prevention...as long as they are healthy they don't go see a doctor until there is an emergency...if they are walking around, they don't see themselves as sick...(when they are) not doing work then they see the doctor. There is something called prevention and they don't have that idea. They wait until they are too sick to work before going to the doctor. Up to that point they rely on more traditional cultural ways of maintaining their health. (Regina healthcare provider)

Due to the limited access to the health care system in the refugee camp they never practiced going to their physician and having a family physician or routine immunizations for their children...and they have the same kind of concept after coming to Canada; they will not go and see the doctor until they are in the final stage...It is a

different practice from what they have been used to from one generation to another generation. (Regina Immigrant service provider)

Some people don't understand if my child is not sick why I should go see the doctor. For healthy child supervision we should get their height, weight, growth...they don't have that knowledge. (Regina healthcare provider)

5.7.8.2 Expectations of Western Medicine

Sometimes newcomers expect Western medicine to offer medicine to cure all sicknesses and don't understand the concept of viruses that don't respond to antibiotics, or chronic disease that needs long-term treatment.

...most cultures think that the doctor gives me this medicine, when it is done I will feel better. A lot of cultures don't know there is something called chronic disease and they have to take medicine for a long time. (Regina healthcare provider)

...doctors are not giving us medications when we get a cold (newcomer comment on survey)...in their culture that when they go to the doctor they give them...medication, and here they tell us 'take Tylenol and go home'. (Regina healthcare provider)

(some newcomers) come and think that (in)...this Western model, pill equals solution to your life; whereas if you are dealing with something that is chronic...it is back to understanding what that is. (Saskatoon immigrant service provider)

...the majority of them think that when they come to Canada their (special-needs) child will be cured and will be freed from that disability. They do not understand this is a syndrome or lifetime thing...They don't understand the disability as a long term thing. (Saskatoon immigrant service provider)

5.7.8.3 Traditional Health Practices

Some newcomers may rely on traditional health practices to maintain their health and may not understand how that may adversely interact with some Western treatments.

...(cancer) patient who was having issues with bleeding and...they were trying all types of interventions with this patient and finally when it got to the point of being life threatening...they realized that this individual was talking with a family member from their home country...was recommending some supplements for this individual to take on top of their medical treatment, but the supplements were actually acting like a blood thinner and so once this information came out they were able to stabilize this patient. (Saskatoon healthcare provider)

5.7.8.4 Fear of Government Authorities

Some service providers acknowledged that fear of government authorities or lack of trust in the public healthcare system can make it difficult to establish good relationships with healthcare providers. Cases of domestic violence can be especially complicated to establish trust. In some cases lack of trust in the public healthcare system can lead to an ongoing search for other healthcare options. In addition, newcomers may not understand their right to ask questions of their physician to better understand and participate in treatment decisions or to change their physician when they are not satisfied with the care.

...fear of authority (is a) barrier. Some immigrants come from countries where doctors report to the government or are spies. (Saskatoon immigrant service provider)

...moms don't say...they don't know what to say because in their country if they admitted things they were persecuted so they can be very closed. (Saskatoon healthcare provider)

...some newcomers fear...if they have some communicable disease they may be deported. (Regina immigrant service provider)

...some don't like counseling for domestic violence. Clients have a fear of authority, of being reported, of getting the husband in trouble, which will lead to him being sent home and the whole family will have to return with him. (Saskatoon immigrant service provider)

...lots of people are against the public health and they want it to be private...they feel they can't have that trust, because...they cannot trust any public services in their own country...they will say 'because it is public it's not providing the service that you need.' So whatever the physician says, whatever the referral is, whatever the test they have to make, they do not rely on that and they are always seeking another option. (Saskatoon immigrant service provider)

...a client from Nepal going through chemo at the hospital and I have heard them say, 'this wouldn't happen in Nepal, how long it took to diagnosis it. (Saskatoon immigrant service provider)

...our clients don't know about their rights, patients have rights to ask a question, challenge a doctor, ask about why you are prescribing this medicine...may be in their country they are not supposed to ask the doctor because they are the highest person, so they don't ask. It is cultural. (Saskatoon immigrant service provider)

She is telling me this obstetrician is not good, so I tell her let's go change it and she says no. They think something will happen if they change, whether she may write something on the paper or whatever. Back in their country may be they do get in trouble...the doctor doesn't send any records to the new doctor. (Saskatoon immigrant service provider)

5.7.8.5 Summary Reflections on Health Attitudes and Beliefs

Many of the participants' comments are in alignment with past research. Other studies have found that some newcomers may not recognize the importance of preventative care to manage chronic conditions (Renfrew et al., 2013) and to maintain good health (Vargas Bustamante et al., 2010). For example, Renfrew et al. (2013) observed that some immigrants did not understand diabetes as a chronic disease that cannot be cured and that it requires ongoing management. In addition, some newcomers prefer to rely on traditional healthcare approaches instead of Western healthcare (Council of Agencies Serving South Asians, 2008). If healthcare providers are not aware of possible attitudes towards Western medicine and use of traditional treatments it can be difficult to come to a shared understanding of the treatment plan with clients. These diverse healthcare beliefs may result in delayed access to healthcare services for the treatment of a minor problem until it reaches an acute condition that requires more intensive treatment.

5.7.9 Work, School, Childcare and Transportation Demands

Although several service providers expressed concerns about healthcare access barriers related to lack of childcare, transportation and other household demands; these types of barriers were not mentioned by newcomers themselves very often. Many comments reflect the interconnectedness of these issues when families plan to attend an appointment, as well as their inter-relatedness to how the healthcare system functions.

We have to make a lot of tactic for the client to go to that service, language barrier, transportation and daycare...The mother, if the husband is going to work in the afternoon or evening time, the mother cannot access, go by bus, especially in this cold weather it is not easy if they have 3 or 4 children. So they need childcare so she can go at least and transportation. (Saskatoon immigrant service provider)

I have had a lot of immigrants and refugees...saying that their family physician only accepts 1 matter at time...So normally what happens is they either quit going back for the second matter because they have to take off from their job, they have to make sure they have child minding services available for children...or they find another solution, go to back home, do something else or just be nagging about health services here. (Saskatoon immigrant service provider)

5.7.9.1 Transportation and Proximity

Many newcomers sought conveniently located physicians to overcome transportation difficulties. In many cases, newcomer women are not as quick as their husbands to get their driver's license and they rely on their husbands for transportation.

I am looking for one (physician) nearby our house because we don't have our own vehicle and we always need to get the bus to go so if it is near our house it is easy for us in winter. (Saskatoon immigrant)

I am working so I have not much time to drive them...and their mother is not knowing how to drive...so I am everything for them, I am earning too and if there is something like going to the doctor I arrange their trips too. (Saskatoon immigrant)

5.7.9.2 Childcare

Specifically with regards to childcare, newcomers do not have established support systems to rely on for occasional childcare. In addition to practical childcare needs to allow parents to attend appointments, newcomer children may also be missing out on some of the benefits of daycare.

...(for) some newcomers childcare may be a problem, that is common to Canadians too, but they don't have the support system needed to be able to get some help to go and see a doctor. (Regina immigrant service provider)

...one of the things that they were afraid of is to send their kids to daycare because they didn't know who these people were...daycare is so much a part of early childhood

education. It's an opportunity as daycare workers notice if a child is at the level they should be at, whether it's their speech, height, the way they hold their crayon, whether everybody else can climb on the slide and they can't and those kinds of things. We have a whole population of kids who aren't getting it...then they get into the school system and kids are behind because they haven't had those early assessments. (policy maker)

5.7.9.3 Busy Schedule

Many newcomers maintain a very busy schedule to accomplish all the tasks they need to successfully establish their new lives. This often makes it difficult to attend scheduled healthcare appointments.

Right now I don't have time (for a preventative healthcare appointment), like Saturday to Sunday they (physicians) are off most of those times that I am home...that is why it is difficult... On the weekdays always in my work place I can't pick a phone and call anyone. I can if I get permission from my director...I always start from one thing to another, next week I am booked for my driving class lesson and theory, then next week I final exam and on Saturday one of my workshops. (Saskatoon immigrant)

...my dad and mom have eye vision problems and my dad has cholesterol and sugar diabetes and high pressure, and I frequently take them to the hospital and if the hospital calls and if I am busy and my wife also busy then we postpone (it). (Saskatoon refugee)

5.7.9.4 Summary Reflections on Work, School and Transportation Demands

Participant experiences reflect many of the same healthcare barriers identified in previous research, such as lack of transportation (Kilbride, 2010) and childcare (Sethi, 2013). Newcomers may have difficulty arranging transportation or taking time off work to attend medical appointments (Council of Agencies Serving South Asians, 2008; Sanmartin & Ross, 2006). Newcomer women may encounter additional challenges to access healthcare services due to long work hours in jobs without sick leave or childcare responsibilities (O'Mahony & Donnelly, 2007). Overall, newcomer families are coping with a multitude of daily tasks with limited social support and transportation options that can make it a challenge to attend healthcare appointments.

5.8 Main Theme 5: Accessible Healthcare Services

Table 5.5 Main Theme 5: Accessible Healthcare Services					
Sub theme	Interviewee Type				
	Health care provider	Immigrant service provider	Policy maker	Immigrant Parent	Refugee Parent
Engagement in planning, partnerships	31	57	5	1	1
Increase awareness of health services	7	11	1	6	3
Increase cultural competence	26	28	1	2	1
Responsive, accessible services	91	53	5	35	24
Targeted newcomer health services	33	25	3	0	21

*Each individual occurrence of data extracts coded to sub themes across the data set stratified by interviewee type

5.8.1 Responsive, Accessible Services

Both service providers and newcomers recognize the importance of responsive healthcare services, including convenient access, as core components to build an accessible healthcare system. Newcomers mainly spoke about the importance of convenient access to healthcare services; while service providers suggested the development of integrated primary healthcare sites, not exclusively for newcomers, but with comprehensive services provided in a culturally responsive manner.

5.8.1.1 Saskatchewan Health Card

In order to access publicly funded healthcare newcomers need a Saskatchewan health card. Unlike several other provinces, Saskatchewan deems all permanent residents eligible for a health card immediately upon arrival. When the Ministry of Health became concerned that immigrants to other provinces were coming to Saskatchewan to get a health card that they could then use until they were eligible for health coverage in their home province, they consulted with Regina Open Door about how to ensure that only permanent residents who intended to reside in Saskatchewan could get a health card. The Ministry of Health responded to concerns about their policy that required a permanent address, and was able to work out a process that allowed for immediate access to health cards for legitimate newcomers to Saskatchewan.

...newcomers would come to Saskatchewan to get a Saskatchewan health card right away and then use it for 3 months in BC or Alberta...they cracked down on this by saying give me your permanent address when you apply, but refugees...don't get into permanent housing right away, they stay in temporary housing, or some families also stay with relatives...So we said what if you provide a temporary card for 1 month and we will sign to let you know the person is here...and after 1 month we send you the address and they send them the full health card. (Regina immigrant service provider)

5.8.1.2 Accessible Services

5.8.1.2.1 Healthcare Provider Perspective

Many healthcare providers shared ideas for more accessible healthcare services that respond to the needs of vulnerable populations, including newcomers, such as conveniently located healthcare services with streamlined access. In general healthcare providers are suggesting that a 1 stop shop with services co-located and readily accessible when needed would be ideal.

...for not just immigrant families, but everybody, they have increased their drop in immunization clinics...and they are very well received. Every Friday afternoon we have a drop in clinic here (school) for immunization and it is very popular. A lot of these folks cannot make appointments; they don't know what life is going to look like so drop in clinics work well. Also the health bus 1 day a week...is parked in a neighbourhood that is very close to where a lot of these folks live...and it's on a Saturday so that's a nice day to be there because for a lot of these folks Monday to Friday doesn't work for them; they want weekend appointments. (Saskatoon healthcare provider)

...if this (clinic) truly operated like primary health care site, when I saw them, then they could go see the public health nurse or...the physician right away or I could send them to the dental clinic or send them to the social worker or lactation consultant...if we operated without an appointment model. (Saskatoon healthcare provider)

I have a clinic in a few schools in the core neighbourhoods in Saskatoon. That's where I see a lot of refugee children...It's general pediatric care for children with health problems...anyone can refer (to me at those clinics) so the public health nurses, teachers, parents themselves can self-refer. (Saskatoon healthcare provider)

...dental and immunization are all on the same day in the same place (school) and that is a really big thing to remove some barriers. I think that was a great collaboration where we worked together to figure out what they needed so we cover the basics. (Saskatoon healthcare provider)

5.8.1.2.2 Newcomer Perspective

Newcomer participants place a high value on convenient healthcare services. Once newcomers became aware of walk-in clinics they found them very convenient for meeting a variety of health needs. Clinics that do not require appointments, are open longer hours, and that are conveniently located are preferred by many newcomers to overcome some barriers, such as transportation, limited opportunity for day time appointments and language difficulties.

In the beginning we don't know how to go to walk in clinic...but later when we have a little bit experience because if we go to (clinic) we have to book appointment and it takes time so we just go to walk-in clinic. (Regina refugee)

...there is walk in clinic inside of superstore and this is easier for us so now we go there. (Saskatoon immigrant)

I like to go to walk in clinic and see doctors there. Sometimes kids have flu or cold so we may take them to the walk in clinic or the health bus. (Saskatoon refugee)

...the walk in clinic is better for health services because newcomers don't always speak English...for some speaking is hard. With walk in clinic you don't need to phone for appointment. (Saskatoon refugee)

5.8.1.3 Responsive Services

Responding to newcomer healthcare needs often means reflecting on your normal process and adjusting it as necessary to better accommodate newcomers. Many healthcare providers have gone the extra mile to provide support needed to ensure that children can access programming and that women are provided with urgent care in a respectful manner. In addition, sometimes extra time needs to be dedicated to building relationships with newcomers so they feel comfortable accessing services.

...we often will ask any new referral to bring in a food record of what their child has eaten for a few days; we don't ask that of our refugee families just because of the language barrier. So I would go through a 24 hour recall with them instead, through an interpreter. (Regina healthcare provider)

...offered cab vouchers...tried to arrange group bookings...so they are not having to come for another appointment...hired some interpreters that are on site...(and) email the interpreter to contact the (client). (Regina healthcare provider)

...every summer we hold a kids active living and cooking club and I wanted this little boy to attend it and he said 'Oh yeh great idea' and I gave him the phone number to pass on to his parents to phone in and register...(He) didn't show up on the first day so I had my assistant phone again to remind them and 'OK'; so we asked to talk to the brother and it was basically holding their hand to get this kid to come and eventually he did and had a great time. (Regina healthcare provider)

We have an added counselor who is willing to see the newcomers with the translator. (Regina healthcare provider)

...at the hospital they had a male surgeon doctor so they put a curtain not to feel shy. (Saskatoon immigrant service provider)

So any of these mandates that we are trying to...be efficient and not waste money, that doesn't necessarily work in these scenarios. You have to put the human/individual first and the relationship develops, then you move forward because once you have that relationship going the people are open and you can work better...but that takes time. (Saskatoon healthcare provider)

5.8.1.4 Interpretation and Cultural Liaison

Interpretation is a vital component of responsive healthcare services for newcomers who do not yet understand English. Immigrant service providers can be the link to arranging interpretation services and serve as the contact point for referrals from English speaking healthcare providers. Service providers are suggesting the need for consistent access to convenient high quality interpretation services that respond to the specific needs of healthcare situations. In addition, some resourceful newcomers sought out responsive healthcare providers to meet their needs.

The referral needs to be coordinated. All the clients, even existing clients, for 2 to 3 years still have a language barrier and work through us. I am primarily the person booking an appointment or making a referral to family physician and...dental or eye appointments...they always put (us) as...primary contact to coordinate the appointment with the specialist. (Regina immigrant service provider)

We send an interpreter when we set up an appointment with the eye doctor...family physician...specialist...or the dentist. (Regina immigrant service provider)

...it would be great to create a pool of interpreters in the health region and that would make easier access for all newcomers...(and) having the directory of which physicians who speak a second language ...can help a little bit. (Regina immigrant service provider)

Translated and printed materials in the...major languages in the community (would be helpful). (Regina immigrant service provider)

We use a lot of...the immediate phone translation that has helped a lot with the understanding...when we are doing specific questions about immunization reactions. There is somebody immediately on that phone. (Saskatoon healthcare provider)

...if they could have their own training program...not just for interpreters, but health specific. (Saskatoon immigrant service provider)

Open Door helps them with accessing family health benefits, helps them get their health card soon and makes sure they have that support...(and) at least see the optometrist to check their eyes to see if they need glasses because at least during the first year under IFCB it will be covered. (Regina healthcare provider)

I used to book him (husband) with some Indian doctors so that he could go and visit them and talk to them, rather than me interpreting for him. I used to feel that (he can) go and talk to them so that...he could deal with his own situation; it gives some sort of things that I can't express, like I am not (such a) dependent person. (Regina Refugee)

...instead of going for an x-ray you can have it is all done in 1 place like a clinic with nurse and x-ray, (I would also like) a bit more after hours services available. (Regina immigrant)

...we joined a doctor...He speaks our language...(the clinic) is open until 6:00pm or 7:00pm. He is also available on Saturdays. We have no complaints. (Regina immigrant)

5.8.1.5 Public Health Services

5.8.1.5.1 Newcomer Perspective

Public health services were identified as an important responsive service that does outreach to newcomer families, often in conjunction with schools, to help connect them to healthcare services. When asked about which healthcare services they had accessed for their children, many newcomer parents mentioned public health services. Aside from the school and church clinics, Saskatoon public health services appear to pursue several avenues to reach out to

newcomers. Regina newcomers also mentioned accessing public health services; however, there did not seem to be the same level of organized outreach to the population.

We go to WP Bates School public health clinic, for flu and vaccine every year. They call us, sometimes I phone and we go together. (Saskatoon refugee)

...took them (children) for their vaccinations...In the church here they provide it, a certain time of month they have the vaccinations here. (Saskatoon immigrant)

Our first few months when we went to the healthcare, dental health care at Idylwyld Drive, where they gave us some immunizations...They called us there because our doctor recommended us for immunizations so he referred them our names and then they called. (Saskatoon immigrant)

...there was a lady who was coming to us and she provided all the vaccines, and for some vaccines I brought them (children) to her at the public health clinic so they have been given every kind of vaccine...The public health nurse came here several times, once she came here (current house) and so many times she came to Stonebridge (previous residence) in the first couple of months. (Saskatoon immigrant)

...(children) got vaccinations and saw that dentist at the same place, they check the teeth at the same time, and they had some other tests at the school, hearing tests...how they speak at school...(my) son was putting on weight and...at public health they talked about MEND and gave me contact numbers. (Saskatoon immigrant)

We went to the public health office on Park St. They sent us to that one, I phoned and they said you go there. I wasn't quite sure where to go, but I phoned and things worked out. ..They helped me before (daughter) went to school. From the Open Door Society we had a little screen with (daughter) there for the speech development, about readiness for school...Somebody recommended to me that that was open to me and I could check it out if we needed more help. (Regina immigrant)

5.8.1.5.2 Healthcare Provider Perspective

Healthcare providers emphasized the importance of convenience and outreach in the provision of public health services to support the health of newcomers. In addition, Saskatoon public health services either provide or connect newcomer families to low-cost dental care.

Although public health services are providing high quality services, there are opportunities to review services with a critical focus on the provision of outreach and comprehensive services to support newcomers during their first few years in Canada.

A lot of the newcomers settle in an area that has a school very close...and they have a drop in immunization clinic every Thursday so a lot of those folks access that service simply because of the geographical location and then word of mouth when people are living close by they meet other people...that they share a community with, 'Oh I go to WP Bates' and so then they go there as well. (Saskatoon healthcare provider)

Public health has the child's dental clinic as well, there's a couple places...the University of Saskatchewan...health professionals in training...clinic near St. Paul's Hospital...medical and dental, at SWITCH, Westside community clinic...We have a dental hygienist that comes to clinic every Thursday...examines their teeth and fluoride varnishes them...primarily looks at the preschool kids (Saskatoon healthcare provider)

The public health role in that whole prevention is huge and that is one piece I would increase because you see them from the time they are born, form those trusting relationships...our immigrant population has increased so much, but the role of the public health nurse has gone so much into the immunization piece that it's missing that role...that could enhance and prevent a lot of visits to the hospital if actually there would be health promotion and education going on. (Regina healthcare provider)

5.8.1.6 Developing Capacity

As Saskatchewan's newcomer population continues to expand, it will be necessary for healthcare organizations to reflect on their capacity to recognize and understand the needs of newcomers and to adjust their practices to respond accordingly. An evaluation of current healthcare services with a cultural lens will assist with planning our way forward to meet the healthcare needs of our diverse population.

...some reflection on the part of organizations...how prepared are we and what kind of skills do we have in actually meeting the needs of people...making sure that staff know...how they can access (interpretation) services and creating a culture where that is the first approach, rather than just deferring to I don't know how to do that...developing policies that actually ingrain this idea into their work culture of how do we support our newcomers. (Saskatoon healthcare provider)

Part of our move forward is to help the community start preparing and asking for those things in their budgets...Taking them to realizing that that is where...Saskatchewan is headed with the newcomers coming in, that is something they should probably start planning for in their programing. (Regina immigrant service provider)

...taking into consideration that cultural perspective that they are coming from and blending it to why we do what we do here. It just benefits everyone in the long run, whatever policy is developed...it will affect everyone, so explore what it is within that

culture, their beliefs around breastfeeding...being active or...the Canada Food Guide...in the long run would it be so powerful. (Regina healthcare provider)

5.8.1.7 Model Programs

Many service providers were aware of supportive healthcare models used in other cities that incorporated interpretation services, cultural brokers and health facilitators. The development of integrated primary healthcare sites that provide comprehensive services with convenient access in a culturally responsive manner that incorporates the role of cultural facilitators would provide ideal service for many newcomers.

Winnipeg has a very good model where they have health cultural brokers, who are basically interpreters and they are trained by the Winnipeg health region...it was a very good model that really facilitated access to health care...don't want to say that there should be private service, but for those who are struggling they need some assistance. (Saskatoon immigrant service provider)

...there are models for interpretation services that are...cheaper than the language line...Vancouver has health educators, people who have done health care work in their country, are trained to provide health education to newcomers in their first language...promising practices we can apply here. (Regina immigrant service provider)

...communities can arrange the healthcare providers...people from their own community to educate them, who are going to deliver the knowledge to their own community...so they can accept what does it mean for preventative health and health promotion...the continuation of care is important so if the health system in Saskatchewan has these primary care centres...they are open for the newcomers and take care of them...a place where they can see their family physician, their own psychologist or counselor, nutrition therapist...A multidisciplinary clinic. (Regina healthcare provider)

5.8.1.7.1 Mentor or Host Family

The use of mentors or host families to provide additional guidance on an as-needed basis during the first few months in Canada was mentioned as an ideal model to support newcomers to access a variety of services by many service providers and newcomers. Healthcare providers recognized that some newcomer families struggle with accessing healthcare among other services and emphasized the primacy of mentorship and the role of the public health nurse in

collaborating with formal and informal mentors. Although many immigrant serving agencies offer host family programs, perhaps there could be additional training for host families to encourage their involvement, and/or healthcare providers could be made aware of these programs and be open to collaboration with the client and their mentor when appropriate.

...we have host families...that...supported not only that family, they supported the whole community and it was something! The host family can take them around, show them the places. (Regina refugee)

...when we first came once a week the church came and took us to the grocery store in a big 15 passenger van...the members of First Baptist Church did that for us. Just for our group because we were the first group of refugees from Thailand that came to Regina, 45 families that came and we didn't know anybody so they tried to help us for a month. (Regina refugee)

...there should be a nongovernmental organization or somebody who can represent health or in general...just guide them the first 6 months where to go, what are the places, this is the healthcare... (Saskatoon immigrant)

...they (immigrant service agency) should be a little bit active, not passive and they should guide a little bit the newcomers...like how they can get their healthcare, get education for their kids, etc. I contacted them first and last day and I was emailing her, but I go no response, may be a lot of cases out there like me. (Saskatoon immigrant)

...for some families where there is a language barrier almost having the ability to call on a mentor or somebody that could guide them a little bit, that spoke their language, that was from the same area of the world, that could be called on to either help with navigating the city...or accessing services...would be very helpful because...even if they don't have to call them...there is somebody there that can help them if they need it...this is temporary, 6 months or a year. (Saskatoon healthcare provider)

That support is missing sometimes...that's why I come back to mentorship, who is there that could help that particular family to make sure they access that service? As a public health nurse it's helping to identify who their mentors are, if they have a church member or community member to help them, talk together to make sure they are able to access resources, otherwise it is just gets lost. (Regina healthcare provider)

5.8.1.8 Policy Suggestions

When asked about policy suggestions to improve newcomer health, healthcare providers recommended improving health benefit programs to make prescription drugs, and dental and vision care more accessible, as well as universal childcare so parents can more easily integrate

into employment. Immigrant service providers would like to see more prevention programs designed with a newcomer lens, as well as gender and Aboriginal lenses. In addition, immigrant service providers mentioned some specific policy challenges that make it difficult to support newcomer integration. Many government services prefer to provide service over the phone instead of in-person drop in service, and this presents significant challenges for newcomers who do not speak English. Current privacy guidelines have not been designed through a newcomer lens and can be a barrier when a case worker is trying to assist a newcomer client to access a government service. For example, the reporting system for the housing supplement relies heavily on telephone contact, which is a barrier for newcomers. These examples speak to the importance of applying a newcomer lens to all programs and policies to ensure equitable access to that population without creating an administrative workload burden for immigrant settlement agencies. In addition, government programs often do not realize that newcomers may not have the same understanding of concepts like ‘neglect’, so perhaps additional information could be designed for newcomers with the aim of preventing misunderstandings, before intervention becomes necessary.

When you talk to Social Services they say we have a high incidence of newcomers on our cases, we need help. We say OK before it gets to that point may be we can provide them some information on what child protection is, what neglect is, but nothing exists... Health is the same thing, so prevention programs are needed...when creating programs look at a gender lens, but apply a newcomer lens as well when looking at policy...that is not happening. (Regina immigrant service provider)

Privacy policy, for example, there is a huge problem...they say ‘no I cannot share with you because there is a privacy policy.’ I say ‘but I have the newcomer here, I have a signed document here,’ ‘no let the newcomer talk to me,’ but he can’t talk because he doesn’t speak English...A key point is creating a circle of care team with the organizations working with newcomers, the health region and other service providers in the community...in terms of providing service or care that is needed immediately how we can share and protect information. (Regina immigrant service provider)

Social Services could have a better system with Open Door. They could provide access to a system or data and we could do the report and upload it...but they don't do that. They like to take the phone calls or by mail. You have 35 people waiting to do this (report) when they come into our agency. Our workers have to sit down to do the reporting for that. The appointment is 15 minutes, but sometimes there is a line up and the worker has to spend 2 hours making these calls. (Regina immigrant service provider)

5.8.1.9 Summary Reflections on Responsive, Accessible Services

In alignment with participant comments and best practice recommendations regarding healthcare access, healthcare systems should be designed to accommodate cultural, religious, linguistic and health status differences common to newcomers (WHO, 2010). As noted in section 5.7.1 Navigation Difficulties, newcomers experience many difficulties with accessing healthcare due to misunderstandings about how to access care. Furthermore, language difficulties are a common barrier to making appointments and having good communication with healthcare providers, as per section 5.7.2.1 Language Difficulties. In addition they may encounter many barriers to accessing healthcare due to their life circumstances that make it difficult to attend planned appointments during workday hours, as per section 5.7.8 Work, School, Childcare and Transportation Demands. These barriers indicate many opportunities to review healthcare services with a newcomer lens to understand how to develop more responsive services to support better health outcomes among newcomers. For example, given that not providing interpretation services can result in healthcare inefficiencies such as unnecessary tests, longer hospital stays, adverse events, non-attendance at appointments and excessive physician time (Access Alliance, 2009), the provision of interpretation services should be a key component of responsive healthcare. Overall, healthcare services need to be adapted to allow for convenient access to holistic integrated care.

5.8.2 Increase Cultural Competence

5.8.2.1 Bridging the Cultural Gap

Many of the service providers interviewed agreed that increasing the cultural competence of our healthcare system would contribute to the development of accessible healthcare services for newcomers. Many service providers are unaware of cultural practices and traditional medicine in different countries and how these practices impact access to healthcare. However, there is a balance that must be achieved between attenuating the healthcare system to meet the needs of newcomers and educating newcomers on how the Canadian healthcare system works to support the development of a shared understanding.

...there are still people...who have no idea what Islam is or Ramadan is...there is a real knowledge gap there so it would probably be helpful to know what is appropriate and what's not. Trying to understand where people are coming from a little better before asking certain questions. (Saskatoon healthcare provider)

...if you see the back of a person who has done coining or cupping it looks like an abusive mark...you would say this person has been in an abusive relationship...so be more related, be more knowledgeable about the different traditional cures and build the trust with the patient. (Saskatoon immigrant provider)

...we also have to somehow bridge that gap, we are in Canada and people are coming here and they are learning...how things operate here...there is a balance...there is that meeting place where we both come together. (Saskatoon healthcare provider).

Trying to desensitize the client to how they may feel they are being treated, as well as trying to educate others around the needs of newcomers. It goes both ways. We have...staff (who do) cultural bridging...they do cultural awareness, history of immigration, and history of newcomers. (Saskatoon immigrant service provider)

There is a lot more formal teaching about these topics in medical school...now compared to previous years. It used to be zero, but now we have a few lectures... few different programs that you can get involved with in med school that provide them exposure to newcomers; the Student Initiative for Refugee Health program where first year medical students are matched with a newcomer family. (Saskatoon healthcare provider)

We have had staff education around refugees and what some of their concerns may be so even our front line staff is aware of different issues and cultural reasons why things might be going the way they are so that has helped. (Regina healthcare provider)

5.8.2.2 Customized Health Education

The need to provide culturally sensitive dietary advice and education was highlighted by service providers. Health education messages needed to be customized to be relevant to people from different cultures and respectful of their traditional knowledge. The Canadian Food Guide was designed from the viewpoint of those who consume a Western diet, so fails to be an adequate dietary guide for cultures whose staple foods include maize or pulses. Newcomers may not view organized physical activity as a recreational activity if they have done physical work all of their lives and walked everywhere so they may not recognize the importance of getting their children to be physically active. Adopting the newcomer's perspective before delivering health education messages can lead to more successful health promotion among newcomers.

...the Canadian Food Guide is kind of alien for people coming from other cultures where their staple crops or foods are different than the traditional Canadian or American diet. (Saskatoon immigrant service provider)

It is really important to...talk about peoples' food in their home countries so it is not just coming here and starting from scratch with this is what a Canadian diet looks like because often a Canadian diet is pretty unhealthy...they have a lot of really good knowledge that they have come here with so sometimes that gets lost because there is the assumption that I need to adapt and change my ways from back home, but actually my ways from back home were healthy. (Saskatoon immigrant service provider)

What's really important is ...not having that expectation that the way we eat or the foods we have are the foods that our newcomers should be eating. So there is the process of understanding what's important and how can you translate good nutritional practices into the dietary practices that they bring with them. (Saskatoon healthcare provider)

...have healthcare professionals that are trained, especially dietitians trained in cross cultural communications and know about traditional diets from different countries and so could work with that to make some suggestions for healthy eating for the families (Saskatoon healthcare provider)

...explore what it is within that culture, their beliefs around breastfeeding, beliefs around being active...how can we blend it to (Canadian recommendations)...in the long run it would be so powerful. (Regina healthcare provider)

5.8.2.3 Traditional Healing Practices

5.8.2.3.1 Newcomer Perspective

Several newcomers mentioned the use of traditional healing practices to prevent illness, as well as a first line treatment to try before seeking medical help. It is not clear if any of them have ever mentioned their traditional healing practices to their healthcare providers or if they would be comfortable doing so.

Back home my people...eat nuts, so they can't get cold very easily...Some of them when they go outside they got cold very quickly. I thought that nuts may protect from getting cold. (Saskatoon immigrant)

I give them warm milk with garlic for coughing and it is better...runny nose then it is gone. Sometimes it helps and we don't need to go to doctor. Sometimes it doesn't help and we go to the family doctor or clinic. (Saskatoon refugee)

I make onion juice when they have a sore throat or when they are coughing...I even make onions a bit warm when they say their ear hurts, it would help to soothe the pain to put onion on the ear warm. If they have sunburn I would use the quark we make, it is very cooling and soothing, we even use it in Germany to help breastfeeding mothers when they get sore, it is cooling, nothing shamanical. When they have any easy fever I would wrap them up around the calves to cool the body down...If it is not going away after 3 days then you would go see the doctor. (Regina immigrant)

5.8.2.3.2 Service Provider Perspective

Some service providers mentioned that increasing understanding of traditional and alternative healing practices among healthcare providers would contribute to a supportive healthcare environment. Service providers noted the importance of respecting traditional health beliefs, which can be core cultural components of some newcomers' identities, while providing evidence-based health advice. It is also important to be aware of any traditional treatments being used by patients to ensure they are not contraindicated for the client's condition.

A lot of people...have some traditional practices...it makes them feel connected to their roots and even if it is not an effective procedure, but doesn't harm them it gives them that inner satisfaction and inner reliability that they can do something for themselves.

(Saskatoon immigrant service provider)

...clients continue to have those beliefs and ways of practicing health, but they probably wouldn't articulate it as health because it's like a lifestyle, how they live and religion and spirituality, recognizing that as part of health, more than we do here, but that doesn't necessarily come out when they go to a health appointment, they see it as separate.

(Saskatoon immigrant service provider)

...the healing forces by holy water, the prayer, and also when the community are together and strong to support the family that is psychological healing. Not only healthcare or medical, it's a healing...at the time of sickness the whole community stands with you and they don't leave you alone...In childbirth in Eritrean culture...the mother will have traditional sauna...and when she comes out the flaxseed soup...she have to drink...it makes her muscles loose so it helps her at delivery time. (Saskatoon immigrant service provider)

...the spread of germs and disease, prevention of disease...that in my science head I explained it as a virus, whereas some people might have an understanding that it is an evil spirit, a curse or something, so just to explain what my stand is and then listen to how they feel. (Saskatoon healthcare provider)

...always ask them if they use anything from back home, (Regina healthcare provider)

5.8.2.4 Summary Reflections on Increasing Cultural Competence

Participant comments indicate that the provision of culturally competent health services may be at the centre of all the inter-related initiatives that support newcomer health. It is the link between the core identities of newcomer groups to Westernized medical care. Since the Western biomedical model has been found to be an ineffective approach to culturally sensitive care (Jhangiani & Vadeboncoeur, 2010), efforts should be made to move towards culturally competent care through a critical examination of institutional policies and procedures to identify how they may be contributing to the disempowerment of vulnerable groups (Douglas & Pacquiao, 2010). Culturally competent healthcare services can bridge traditional beliefs and practices with those of Western medicine (Renfrew et al., 2013) and has the potential to improve newcomer health outcomes and client satisfaction (Brach & Fraser, 2000). The overall objective should be to

facilitate better understanding between Western healthcare providers and cultural groups without forcing anyone to supplant their beliefs with new ones.

In alignment with participant suggestions, the use of culturally and linguistically appropriate health education materials can produce positive results. For example, positive results with regards to increased HIV testing have been noted after exposure to a health promotion video designed to emphasize culturally relevant values among African-American women (Kalichman et al., 1993). Other studies have demonstrated increased client satisfaction with culturally relevant health education videos (Stevenson et al., 1994). Overall, it would be beneficial to enhance the cultural capacity of the healthcare system to support newcomers to feel respected and welcomed, as well as to ensure that treatment recommendations take into account traditional beliefs and practices to support the best clinical outcomes and client satisfaction.

5.8.3 Targeted Newcomer Health Services

5.8.3.1 Regina Community Clinic

The Regina Open Door Society, Regina Qu'Appelle Health Region and Regina Community Clinic have partnered to offer targeted health services to refugees in the Regina area since 2004. One of the keys to success has been the availability of supportive interpretation services. Overall success of the Regina partnership in terms of healthcare access measures and client satisfaction is high. In some instances quick access to the targeted healthcare service has been beneficial for those with existing health issues, such as a newcomer who had a potentially stigmatizing mental health issue and had facilitated access to good treatment that assisted him to recover and successfully integrate into Canadian society.

We have a coordinated healthcare protocol in place to help them to provide the service. All individuals receive the (initial) health assessment from the public health nurse (and) all those people go the Community Clinic for their physical examination. (Regina immigrant service provider)

Regina Community Clinic is a very well done primary care centre, we have all the facilities of a lab, x-ray department, nurses, nurse practitioners... nutritionists, exercise therapist, counselor, and good physicians...the best setting to serve those people, especially we are...on salaries, so we have time to spend with this people because they don't speak English, might need translator, we take longer time and other physicians don't have the time to do that. (Regina healthcare provider)

We developed a health guide to tell people what to expect when they come here in 7 languages so far...The health guide includes resources, when you come here what will be done when you come here, what is...a crisis...when to go to emergency...medication labels...the health card. (Regina healthcare provider)

...we provide communication in their first language either with the interpreter or staff if available to speak in their language so it makes it easy for the family not to miss an appointment. (Regina immigrant service provider)

...has been working very effectively...resulted in coordinated healthcare for all individuals with high medical needs (and) ... 99 to 100% success in terms of immunization because we do close follow up...Also in terms of going back to medical clinic, visiting the family physician is significantly high at 98 to 99%. (Regina immigrant service provider)

Our partnership approach...prevents 95 to 96% of our clients from ending up in emergency services. Most of our clients...go to Regina Community Clinic and get service from family physician. Only in serious situation the family ends up in Emergency (department), which is a good thing, saves millions of dollars for health region... Before our partnership started, many ended up in Emergency. (Regina immigrant service provider)

It was difficult, we didn't know how...to look for a doctor or health service...we just arrived...and the case worker took us to Regina Community Clinic to register for family doctor...Newcomers going to Regina Community Clinic works good because they can help us with our health and in the first visit to see the doctor, they do everything for us. We saw a dietitian/nutritionist. (Regina refugee)

...we were supported by Open Door that was the good thing, we were booked by the public health nurse to see the doctor over there...My husband was on medication that was why we got into the doctor because he used to get his medication for the depression from there...and he took it for a year...After he got the job and started working and he is good now. He doesn't need it anymore. He got good care from Regina Community Clinic. (Regina refugee)

5.8.3.1.1 Capacity Issues

The Regina Community Clinic is meeting the healthcare needs of refugees, although they are currently experiencing increased service demands that they are stretching to accommodate with existing resources. The Regina Community Clinic accepts all new government sponsored refugees to the Regina area as patients, and when many of them do not transition to other physicians in the community it can become difficult to continue the same level of service without the addition of new resources. Even demand for the public health services provided by the Regina Qu'Appelle Health Region at the Regina Open Door Society location is growing. Although the Regina Qu'Appelle Health Region Public Health Services and Regina Community Clinic are providing good targeted service to refugees, immigrants do not have access to the same dedicated service. Given this lack of targeted services for immigrants and the increasing demand for supportive healthcare services by refugees, some service providers suggest the need for a primary healthcare clinic that focuses on newcomer health.

When we started, we started with 20 or 30 patients a year...and then the number increased every single year, now...we take 200 to 250 patients a year, so we have over a 1000 patient population right now...90 or 92% of them stayed in the clinic since they started here...The patients are very comfortable, even when we tell them they can go find another physician in the community they don't...they like the clinic, they come for follow ups, if they have a translator and somebody to bring them they don't miss their appointments. (Regina healthcare provider)

Every year we do flu clinic for about, this year close to 700...for us 700 is huge number...(public health nurse) sees more people, sometimes we have more people waiting in that section than the other. (Regina immigrant service provider)

Our health program is mainly for refugees...we have proposed to have a primary health site that focuses on newcomers many times...Lack of interpretive services is one of the reasons people are not going (to other healthcare services). Immigrants are not getting interpretive services, even refugees are only getting the service...for the first 6 months while they are going through the health partnership. (Regina immigrant service provider)

...federally sponsored refugees are spoiled in a way because we take good care of them, none of the other newcomers to Saskatchewan get that kind of treatment ...every newcomer to Saskatchewan should get the same treatment. (Regina healthcare provider)

I am convinced we need a new primary health care site that is specific to newcomers...We have a lot (newcomer) physicians and nurses who are not practicing (newcomers who don't have their credentials recognized) and...no reason why we can't...train them to deliver health information in the client's first language and pay them per session. (Regina immigrant service provider)

5.8.3.2 Saskatoon Westwinds Clinic

In Saskatoon, a nurse practitioner at Westwinds Primary Health Clinic sees many refugees who are referred to her by the Saskatoon Open Door Society. Typically she receives requests from settlement counselors when they have new arrivals that need a health exam and an appointment is made with consideration given to the urgency of the referral. Sometimes settlement counselors may think a referral is urgent when it is not, possibly because they don't have access to a dedicated public health nurse to do timely screening. Although in-person interpretation services are not routinely provided for clients who see the nurse practitioner, she has access to telephone interpretation services through the Saskatoon Health Region's account when needed. As discussed in the previous section about responsive services, rather than developing targeted services for newcomers, the Saskatoon Health Region has focused on expanding programming to reach vulnerable populations, including newcomers, who live in low income areas. An exception to this approach is in the area of mental health, where the Saskatoon Health Region is partnering with an immigrant serving agency to offer counseling on site to overcome some access barriers.

(nurse practitioner at Westwinds)...makes sure their immediate needs are met anticipating any sort of issue or problem, trying to address it for them, giving them some ideas about where they can go...certainly don't want to foster a dependency on (the) services...just letting them know if they have a question or are not sure about where to go...(they) can ask...(she is) a facilitator and points people in the right direction...

sometimes (she sees refugees) over a long period of time simply because they don't want to see anybody else...they go out there and see what they can get out there and they want to come back, sometimes they are complicated. (Saskatoon healthcare provider)

Open Door staff took us to Westwinds and they introduced us to (nurse practitioner). Even today (she) follows my...mom for breast cancer. She does my mom's pap test. Still she gives us service...(She) gives us the idea to get family physician...we have the right to have a physician...I went there (clinic) and said I am ready...and I filled out the form...other doctors looking after us (now). (Saskatoon refugee)

...we have a counselor that comes Tuesday afternoons...employed by the health region...people can bypass the whole intake process to come in and see a counselor here. There is definitely people who would not come to see her (at the health region site)...There is a lot of stigma with mental health. (Saskatoon immigrant service provider)

...the health region could acknowledge the energy, time and resources needed for newcomers and staff accordingly. Right now we try to patch it together when people come into clinic. There is no targeting of staff to say OK you have half a day a week to address the needs of immigrants in your community because you have a high concentration...We could work more collaboratively with agencies that settle...have a nurse that is going to...commit her time for half a day...to immunize, interview...we try the best we can, but we could do better. (Saskatoon healthcare provider)

5.8.3.2.1 Capacity Issues

Similar to healthcare access for newcomers in Regina, there is not a standard referral system for immigrants to access dedicated healthcare providers in Saskatoon. Currently, a coalition of healthcare and immigrant service providers is collaborating on the Providing Access to Healthcare (PATH) project to develop standard processes in the healthcare system to meet newcomers' healthcare needs in Saskatoon. In addition some service providers advocated for a newcomer primary healthcare clinic to serve refugees, immigrants or both populations.

...the settlement advisor assigned to the refugees usually is helpful because they directly take them to clinic, open a file for them, find a family physician for them. But with immigrants we don't have that. (Saskatoon immigrant service provider)

The intention of PATH is trying to create pathways and processes between healthcare providers, where newcomers can arrive in the city and there would be established processes...that people would move through the system, so strong connection and communication...methods of referral, and practitioners who are on board to be able to really wrap around the diverse needs of the newcomers. (Saskatoon healthcare provider)

...anything that helps to build that trust, that the patient can trust the system and communicate to the healthcare providers will be helpful...it is a mutual effort, cultural competency of the staff and health care providers, as well as the reliability of the services and the connection that the patient can feel with the doctor....a community clinic...that can provide services directly to immigrants and refugees would help them to open up easier. (Saskatoon immigrant service provider)

...trying to organize a dedicated refugee clinic...a 1 stop shop, all refugees would be seen by a family doctor, and pediatricians would be involved...allied health...and things could be done on site, like blood work...TB testing...all their screening could be done there and they would be followed for x amount of time. Translators would be available there and people would be familiar with how to work with that population and also with resources present in the community. (Saskatoon healthcare provider)

5.8.3.3 Summary Reflections on Targeted Newcomer Health Services

All participating healthcare and immigrant service providers agreed that there is a need to make adjustments to the healthcare system to more systematically address the health needs of newcomers. However, perspectives ranged from providing supports to assist newcomers to better access universal healthcare services to the development of specialized primary healthcare sites for newcomers or refugees. Several studies have found that both targeted newcomer programs and more universal community health centres can successfully serve the newcomer population. For example, a mobile health clinic that provided primarily reproductive healthcare services to immigrant women demonstrated some positive results with regards to providing accessible, holistic, and culturally and linguistically appropriate healthcare service (Guruge et al., 2009). Similarly, the community health centre (CHC) model successfully engaged with Black Caribbean immigrants such that they were more likely to access care at the CHCs and receive diabetes care from a nurse educator than the Canadian-born (Hyman et al., 2014). However, as noted by several service providers targeted programs in Saskatchewan can quickly develop capacity issues when refugee clients do not transition to regular universal services after the first year, and are totally inaccessible to immigrants who may need similar services. In consideration

of these issues and given the current fiscal restraints in Saskatchewan, enhancing the overall cultural capacity of the healthcare system and embedding interpretive supports across the system would likely be the most successful approach to improving healthcare services for newcomers.

5.8.4 Increase Awareness of Health Services

One of the key prerequisites to accessing healthcare is being aware of the services and how to access them. Newcomers may get information from a variety of places including immigrant settlement agencies, newcomer welcome centres, public health nurses and their neighbours so they don't always get accurate or timely advice when they have a need for healthcare service.

5.8.4.1 Newcomer Perspective

Several newcomers, and more commonly immigrants, mentioned difficulties with not knowing where to access healthcare and that an orientation to healthcare services would be helpful. Although refugees have access to case workers at immigrant settlement agencies, immigrants don't get the same level of service and this may put them at a disadvantage. However, English-speaking immigrants appeared to understand where to look for information on community resources.

I had to run to Open Door to talk to the case worker...better to get some teaching about health and health care services. (Regina refugee)

I think orientation would be good because before when we came here nobody told us that...we are eligible for anything like free dental for children...Just the orientation would be good so they know about benefits. (Regina immigrant)

...a representative from the health region who can come to them at their house and tell them all the rights and benefits they can have...and their phone number so they can have a person to talk to tell what they need. (Saskatoon immigrant)

Better orientation would be good. We didn't have any of our family members or relatives or any family friends when we came to Regina, we had no contacts, it takes time to know your community centres. (Regina immigrant),

Open Door Welcome Centre told us about health care here...they gave us a brochure and health card application...I think there are things on the government website/health site, to say what you can expect coming into the country. (Regina immigrant from UK)

5.8.4.2 Service Provider Perspective

Service providers generally agreed that we need to systematically inform newcomers about the healthcare system so they are better prepared to access healthcare services when they have a need. They recognized the need for multiple modalities to assist newcomers to understand and connect to the healthcare system. In addition, some newcomers with more complex healthcare needs may require more intensive short-term case management type services to assist them to connect with healthcare services.

...since 2010...it has changed a lot, they are doing a much better job (of orientation) compared to the previous days. Orientation to health services and they are making actual connections, bringing the specialist to give orientation...at Open Door...how can we access to the dentist, if you have low income where they can go, the people from SIAST came to do that presentation...and they always hire interpreters to talk about things like that at Open Door. (Regina immigrant service provider)

...we do a community fair...annually and invite a lot of health region service providers...it includes health care providers for newcomers to come in and learn about health. (Regina immigrant service provider)

...hospitals...(could) be open to tours...an orientation to how a hospital works (and providing) more knowledge before they come, pre-arrival information, that seems to be a huge issue for a lot of people, a lot of assumptions being made, what Canada is, the kind of services. (Saskatoon immigrant service provider)

(In terms of pre-arrival information, providing) the community link especially if people are just coming and they ask to find other people who live in the area, city or whatever community to make those connections for them. (Regina healthcare provider)

...after settled in their permanent resident for a few months if the health care provider could introduce their services...go for a home visit. (Regina immigrant service provider)

...positions like the community coordinator, who in a school setting is kind of the go to person for a multitude of issues, whether they are financial or social issues, health issues

and so that can be a good connecting point for families...to access services related to health. (Saskatoon healthcare provider)

5.8.4.3 Summary Reflections on Increasing Awareness of Health Services

The first step to accessing healthcare services is to understand where and how to access services, so a systematic approach to ensuring newcomers are advised of services would help to facilitate access. Consistent with participant comments, previous research has demonstrated that recent newcomers often lack understanding on how or where to access healthcare services (Son, 2013). Participants noted that settlement agencies and ethno-cultural organizations/networks are reliable sources for this type of information, but newcomers, especially immigrants, who do not engage with these organizations may not encounter this information. There are also other opportunities to enhance awareness of healthcare services, including the provision of pre-arrival information, hospital tours and outreach services from Public Health.

5.8.5 Engagement in Planning, Partnerships

5.8.5.1 Existing Partnerships

The importance of partnerships in the development of health programming for newcomers was stressed by many service providers when they spoke about existing successful programs or those that are currently under development. Successful partnership development requires ongoing communication and senior leadership involvement. Service providers mentioned several examples of successful partnerships, including partnerships with MEND (Mind, Exercise, Nutrition and Do It) to offer health promotion programming to youth and a local charity to support the health and social needs of newcomer youth that are not covered by other programs.

...we are collaborating with polytechnic dental clinic...and we are having a free dental clinic...focusing on refugee clients who have oral health problems...With REACH (Regina Education and Action for Child Hunger) we have offered cooking classes...but very limited resources. (Regina immigrant service provider)

We have a monthly Regina Open Door Society meeting, who would sit there would be (our physician), our nurse practitioner that deals with newcomers, our Executive Director, members from Open Door, the Public Health Nurse, and...the medical health officer from Regina Qu'Appelle Health Region...They meet to understand the health issues going on and how they can improve upon this. (Regina healthcare provider)

MEND (Mind, Exercise, Nutrition and Do It)...A University of Saskatchewan program...One of my groups...I sent them to MEND...they talk about healthy eating, being active, screen time. One session of MEND is only for Open Door clients...It is at YMCA...our funding is for transportation...It is a good program. (Saskatoon immigrant service provider)

...through developing partnerships, we provide more access to programs that are already in place to our clients. (Saskatoon immigrant service provider)

...the Care and Share Dignity Fund to cover lice shampoo, etc. (Saskatoon service provider)

5.8.5.2 Building Partnerships

Many organizations recognize that everyone holds a piece of the partnership puzzle and cannot succeed alone, so there is a need to communicate with each other to develop successful collaborative health programs. Some barriers to collaboration that need to be overcome include overly narrow funding parameters and established ways of working that need to be worked through. In addition, sometimes partnership building work is not prioritized amongst the daily service delivery demands. In Saskatoon service providers are in the initial stages of building the PATH partnership and realize that communication is key to moving forward.

Definitely we could do more, but we cannot do it alone...we seek the support, not necessarily funding, but more an initiative we can be a part of, the health region could take the lead. We could improve the health education programs, perhaps looking at some nutrition programs...I know we could do more...the health region and Saskatchewan Health need to play a big part in this. (Regina immigrant service provider)

Somebody may have a program already out there that could be beneficial for newcomers, but when you talk to them they say 'no, we are asked to focus on this particular

population and don't have the funds to work with yours.' We need more flexibility to work together. (Regina immigrant service provider)

Some really great programs and their aim is to try to work with low income communities or focusing on First Nations, but the objective isn't specific to First Nations, it is just who they have worked with in the past, there has been efforts to look at how can we both work more with newcomers and also have inclusive spaces for First Nations and newcomer populations. (Saskatoon immigrant service provider)

...we ask a lot of times for emergency (department) to get involved (in newcomer health partnership) because they have a lot of those cases, but they never care to...ask us, they investigate these people over and over again. We are the resource...they repeat tests over and over on these people. (Regina healthcare provider)

...right now we work quite separately, perception that settlement does this and (health system) does that, but if we build more pathways between and amongst our services there would be more support in trying to develop pathways for newcomers to access services. (Saskatoon immigrant service provider)

...there is no kind of cohesive strategy of how to provide health services for refugees and immigrants...there is a lot of different services being offered , but there is very little communication among service providers...come up with a sustainable strategy for improving health services. (Saskatoon immigrant service provider)

...if we could come all together without throwing bones to each other we could make more change. (Saskatoon immigrant service provider)

5.8.5.3 Newcomer Engagement in Healthcare Planning

There was strong support among service providers to consult with newcomers about healthcare planning to ensure that their healthcare needs are taken into account. Service providers mentioned consultation gaps and lack of responsiveness to suggestions, as well as opportunities to consult with newcomers. One service provider mentioned that she was surprised to be consulted by federal corrections service when she has not been invited to provide cultural advice to the healthcare system.

They need to be invited to those conversations, they need to be at the decision making table, they need to provide that wisdom and guidance. I think just as much as it's really big with our First Nations and Metis. You can't make decisions for people or on behalf of people, they need to be invited to the conversation at the table because what they have to say is important. They have the understanding. (Saskatoon healthcare provider)

...focus groups or ongoing discussion or...may be have a means of getting their feedback regularly through existing programs or through university students or... through the mail, surveys. (Saskatoon immigrant service provider)

PATH...is trying to connect directly with newcomers and ask what has your experience been and how can we make a system that is more appropriate, what's worked for you, what's failed for you...you have to actually go out and take the time to create a space and environment that is comfortable, have access to translators where people can actually share their experiences. (Saskatoon healthcare provider)

...so far the system hasn't involved newcomers in terms of seeking their input into how the healthcare system can be improved or tailored to meet their needs. There is definitely a role for newcomers to play in shaping any kind of policy in the community, but I haven't seen a wider consultation with newcomers. (Regina immigrant service provider)

I asked the health region why can't you create a directory of the physicians that speak different languages so newcomers can go and see them...OK and then it doesn't go anywhere...The newcomer population is not enough in focus, for some reason I don't see that. At least I don't have evidence that it is. (Regina immigrant service provider)

I was very disappointed when (Healthline) 811 was launched, nobody contacted us, they didn't have any strategy to promote it among newcomers, although it is an excellent and valuable service...We don't get opportunities in some areas that we should be when developing policies. Like primary health care for example, I haven't heard from anybody. (Regina immigrant service provider)

The federal correctional service is seeking advice on cultural issues, I was surprised. (Saskatoon immigrant service provider)

5.8.5.4 Meaningful Consultation and Involvement

When meaningful consultation happens it can have a substantial impact. However, healthcare planners must remember to thoughtfully include the growing newcomer population in their demographic overview to inform healthcare consultation plans. Service providers' comments conveyed that successful consultations were often facilitated by healthcare administrators becoming of aware of someone they could connect with in an immigrant serving organization. Beyond an advisory capacity, service providers also offered some suggestions about how to engage newcomers in leadership roles.

I remember for years they didn't include anything on newcomers and I was upset and I phoned someone and said there is nothing on newcomers and they said they forgot. How

can you forget this when people are coming here in droves? And now there has been consultation. ...the creation of the Saskatchewan Mental Health Coalition and the invitation to Open Door to be part of that forum and have a voice at that table and also having a component on immigrant and refugee health being put into their report...not just the First Nations and Aboriginal populations. (Regina immigrant service provider)

...recently I got a call from Royal University Hospital maternity asking for a few of our clients who can speak English to go there to sit in their advisory committee for patients ...they want to know how to make it better, positive feedback...Because we are part of the breastfeeding initiative committee I got a call from the manager. (Saskatoon immigrant service provider)

...there is a lot of capacity for internationally trained health professionals who have a lot of valuable input and time to be used...(they could assist with) some expertise in terms of health literacy. (Saskatoon immigrant service provider)

...it would be nice to have mother groups that would support each other...for example, a Somali women postpartum depression group that would be led by a Somali woman, or a breastfeeding Filipino mothers' group that would be led by a community leader. (Saskatoon healthcare provider)

...community involvement and community engaged health care is the only way that can serve the people in a meaningful way because they really have to understand what they need to do for their own health. If we give them some respect and autonomy to take leadership and ownership of their own health that can be a more successful way of getting a truly healthy nation. (Regina healthcare provider)

5.8.5.5 Summary Reflections on Engagement in Planning and Partnerships

Participant comments emphasize that successful partnerships involve good communication between organizations and a willingness to share resources and expertise in the spirit of improving health services for newcomers. Effective partnership building requires focused work by all involved organizations to come to an understanding about how everyone can contribute to building a collaborative healthcare model for newcomers. In alignment with participant comments, research has demonstrated that successful healthcare partnerships entail meaningful consultation and involvement with the newcomer community (Anderson et al., 2003). When community members are consulted as experts and treated as true partners in a

collaborative program development process, focus is placed on cultural relevance and long-standing problems can be resolved (Israel et al., 2005). Newcomer communities and settlement organizations can be valuable partners in the development of responsive healthcare services.

5.9 Summary

The qualitative data was analyzed within 5 main themes: dietary acculturation and emergence of Western chronic health concerns, social determinants of health as experienced by newcomer families, physical activity limitations, barriers to healthcare and accessible healthcare services. Overall, the data demonstrates that all newcomer families do not experience the same health status challenges, nor the same difficulties with accessing healthcare. Racialized newcomers with limited English skills and lower incomes reported more challenges with maintaining healthy traditional diets for their children due to the new food environment and economic constraints, as well as accessing appropriate physical activity opportunities for their children, and this is setting the stage for the development of overweight, obesity and other chronic health problems among newcomer children. Schools emerged as playing a central role in newcomer children's health through developing an inclusive food environment and providing free and accessible opportunities for physical activity.

With regards to healthcare access issues, racialized newcomers again more commonly experienced barriers to access as compared to newcomers from Western Europe and the US. Barriers to healthcare include health system navigation difficulties related to understanding how and where to access care, lack of awareness of available healthcare services, language difficulties, low literacy levels, lack of appropriate interpretation services, limited appointment times, services that do not respond to cultural and gender specific needs, different perspectives on preventative healthcare and chronic disease, and making time to attend healthcare

appointments in a busy schedule. Although these barriers apply to both refugees and immigrants, some immigrants appeared to be at more of a disadvantage with regards to healthcare access due to not having a case manager available to help them out when they have a healthcare need. Immigrants often relied on other community members and neighbours for information so they often did not find out about provincial health benefits programs for individuals with lower incomes until someone told them about it. As a result of these barriers many individuals experienced treatment delays, inappropriate treatment, and in some cases unnecessary pain and suffering.

In recognition of the above barriers, participants stressed the importance of developing responsive healthcare services, including convenient access and primary healthcare sites that offer comprehensive care in a culturally responsive manner with embedded interpretation services, as core components to build an accessible healthcare system. Healthcare services also need to develop meaningful partnerships with newcomer service organizations to ensure the development of programming that meets newcomers' needs.

Immigration is changing the cultural mix in Saskatchewan communities. It is no longer acceptable to deliver healthcare from a Western Eurocentric viewpoint to a population that is morphing to include many cultural groups. All levels of healthcare organizations, from the Ministry of Health, regional health authorities, community clinics to individual healthcare providers, need to reflect on their capacity to serve newcomers and respond appropriately.

6. DISCUSSION

Both quantitative and qualitative data are discussed under each topic. The qualitative data confirms many of the quantitative findings, as well as provides complementary explanations of several concepts.

6.1 Newcomer Diet

6.1.1 Data Triangulation

Eighty-two percent of participants had a healthy eating score that assigned them to the ‘diet needs improvement’ category. This is consistent with comments from parents and service providers about concerns with newcomer children’s diets. Newcomer parents commonly talked about how their families’ busy schedules and their children’s demands for fast foods and sugar sweetened beverages were challenges to maintaining a healthy traditional diet. An additional nuance offered by the qualitative data gathered from some parents was the primacy of ensuring that their children’s needs are met and that they don’t feel deprived. Furthermore comments from immigrants from higher income countries that indicated they may be more attuned to Western dietary problems allows for differentiation of their experience in contrast to the racialized groups, which was not possible with the quantitative data.

The overall low consumption of milk and alternatives and fruits and vegetables noted in the quantitative data is consistent with healthcare provider comments that many newcomer children eat a high carbohydrate and meat-based diet and do not consume many milk products. Immigrant service providers noted concerns with possible overconsumption of meat in response to experiencing deprivation in refugee camps; however, this was not consistent with the quantitative data. Perhaps there are different perceptions about appropriate quantities of meat to

consume as compared to Canada's Food Guide or these comments are related to the major dietary changes as newcomers shift from a grain and pulse-based diet to include more meat when they arrive in Canada.

The quantitative data indicates that some participants are at risk for inadequate consumption of folate (30%), iron (10%), zinc (27%), vitamin B12 (10%), vitamin D (91%) and calcium (80%) intakes. Comments from healthcare providers indicate that they are most aware of newcomer children being deficient in iron, vitamin B12 and vitamin D. Their comments link these deficiencies with vegetarian diets and low consumption of meat, fortified grains, and milk products. However, healthcare providers do not seem to be as aware of the fairly common possibility of calcium, zinc and folate deficiencies.

6.1.2 Comparison to Canadian Children

Canadian children appear to have generally adequate diets, although many consume diets with room for improvement according to data are from cycle 2.2 of the Canadian Community Health Survey (Health Canada, 2012). Children up to age 8 consume diets that provide adequate amounts of most vitamins and minerals, with the exception of calcium and vitamin D. A large proportion do not have adequate intakes of vitamin D (86.0% of 1-3 year olds and 92.7% of 4-8 year olds) and 23% of children aged 4-8 have inadequate intakes of calcium. In addition, 77% of 1-3 year olds and 93% of 4-8 year olds have intakes of sodium exceeding the upper limit. Among older children the risk for inadequate dietary intakes increases (Health Canada, 2012a). Boys aged 9-13 years are at risk for inadequate intake of vitamin A (11.6%), vitamin D (84.5%) and calcium (43.9%). Girls aged 9-13 are at risk for a broader range of dietary inadequacies including vitamin D (93.1%), calcium (66.9%), vitamin A, magnesium, zinc, and phosphorus

(ranging between 10-30%). In addition a large majority of boys (97%) and girls (80%) have intakes of sodium above the upper limit.

Similar to Canadian children, newcomer children are at risk of inadequate vitamin D (91%) and calcium (80%) intakes. This is consistent with their low consumption of milk and alternatives as only 24% of immigrants and 16% of refugees consume sufficient milk servings according to Canada's Food Guide. However, newcomer children are also at risk of inadequate intakes of folate (30%) and zinc (27%). Inadequate folate consumption is likely due to not consuming sufficient servings of fruits and vegetables as 78% of participants do not meet Canada's Food Guide Recommendations in this area. Similarly, inadequate intake of zinc is likely linked to not consuming sufficient servings of meats and alternatives as 25% of participants do not meet the recommended number of servings. In addition refugees are at additional risk for inadequate intakes of vitamin B12 (12%) and iron (18%). This is likely associated with the higher proportion of refugees who do not consume the recommended number of meat and alternative servings (31%) as compared to immigrants (18%) and may also be linked to the consumption of a vegetarian diet as noted by a Saskatoon healthcare provider and a Regina refugee. Also similar to Canadian children, a large proportion of newcomers are at risk of consuming too much sodium above the upper limit (50%); however, this appears to be less prevalent than among Canadian children.

In regards to Healthy Eating Index scores, all groups of Canadian children between the ages of 4 and 13 have average scores in the diet needs improvement category (ranges from 59.7 to 65.4) and the large majority of each age group have scores in this category (ranges from 91.3% to 96.5%) (Garriguet, 2009). Newcomer children in the current study may be doing a

little bit better as their average score is 72.8% and 82% of them are in the diet needs improvement category, with the remainder in the good diet category.

6.1.3 Impact

The dietary inadequacies noted above indicate that newcomer children may be at risk for suboptimal bone development, poor growth and anemia. Adequate body supplies of both calcium and vitamin D are keys to ensuring optimal bone mass gain during growth. A positive correlation has been observed between dietary calcium intake and bone mineral mass during childhood and adolescence (Bonjour & Rizzoli, 2001), and vitamin D serum levels have been positively associated with bone mass gain among adolescents (Clemens et al., 2005).

The prevalence of inadequate zinc intake (27%) observed among the newcomer children is a concern because it can result in stunting and poor development (Panel on Micronutrients, 2000). The primary clinical feature of mild zinc deficiency among children is impaired growth that improves with zinc supplementation (Walravens et al., 1989). High dietary phytate consumption can impede zinc absorption (Oberleas et al., 1966), while consumption of animal protein can enhance absorption (King and Keen, 1999). Thus, the consumption of vegetarian diets with high phytate content may increase their risk of stunting.

The inadequate consumption of folate, vitamin B12 and iron among newcomer children, especially refugees, is also concerning since deficiency in 1 or more of these micronutrients can result in anemia (Institute of Medicine, 1998). Anemia has been associated with delayed growth, impaired cognitive development and behavioural changes in children related to attention span, intelligence, sensory perception, emotions and behaviour, which may persist into adulthood without treatment (Lozoff, 2007; Jáuregui-Lobera, 2014). Similar to zinc, iron absorption can be inhibited by high dietary phytate consumption (Cook et al., 1997) and enhanced through the

consumption of iron from animal sources (Institute of Medicine, 1998). In addition, exclusive breastfeeding after 6 months of age without the introduction of iron-rich complementary foods or iron supplements, use of cow's milk and frequent consumption of tea are risk factors for iron deficiency among newly arrived refugee children (Hassan et al., 1997). The consumption of sufficient milk to maintain adequate vitamin D status, while not adversely affecting iron status may be a challenge for some children. A Toronto study involving preschoolers concluded that 2 cups of milk per day was sufficient to maintain optimal vitamin D status with minimal impact on serum ferritin (Maguire et al. 2013). However, children with darker skin pigmentation who did not receive vitamin D supplementation during the winter required 3 to 4 cups of milk per day to maintain optimal vitamin D status, which was associated with lower serum ferritin levels.

In addition to iron, an adequate supply of vitamin B₁₂ and folate is required for normal blood cell formation and neurological function. (Institute of Medicine, 1998). Vitamin B₁₂ is normally obtained from animal source foods, as well as fortified ready-to-eat cereals; while folate is found in ready-to-eat cereals, breads and some fruits and vegetables (Institute of Medicine, 1998). Newcomer children in the current study did not commonly report eating ready-to-eat cereals, an important source of vitamin B₁₂ and folate in the Canadian diet. Since the newcomer children more commonly consume rice and unleavened bread and some are vegetarian, a substantial number are at risk for anemia.

6.2 Food Security

6.2.1 Data Triangulation

According to the quantitative data, length of residence in Canada and parents' education level are significant predictors of household food security. This is consistent with qualitative

findings that indicate families are trying to stretch food further due to low incomes. When families first arrive many are living on low incomes either from social assistance in the case of refugees or on their savings that need to support them until they find jobs in the case of immigrants. The qualitative data provides further detail that links food insecurity to lack of awareness of health benefit programs, insufficient drug benefits, insufficient funds for hygiene items and repayment of transportation loans provided to refugees. In addition, none of the immigrant families from Western Europe and the US mentioned any difficulties with food security.

6.2.2 Comparison to Canadians

The most recent CCHS survey in 2014 that included an optional Household Food Security Survey Module found that 12.0% of households experienced some level of food insecurity, with Saskatchewan being the province with the lowest level of food insecurity at 10.6%, among those who implemented the optional module (Tarasuk, 2014). Across Canada newcomers who have been in Canada less than 5 years more commonly experienced food insecurity (15.2%), as compared to newcomers who have been in Canada longer (12.0%) and the Canadian-born (11.8%). Income was the strongest predictor of food insecurity. Food insecurity was common among households whose major source of income was social assistance (61%); however, the majority of food insecure households (62%) were those that relied on wages from employment.

Consistent with the national data, the current study observed a high level of food insecurity among newcomers who have been in Canada less than 5 years (53%), and that recent newcomers are more likely to be food insecure. However, this rate of food insecurity is substantially higher than the national figure, possibly due to enhanced outreach to vulnerable

newcomers who did not speak English or French through interpreters to support their participation. Similar to the national study, 69.9% of newcomers on social assistance in the current study reported that they were food insecure at the household level, while 60% of food insecure families relied on wages from employment.

The additional qualitative data gathered through the current study that links food insecurity to insufficient access to health benefit programs and policies requiring prompt repayment of transportation loans provided to refugees provides enhanced perspectives on this issue beyond low income. Further, participant recollections about newcomer children who don't eat their lunch that they take to school or throw it away because they are embarrassed about their ethnic food provides an additional dimension to the concept of food security for children related to the school food environment. This type of information was not available through the national CCHS data.

6.2.3 Impact

Food insecurity during childhood can have a variety of negative impacts that may persist into adulthood. Young children in food insecure households tend to consume an energy dense diet (Kirkpatrick & Tarasuk, 2008) and persistent household food insecurity can result in the establishment of unhealthy eating patterns (Matheson et al., 2002) that persist into adulthood and contribute to the development of obesity (Sarlio-Lahteenkorva & Lahelma, 2001). Food insecurity during childhood has been linked with increased risk for chronic illness, acute infection, iron-deficiency anemia, and developmental and mental health problems (Weinreb et al., 2002; Rose-Jacobs et al., 2008; Slack and Yoo, 2005; Whitaker et al., 2006; Kursmark and Weitzman, 2009; Skalicky et al., 2006; Gundersen & Kreider, 2009a), while research involving child immigrants has associated food insecurity with the development of learning disabilities

(Weigel et al., 2007). More recently, Canadian research has shown that children who experience food insecurity are at risk for physical and mental health problems, such as depression and asthma in adolescence and early adulthood. (McIntyre L, et al., 2012; Kirkpatrick S, et al., 2010).

The level of acculturation may mediate the impact of low-income on the development of food insecurity among newcomer children. Low-income has been associated with higher intakes of sodium, protein and energy, while limited acculturation has been linked with lower intakes of sodium, energy and percentage of energy from fat and saturated fat and higher intakes of folate among Hispanic children (Mazur et al., 2003). Accordingly, this research indicates the important role of maintaining traditional cultural dietary practices to positively impact food security among low-income families.

6.2.4 Food Bank Usage

The Regina Food Bank advises that 6% of their clients (480 hampers per month) self-identify as newcomers to the community (Murray, 2015). They make efforts to lower barriers for newcomers to access their services by accepting confirmation of permanent residency documents in place of the normally required Saskatchewan Health Card as proof of residency, as well as providing ongoing services for a 1 year period following initial intake before having to meet with a client intake worker again. In collaboration with other immigrant serving organizations, the Regina Food Bank has also branched out to providing training of interest to newcomers through their Adult Centre for Employment Readiness and Training (ACERT). They have offered English as a Second Language, Workplace Essential Skills for Newcomers, computer training, job search workshops and Nutritional Leadership Cooking training programs. The Nutritional Leadership Cooking program provides basic instruction on healthy, affordable food selection and preparation. In 2013, about 60% of ACERT clients self-identified as an immigrant or refugee. In

addition, the Regina Food Bank is part of a Newcomer Food Security Group with RQHR, RRLIP, REACH and RCC. This group meets about 4 times a year to discuss newcomer food security issues and to plan activities that support newcomers.

6.3 Food Environment

6.3.1 Comparison to Children's Food Environments in Westernized Countries

Consistent with literature on the 'nutrition transition' many high income countries, such as Canada, are in an advanced stage that entails reduced physical activity, sedentary lifestyles, energy dense diets and increased incidence of chronic diseases (Popkin, 2006). This trend includes increased consumption of fast foods (Poti & Popkin, 2011), increased consumption of sugar-sweetened beverages and processed foods, and reduced consumption of fruits, vegetables and legumes (Popkin, 2006). The environment includes increased access to fatty, sweet and processed foods through a variety of retailers (Popkin, 2011), and television commercials that influence dietary consumption patterns (Hitchings and Moynihan, 1998).

In addition to the national and community level food environment, the home and family environment contribute to shaping children's dietary patterns. Newcomers who are suddenly thrust into the Canadian environment may experience dietary intake changes related to the limited availability of traditional foods, economic-constraints, time-constraints that lead to the use of convenience foods, children's demands and the ability to cook western foods (Patil et al., 2009). There is also dietary variation across ethnic groups. A study involving both African-American and Hispanic families observed that unhealthy food were available to children in both groups; however, Hispanic families were more likely to have soda and fresh fruit and vegetables available; whereas African-American families were more likely to treat dessert as a reward or

restriction (Skala et al., 2012). Access to traditional food knowledge (TFK) can also impact the types of food offered to newcomer children. In a study involved Indonesian-Chinese Canadians, parents recognized the important role of transmitting TFK to their children to shape their food habits, otherwise there is a risk that children will not only refuse to eat the food, but express their dislike with parents' preparing the food due to its aroma (Kwik, 2008). Some participants also mentioned that all family members have their own taste preference, even if they are generally supportive of traditional foods.

Feeding styles among newcomer mothers and their children may also impact children's intake and weight. In a study involving newcomer families, the greatest proportion (34%) displayed a low demanding/high responsive style (i.e., being warm and accepting, but making few demands with regards to food on the child), and this feeding style was positively associated with higher child weights (Tovar et al., 2012).

The school food environment is a major component of newcomer children's food environment as children consume 35-47% of their daily dietary intake at school (Briefel et al., 2009). In the US, students consume high amounts of SSBs and energy dense food (pizza, french fries, chips and candies) at school (Briefel et al., 2009, Fox et al., 2009; Briefel et al., 2009a). Although there is limited data describing the Canadian school food environment, a study from British Columbia reported that "junk" foods (e.g., pop, cookies, chips, candies) were widely available in middle and high schools (Rideout et al., 2007). A more recent study from British Columbia found that availability of SSBs was positively associated with higher SSB intakes and obesity; however, consumption of less healthy food was positively associated with overweight (Masse et al., 2014).

Many participants in the current study mentioned similar dietary challenges within the current community, school and home food environments. Newcomers and service providers talked about being thrust into an environment where energy dense foods are readily available and demanded by children. Newcomer parents talked about trying to maintain a healthy traditional diet, but they encountered difficulties with their children demands for more fast food. Some parents also emphasized the primacy of responding to their children's needs, which could result in a low demanding/high responsive style of feeding (Tovar et al., 2012) or assertive and intrusive feeding styles (Lumeng et al., 2012). Lumeng et al. (2012) reported that ethnic minority mothers and mothers with lower education were at higher risk of an intrusive feeding style, which was associated with higher child adiposity. Many refugees described transitioning from refugee camps with limited food resources to the Canadian food environment, where they can buy more meat, 'junk foods' and SSBs preferred by their children. Some parents mentioned the fast paced lifestyle here and the limited time available to ensure their children consumed a healthy diet. In addition, many parents and service providers expressed concerns with school food environments that normalized the consumption of 'junk foods' and made it uncomfortable for children to consume traditional foods at school, thereby increasing children's demands for 'junk foods'.

6.3.2 Impact

School nutrition policies and practices can have significant impact on children's dietary behaviours and health outcomes. Studies have reported increased fruit intake and decreased consumption of low-nutrient energy-dense foods associated with healthy food policies and practices (Taber et al., 2012). In addition an American study noted that older students in states with strong school nutrition policies did not gain as many BMI units and were more likely to

transition from an overweight or obese BMI to a healthy BMI as compared to students in other states (Taber et al., 2012a). Although the Canadian school food environments may not be equivalent to American schools, school food environments play an important role in shaping dietary habits that may last a lifetime.

6.4 Physical Activity

6.4.1 Data Triangulation

Participant responses to the physical activity questionnaire indicate that many of them are sufficiently active (715%); however, a high number also engage in too much sedentary activity (58.4%). The qualitative data provide explanations related to physical activity preferences and barriers to participation. Parents often wanted their children involved in sports and activities that are typical in their cultures; which often meant that boys played soccer, while girls participated in cultural dance activities. Schools played a pivotal role in providing physical activity opportunities for many families because activities were close to home, conveniently accessible and free. Barriers to participation in physical activities include: recreational physical activity being a foreign concept, cultural limits to women's and girls' participation, lack of awareness of available activities, transportation difficulties, busy schedules, limited financial resources, safety concerns, and children's preference for screen time. Most of these comments related to barriers came from racialized participants, while immigrants from Western Europe and the US indicated that their children were registered for their preferred organized sports.

6.4.2 Comparison to Canadian Children

According to the Canadian 24 Hour Movement Guidelines for Children and Youth, in order to support healthy development children and youth should limit sedentary behaviours, get

enough sleep and participate in a variety of physical activities across different environments (e.g., home/school/community) and contexts (e.g., active play, sport) (ParticipACTION, 2016). Children and youth aged 5 to 17 years should engage in at least 60 minutes per day of moderate to vigorous physical activity (MVPA), including muscle and bone strengthening activities at least 3 days per week and limit sedentary recreational activities to no more than 2 hours per day. Younger children aged 3 to 4 years old should engage in at least 180 minutes of daily physical activity of any intensity and limit sedentary recreational activities to less than 1 hour per day.

According to the Canadian Health Measures Survey data, 14% of 5 to 11 year olds are achieving the target of 60 minutes MVPA at least 6 days per week and 24% of them meet the sedentary behaviour recommendation (ParticipACTION, 2016). Among younger children 70% of 3 to 4 year olds are engaging in at least 180 minutes of daily physical activity, and 15% of them meet the sedentary behaviour recommendation (ParticipACTION, 2016). In regards to participation in organized sports, Canadian children whose parents have post-secondary education or have the highest incomes are more likely to participate (Canadian Fitness and Lifestyle Research Institute , 2016). Other research has observed that barriers to children's active play include parental concerns about safety, including bullies, traffic and stranger danger (Lee et al., 2015). Canadian schools appear to play an important role in ensuring children are physically active with 77% of schools stating that they provide age and stage appropriate physical activities and 69% having a policy to provide daily physical activity to all students (ParticipACTION, 2016). Preschoolers' activity levels may be impacted by the incorporation of active play into the schedule of the preschool or childcare centre that they attend. In Saskatchewan, *The Child Care Regulations, 2015* states: "The licensee of a centre must provide a safe outdoor play area of 7 square metres per licensed childcare space...at least half of the

outdoor play area required...must be adjacent to the centre and the remainder must be within walking distance of the centre.” (Government of Saskatchewan, 2000) The Act does not specify requirements outlining the amount or type of physical activity that must be offered so there could be wide variance among centres.

In comparison to Canadian children, newcomer children in the current study appear to be doing quite well as 71.5% of them meet age appropriate recommended hours of physical activity and 41.6% meet the sedentary behaviour recommendation. However, it is not clear whether all physical activities reported by newcomer parents and children would meet the threshold for MVPA. Similar to Canadian children, newcomer children whose parents have high incomes most commonly mentioned participating in organized sports in comparison to children from lower income families. In alignment with other research, newcomer parents also mentioned concerns with allowing their children to engage in unsupervised active play outside due to safety concerns. Many newcomer parents recognized the important role that schools play through offering opportunities for physical activities. They like their children to access physical activities both through in-class physical activity, as well as programs offered after hours on school grounds as these are easy to access close to home and are often free or low-cost. Many newcomer parents and children mentioned their preferences for familiar sports such as soccer and cultural dance activities. Since many schools are supportive environments for physical activity, there may be opportunities for ethnic groups to partner with schools on the development of physical activity programming for newcomers.

6.4.3 Impact

The importance of physical activity to healthy growth and development has been emphasized by recent research. An international study found that 9 to 11 year olds who engage

in at least 55 minutes of MVPA daily are at decreased risk for obesity in comparison to others (Katzmarzyk et al., 2015). In addition, excessive sedentary behaviour is thought to be a risk factor for the development of chronic diseases, such as type II diabetes and coronary heart disease (Stierlin et al., 2015). In light of the high proportion of newcomer children with high cholesterol (52%), especially among refugees (60%), it is important to consider how newcomer children can be supported to meet physical activity and sedentary activity recommendations to decrease their risk of chronic disease.

Physical activity can also promote healthy brain development to support learning and good academic outcomes. For example, children's participation in 20 minutes of daily physical activity has been linked to improved standardized test scores and better attention in the classroom (Donnelly & Lambourne, 2011). There is also some evidence that younger children up to age 5 may benefit from physical activity to support cognitive development (Carson et al., 2016). However, too much sedentary activities may counteract the positive impact of physical activity on brain development (Voss et al., 2014). Although there is some evidence that reading is beneficial to early cognitive development, screen time is not (Carson et al., 2015). Since many newcomer children live in low income households (36.3% of study sample) they are at risk for poor cognitive development, not reaching their full developmental capacity, and subsequently low engagement with the labour market and poor health as adults (Palloni et al., 2009). Given the impact that physical activity and sedentary activities can have on long-term health, it is important to consider how to increase physical activity and decrease screen time recreation among newcomer children.

6.4.4 Saskatchewan Initiatives

Current provincial initiatives focused on improving healthy lifestyles among children and youth in Saskatchewan include Saskatchewan in Motion, Mind Exercise Nutrition Do it (MEND) and Healthy Start. Since 2009, Saskatchewan in motion has focused on increasing physical activity among school-aged children and youth (Saskatchewan in motion, no date). They promote the “30-30-30” solution based on the premise of families, communities and schools each accepting responsibility for 30 minutes of daily physical activity as part of a child’s day to meet Canada’s Guidelines for Physical Activity. Saskatchewan in motion provided tools and resources to teachers, community leaders and parents to assist with reaching the goal. More recently in 2012 Healthy Start was initiated with the goal of increasing healthy eating and physical activity opportunities in early learning environments (Healthy Start, 2016). They have developed resources and provided training sessions to early childhood centre staff at 89 centres as of April, 2016 and continue to provide on-going support. Healthy Start is currently undergoing a comprehensive outcome evaluation study. Although newcomer children are likely among those who are touched by Saskatchewan in motion and Healthy Start programming, these programs were not mentioned by any of the study participants.

MEND Saskatchewan was also launched in 2012 with initial programming based in Saskatoon (MEND Saskatchewan, 2016). MEND programming has since expanded to at least 11 other communities. MEND is a free healthy lifestyle program currently offered to 2 age groups: children aged 2-4 years and youth aged 7-13 years. The program focuses on teaching children and their parents about nutrition and making healthy choices to eat better and be more active. Positive outcomes associated with participation in MEND have been widely documented. Studies have demonstrated that participation in MEND 7-13 is associated with reductions in BMI

and waist circumference. Improved dietary intake, increased physical activity and reduced sedentary behaviours have also been observed in association with participation in MEND (MEND Saskatchewan, 2016).

Saskatoon Open Door Society is listed as a collaborator on the MEND Saskatchewan website (MEND Saskatchewan, 2016). MEND does not keep records of newcomer participation so it is not possible to understand the extent of their participation overall. Both a Saskatoon immigrant service provider and a Saskatoon newcomer made positive comments about MEND. The Saskatoon immigrant service provider valued the partnership with MEND to be able to provide health promotion programming to newcomer families and perceived positive outcomes for families who participated. The mother who mentioned that her son had attended MEND appreciated the programming, but struggled with transportation to get there in the winter and discontinued participation.

6.5 Growth and Development

6.5.1 Data Triangulation

The quantitative data indicates that older children, those with better educated parents, and those who consume a poorer quality diet are at higher risk for being overweight/obese. In addition, older immigrant children aged 8 to 13 years old, are at significantly higher risk of being overfat according to their percentage body fat. In alignment with the quantitative data, healthcare providers commented that many newcomer children are gaining too much weight and that this is linked to dietary changes. Other factors that may affect weight gain also came to light through the qualitative data, such as mental health problems, lack of knowledge about chronic health conditions, previous food deprivation that failed to support learning how to eat healthily,

skewed healthy weight perceptions and heightened concern to ensure all of the children's needs are well met.

6.5.2 Stunting in Comparison to Canadian Children

Although recent national Canadian data related to growth delays is not published, regional data is available for some areas. Recent data related to growth delays among young children is available from the Quebec Longitudinal Study of Child Development. Ehounoux et al. (2009) report that 10.1% of their total sample experienced growth delays ($\leq 10^{\text{th}}$ percentile); however, only 9.5% of the never poor group experienced growth delays, while 20.4% of those who experienced at least 2 periods of poverty between 2.5 and 4 years of age experienced growth delays. This group of children who experienced long-term poverty during early life was 3.43 times more likely to experience growth delays compared to the never poor group. Poverty was measured using a tool that measures lack of money for basic needs, as opposed to the LICO, which may not be sensitive to those who are just above the LICO, but experience problems with providing for their children's basic needs.

In comparison, 23% of refugee children in the current study are stunted ($\leq 5^{\text{th}}$ percentile), while only 4.6% of the immigrant children are stunted. In terms of percentile height for age, refugee children are significantly shorter than immigrant children. Refugee children, especially those from Asia are at greater risk for lower percentile heights. Although no association with present incomes below the LICO was observed, there are likely links to previous periods of poverty as demonstrated in the Quebec study above. In addition it is possible that the refugee children were subjected to extreme stresses at early ages that impacted their growth. A study in Jamaica that involved the use of psychological and physiologic stressors found that children who had experienced growth delays had faster heart rates and higher urinary epinephrine and

norepinephrine concentrations in comparison to controls (Fernald and Grantham-McGregor, 2002). The authors report controlling for socio-economic factors and suggest that the physiologic difference in stress-sensitive systems is linked to growth retardation.

6.5.3 Obesity in Comparison to Canadian Children

Using data from the Canada Health Measures Survey (2009-2013 data combined), Carroll et al. (2015) report that 13% of Canadian children aged 3-19 years are obese. However, this figure varies by both age and sex as 11.3% of boys aged 3-6 years, 14.8% of boys aged 7-12 years, 10.3% of girls aged 3-6 years and 8.7% of girls aged 7-12 years are obese. In comparison, 10.1% of newcomer children aged 3-13 years in the current study are obese. More specifically, 9.7% of boys aged 3-6 years and 8.8% of boys aged 7-13 years are obese, while 12.9% of girls aged 3-6 years and 11.2% of girls aged 7-13 years are obese. According to this data, there appears to be a trend emerging where newcomer girls are more at risk of obesity than boys, which is opposite to the Canadian data. Many study parent participants also noted that their sons often participated in sports like soccer, whereas their daughters were more engaged in quieter play or traditional dance groups. A Muslim participant pointed out that Muslim girls are restricted from participating in regular swimming sessions where men and boys are present. Kirchengast and Scholar (2006) also observed that in Austria immigrant Turkish girls are at increased risk for overweight/obesity. The authors note that this phenomenon may be due to cultural and religious factors as Turkish post-menarcheal girls are subject to strict cultural and religious expectations that include not participating in physical activity outside the household.

Further analysis revealed that older children, those with better educated parents, and those who consume a poorer quality diet are at higher risk for being overweight/obese. Although the relationship between consuming a poor quality diet over an extended period of time and

becoming overweight may be obvious, it is less clear how children from better educated parents may become overweight. The better educated parents may have emigrated from countries where plump children are considered healthy as noted by some healthcare providers in the current study, the primacy of responding to children's needs as noted by some newcomer parents, the child feeding pattern is permissive (Tovar et al., 2012), or the parents' high social class in their home country allowed them to have hired help do all the meal preparation and they never learned how to prepare healthy traditional meals (Kwik, 2008).).

Canadian standards for waist circumference for children aged 11-18 years old were only recently proposed in 2004 (Katzmarzyk, 2004). Given the fairly recent advancement of children's waist circumference standards, there is not much published information on waist circumference among Canadian populations. In the current study immigrant children aged 11-13 years were at significantly higher risk of having waist circumference \geq 90th percentile (54.5% vs. 20.0%); however, no significant predictors were identified.

The weight gain equation can be impacted by many possible determinants, including nutritional intake and physical activity patterns; however, it is notable that obesity coincides with lower fruit and vegetable consumption in both children and adults (Shields, 2005; Tjepkema, 2005). Garriguet (2007) noted that in 2004 Canadian children's consumption of calories had not changed significantly from 1970 levels, and that their diet contains an acceptable level of fat intake within the Acceptable Macronutrient Distribution Range (AMDR). However, Garriguet (2007) also observed that in 2004, 62-70% of children did not consume the recommended number of servings of fruits and vegetables according to the Canadian Food Guide. These data suggest that the only dietary link to increasing obesity among children and adolescents may be

inadequate fruit and vegetable consumption and the possible consumption of other primarily carbohydrate-based foods to fill the void left by the lack of fruits and vegetables.

According to the current study results, 77.7% of newcomer children do not meet the Canadian Food Guide recommendations in regard to fruit and vegetable consumption.

6.5.4 Impact

Obese children and adolescents are more likely to become obese as adults (The et al., 2010) and develop early health problems including hypertension, high triglycerides, hyperlipidemia, high cholesterol, and type II diabetes (Babington & Patel, 2008). There is also building evidence that waist circumference is related to cardiovascular disease risk factors in children and youth. Several studies have reported positive associations between waist circumference and chronic disease risk factors in children and youth (Savva et al., 2000; Freedman et al., 1999). Waist circumference has even emerged as a better predictor of cardiovascular disease risk factors than BMI (Savva et al., 2000). Among children, waist circumference has proven to be useful to predict cardiovascular risk beyond that predicted based on BMI. Janssen (2005) observed that for children in the overweight BMI category, the high waist circumference group was about twice as likely to have high insulin levels, elevated triglyceride levels and metabolic syndrome as compared to the low waist circumference group.

6.6 Other Health Status Concerns

6.6.1 Data Triangulation

According to the quantitative analysis refugee children and children with higher saturated fat intakes are at higher risk for high blood cholesterol. In addition, risk for hypertension is higher for newcomer children who consume more sodium than the upper limit. Although these

specific concerns were not directly mentioned in the qualitative data, some participant comments relate to newcomers' risk for development of chronic disease due to poor diet and becoming overweight.

6.6.2 Elevated Blood Pressure

The results of the 2012 to 2015 Canadian Health Measures Survey (CHMS) indicate that 7% of children and youth aged 12 to 19 years had borderline or elevated blood pressure. Overweight and obese children and youth had significantly higher average blood pressure than children within normal weight range. In comparison, 29% of newcomer children in the present study had borderline or elevated blood pressure. Some research findings indicate that some ethnic groups, particularly immigrants from South Asia, may be at higher risk for developing hypertension with longer residency in Canada, with women being at higher risk than men (Chiu et al., 2010).

There is some evidence of an association between high sodium consumption and high blood pressure, although most studies involve adult participants. In a pooled analysis, Mente et al. (2016) observed that sodium excretion (surrogate measure for intake) was more strongly associated with increased blood pressure in individuals with hypertension in comparison to those without hypertension. They also found an increased risk of cardiovascular disease associated with high sodium excretion only among the individuals with hypertension group. About 24% of those with hypertension and 10% of the overall study population experienced the increased risk of cardiovascular disease associated with high sodium excretion. This suggests that hypertension and cardiovascular events are mediated by other mechanisms besides sodium intake. Increased levels of renin, aldosterone and catecholamines have all been associated with increased cardiovascular disease events and mortality in several studies (Sim, 2014; Zoccali, 2002).

Therefore it is not known whether high sodium intake plays a primary role in increasing blood pressure among the whole population.

6.6.3 High Cholesterol

According to data from the 2009-2011 CHMS, 35% of children aged 6-11 years have unhealthy cholesterol levels ($>4.5\text{nmol/L}$) (Statistics Canada, 2013e). In comparison, 52% of the newcomer children in the current study have unhealthy cholesterol levels ($\geq 4.4\text{nmol/L}$). Refugee children more commonly have unhealthy cholesterol levels in comparison to the immigrant children (60.0% and 42.4% respectively). Refugee status and higher saturated fat intakes were identified as significant risk factors associated with unhealthy cholesterol levels. Study participants also observed that some families came from very deprived conditions in refugee camps and consumed more meat upon their arrival in Canada. As low levels of physical activity and poor dietary behaviours have been associated with cardiovascular risk factors in general populations (Andersen et al., 2006; Lichtenstein et al., 2006), these same factors likely play a similar role among the immigrant population. However, the refugee population may have also been subjected to significant stress prior to migration and possible ongoing stress related to adjusting to Canadian life after forced migration. Several studies have reported associations between increased stress and elevated cholesterol levels (Thomas et al., 1985; Theorell & Aberstedt, 1976). Among an elderly cohort, Thomas et al. (1985) observed an inverse relationship between social support and cholesterol levels, suggesting that social support may mitigate the harmful physiologic effects of stressful stimuli.

6.6.4 Impact

Recent research has found that immigrant adults have a lower risk of atherosclerosis, a risk factor for cardiovascular disease associated with high cholesterol, but this risk increases with length of residency such that after 20 years immigrants are at increased risk of atherosclerosis in comparison to the Canadian-born (Lear et al., 2009). Given that many newcomer children in the current study already have unhealthy cholesterol levels, they are at risk for the development of cardiovascular disease, possibly earlier than the Canadian population.

6.7 Vitamin D Status

6.7.1 Data Triangulation

Overall 63.7% of participants have insufficient or deficient vitamin D serum levels. Younger newcomer children, those with higher intakes of vitamin D and those from Western Europe and the US are at lower risk of having insufficient serum vitamin D according to quantitative analysis. According to their comments, healthcare providers are aware that newcomer children are at risk for low vitamin D status due to dietary inadequacies and lack of exposure to sunlight. An immigrant service provider emphasized the link between change in physical climate and vitamin D status for newcomers with dark skin who used to live in tropical environments.

6.7.2 Comparison to Canadian Children

According to the Canadian Health Measures Survey, 2012 to 2013, 2% of children aged 3 to 11 years have deficient levels of vitamin D, 20% have insufficient levels and the remaining 78% have adequate levels (Statistics Canada, 2015). Across all ages the data also shows that

participants with racial backgrounds other than white are at significantly higher risk for inadequate vitamin D levels (38%) and deficient levels (20%), compared to those who are white (21% inadequate and 6% deficient).

In comparison to Canadian children, a high percentage of newcomer children have deficient (21.4%) and insufficient (42.3%) serum Vitamin D status. Younger newcomer children, those with higher intakes of vitamin D and those from certain regions have higher serum vitamin D levels. Similar to Canadian findings, newcomer children from Middle East, Asia and Africa (who would naturally have darker skin complexions) are at higher risk of having insufficient serum vitamin D. This is also in alignment with other Canadian research that reports seemingly healthy non-Western immigrant children have a higher risk of having deficient/insufficient vitamin D status (12%) than Western-born children (5%) (Omand et al., 2013). However, the relationship was no longer significant after cow's milk intake, vitamin D supplementation, season and age were taken into account so these variables may mediate the relationship between immigration status and vitamin D status.

The current study results related to vitamin D levels come as no surprise given the inadequate intake of vitamin D (91.0%) and milk products (80.2%) observed among participants. It is also consistent with parent and healthcare provider observations that many children do not drink milk or consume other milk products. However, some of the children must spend enough time outdoors in the sun to make up for their inadequate vitamin D intake. Vitamin D deficiency may be related to low income that limits healthy nutrient-dense dietary choices, lack of knowledge regarding children's requirements for vitamin D rich foods, and in some cases, lifestyle habits that limit exposure to sunlight such that the dermal synthesis of vitamin D is reduced.

6.7.3 Impact

Achieving optimal peak bone mass is supported by an adequate supply of vitamin D. Vitamin D serum levels have been positively associated with bone mass gain among adolescents (Clemens et al., 2005). There may also be key growth periods, during which adequate vitamin D intake is important, as infants who received a vitamin D supplement were observed to have significantly higher areal BMD at 7-9 years of age (Zamora et al., 1999). Among other possible deficiencies, lack of vitamin D during growth periods may have contributed to stunting among the current study population.

6.8 Bone Health

6.8.1 Data Triangulation

A large proportion of newcomers have low TBBMC (41.5%). Quantitative analysis indicates that newcomer children who are taller and those who have higher serum vitamin D levels have higher TBBMC levels. Concerns about bone health were not raised by participants during interviews.

6.8.2 Comparison to Canadian Children

Pediatric reference standards for bone mineral content based on an international sample were only recently published in 2010 (Baxter-Jones et al., 2010). This study observed that once age, height and weight were controlled, Hispanics and Asians generally had less BMC accrual than Caucasians and Caucasians had less BMC accrual than Blacks. From this sample, Baxter-Jones et al. (2010) developed reference standards that accounted for ethnicity.

TBBMC of newcomer children in the current study was compared against these multiethnic reference standards. The results indicate that immigrant children have a significantly higher mean total body bone mineral content than refugees; however, there is no difference with regards to the percentage of immigrants and refugees with low TBBMC. As may be expected, newcomer children who are taller and those who have higher serum vitamin D levels have higher TBBMC levels. Other confounding variables remained in the final model, including interactions between height and intake of sodium. Low sodium intake appeared to be associated with low TBBMC among taller children, so there is a possibility that low sodium intake is limiting bone growth among taller children.

In addition to vitamin D status, an adequate calcium intake contributes to ensuring adequate bone mass gain during growth. There is a positive association between dietary calcium and bone mineral mass during childhood and adolescence and evidence that suggests calcium intake before pubertal maturation is especially important as higher bone mass gains are possible (Bonjour & Rizzoli, 2001; Wosje & Specker, 2000).

6.8.3 Impact

Early bone growth can impact the risk of developing osteoporosis in later life. Failure to achieve peak bone mass during childhood growth can result in reduced adult bone mass and lead to osteoporotic fractures (Ferrari et al., 1998). For example, one study reported that the amount of bone mineral acquired by early adulthood explained 60% of the risk of osteoporosis (Hui et al., 1990). Accordingly, peak bone mass is recognized as a key determinant of bone health throughout life.

6.9 Low Income/Poverty

6.9.1 Data Triangulation

According to participant responses to the socio-demographic questionnaire, 36.3% of participants are in the lowest income category and 66.7% are below the low-income cut off. During the qualitative interviews many participants talked about how living in poverty or on a low income for an extended period makes it difficult to maintain a healthy diet and lifestyle, as well as access recreational activities. Many newcomers are working at low-wage jobs to try to make ends meet and are only earning enough to cover the basic necessities.

6.9.2 Comparison to Canadians

Statistics Canada data indicate that 9.6% of Canadians and 5.9% of Saskatchewan residents live on incomes below the low-income cut off (Statistics Canada, 2016a). Study participants appear to be much more vulnerable as 66.7% live on incomes below the low-income cut off.

The challenges associated with living in poverty for extended periods appear to permeate the life circumstances of many newcomer children in the study sample. Many refugees and racialized immigrants are only earning enough to cover their families' necessities from their low-wage jobs over an extended period. Gilmore (2009) observed that in relation to their educational attainment, newcomers are often under-employed or work at lower skilled jobs than expected. This does not allow for much discretionary spending on healthy food or children's activities so children may progress through important growth stages under suboptimal conditions before their families attain more stable economic conditions.

6.9.3 Impact

Children who grow up in poverty are more likely to experience poor health and chronic conditions (Case et al., 2007). Poor childhood health can reduce the attainment of optimal cognitive skills such that the individual's ability to engage in the labour market is impacted and the individual stagnates at low socioeconomic status (Palloni et al., 2009). Given that many Saskatchewan newcomer families in the current study live on low incomes and are struggling to make ends meet they are at risk for the development of chronic diseases and poor health outcomes over the long-term.

In addition, some newcomers' comments indicate that they are disheartened by what they feel is unfair access to good employment opportunities, and a few have experienced symptoms of depression. As noted by Simich et al. (2006), downward class mobility among newcomers is associated with higher risk of diabetes, heart disease and depression. Some Saskatchewan newcomers, primarily refugees and racialized immigrants, are experiencing difficulties with integration such that they may be at risk for poor health outcomes.

6.10 Healthcare Access

6.10.1 Barriers

Participant comments highlighted how the interaction of our Western healthcare system, characterized by a fairly rigid one size fits all approach designed to serve English-speaking individuals who have the capacity and resources to keep appointments and follow treatment recommendations, creates many healthcare barriers for newcomers, who often experience language difficulties, live on a low income, are not familiar with how Western healthcare is organized, and have culture and gender-based expectations of care. Participants mentioned

problems with accessing care, delayed treatment, and suboptimal care due to navigation difficulties, poor English language skills, lack of appropriate interpretation services, cultural misunderstandings, and lack of gender-specific healthcare providers.

Many participant concerns are in alignment with other research that notes several barriers to healthcare including: lack of familiarity with the healthcare system (Son, 2013), low health literacy (Renfrew et al., 2013), poor interpretation (Juckett and Unger, 2014) limited appointment times (Renfrew et al., 2013), preference for healthcare from service providers who are from the same culture (Munger et al, 2010), lack of gender-specific healthcare providers (Sethi, 2013), poor understanding of preventative care and chronic disease (Renfrew et al., 2013) and cost (Access Alliance, 2011). Although less common, a few participant experiences also reflected other healthcare barriers identified in previous research, such as lack of transportation (Kilbride, 2010), childcare (Sethi, 2013), and work demands (Council of Agencies Serving South Asians, 2008).

Participant comments also revealed healthcare system inequities between refugees and immigrants that are not frequently cited in other research. Refugees are able to access case managers to ask for information, designated interpreters for healthcare appointments, and they are referred to specific healthcare providers in Regina and Saskatoon, while immigrants do not get the same service.

The current study also highlighted some child-specific concerns, such as the use of children as interpreters for their older family member. Participant comments also referred to children's roles in managing their parents' chronic diseases by assisting them with system navigation and supporting health literacy. Service providers noted several concerns related to the use of child interpreters, including the risk of family conflicts and confidentiality issues. Juckett

and Unger (2014) recommend that children should never be used as interpreters, except in the case of emergency, as they are untrained interpreters, which may increase the risk for errors, violation of confidentiality, and poor outcomes.

Of great concern is that newcomers often have difficulty accessing health services that are covered by provincial health benefits programs for individuals with lower incomes, such as Family Health Benefits and Special Support Program for Drug Coverage, and that some service providers do not appear to be aware of this issue. These programs are designed to cover healthcare gaps for lower income families, but they are not reaching many newcomer families. There is a need to review these programs with a newcomer lens to ensure mechanisms are in place for newcomers to access these programs.

Given that restrictions on which groups of refugees could access IFHB benefits have recently been lifted, many concerns with accessing these benefits have been alleviated. However, refugees do not always understand IFHB services available to them and they may not find many healthcare providers registered with IFHB in some parts of Saskatchewan.

Of note, health system attempts to create a First Nations client-centered environment emerged as a barrier for newcomers to access some healthcare services. Many newcomers reside in low-income areas of Regina and Saskatoon alongside with First Nations populations, but many participant comments indicate that newcomers are not comfortable seeking healthcare from services that appear to be targeted to First Nations populations.

In summary, many of the healthcare barriers noted in the current study are in alignment with previous research; however, other barriers, such as difficulty accessing provincial benefit programs, inequity of access between refugees and immigrants and resistance to accessing healthcare services that target First Nations populations may be unique to Saskatchewan.

6.10.2 Supports

Overall, the development of responsive healthcare services, including convenient access and primary healthcare sites that offer comprehensive care in a culturally responsive manner with embedded interpretation services, emerged as core components to build an accessible healthcare system for newcomers. Meaningful partnerships with newcomer service organizations will be key to ensuring the development of programming that meets newcomers' needs.

The healthcare system needs to acknowledge the growing newcomer population in Saskatchewan and reflect on their capacity to meet diverse newcomer healthcare needs. Consistent with participant comments and best practice recommendations, healthcare systems should be designed to accommodate cultural, religious, linguistic and health status differences of newcomers (WHO, 2010). This should involve a critical examination of institutional policies and procedures to identify how they may be contributing to the disempowerment of vulnerable groups (Douglas & Pacquiao, 2010).

However, some consideration will need to be given to whether a targeted or inclusive approach to healthcare is adopted. Newcomer populations can be successfully served by both targeted newcomer programs and more universal community health centres. Mobile health clinics for immigrant women have demonstrated positive results (Guruge et al., 2009), as well as the more inclusive community health centre (CHC) model (Hyman et al., 2014). While the development of targeted primary healthcare sites that provide culturally responsive services may be ideal for many newcomers, they can create long-term dependence on those limited resources to provide care for the constantly growing newcomer population, as is the case for some clients of the Regina Community Clinic. The other option is the inclusive approach, whereby a

newcomer lens is adopted to guide the transformation of healthcare services. In low-income areas, this may include the development of inclusive healthcare services for all vulnerable populations, which incorporates culturally sensitive care for both First Nations and newcomer populations, including interpretation. At a regional level consideration may also be given to hiring some cultural facilitators to assist newcomers with high or complex health needs to access healthcare services at various facilities.

The importance of partnerships in the development of health programming cannot be overstated. Service providers mentioned several partnerships that are key to ensuring program success, either through engaging participants to attend or providing supports such as transportation or facility use. However, sometimes overly narrow funding parameters or established ways of working together can be barriers to partnership that need to be addressed. In addition, participants mentioned the importance of engaging with the newcomer community for successful healthcare partnerships, which has also been mentioned by others (Anderson et al., 2003). Engaged community members ensure that focus is placed on cultural relevance and resolving long-standing problems (Israel et al., 2005).

Participant comments and the growing body of research, in the context of our changing demographics, reinforce the importance of rethinking healthcare planning processes to ensure that newcomer healthcare needs are considered. The time has come to transform the current mismatch of a Western healthcare system trying to meet the needs of a diverse population.

6.11 Recent Saskatchewan Policy

6.11.1 Health Region Interpretation Policies

The Saskatoon Health Region released a reference guide for healthcare providers in their region to access interpretation and translation services in 2013 (Saskatoon Health Region, 2013). The guide details how to access an MCIS telephone interpreter, health region staff or volunteer interpreter, and sign language interpreter, but leaves it to the reader to decide which type of interpretation is most appropriate in each case. The Regina Qu'Appelle Health Region has provided information to their staff on how to access Can Talk telephone interpretation and services for those who are deaf and hard of hearing. In mid-2014 they also informed all staff that they should use Can Talk service prior to seeking out a staff member who translates (Ash, 2016). This may have been in response to concerns about client confidentiality or interpretation accuracy issues. However, Can Talk has not worked well for everyone and face-to-face interpretation has been required for some patients (Ash, 2016).

6.11.2 International Healthcare Professional Engagement

The Saskatoon Health Region is providing leadership related to supporting internationally trained healthcare workers to engage in employment in Saskatchewan. In collaboration with the Ministry of Health, and with funding from Health Canada, the Saskatoon Health Region leads a provincial project, Pathways: Internationally Educated Health Professionals (IEHP) Support, Bridging and Integration, which provides information and support to assist IEHPs to achieve licensure and seek employment within their professions (Saskatoon Health Region, no date).

International medical graduates (IMG) have an opportunity to be assessed for their readiness to practice family medicine in Saskatchewan through the Saskatchewan International

Physician Practice Assessment (SIPPA) program. The SIPPA assessment model combines orientation, tri-model examination (general medical knowledge, pharmacology and communication, and case management skills), and a clinical field assessment (SaskDocs, 2016). SIPPA intake is typically offered 3 times per year, with 24 seats in each session. Approximately half of the physicians in Saskatchewan are IMGs. Although the primary motives for undertaking these projects may be to support human resource needs, the projects will likely assist with transforming the healthcare system workforce to more closely resemble the population served in Saskatchewan and perhaps becoming more open to considering how to meet the needs of the newcomer population.

6.11.3 Government Response to Syrian Refugee Influx

There has been a wide provincial response in preparation for the recent influx of Syrian refugees between late 2015 and early 2016. The Government of Saskatchewan initiated a provincial committee that included human service ministries, health regions and immigrant serving organizations (Ministry of Health internal documents, 2015). This committee had regular teleconferences to plan for the influx and respond to any emerging concerns. In addition the Ministry of Health hosted a mapping exercise in December 2015 to map out how refugees currently access healthcare and to understand any gaps in the system. Participants included the Regina Open Door Society, the Regina Community Clinic, and the Regina Qu'Appelle Health Region so it largely focused on the Regina-based system. At this event it was noted that GARs are generally well supported to access healthcare during their first year, but there can be problems with transitioning families from IFHB to provincial benefits programs at the end of their first year, which requires some attention. This information has been shared with other health regions for their consideration.

6.11.4 Ministry of Economy Policy

The Ministry of Economy manages provincial immigration policy in Saskatchewan. They describe Saskatchewan's settlement model as a shared responsibility to empower immigrants to make their own decisions (McRorie, 2015). The model includes 3 components: pre-arrival information, orientation and planning services; connections to appropriate community services; and specialized language and employment services. The immigration website is an important tool for the provision of information to newcomers, both pre- and post-arrival.

The Ministry of Economy is making efforts to support newcomer integration into skilled employment. Saskatchewan is currently working with other provinces, territories and the federal government on the implementation of *A Pan-Canadian Framework for the Assessment and Recognition of Foreign Qualifications* (McRorie, 2015). The Ministry of Economy has allocated funding for the development and pilot-testing of tools, resources and programs to facilitate the assessment and recognition of foreign qualifications in regulated occupations and trades so internationally trained workers will be able to use their education, skills, and experience within the Saskatchewan labour market to the fullest possible extent.

6.12 Challenges and Limitations

Many participants found it challenging to speak English to the level required to fully understand and respond to study questions. Given this challenge, interpreters were used for many participant interviews. The use of interpreters was a limitation as there may have been some inaccurate interpretation due to different cultural meanings of words. Interpreters for the refugees were associated with the Regina and Saskatoon Open Door Societies so they knew the participants very well. However, for some immigrants who needed interpretation, the use of an

interpreter from their community may have created barriers as they may have felt uncomfortable about providing information regarding income, food security, or health issues to a peer from their community. Transportation was a barrier to participation for many participants so transportation services were arranged so that this would not limit participation. A parent or guardian was always required to attend with the child, but at times the parent who attended did not have good knowledge of the child's diet so there may have been gaps in the dietary recalls.

With any self-reported information there is always the possibility of errors due to dishonesty or poor memory. Limitations associated with 24-hr recalls include under-reporting/over-reporting, omission of frequently forgotten items such as beverages, sauces and additives, such as oil and salt. In order to ensure accuracy, food model booklets, measuring cups and spoons were used to assist with portion size estimations. In addition, colour pictures of various food items such as cereals, vegetables and fruit, juice boxes, etc. were available to help with participants' food recall. During the 24 hour recalls, interviewers probed for frequently forgotten items after each meal reported and at the end of the recall.

As mentioned in *Section 4.2 Study Sample Group*, the data contains missing values above 5% for some variables, including income (10.0%), food security (5.7%), usual intake of food and nutrient values (3 - 24 hour recalls) (12.3%), measures derived from blood samples (8.0%) (glucose, cholesterol, serum vitamin D), and DXA measurements (7.3%) (bone mineral content and body fat). The missing variables are a result of study withdrawals, refusal to provide information and children's difficulties with the blood sampling and DXA measurements.

Participants were categorized according to region of origin; however, there was uneven distribution of participants across the regions, which made it difficult to assess the effect of region of origin in relation to other variables.

6.13 Moving Forward

Results from the current study suggest many universal and targeted opportunities to improve the health status of newcomer children and healthcare access for newcomers. Schools emerged as a universal environment that touches the lives of most children, including newcomers. Specific focus could be put on applying a newcomer lens to the school experience so that future health promotion activities promote acceptance of ethnic foods among students and provide opportunities for physical activities that are attractive and accessible to newcomer children. In addition health promotion activities targeted towards newcomer parents could be explored through various partnerships involving schools, health regions, ethno-cultural organizations and immigrant serving organizations. Successful programming may include opportunities to share traditional food knowledge alongside experiential learning activities about healthy foods for children. These activities could be supported by leadership at both municipal and provincial levels that could involve the development of a municipal food charter that includes cultural values or provincial leadership in support of health promoting schools.

Food insecurity issues among newcomers require attention, especially with regards to how gaps in benefit programs that are targeted to low-income families are resulting in food insecurity for newcomer families. Provincial ministries should review their benefit programs through a newcomer lens to gain a better understanding about whether they are having the desired impact.

The demographics of Saskatchewan are changing and the healthcare system needs to recognize these changes and plan accordingly for the long-term. Newcomers need to be aware of healthcare services, including benefit programs, and feel welcome to access them so there may be a need to develop communications plans to reach the newcomer population. This can

assist with ensuring newcomers have access to healthcare, as well as supporting them to select the right type of care so emergency departments are not accessed for non-urgent care. In addition, consideration should be given as to whether targeted newcomer health services are warranted in some neighbourhoods with a high newcomer population or a more inclusive approach with embedded interpretation and cultural supports should be adopted across regions.

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How healthy is YOUR child?

Participants Needed for Research Study!

Immigrant or refugee children

age 3-13 years who have
been in Canada 5 years or less

What is measured?

Diet and physical activity status

Body composition

Height, Weight, etc.

Vitamin D, glucose, etc.

Oral/Dental health

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Regina :

Ginny Lane: (306) 525-3205



Appendix B: 24 Hour Recall Questionnaire

Time	Food Items	Type & Preparation	Amount	Brand Name or Where Bought
Morning				
Mid-morning				
Noon Meal				
Midday				
Evening Meal				
Before Bed				

Was this intake usual? Circle one: Yes / No if No, explain why not _____

Any vitamin/mineral intake during this time? Circle one: Yes / No if Yes, list names: _____

Appendix C: Vitamin D Food Frequency Questionnaire (FFQ)

Type of food/ drink	Never or <1/ month	1/ month	2-3/ month	1/wk	2/wk	3-4/ wk	5- 6/ wk	1/d	2+/d	Med. serving	Serving size		
											S	M	L
Milk: whole, 2%, 1%, or skim										1c (8oz or 250mL)			
Chocolate milk										1c (8oz or 250mL)			
Soy beverage fortified										1c (8oz or 250mL)			
Soy drink: plain (not fortified)										1c (8oz or 250mL)			
Other plant milks (rice, potato, etc)										1c (8oz or 250mL)			
Milk in coffee or tea										1 Tbsp			
Milk on cereal (if not included above)										½ c			
Milk shake										1c (8oz or 250mL)			
Milk dessert (ice cream, pudding)										½ c (1 scoop, 1 container)			
Yogurt (milk or soy)										½ c (125g, 1 container)			
Soft cheese										1 Tbsp			
Hard cheese										1 cube 2" (2 slices)			
White bread, bun, biscuit, roll, bagel, naan, tortilla										1 slice, 1 small roll, ½ bagel			
Dark bread, bun, biscuit, roll, bagel, naan, tortilla										1 slice, 1 small roll, ½ bagel			
Taco chips, nacho chips										1c (28g)			
Waffle, pancake, French toast										1 piece (4" round)			
Butter (in any foods eaten)										1 pat, 1 tsp			
Margarine (in any foods eaten)										1 pat, 1 tsp			
Tofu										1 cube 2"			
Macaroni with cheese										1c			
Canned salmon										2 Tbsp or 1c of casserole			
Canned tuna										2 Tbsp or 1c of			

Type of food/ drink	Never or <1/ month	1/ month	2-3/ month	1/wk	2/wk	3-4/ wk	5- 6/ wk	1/d	2+/d	casserole Med. serving	Serving size		
											S	M	L
Salmon steak										90g (3oz)			
Other fish: white										90g (3oz)			
Other fish: oily										90g (3oz)			
Cream soups made with milk										1c (8oz or 250mL)			
Taco or burrito with cheese										1 taco or ½ burrito			
Pizza with cheese										1 slice			
Lentils, beans, peas										½ c cooked			
Eggs: eaten alone or in other foods										1 large egg			
Orange juice: not fortified with calcium & vit D										1c (8oz or 250mL)			
Orange juice: fortified with calcium & vit D										1c (8oz or 250mL)			
Broccoli, kale, greens										1c raw or ½ c cooked			
Seafood (eg. Shrimp or crab)										1c meat			
Beef or pork										90g (3oz)			
Bacon or sausage										2 slices or 2 links			

Appendix D: Children's Physical Activity (CPA) Questionnaire

Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time. It can be done in sports, school activities, playing with friends, or walking to school. Some examples of physical activity are running, brisk walking, dancing, swimming, rollerblading, skateboarding, biking, soccer, basketball and football.

For these first two questions, add up all the time you spend doing physical activity each day.

1. Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?

None (zero days)

1 day

2 to 3 days

4 days or more

2. Over a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?

None (zero days)

1 day

2 to 3 days

4 days or more

3. About how many hours a week do you usually take part in physical activity (that makes you out of breath or warmer than usual) in your **free time at school** (for example, at lunch)?

Never

Less than 2 hours per week

2 to 3 hours per week

4 to 6 hours per week

7 or more hours per week

N/A-not in school

4. About how many hours a week do you usually take part in physical activity (that makes you out of breath or warmer than usual) in this **class time at school**?

Never

Less than 2 hours per week

2 to 3 hours per week

4 to 6 hours per week

7 or more hours per week

N/A-not in school

5. About how many hours a week do you usually take part in physical activity (that makes you out of breath or warmer than usual) **outside of school** while participating in lessons or **league or team sports**?

Never

Less than 2 hours per week

2 to 3 hours per week

4 to 6 hours per week

7 or more hours per week

6. About how many hours a week do you usually take part in physical activity **outside of school** while participating in **unorganized activities** (ie. playing after school or on weekends), either on your own or with friends?

Never

Less than 2 hours per week

2 to 3 hours per week

4 to 6 hours per week

7 or more hours per week

7. About how many hours/day do you watch TV/videos or play video games (not including school time)?

Don't watch TV or videos or play video games

Less than 1 hour a day

1 to 2 hours a day

3 to 4 hours a day

5 to 6 hours a day

7 or more hours a day

8. On average, about how many hours a day do you spend on a computer (working, playing games, e-mailing, chatting, surfing the Internet, etc.) (does not include during school time)?

Don't spend time on the computer

Less than 1 hour a day

1 to 2 hours a day

3 to 4 hours a day

5 to 6 hours a day

7 or more hours a day

Sun Exposure (SEB)

The next two questions are about your exposure to the sun since you have been in Canada. For these questions, think about a typical weekend or day off from school in the summer months.

1. About how much time each day do you spend in the sun between 11 am and 4 pm?

None

Less than 30 minutes

30 to 59 minutes

1 hour to less than 2 hours

2 hours to less than 3 hours

3 hours to less than 4 hours

4 hours to less than 5 hours

5 hours

2. In the summer months, on a typical weekend or day off from school, when you are in the sun for 30 minutes or more, how often do you use sunscreen?

Always

Often

Sometimes

Rarely

Never

Appendix E: Socio-demographic (SD) Questionnaire

First Name: _____ Last name: _____
 Home Address: _____ Phone number: _____
 Household type (ie. mother only, father only, both parents): _____
 First name of subject's mother: _____ Last name of subject's mother: _____
 First name of subject's father: _____ Last name of subject's father: _____
 Total number of individuals in the household: _____ Number of children in household: _____

Age and sex of children including the study participant (add more columns if needed):

Child 1	Child 2	Child 3	Child 4	Child 5
Age	Age	Age	Age	Age
Sex	Sex	Sex	Sex	Sex

Age/sex of participant

1. Participant's Date of Birth (MM/DD/YY):

Participant's Calculated Age:

Participant's Sex:

2. Mother's Date of Birth (MM/DD/YY):

Mother's Calculated Age:

Father's Date of Birth (MM/DD/YY):

Father's Calculated Age:

Medical History

3. Has your child (the participant) ever broken a bone? If so, indicate which bone and at what age.

Yes Indicate which bones _____

No

4. Does your child take calcium or vitamin D supplements?

Yes Indicate which ones and how much _____

No

5. Has your child ever been diagnosed by a healthcare professional as being malnourished and/or treated for malnutrition? If so, describe condition and treatment. (probe for symptoms, underweight, failure to thrive, length of hospitalization, treatment provided) _____

6. Has your child ever received medical attention for severe diarrhea? If so please describe the episode and treatment (probe for severity of diarrhea, other symptoms, length of hospitalization, treatment provided) _____

7. For how long was your child exclusively breastfed?

- Never breastfed
- <6 months
- 6months-1year
- longer

8. At what age did you start to give any other foods besides breastmilk to your child (includes formula, other liquids and solid foods)?

- <1 months
- 1 month to <2 months
- 2 months to <3 months
- 3 months to <4 months
- 4 months to <5 months
- 5 months to <6 months
- 6months-12 months
- 1-2 years
- 2-3 years

9. At what age did you start to give solid foods to your child (eg. cereal, fruits, vegetables, meats)?

- <1 months
- 1 month to <2 months
- 2 months to <3 months
- 3 months to <4 months
- 4 months to <5 months
- 5 months to <6 months
- 6months-12 months
- 1-2 years
- 2-3 years

10. At what age did you stop breastfeeding your child?

- Never breastfed
- 1 month to <2 months
- 2 months to <3 months

- 3 months to <4 months
- 4 months to <5 months
- 5 months to <6 months
- 6months-12 months
- 1-2 years
- 2-3 years
- > 3 years (fill in year)_____

11. Indicate your child’s birth weight (include units). _____

- unknown

12. Was your child born prematurely? If so, indicate length of gestation:

- No
- full term
- 4-6weeks premature
- 6-10 weeks premature
- >10 weeks premature

Socio-demographic characteristics (SDC)

13. Indicate your migration status:

- immigrant (permanent resident)
- refugee (permanent resident)
- Canadian Citizen
- student or worker (temporary resident)
- non status (unrecognized immigrant)

14. In what country was your child born?

15. What date did you (participant) first come to Canada (MM/DD/YY) (must be < 5 years)? If the participant was born in Canada, indicate when family arrived. _____

16. People living in Canada come from many different cultural and racial backgrounds. Are you:

- White Chinese South Asian (e.g., East Indian, Pakistani, Sri Lankan) Black Latin
- American Southeast Asian (e.g., Cambodian, Indonesian, Laotian, Vietnamese, Burmese) Filipino
- Arab West Asian (e.g., Afghan, Iranian) Japanese Korean

17. What languages do you speak (list all, including English)?

18. What language do you speak most often at home?

19. What is the language that you first learned at home?

20. Can you still...?

speak and understand your first language

only understand your first language

neither speak nor understand your first language

Education (EDU)

21. What is your (participant's) highest grade of elementary school completed in your home country?

22. What grade of elementary school are you (participant) in here in Canada?

23. Father's education in home country:

<grade 8

<grade 12

high school diploma

some University

University degree-Indicate highest degree _____

Trade/other education-Indicate certification _____

refuse to answer

24. Father's education in Canada:

high school diploma

some University

University degree-Indicate highest degree _____

Trade/other education-Indicate certification _____

refuse to answer

25. Mother's education in home country:

<grade 8

<grade 12

high school diploma

some University

- University degree-Indicate highest degree_____
- Trade/other education-Indicate certification_____
- refuse to answer

26. Mother's education in Canada:

- high school diploma
- some University
- University degree-Indicate highest degree_____
- Trade/other education-Indicate certification_____
- refuse to answer

Income (INC)

Although many health expenses are covered by health insurance, there is still a relationship between health and income. Please be assured that, like all other information you have provided, these answers will be kept strictly confidential.

27. What is your best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months? If participant has been in Canada less than 12 months, indicate average per month and multiply by 12. _____ refuse to answer

28. Thinking about the total income for all household members, from which of the following sources did your household receive any income in the past 12 months? If participant has been in Canada less than 12 months, indicate sources of income since arrival in Canada.

- Wages and salaries Income from self-employment Dividends and interest (e.g. bonds, savings) Worker's compensation Retirement pensions, superannuation and annuities Old age security and guaranteed income supplement Provincial or municipal social assistance or welfare Child tax benefit Child support Alimony, other (e.g., rental income, scholarships) Refuse to answer

29. What was the main source of income?

- Wages and salaries Income from self-employment Dividends and interest (e.g. bonds, savings) Worker's compensation Retirement pensions, superannuation and annuities Old age security and guaranteed income supplement Provincial or municipal social assistance or welfare Child tax benefit Child support Alimony, other (e.g., rental income, scholarships) Refuse to answer

30. Can you estimate in which of the following groups your household income falls?

Was the total household income from all sources:

- less than \$5,000
- \$5,000 to less than \$10,000

\$10,000 to less than \$15,000

\$15,000 to less than \$20,000

\$20,000 to less than \$25,000

\$25,000 to less than \$30,000

\$30,000 to less than \$40,000

\$40,000 to less than \$50,000

\$50,000 to less than \$60,000

\$60,000 to less than \$80,000

\$80,000 to less than \$100,000

\$100,000 or more

Appendix F: Food security (FS) Questionnaire

The following questions are about the food situation for your household in the past 12 months. If you/your family have been in Canada less than 12 months, consider only time spent in Canada since your arrival.

1. Which of the following statements best describes the food eaten in your **household** in the past 12 months, that is, since [current month] of last year:
 - a) Have you and the other members of your household always had enough of the kinds of food you wanted to eat?
 - b) Have you and the other members of your household had enough to eat, but not always the kinds of food you wanted?
 - c) Have there been some times when you and the other members of your household have not had enough to eat?
 - d) Have you and the other members of your household often not had enough to eat?

For the following questions, please tell me if the statement was often true, sometimes true, or never true for you and the other members of your household in the past 12 months (or since arrival in Canada).

2. The first statement is: You and the other members of your **household** worried that food would run out **before you got money to buy more**. Was that often true, sometimes true, or never true in the past 12 months?
Often true Sometimes true Never true
3. The food that you and the other members of your **household** bought did run out and there **wasn't any money to get more**. Was that often true, sometimes true, or never true in the past 12 months?
Often true Sometimes true Never true
4. You and the other members of your **household couldn't afford** to eat balanced meals. Was that often true, sometimes true, or never true in the past 12 months?
Often true Sometimes true Never true
5. You and the other members of your household relied on only a few kinds of low-cost food to feed **Child Name** because you were **running out of money** to buy food. Was that often true, sometimes true, or never true in the past 12 months?
Often true Sometimes true Never true
6. You and the other members of your household couldn't feed **Child Name** a balanced meal, because you couldn't afford it. Was that often true, sometimes true, or never true in the past 12 months?
Often true Sometimes true Never true
7. **Child Name** was not eating enough because you and the other members of your household just **couldn't afford enough food**. Was that often, sometimes, or never true in the past 12 months?
Often true Sometimes true Never true

The following few questions are about the food situation in the past 12 months for you or any other adults in your household.

8. In the past 12 months, since last [current month] did **you or any other adult members of your household** ever cut the size of your meals/eat less at meal time or skip meals (ate less than usual) because there **wasn't enough money** for food?
 - 8.a How often did this happen---almost every month, some months but not every month, or in only 1 or 2 months?
9. In the past 12 months, did **you (personally)** ever eat less than you felt you should because there **wasn't enough money** to buy food?
10. In the past 12 months, were **you (personally)** ever hungry but didn't eat because you **couldn't afford** enough food?
11. In the past 12 months, did **you (personally)** lose weight because you **didn't have enough money** for food?
12. In the past 12 months, did **you and the other adult members of your household** ever not eat for a whole day because there **wasn't enough money** for food?
 - 12.a How often did this happen---almost every month, some months but not every month, or in only 1 or 2 months?

Now, a few questions on the food experiences for children in your household

13. In the past 12 months, did you or the other members of your household ever cut the size of your **child's** meals so that they ate less than usual because there **wasn't enough money** for food?
14. In the past 12 months, did your **child** ever have to skip meals because there **wasn't enough money** for food?
 - 14a. How often did this happen---almost every month, some months but not every month, or in only 1 or 2 months?
15. In the past 12 months, was your **child** ever hungry but you just **couldn't afford** more food?
16. In the past 12 months, did your **child** ever not eat for a whole day because there **wasn't enough money** for food?

Appendix G: Participant Information and Consent Form

TITLE: Healthy Immigrant Children (HIC)

PRINCIPAL INVESTIGATOR: Dr. Hassan Vatanparast, Assistant Professor
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Student Researcher: Virginia Lane, Ph.D. candidate, College of Pharmacy & Nutrition, U of S.

INTRODUCTION

You are invited to take part in this study on nutrition and health issues among newcomer immigrant and refugee children, age 3-13 years, in Regina. This consent form may contain words that you do not understand. Please ask the researcher or study staff to explain any words or information that you do not clearly understand. You may ask as many questions as you need to understand what the study involves. **Participation in this study is voluntary with no consequence whatsoever should you or your child choose to not participate.** If you agree to take part in this research study, you need to sign this form. Your signature means that you are willing to take part in this study.

STUDY PURPOSE

The overall goal of this study is to assess nutritional status and physical activity levels of newcomer children and their association with bone and body composition.

TIME REQUIRED TO PARTICIPATE

The total time requirement for participation is approximately 1.5 hours at the first visit and two 20 minute periods for additional dietary assessments. Transportation will be provided to participants, if required.

STUDY PROCEDURES

Each of the five stations, explained below, will take 20mins to complete

1. Usual dietary intake of your child will be obtained using a questionnaire. You will be asked to help your child recall what he/she ate and drank in the last 24 hours. This information will need to be completed on three occasions, three weeks apart and will take around 20 minutes to complete each time.
2. Household food security will be assessed using a questionnaire. Food security is a concept that identifies that everyone has a right to safe, nutritious food for a healthy and active life.
3. Height, weight, and waist circumference of your child will be measured. Blood pressure will be taken by placing a cuff around your child's arm, which will inflate with air while a researcher listens to his/her heart beat. Blood glucose, vitamin D, and blood lipids will also be assessed by obtaining a blood sample via a finger prick. This procedure will be done by a researcher who is trained to take blood using the finger prick method. The procedure is safe and will only take a few minutes to complete.
4. A physical activity questionnaire, which includes sun exposure questions, will be completed.
5. Your child's whole body bone mineral content and density, and body composition will be measured using a DXA scan. The procedure takes place in a private room where the parent can still be present.

BENEFITS

You will receive a brief report on the nutritional status of your child with some general recommendations on how to improve your child's nutritional status. It is hoped that the information gained from this study can be used in the future to enhance nutrition and health status of newcomer children.

RISKS AND DISCOMFORTS

There is a minor health risk related to small amounts of radiation needed to obtain images during the DXA scan. The radiation dose is minimal (0.01 mSv), when compared to the amount of natural background radiation the average person is exposed to every day. Also, your child may feel discomfort at the time of the finger prick.

COST AND REIMBURSEMENTS

An honorarium of \$20.00 will be provided to cover your time and expenses such as travel/parking. If you decide to withdraw early from this study, your compensation will be proportional to your time in the study.

CONFIDENTIALITY AND LEGAL RIGHTS

The researchers will keep your personal information confidential. Your name and other identifying information will not be used in the study records. Instead, each child will be assigned a number. Only the researchers have access to your study records and know your name. No other people or groups will have access to your information. Information kept on record includes the results from questionnaires, blood tests and DXA scan. This information will be kept for 5 years in a double locked cabinet at the College of Pharmacy and Nutrition. Your information and results of the study will also be recorded in a computer database. The results of this study will be presented in a scientific meeting and published in a scientific journal, but your identity will never be revealed.

VOLUNTARY WITHDRAWAL FROM THE STUDY

You and your child do not have to be in this study. The choice to participate is up to you. If you do decide to take part in this study, you are still free to withdraw at any time without giving reasons for your decision and without any negative effect. All data collected about you up to the point of your withdrawal will be kept for analysis. If you choose not to take part, you do not have to provide a reason and it will not affect your care, rights to any services, relationships with service providers, or relationships with any of the researchers.

AFTER COMPLETION OF THE STUDY

After your participation, if you wish to receive your child's results, you will be mailed a summarized copy with general recommendations. Results will be compared with standard values for your child's age and sex group and with national data so you will be able to compare your child's results with Canada's norms.

CONTACT INFORMATION

If you have any questions about this study or your care/treatment or desire further information about this study before or during participation, you can contact Hassan Vatanparast by emailing vatan.h@usask.ca or calling (306) 966-6341. Collect calls will be accepted.

If you have any questions about your rights as a research subject or concerns about the study, you should contact the Chair of the Biomedical Research Ethics Board, c/o the Research Ethics Office, University of Saskatchewan, at 306-966-4053. Collect calls will be accepted.

This study has been reviewed and approved on ethical grounds by the University of Saskatchewan Biomedical Research Ethics Board. The Research Ethics Board reviews human research studies. It protects the rights and welfare of the people taking part in those studies.

CONSENT TO PARTICIPATE

I have read (or someone has read to me) the information in this consent form. I understand the purpose and procedures, as well as the possible risks and benefits of the study. I was given sufficient time to think about the study and had the opportunity to ask questions to which I received satisfactory answers.

I am free to withdraw from this study at any time for any reason and the decision to stop taking part will not affect any services I am currently receiving or wish to receive in the future. I agree to follow the instructions of the research team. My signature indicates that I voluntarily consent for me and my child to take part in this research study and give permission to the use and disclosure of my de-identified personal health information collected for the research purposes described above. My child has had the study explained to him/her in my presence and verbal assent was obtained from him/her.

By signing this document I do not waive any of my legal rights. I will be given a copy of this consent form.

Assent completed Assent Not Applicable

Printed name of parent/legal guardian _____ / ____ / ____
Signature & date (m/d/y)

Printed name of person obtaining consent & assent _____ / ____ / ____
Signature & date (m/d/y)

Printed witness' name _____ / ____ / ____
(Translator if subject does not read English) Signature & date (m/d/y)

E-mail address (if applicable)

I wish to receive the results of this study (Please circle one): Yes / No

I consent to be contacted in the future about further participation (please circle one): Yes / No

PHOTOGRAPHIC CONSENT

By signing this form, I agree to allow my child to be photographed. These photographs will be used for educational and research dissemination purposes (during scientific presentations). I understand that both I and my child have the right to refuse to provide photographs for use in this study. We also have the right to withdraw from this part of the study at any time, e.g., before or even after the photographs are taken. My decision will not affect my child's health care or our services/relationships with any organization or person. I am free now, and in the future, to ask questions about the obtainment or use of the pictures of my child. I understand that the pictures of my child will not be given to anyone other than the research team and will only be shown to others during scientific presentations and no information will be otherwise published without first asking my permission.

My signature below indicates **“I agree, or consent, to have my child's picture taken as part of the study.”**

Printed name of parent/legal guardian

Signature & date

Printed name of person who explained consent

Signature & date

Printed witness' name
(Translator if subject does not read English)

Signature & date

Appendix H: Canada's Healthy Eating Index Scoring Criteria

Component	Range of scores	Scoring criteria
Adequacy†		
0 to 60 points		
Total vegetables and fruit	0 to 10 points	Minimum: 0 Maximum: 4 to 10 servings*
Whole fruit	0 to 5 points	Minimum: 0 Maximum: 0.8 to 2.1 servings (21% of recommendation for total vegetables and fruit)*
Dark green and orange vegetables	0 to 5 points	Minimum: 0 Maximum: 0.8 to 2.1 servings (21% of recommendation for total vegetables and fruit)*
Total grain products	0 to 5 points	Minimum: 0 Maximum: 3 to 8 servings*
Whole grains	0 to 5 points	Minimum: 0 Maximum: 1.5 to 4 servings (50% of recommendation for total grain products)*
Milk and alternatives	0 to 10 points	Minimum: 0 Maximum: 2 to 4 servings*
Meat and alternatives	0 to 10 points	Minimum: 0 Maximum: 1 to 3 servings (75 to 225 grams)*
Unsaturated fats	0 to 10 points	Minimum: 0 Maximum: 30 to 45 grams*
Moderation‡		
0 to 40 points		
Saturated fats	8 to 10 points 0 to 8 points	Minimum 7% to 10% of total energy intake 10% to maximum 15% of total energy intake
Sodium	8 to 10 points 0 to 8 points	Adequate intake to tolerable upper intake level Tolerable upper intake level to twice tolerable upper intake level
—Other foodl	0 to 20 points	Minimum: 5% or less of total energy intake Maximum: 40% or more of total energy intake

* according to age and sex, as specified in *Canada's Food Guide*

† for adequacy components, 0 points for minimum or less, 5 or 10 for maximum or more, and proportional for amounts between minimum and maximum

‡ for moderation components, 10 or 20 points for minimum or less, 0 points for maximum or more, and proportional for amounts between minimum and maximum

Reference: Garriguet, D. (2009). *Diet Quality in Canada*

Appendix I: Dietary Reference Intakes

Nutrients	Children 4-8yrs	Boys 9-13yrs	Girls 9-13yrs
Protein in g/kg/d (EAR)	0.76	0.76	0.76
Carbohydrate in g/d (EAR)	100	100	100
Fibre in g/d (AI)	25	31	26
Vitamin D in IU/d (EAR)	400	400	400
Folate (DFE) in DFE/d (EAR)	160	250	250
Vitamin B12 in mcg/d (EAR)	1.0	1.5	1.5
Calcium in mg/d (EAR)	800	1100	1100
Iron in mg/d (EAR)	4.1	5.9	5.7
Zinc in mg/d (EAR)	4.0	7.0	7.0
Sodium in mg/d (AI)	1200	1500	1500

Reference: Health Canada. (2010a). *Dietary Reference Intakes Tables*