Dietitians of Canada
Les diététistes du Canada

Prevalence, Severity and Impact of Household Food Insecurity: A Serious Public Health Issue

Background Paper

Dietitians of Canada

August 2016

www.dietitians.ca/foodinsecurity

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Introduction

Dietitians of Canada actively positions the challenges of household food insecurity among our members and advocates to reduce household food insecurity in Canada[1]. The purpose of this report is to highlight newer published literature and expert comment on the prevalence, severity and impact of household food insecurity in Canada, since earlier positions of Dietitians of Canada (DC) in 1991 and 2005 (1-3). In addition, a second document provides DC's position statement and outlines recommendations for policy interventions, and future monitoring and research, to address household food insecurity (4). The Executive Summary highlights information from each of these two reports, all available at www.dietitians.ca/foodinsecurity .

Household food insecurity is a serious public health issue in Canada. In 2012, the last year for which there is comprehensive national data, 12.6% of Canadian households experienced food insecurity including marginal, moderate and severe food insecurity (6). Household food insecurity refers to "inadequate or insecure access to food because of financial constraints" (6). In Canada, between 2008 and 2012, the total number of people living in food insecure households rose by 580,000, to approximately 2.8 million adults and 1.15 million children – a total of about 4 million people (6). More recent data from some provinces and territories during 2013 and 2014 suggests the prevalence of household food insecurity in Canada has remained similar to that in 2012 (7, 8).

Household food insecurity is an important social determinant of health[2] (6, 10-12) and the product of another determinant of health: income - inadequate income to pay for basic needs. Cross-sectional and longitudinal surveys have shown strong relationships between household food insecurity and low income or poverty (6, 13-19). Poverty, however defined[3], is recognized in Canada and globally as the most important barrier to good health (11, 22-25).

As of May 2016, the federal government does not yet have a national poverty reduction strategy in place, while most provinces and territories have developed or are committed to developing poverty reduction plans (26). In November 2015, the Ministerial Mandate letter of the Prime Minister of Canada to the federal Minister of Families, Children and Social Development included a mandate to "lead the development of a Canadian Poverty Reduction Strategy, that would set targets to reduce poverty and measure and publicly report on our progress.... [and] align with and support existing provincial and municipal poverty reduction strategies" (27). Poverty reduction must include strategies to reduce household food insecurity for all Canadians. As well, monitoring the prevalence of household food insecurity in all areas of Canada is essential to guide effective public health policy and community initiatives (6, 8, 11, 12, 16).

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[1] The In 2005, our position statement was the following: "The position of Dietitians of Canada (DC) is that all Canadians must have food security. Recognizing food security as a social determinant of health, DC recommends a population health approach to food security: that is, an approach that seeks to reduce health inequities through the pursuit of social justice. A population health approach addresses the root cause of individual and household food insecurity – poverty – through improvements to the social safety net".

[2] The social determinants of health are the social and economic factors and the living and working conditions that influence people's health that people experience every day. Extreme differences or inequities in income and wealth have negative health consequences for people living in poverty (9).

[3] The prevalence or rate of poverty depends on which measure is used (20, 21). In Canada, there is no official measure or designated definition of poverty (8).

The Right to Food and Definitions of Food Insecurity

The Right to Food is entrenched in the Universal Declaration of Human Rights (Article 25), which states "Everyone has the right to a standard of living adequate for the health and well-being of himself [sic] and of his [sic] family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control" (28). Further guidance by the FAO in 2005 on the "right to adequate food and the achievement of food security" stated the "aim is to guarantee the availability of food in quantity and quality sufficient to satisfy the dietary needs of individuals; physical and economic accessibility for everyone, including vulnerable groups, to adequate food, free from unsafe substances and acceptable within a given culture; or the means of its procurement" (29).

A key challenge in defining food security is the historic use of the term to describe food access and food systems at multiple levels from local community to national to global, as well as situations describing individuals and households with adequate financial access to food. The terms household food insecurity, hunger, food security and community food security have been used in different ways, describing different concepts in published literature, grey literature and popular discourse, creating some confusion about how problems are defined and how data is used to conceptualize solutions. Food security at the community level and beyond does not necessarily prevent certain individuals and households within a community from experiencing household food insecurity (30). Most definitions of *food insecurity* focus on household-level financial inadequacy, while most definitions of *food security* focus on population-level access to food. Any misunderstanding of the underlying issues at different levels of food (in)security can lead to confusion or conflation in definition; this may further affect perceptions and can lead to different decisions regarding policy responses (30).

Household food insecurity **is defined as "the inadequate or insecure access to adequate food due to financial constraints"** (6), often referred to as "income-related household food insecurity". Similar definitions include:

- "a condition in which a household's access to food is inadequate or precarious because of insufficient income or inconsistent financial resources" (6, 13, 30).
- "when consistent access to adequate food is limited by a lack of money and other resources at times during the year" (31).

Household food insecurity is a specific term describing a situation within a household, when there is not enough money to buy food. It can be experienced in episodes or as a chronic situation, with negative emotions, social stigma and physical discomfort. A household is food secure when financial access to food is adequate. At a household level "food security includes, at a minimum, the ready availability of nutritionally adequate and safe foods, and an assured ability to acquire acceptable foods in socially respectable ways" (32).

The term hunger is often used colloquially to refer to household food insecurity, but it is not the same. Hunger encompasses the sensations of discomfort, weakness, pain or sickness experienced by an individual that result from an extended period of not having enough to eat (11). The hunger experienced by an individual is therefore a potential *result* of food insecurity within a household, and may not be experienced by everyone in that household. The experience of severe food insecurity, missing meals and going without food, has been acknowledged in relation to the greater likelihood of physiological involuntary hunger (13, 33), but the measurement of household food insecurity in Canada does not specifically measure hunger. An expert panel (in the USA) acknowledged, "Hunger is a very politically sensitive word that conjures images of severe deprivation" (34). Criticisms often challenge the hunger "cut point" used to define the presence of hunger, within the range of food insecurity experiences, from food uncertainty to food insufficiency (34). The panel also acknowledged that, if key policy questions were to revolve around the issue of hunger, then its

measurement would require better definition. In the public discourse, hunger is a term often equated with the use of food banks (34). The annual report of Food Banks Canada, called HungerCount, indicated 852,137 people (including 35.8% children) had used a food bank in March 2015, an increase of 26.1% over food bank usage in 2008 (35). This is however only a fraction of the approximately 4 million people in Canada currently experiencing household food insecurity (6, 8).

The term ***food security*** is broad, and has been used in different ways. According to the Food and Agriculture Organization (FAO),"Food and nutrition security exists when all people at all times have physical, social and economic access to food, which is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life" (36). In agriculture and global economic analysis, the term 'food security' is often used to indicate the security and sustainability of food production within a community area or country. Community food security may be negatively impacted "when dominant food systems fall short in terms of social, economic and environmental sustainability" (37).

Within the public health context, food security work has broadened. Public health roles are now essentially twofold: first, "to seek to reduce [household] food insecurity (the inability to access sufficient food through socially acceptable means due to financial constraints), and second, to enhance local/community food systems within the global food system" (38). Community-based food initiatives make important contributions to community food security and local food system development. However, policymakers must avoid making erroneous assumptions that community food programs also lead to significant or permanent reductions in income-related food insecurity at the individual or household level; such assumptions effectively draw political attention away from the need to develop policy initiatives specific to individual and household needs for adequate financial resources (39, 40).

By definition, individual and household food insecurity will be reduced or eliminated when financial access to food is adequate and the household situation is reversed to one that is "food secure". Poverty, a socio-economic inequality, increases the vulnerability of households to food insecurity. With adequate financial resources, a household can be restored to having household food security, assuming there is access to a sustainable, sufficient, safe food supply, with culturally and personally acceptable food in the community in which they live.

Solutions for household food insecurity must be equitable and available to all population groups at risk for experiencing food insecurity, as there are many different reasons for intermittent or chronic financial constraints. This is why the Canadian research team called PROOF [4] seeks to identify policy options that can have the impact of reducing household food insecurity. The experience of food insecurity, including marginal food insecurity, is a very sensitive indicator of financial constraints and risk for developing chronic health conditions (41-48) and should therefore be used to measure the success and impact of initiatives to reduce poverty. Solutions must be sufficiently comprehensive to address the needs of vulnerable populations, within a context of health equity. In future, with more dialogue, research and leadership the approaches to policy that reduce household food insecurity will evolve.

[4] PROOF – Research to identify policy options to reduce food insecurity – is an interdisciplinary, internationally-based group of researchers working with knowledge users in the public sector and national non-governmental organizations, in a multi-year research program funded by the Canadian Institutes for Health Research. Led by Dr. Valerie Tarasuk at the University of Toronto, the work of PROOF, including annual reports on Household Food Insecurity in Canada and numerous research publications, can be found on the website http://nutritionalsciences.lamp.utoronto.ca/ .

Measuring Household Food Insecurity

Household Food Security Survey Module

Statistics Canada measures the prevalence of household food insecurity across Canada using the validated Household Food Security Survey Module (HFSSM). Currently, the HFSSM is included within alternate cycles of the Canadian Community Health Survey (CCHS); provinces and territories can choose to include the module in intervening cycles (49). The HFSSM measures self-reported prevalence and severity of household food insecurity through a18-item questionnaire that asks about limitations to food access "because you were running out of money to buy food/ because you couldn't afford it" (49). The CCHS excludes full-time members of the Canadian Forces, individuals living on First Nations reserves, Crown Lands, or in the Quebec health regions of Région du Nunavik and Région des Terres- Cries-de-la-Baie-James, individuals in prisons or care facilities and individuals and families who do not have an address. Survey results therefore likely underestimate the true prevalence of household food insecurity in Canada and do not capture the food security status of some groups at higher risk of household food insecurity such as people who are homeless or First Nations populations living on reserves (6). See **Appendix A** for more detail about the HFSSM.

Household Food Insecurity Data from the Canadian Community Health Survey

Statistics Canada and Health Canada report on household food insecurity data collected through the CCHS. Reports from these federal sources, including Health Canada's comprehensive report in 2007, "Income-related Household Food Security in Canada", consistently report household food security/insecurity prevalence using *three* categories: food secure (calculated using the sum of households who are 'food secure' plus those experiencing 'marginal food insecurity'), moderately food insecure and severely food insecure. The sum of the Moderate plus Severe categories is used to identify the overall prevalence of household food insecurity.

Canadian researchers working with PROOF (6, 13) recommend using *four* categories to characterize household food insecurity, which are: food secure, marginal food insecurity, moderate food insecurity or severe food insecurity. The distinct classification for marginal food insecurity is recommended to acknowledge the higher vulnerability of households who report any level of uncertainty regarding their access to food (6). Recent research shows that households classified as marginally food insecure share characteristics found in moderate and severe food insecure households, suggesting that marginal food insecurity is an intermediary category between food secure and moderately food insecure households (41-43). Table 1 outlines the four criteria used by PROOF to classify the severity of household food insecurity based on the number of positive responses to food- insecure conditions (6).

As of May 2016, PROOF has published four annual reports on "Household Food Insecurity in Canada, [year]", based on data from CCHS 2011 to 2014 (8). In their analyses of CCHS data, the PROOF researchers use all four categories of food insecurity, with 'marginal food insecurity' as a distinct category, excluded from the 'food secure' category. Overall or total prevalence of "food insecurity" is defined by PROOF as the sum of data indicating marginal, moderate and severe food insecurity. It is important to remember this difference in data analysis since the prevalence of household food insecurity cited in Statistics Canada analyses will always appear lower than rates cited by PROOF. Conversely, the number of households designated as 'food secure' by Statistics Canada will be greater than rates cited by PROOF, since the Statistics Canada classification of 'food secure' includes both marginally food insecure and food secure households.

Table 1: Classification of Food Security Status (PROOF), based on CCHS Household Food Security Survey Module

Food Security Status	Interpretation/ Experience	10-item adult food security scale	8-item child food security scale
Food Secure	No report of income-related barriers to accessing preferred variety, quality and quantity of food in a way that maintains personal dignity	Score 0 responses on both scales	
Marginal Food Insecurity	Some indication of worry about running out of food and/or limited food selection due to a lack of money for food	Score no more than one response on *either* scale	
Moderate Food Insecurity	Forced to compromise the quality and/or quantity of food consumed by adults and/or children, due to a lack of money for food	Score 2-5 positive responses	Score 2-4 positive responses
Severe Food Insecurity	Disrupted eating patterns - missed meals, reduced food intake, no food intake for an entire day or longer, among adults and/or children, due to a lack of money for food	Score 6 or more positive responses	Score 5 or more positive responses

Source: Adapted from similar tables in references 6, 8, 13, 50

Prevalence of Household Food Insecurity in Canada

The CCHS has measured household food insecurity in Canada since 2005, but not all provinces and territories have participated in each collection cycle. Household food insecurity data from the CCHS 2013 and 2014 cannot be compared directly with all results or the national averages from 2011 and 2012, since not all Canadian provinces and territories included measurement of household food insecurity in their 2013-2014 cycle. The most recent household food insecurity data for British Columbia, Manitoba, Newfoundland and Labrador and the Yukon are from 2012 (7, 8). Overall, the changes in provincial and territorial rates of household food insecurity were not significantly different for 2013 and 2014 compared to 2011 and 2012 (6-8, 13). The sharpest rise in household food insecurity occurred between 2008 and 2011, and prevalence has remained persistently high (8). This paper uses information primarily from the PROOF 2012 report, to provide details of household food insecurity in all provinces and territories (6).

In 2012, the overall prevalence of household food insecurity in Canada was 12.6%, including 4.1% marginal, 6.0% moderate, and 2.6% severe food insecurity (6). The majority (84%) of food insecure households were in the four provinces with the largest populations, Ontario, Quebec, Alberta and British Columbia – representing 1,399,300 food insecure households (6). However, the *prevalence* of food insecurity in those four provinces (between 11.5% to 13.5%) was much lower than in other regions of Canada, notably the Territories (between 17.1% to 45.2%, a total of 8,800 food insecure households), followed by Nova Scotia, Prince Edward Island and New Brunswick (between 15.6% to 17.5%, a total of 124,000 food insecure households) (6).

Table 2 presents the prevalence of food insecurity (the sum of marginal, moderate and severe food insecurity) in Canada's provinces and territories from 2005 to 2014, with blanks indicating years that provinces and territories opted out of participation (8).

Table 2: Household food insecurity – Canada, provinces and territories, 2005-2014

Household food insecurity – Canada, 2005-2014									
	2005	2007	2008	2009	2010	2011	2012	2013	**2014**
Newfoundland & Labrador		15.7%	14.3%	11.8%	11.5%	10.6%	13.4%		
Prince Edward Island	12.9%	14.9%	15.3%			15.4%	16.2%	16.7%	**15.1%**
Nova Scotia	16.1%	14.4%	13.5%	15.9%	14.9%	17.1%	17.5%	18.5%	**15.4%**
New Brunswick		13.8%	15.1%			16.5%	15.6%	16.0%	**15.2%**
Quebec	11.3%	10.9%	9.4%	11.3%	9.7%	12.5%	13.5%	11.8%	**11.6%**
Ontario	11.6%	11.8%	12.1%	12.5%	11.3%	11.9%	11.7%	12.5%	**11.9%**
Manitoba		12.4%	12.9%	10.8%	10.0%	12.4%	12.1%		
Saskatchewan		9.5%	9.7%	8.2%	9.2%	11.8%	12.5%	12.2%	**10.6%**
Alberta	10.4%	9.1%	10.0%	10.8%	10.9%	12.3%	11.5%	11.3%	**11.4%**
British Columbia	11.0%	10.8%	11.5%	11.9%	11.1%	11.0%	12.7%		
Yukon		17.8%	13.0%	13.9%	12.6%	16.7%	17.1%		
Northwest Territories	14.2%	16.5%	17.8%	9.8%	12.0%	15.2%	20.4%	20.4%	**24.1%**
Nunavut	38.0%	35.4%	34.6%	31.0%	31.0%	36.4%	45.2%	45.0%	**46.8%**

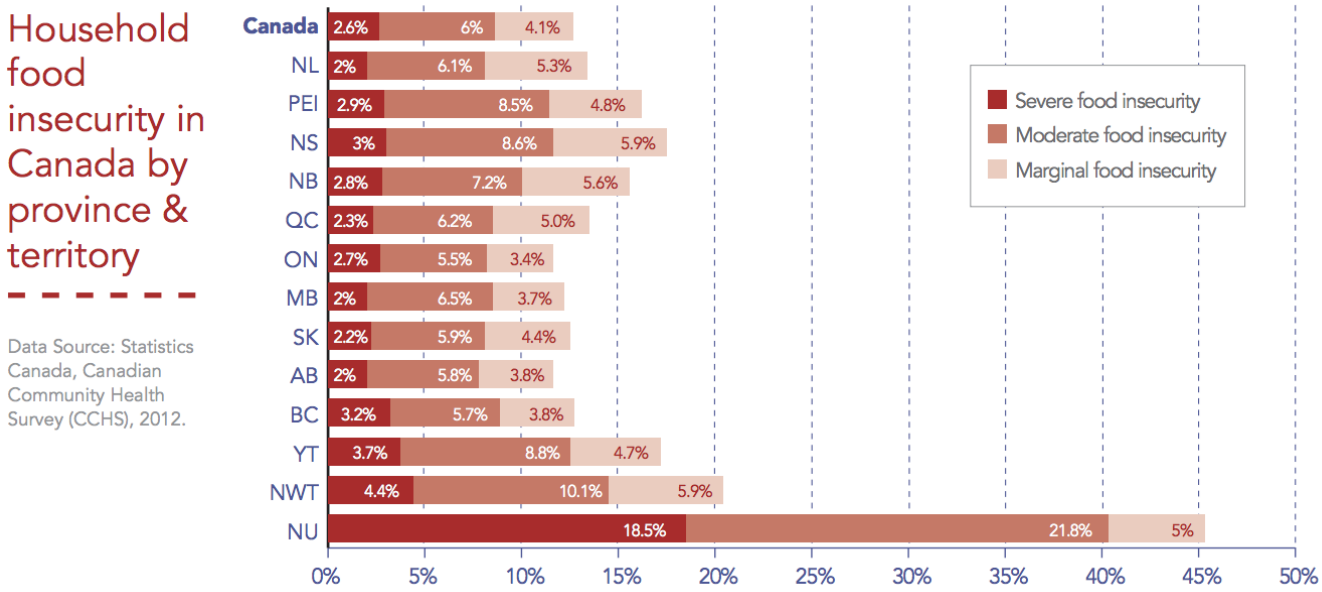
Data Source: Canadian Community Health Survey (CCHS), 2005, 2007, 2008, 2009, 2010, 2011, 2012, 2013 and 2014.

Source: Household Food Insecurity in Canada 2014 (PROOF) (8) – with permission.

Figure 1 provides a detailed breakdown of the prevalence of food insecurity by province/territory, according to the severity of food insecurity, in 2012 (6). Figure 2 provides total numbers of food insecure households by province for 2012. Recognition of the distribution of food insecure households across Canada provides an appreciation of where the largest numbers of food insecure households are located (6).

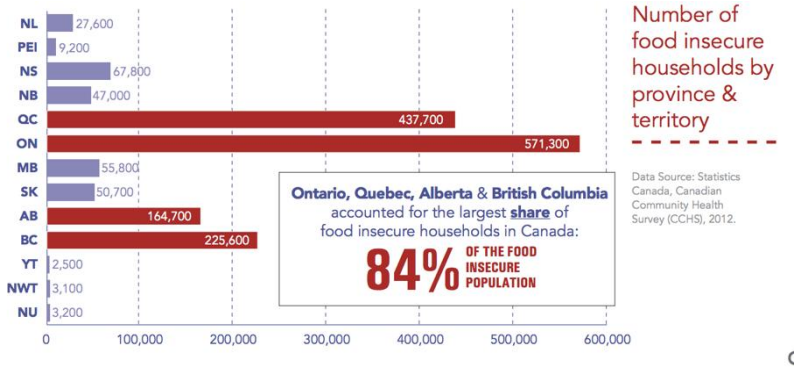
In 2012, the highest prevalence of household food insecurity was in Northern Canada, in the three Territories, followed by the provinces of Nova Scotia, New Brunswick and Prince Edward Island. The overall rate of food insecurity in Nunavut was a staggering 45.2%, affecting a total of 3200 households, in 2012, and this rate was even higher (46.8%, affecting 4300 households) in 2014 (8). The prevalence of food insecurity in the Northwest Territories and Yukon Territory in 2012 was 20.4% and 17.1% respectively, affecting a total of 5600 households (6); like Nunavut, the prevalence in the Northwest Territories was even higher in 2014 – 24.1% (8). Not only was the prevalence of food insecurity in Nunavut in 2014 overwhelmingly high, but also the degree or depth of food insecurity: 19.3% severe food insecurity, 23.5% moderate food insecurity, with 6.1% marginal food insecurity – this means nine out of ten food insecure households in Nunavut experienced moderate or severe food insecurity (8). In Nunavut and the Northwest Territories, 60% and 29% of children, respectively, are living in food insecure households (8).

Figure 1: Household food insecurity in Canada, by province/territory, in 2012



Source: Household Food Insecurity in Canada 2012 (PROOF) (6)

Figure 2: Number of food insecure households in Canada, by province/territory, in 2012



Source: Household Food Insecurity in Canada 2012 (PROOF) (6) – with permission.

The authors of the PROOF reports concluded (in 2016), "The geographic patterning of food insecurity, with the alarming rates in the North and the Maritimes and the density of affected households in our largest provinces, suggests that reducing the prevalence of food insecurity requires attention by provincial, territorial, and federal levels of government. The data in this report provide an impetus for discussion that is critical to the development of programs and policies aimed at tackling food insecurity in Canada" (8). The only province in Canada to experience a consistent drop in household food insecurity over successive years was Newfoundland and Labrador, between 2007 and 2011. Since household food insecurity data was not collected in Newfoundland and Labrador during 2013 and 2014, it is not known if this positive trend has been maintained.

The PROOF report published in 2016 (8) includes rates of food insecurity in major census metropolitan areas in Canada for the cycles 2007-2008, 2011-2012 and 2013-2014, showing marked differences between some major cities. In-depth examination of food insecurity rates in census metropolitan areas (CMAs) showed that the prevalence of household food insecurity rose with greater unemployment rates in the area (8). Variations in household food insecurity from city to city may also reflect local municipal-level poverty reduction initiatives, such as increasing the availability of affordable or subsidized housing (51). In their multilevel modeling study of CCHS 2011-2012 data from 20 CMAs in Canada, Sriram and Tarasuk (52) concluded that part of the variability in household food insecurity rates across different areas is attributable to differences in costs of living. Independent of other household socio-demographic characteristics, they found that higher shelter costs were associated with higher risk for household food insecurity within CMAs.

Prevalence of Household Food Insecurity within Indigenous[5] Populations

As measured in CCHS, the rate of household food insecurity[6] among Indigenous Peoples in Canada was reported to be more than double that of the general population (28.2%, excluding First Nations Peoples living on reserve, versus 12.6%) in 2012, according to PROOF. This higher prevalence was consistent at all levels of food insecurity: marginal - 5.1% versus 4.1%, moderate - 14.8% versus 6.0% and severe - 8.3% versus 2.6% (more than triple by comparison) (6).

First Nations Peoples living off reserve are included in the regular cycle of CCHS surveys. Statistics Canada analysis of data from CCHS 2007–2010 showed household food insecurity (moderate+severe only) among those who identified as First Nations (off reserve only – representing approximately 57% of First Nations peoples), aged 12 years and older, was 22% - about three times higher compared to the non-Indigenous population (7%), with a greater proportion among women (26% food insecurity among First Nation off-reserve females versus 8% among non-Indigenous females; 16% versus 7% for males, respectively) (55).

Household food insecurity among **First Nations peoples living *on* reserve** is not measured in the CCHS. Between 2008 to 2012, household food insecurity data was collected for this population by the First Nations Food, Nutrition and Environment Study (FNFNES). This study reported on the prevalence of household food insecurity using the same measurement tool and categories as Statistics Canada, i.e., food secure (including marginal food insecurity), moderate

[5] The term "Indigenous Peoples" is used throughout this report; we acknowledge also the term "Aboriginal Peoples". Indigenous Peoples includes three distinct groups of Indigenous Peoples in Canada — First Nations, Métis and Inuit. According to the National Household Survey (2011), the total of people with an Aboriginal identity was 1,400,685, representing 4.3% of the total Canadian population. Proportionally, 60.8% were First Nations people, 32.3% Métis, and 4.2% Inuit (53). Aboriginal people form a substantial proportion of the populations of Canada's territories: in the Yukon (23.1%), the Northwest Territory (51.9%) and an overwhelming majority in Nunavut (86.3%) (54).

[6] At present, only the PROOF reports, analyzing national CCHS data, report marginal food insecurity as part of total food insecurity. Typically, reports of food insecurity amongst Aboriginal peoples, including FNFNES, RHS and IHS, follow the Statistics Canada reporting framework for CCHS data – wherein "food secure" = food secure + marginally food insecure; "food insecure" = only moderately + severely food insecure. Unless otherwise stated, the studies used the full 18-item HFSSM to assess the prevalence and severity of household food insecurity.

food insecurity and severe food insecurity. The prevalence of household food insecurity (moderate+severe) among First Nation households living on reserve has been reported for three provinces: 41% in British Columbia (2008-2009) (56); 38% in Manitoba (2010) (57); 29% in Ontario (2011-2012) (58); 47% in Alberta (2013) (58a).

Household food insecurity in First Nation reserves/communities varies geographically, with remote communities experiencing a higher prevalence (57, 58). For example, reports from surveys of two remote First Nation reserve communities, Fort Severn and Mushkegowuk Territory in Ontario, indicated very high rates of food insecurity, with up to 70% of households categorized as food insecure (moderate+severe) (59, 60).

For **Métis people,** there is limited data or research specifically addressing the prevalence of household food insecurity (12). Using CCHS data from 2007–2010, household food insecurity (moderate+severe) among those who identified as Métis, aged 12 years and older was reported to be 15% - approximately double that of the non-Indigenous population (55).

Food insecurity among Canada's **Inuit population** was assessed in the 2012 Indigenous Peoples Survey (61), with a population sample of Inuit, 15 years and older, living both outside and within the Inuit Nunangat (Inuit homeland and its four component regions). Results from the survey indicated that four in ten (41%) Inuit aged 15 and older lived in households experiencing food insecurity. The highest rates of household food insecurity, based on the shorter six-item version of the HFSSM, and answering the question "were you (personally) ever hungry but didn't eat because you couldn't afford food?" were in Nunavut (56% household food insecurity; 30% 'ever hungry') followed by Nunavik (55%; 24% respectively) (61).

Results from another study, the 2007/2008 Inuit Health Survey (IHS), using the full 18-item HFSMM, found similar results: data were collected in the 36 communities in 3 Inuit regions (the Inuvialuit Settlement Region in the Northwest Territories, Nunatsiavut in Labrador and the Territory of Nunavut), accounting for approximately one half of the Inuit population. IHS results indicated that the highest rate of household food insecurity among Inuit was in Nunavut – 69% (35% moderate, 34% severe food insecurity). Rates of food insecurity among Inuit were also very high in Nunatsiavut (46%) and in the Inuvialuit Settlement Region (43%) (62). Inuit children were also profoundly impacted, with the rate of food insecurity amongst Inuit children in Nunavut at 57% (31% moderate, 26% severe food insecurity) (63). A recent study amongst Inuit children in Nunavik also reported high rates of child-specific food insecurity (50%), with about half of food-insecure children showing signs of iron depletion or anemia, as well as differences in stature (64).

Relationship between Income and Household Food Insecurity

As acknowledged in the introduction, household food insecurity is an important social determinant of health, and also the product of another determinant of health, namely, income. The World Health Organization (WHO) defined the social determinants of health as "the conditions in which people are born, grow, live, work and age….shaped by the unequal distribution of money, power and resources", and acknowledged the consequent unfairness and inequities resulting in the immediate circumstances of peoples' lives, including their access to health care and education, as well as conditions of work and housing (22).

As Mikkonen and Raphael observed, a social gradient exists (i.e., the lower the socioeconomic position, the worse the health) even in affluent countries such as Canada, although it is often masked by the overall good health status within the population (65). The authors cited a list of fourteen social determinants of health in Canada as an indication of the complexity and inter-relatedness of impacts and factors affected by socioeconomic position – the list included income and income distribution, education, unemployment and job security, employment and working conditions, early

childhood development, food insecurity, housing, social exclusion, social safety network, health services, Indigenous status, gender, race and disability.

Households with lower incomes are much more likely to report food insecurity, especially severe food insecurity, compared to households with higher incomes (6, 13, 15-17). Health Canada's report on income-related household food insecurity in Canada, based on data from CCHS 2004, included food insecurity prevalence (moderate+severe) within income quintiles: both the greatest prevalence and degree of food insecurity occurred in the lowest income category – 48.3% (including 24.8% severe), followed by 29.1% (including 10.7% severe) in the lower middle category and 13.6% (including 3.5% severe) in the middle income category, while the prevalence of food insecurity in the upper middle and highest income quintiles was only 5.2% and 1.3% respectively. (14) Although food insecurity is related to low incomes, it is more accurately described as related to a level of material deprivation that has negative impacts on health and quality of life (66, 67). Sriram and Tarasuk concluded that food insecurity within a household is likely a reflection of the interplay of household resources (including income, assets, access to credit, etc.) and household expenditures for shelter, food, and other necessities, as well as household debt – all of which are factors in overall material or financial deprivation (67).

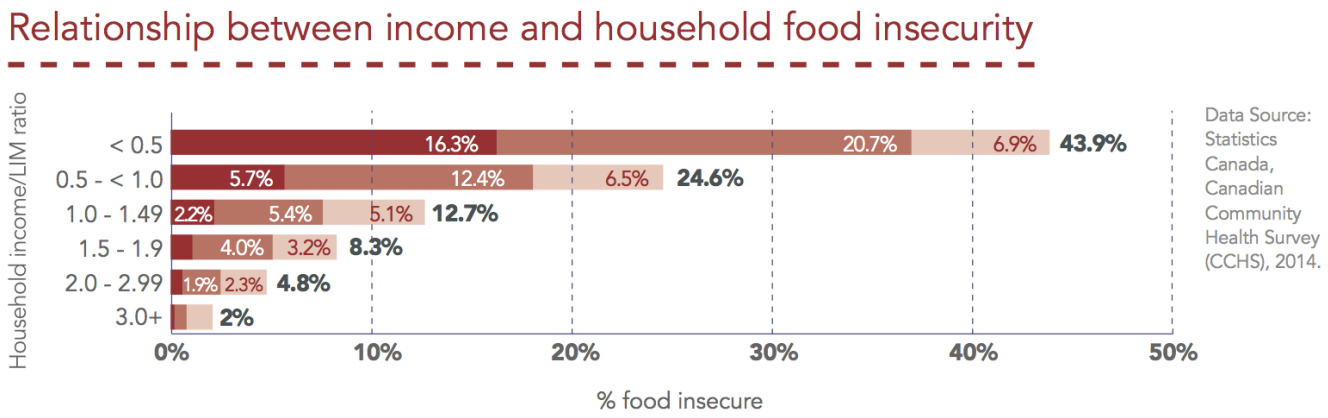
Household food insecurity is more accurately described as being caused by *financial constraints* than by low income or poverty. "Household food insecurity portrays a dimension of material well-being [i.e., material deprivation] not captured by indicators of low income" (66). In this context, Loopstra describes the experience of material deprivation as not only related to poverty or low income, but also to income *precarity* - limited assets, savings and access to credit, reduced income due to decreased work hours, layoff or gaps between work contracts and unexpected problems requiring extra money, like health issues that may require time off work and purchase of medications and other health services (66). Individuals and households who have scarce financial resources or severe financial constraints are often forced to make food purchasing decisions that accommodate competing financial demands for other necessities such as rent, mortgage payments, transportation, utilities, childcare and clothing (66, 68). Financial constraints are often associated with other social or demographic factors such as marginalization, income inequality and lack of employment opportunities; these factors contribute to the greater risk for food insecurity experienced by some Canadian sub-populations.

Figures 3 illustrates the relationship between income, using the Low Income Measure[7] (LIM), a tool to measure poverty and household food insecurity as reported by PROOF, with CCHS 2014 data (8). The lower household income is in relation to the LIM, the greater the likelihood of severe food insecurity. In 2014, 43.9% of households with incomes under half of the LIM were food insecure.

Figure 4 shows the prevalence of food insecurity (including marginal to severe) by household income.

[7] The Low Income Measure (LIM) is 50% of the median national household income, adjusted for household size, e.g., for a household with income equal to half the median income, the ratio of household income/LIM = 1.0; for a household with a median income, the ratio of household income/LIM = 2.0.

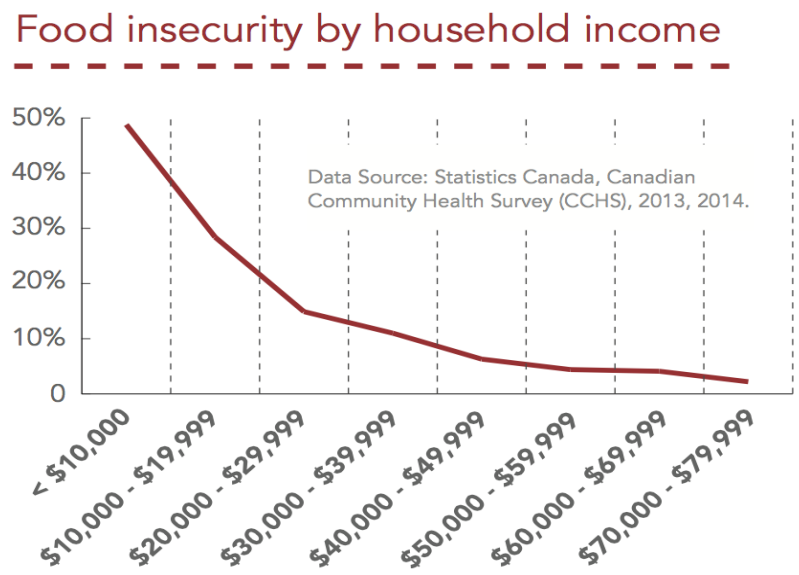
Figure 3: Relationship between income and household food insecurity



*** Food insecurity = severe + moderate + marginal food insecurity*

Source: Household Food Insecurity in Canada 2014 (PROOF) (8) – with permission.

Figure 4: Household food insecurity by household income, adjusted for household size, 2013-2014



Source: Household Food Insecurity in Canada 2014 (PROOF) (8) – with permission.

NOTE: Household income data were *adjusted for household size*, to examine the relationship between food insecurity and household income across all household configurations. The probability of food insecurity rises as household income declines, especially at very low levels of household income. Conversely, the probability of food insecurity decreases as income rises. The line ends at about $80,000 because so few households are food insecure at this income level and beyond, that it is not possible to generate a reliable sample.

The variability in household incomes does not account entirely for all of the variance in financial vulnerability and food insecurity. Between 2007 to 2012, the LIM (representing the rate of poverty) decreased slightly, while rates of food insecurity increased (6), suggesting that low household income[8] is not the only factor contributing to food insecurity. Financial vulnerability can be worsened by high housing costs, unexpected household expenses, sudden income losses, unemployment and medical expenses (41, 68, 70). Some low wage earners may remain food secure if they do not experience unexpected financial or budget shocks. Unexpected financial or budget shocks might include; job loss, salary reduction, death of a breadwinner, unexpected household, health or other expenses such as relocation expenses, increased housing costs, pharmaceutical drugs or legal fees (18, 44, 71-75). It has been estimated that about 10% of the Canadian population is not taking essential medications for cost reasons; different models of pan-Canadian pharmacare, from catastrophic coverage to universal coverage, are currently being studied to address affordability and improve access and adherence to needed medications (76). Households experiencing a drop in income appear to be better protected from food insecurity if they have savings or are able to borrow money (71, 77, 78) but households with a chronically low income have usually exhausted their savings and avenues for borrowing money (75, 78).

Unexpected changes in income and/or expenditures will reduce the amount of money available to spend on food and since low-income households often do not have savings or cannot access short-term credit to buffer the shocks this can lead to periods of food insecurity (40, 79, 80). Household food insecurity has been referred to as "not solely the product of an inadequate income level, but instead a lack of consumption insurance to address budget shocks, which are unexpected decreases in income or purchasing power of income" (75). Indeed, the WHO Commission on Social Determinants of Health (22) acknowledged the need for social protection "in case of specific shocks, such as illness, disability, and loss of income or work".

Source of income as a predictor of household food insecurity

The *source* of a household's income is strongly related to the likelihood that a household will report they have experienced food insecurity in the past year, since the source often dictates the level and/or stability of income. Among food insecure households in Canada, almost two thirds (62.2% in 2012)) relied on employment (from wages and salaries) for their main source of income (6). These employment incomes may be inadequate to pay for basic needs due to low rates of hourly pay, low number of hours available for paid work, or only one earner in a household (7). If incomes from wages and salaries were sufficient for all households relying on employment income, the number of food insecure households in Canada might be reduced by almost two thirds. In 2012, this group of employed but food insecure households comprised 11.2% of all households reliant on income from wages and salaries (6).

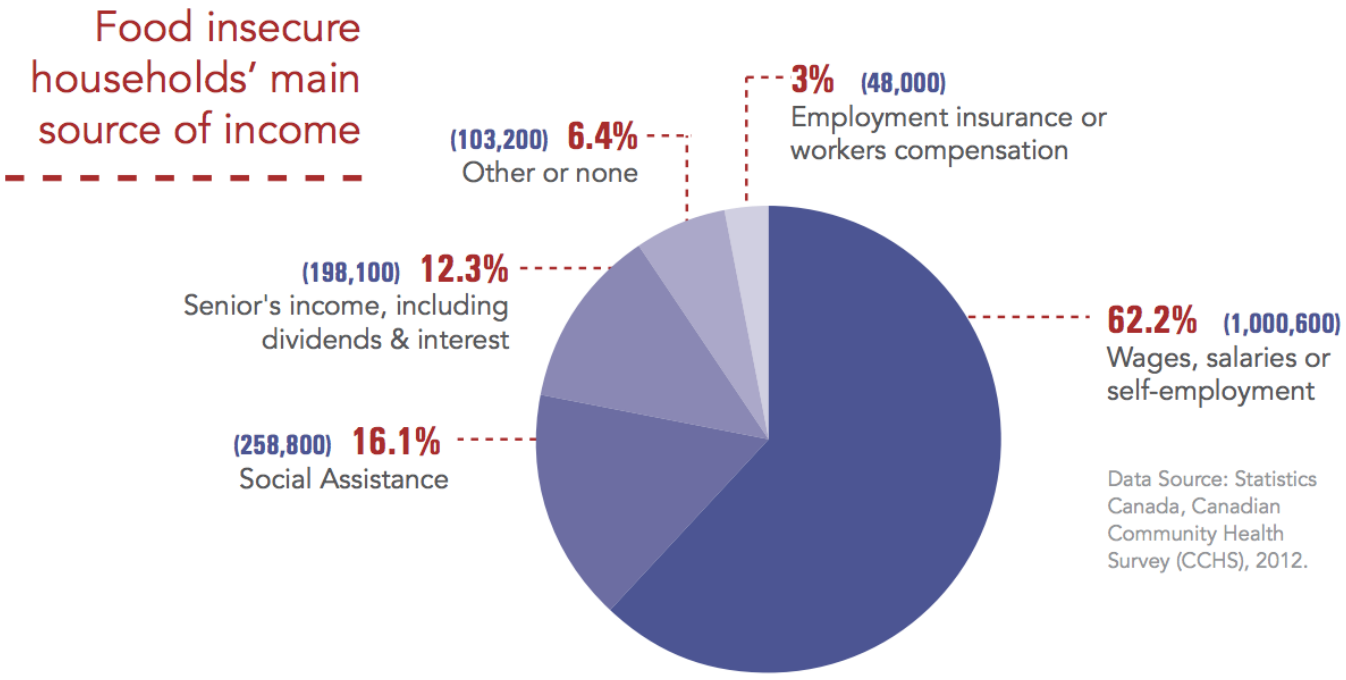
Compared to households in Canada with income from wages and salaries, households whose main income source is from government benefits are much *more* likely to experience food insecurity (6-8, 69, 80-82). In 2012, 69.5% of households reliant on social assistance (i.e., welfare and disability support programs) experienced food insecurity, although this rate varied greatly – from more than 75% in the west and in Nunavut and Yukon Territories to 46.2% in

[8] Low-income households have also been defined as those in which the total income falls within the lowest 10% of all Canadian households (69).

Newfoundland and Labrador, indicating differences in social assistance policy, which is largely determined at the provincial/territorial level. Among households reliant on income from Employment Insurance or Workers' Compensation, the rate of food insecurity was 38.4% (6). Based on these results, the likelihood of a household experiencing food insecurity in Canada is about four to six times greater (e.g., 38.4% and 69.5% compared to 11.2% of wage/salary earning households) when the main source of income is from government-administered programs. While their unique income guarantee is government-sourced, seniors (over age 65 years) in Canada experience the lowest rate of household food insecurity – the combination of Old Age Security and the Guaranteed Income Supplement, and benefits such as pharmacare, are described later in this discussion paper.

In 2012, among the Canadian households experiencing food insecurity (a total of more than 1.6 million households), the *number* of households reliant on government-administered incomes was less than a third (306,800 households) compared to the number of households reliant on wage or salaried incomes (1,000,600 households). Of the more than 300 thousand food insecure households reliant on government-administered incomes, the majority (258,800) received income from social assistance (6). Figure 5 shows the proportions of food insecure households in Canada by their main sources of income, in 2012.

Figure 5: Food insecure household's main source of income



Source: Household Food Insecurity in Canada 2012 (PROOF) (6) – with permission.

Physical and Mental Health Consequences of Household Food Insecurity

A growing body of evidence suggests that the inability to afford a healthy, nutritious diet has a negative impact on the physical and mental well-being of individuals of all ages (7). Adults and children in food insecure households have poorer physical and mental health (41). The presence of household food insecurity is associated with more illness including; poor self-rated mental/physical/dental health, physical limitations, diabetes mellitus, heart disease and other chronic conditions. Low income and household food insecurity also interferes with the management of chronic conditions (15, 17, 41, 45, 83-88). Health problems of individuals may in part be related to the body's physiological response to the stress of severe or chronic food insecurity (and poverty) (41, 89). Multiple stresses, including inadequate income to meet the basic necessities of life, poor quality housing in unsafe neighbourhoods, poor access to child care, lack of access to secure, well-paid employment, frustration with bureaucratic systems for social assistance and lack of social support further compound the challenges and can adversely affect health (90).

Fitzpatrick and colleagues (91) examined data from Ontario adults age 18 years and older collected through the Canadian Community Health Survey (CCHS) between 2003 and 2006, and linked this with person-matched data from the Ontario Hospital Insurance Program (OHIP) (i.e., costs of annual health care including inpatient hospital care, emergency department visits, physician services, same-day surgeries and home care services) and the Ontario Drug Benefit Program (ODBP) (i.e., cost of prescription drugs for seniors 65 years or older, people living in long-term care homes or homes for special care or receiving Home Care, people receiving income from social assistance or disability pension). They examined trends in OHIP and ODSP costs for five years subsequent to the CCHS collections in order to explore factors predictive of high-cost use of the health care system. After adjusting for age and sex, the factors *most* strongly associated with becoming a future high-cost user of health care were household food insecurity (defined as moderate+severe food insecurity), personal income and non-homeownership. The odds of becoming a high-cost user of the health system within the next 5 years were 46% greater for those living with household food insecurity compared to individuals in food secure households. In a similar type of study, Tarasuk and colleagues (92) analysed data from working age Ontario adults (18-64 years) only, obtained from CCHS between 2005 to 2010 and linked with person-matched data from OHIP and ODBP for the same year as the corresponding CCHS data. They found that household food insecurity, independent of other social determinants of health, was "a robust predictor of health care utilization and costs incurred by working-age adults". Compared to annual health care costs of adults from food secure households, the total health care costs (OHIP + ODBP) were much higher for the adults from food insecure households, and these health care costs increased for people in proportion to the severity of their household's food insecurity – the costs of health care being 23%, 49% and 121% higher for individuals with marginal, moderate and severe household food insecurity, respectively (92).

Chronic Health Conditions

Higher rates of numerous chronic conditions, including depression, diabetes, and heart disease are found among food insecure adults. Tarasuk and colleagues used CCHS data collected in 2007-2008 from adults 18-64 years, who were in positions of responsibility for the welfare of their households (i.e., full-time students and adult children living with parents were excluded) to examine vulnerability to household food insecurity according to the presence of chronic health conditions. Compared to adults with no chronic physical or mental health condition, the odds of experiencing household food insecurity increased from 1.43 for adults with one condition to 1.86 for adults with 2 conditions and to 3.44 for adults with 3 or more conditions (41). As well, the proportion of adults reporting multiple (3 or more) chronic conditions rose with worsening household food insecurity – from 9% of adults in food secure households to almost four

times as many (34%) adults in severely food insecure households (and 47% women with mood or anxiety disorders) (41).

Once chronic health conditions manifest, the management of disease is also compromised through the context and presence of food insecurity. The presence of chronic diseases, such as diabetes, heart disease, hypertension, asthma, mood or anxiety disorders, and back problems, often increases vulnerability to food insecurity (41). The experience of food insecurity makes it more difficult to manage chronic health problems requiring dietary modification, such as diabetes (87, 88, 93, 94). Food insecurity increases the risk of developing poor health and chronic diseases, while the presence of poor health and chronic diseases make it more difficult to cope, work and care for oneself, thus increasing the risk of food insecurity, a bi-directional relationship among these variables (41, 94). People with disabilities who rely on disability pensions for income are at higher risk of being food insecure (95, 96).

Mental health

In Canada, the prevalence of mental and/or substance use disorders among individuals 15 years of age and older was 10.1%, based on CCHS 2012 data, in which participants reported symptoms consistent with major depressive episode, bipolar disorder, generalized anxiety disorder, and/or abuse of or dependence on alcohol, cannabis or other drugs (97).

There are multiple ways in which food insecurity could contribute to depression, including through nutritional deficiencies and/or the body's physiological response to the tremendous stress of worry, anxiety, frustration and despair from not having enough money to feed oneself and/or one's family or being forced to consume food in socially unacceptable ways (98-101). Depression could also lead to food insecurity within a household, especially families with young children, through the known symptoms of the illness including lack of energy, fatigue, loss of interest in usual activities, or impairment in thought processes, concentration and decision-making (102). Without intervention, depression and food insecurity can become interlocked in a downward spiral. The most appropriate response to problems related to or stemming from mental health conditions[9] is to *treat the condition*, while providing support to the individual/ household affected and addressing other issues related to situations arising when the conditions were not (yet) successfully treated.

The prevalence of mental health concerns and depression among food insecure adults is higher than compared to the general population (103, 104). Using data from British Columbia, Davison and Kaplan (104) found the prevalence of food insecurity to be significantly higher among adults with mood disorders compared to the general population (36.1% vs 7.3%). As well, they reported a significant association between food insecurity and psychological measures (mania symptoms), with an adjusted prevalence ratio of 2.37, demonstrating greater risk of mania among individuals with mood disorders who were also food insecure (104). Another Canadian study, using a subsample of CCHS 2007 data, reported finding a significant relationship between the experience of food insecurity (moderate + severe) and financial concerns with suicidal ideation among adults (105). With adjustment for covariates, the researchers found that suicidal ideation was significantly associated with food insecurity at both the moderate level (adjusted odds ratio = 1.32) and severe

[9] For detailed discussion of nutrition care and mental health conditions, see Dietitians of Canada's report, *Promoting Mental Health through Healthy Eating and Nutritional Care* (99), which includes many mental health disorders – such as neurodevelopmental, schizophrenia spectrum, psychotic, bipolar, obsessive-compulsive, eating disorders and more (99).

level (adjusted odds ratio = 1.77) of food insecurity (105). While the authors conceded that there may be a relationship between mental health and how a person perceives and reports on their food security status, they recommended that longitudinal investigations could advance understanding of causal pathways contributing to associations between food insecurity and mental health conditions (104, 105). Numerous studies have found strong associations between maternal depression and food insecurity (17, 46, 47, 98, 102, 106-108). While most studies on maternal depression and food insecurity have been cross-sectional (and therefore cannot determine the direction of cause and effect), results from one longitudinal study indicate that food insecurity may be a causal or contributing factor to depression, independent of poverty (98). In another longitudinal study, the authors concluded that a bidirectional relationship exists between food insecurity and depression, meaning that food insecurity led to depression and depression led to food insecurity (100).

The Mental Health Commission of Canada acknowledged that up to 70 per cent of mental health problems and illnesses begin in childhood or adolescence (109). Individuals with serious mental illness are frequently unable to access community services and supports due to stigma, gaps in service and/or challenges in system navigation. Lack of sufficient primary health care and community mental health services, shortages of affordable housing, and inadequate income support further alienate them from life in the community. Exclusion from these social and economic supports results in social isolation, significantly increasing their risk of chronic poverty and food insecurity (110).

Children's health

One in six children lived in a food insecure Canadian household in 2012 (6). Children who have experienced hunger (which is a physical symptom associated with the most severe level of food insecurity) are more likely to have poorer physical and mental health in adolescence and early adulthood and are at greater risk for developing chronic conditions (6). Canadian and American research indicates that, compared to children in food secure households, children in food insecure households are more likely to experience birth defects (111), poor overall health (19, 62, 112), hospitalization (62, 113), iron deficiency (114, 115), asthma (19), chronic health conditions (19), reduced stature (64), developmental problems (116, 117), behavioral problems (118) and higher rates of depression, and suicidal ideation and suicide attempts in adolescence (100, 104, 105, 119). Logistic regression analysis of data from the first five cycles (about ten years) of the Canadian National Longitudinal Survey of Children and Youth showed that negative impacts on health related to childhood hunger[10] persisted even after taking into account other household socio-demographic factors such as income and education (19). Comparing health impacts for children who had 'ever' versus 'never' experienced hunger over the ten year period, there was a consistently greater likelihood of being in poor health (32.9% versus 12.8%), having a diagnosed chronic condition (36.9% versus 32.6%) and/or having asthma (24.8% versus 18.0%). Furthermore, the odds ratios, adjusted for other variables, consistently showed greater likelihood (about two to four times greater) of poor health/ diagnosed chronic condition or asthma when a child had 2 or more episodes of hunger reported versus one

[10] Based on response to the question, "Has [the child] ever experienced being hungry because the family has run out of food or money to buy food?". The Canadian National Longitudinal Survey of Children and Youth (19) was conducted biennially between 1994-2009 (8 cycles) – it did not assess food insecurity using the HFSSM. Subjects were recruited in each of Canada's 10 provinces, excluding children living on First Nation reserves or of military forces households.

episode during the survey period, leading the authors to conclude that "repeated exposure to food insecurity appears to be particularly toxic" (19).

Dietary/nutritional status

Analysis of dietary and food insecurity data from the CCHS Nutrition study in 2004 points to poorer quality diets and higher risk of inadequate intakes of some nutrients among adults and adolescents in moderately and severe food insecure households (14). More youth and adults from food insecure households (moderate + severe) were found to have inadequate intakes of vitamins (A, C, some B vitamins) and minerals (calcium, magnesium, zinc) compared to those from food secure households (120, 121). Canadian research also found that teens and adults in food insecure households ate less vegetables, fruit and milk products (121). A study with Inuit children in Nunavik reported high rates iron depletion or anemia, affecting almost half of children from food-insecure households (64); nutrition surveillance data collected from children and adolescents in the USA showed that iron deficiency anemia was more likely among children in food-insecure households (114, 115) .

Dachner and colleagues (122) examined food and nutrient intakes over the course of a month for 182 low-income, predominantly food-insecure women with children, whose primary source of income was social assistance, received monthly. Among the women with moderate or severe adult food insecurity, there were significant declines in energy, carbohydrate, vitamin B-6, and fruit and vegetable intakes as time increased since receipt of income. This decline was not significant for the women who were food secure or marginally food insecure. The results demonstrated how the women's resilience or vulnerability was reflected in their food security status over this time, with dietary compromise when household resources diminished, which threatened their nutritional health (122). Household food insecurity appears to be a strong marker of nutritional vulnerability amongst children and adults (64, 114, 120, 122).

Body Weight

Although food insecurity and body weight are often linked, the evidence is not straightforward. Some studies have linked persistent food insecurity with a greater risk of being underweight (123-125). Conversely another study (126) reported a higher proportion of obesity among moderately food insecure Canadian women of all ages. The authors estimated that the cost of obesity due to moderate food insecurity among women in Canada was as much as $108 million (in 2006), prompting the conclusion that eliminating food insecurity could lead to significant savings in health care costs (126).

Canadian studies examining the risk of increased body weight of children (as BMI percentile for age) living in food insecure households have reported different results for boys versus girls (127, 128), while another research team found that associations were no longer statistically significant when using measured versus reported body heights and weights (129). Tarasuk has commented there is a need for more longitudinal research to understand how food insecurity status affects body weight for all ages group within Canada (130).

Health care costs

Strong associations have been reported between household food insecurity and the likelihood of becoming a high cost user of the health care system (91, 92, 131). Compared to individuals from food secure households, the odds of adults becoming a high cost user within the next 5 years were 46% greater for those living with food insecurity, using data from CCHS and the Ontario Health Insurance Plan (OHIP) (91). Household food insecurity has been reported to be a robust predictor of both utilization and costs of healthcare for working-age adults, independent of other social determinants of health (92). A reduction in rates of household food insecurity could reduce considerable public expenditures in health care (91, 92).

Health care practitioners generally understand that some of their patients/clients are living in poverty and/or experience household food insecurity (83, 88). Nevertheless, with the exception of practices that focus on caring for particularly vulnerable populations such as people who are homeless or new arrivals in Canada, little attention may be paid to assessing and addressing issues of food insecurity amongst clientele (132). Individuals living in food insecure households often struggle to afford the medical and nutrition therapies recommended by health professionals to prevent or treat health conditions (41). In most provinces and territories, individuals who rely on social assistance or disability pension for income can apply for additional funding or allowance to cover some of the additional costs resulting from the higher prices of certain foods required for some special diets. Food insecurity among adults with diabetes has been associated with increased need for health services and use of physician services, in addition to poorer self-management and more frequent episodes of low blood sugars) (83, 88, 91, 92, 133). However, as pointed out by the researchers in PROOF, "once chronic diseases are established, their management is also compromised in the context of food insecurity" (6).

In summary, evidence has linked the experience of household food insecurity to health disadvantage or inequity, a greater risk for poor health and chronic conditions; household food insecurity is a more potent determinant of diet quality than income or education, and compromises the management of disease management, increasing the odds that an individual will become a high cost user of the health care system. The health impacts of poverty and food insecurity need to be addressed on an individual and systemic level, to improve health outcomes and manage the continued escalation of costs to the health care system. The health impacts of poverty and food insecurity need to be addressed on an individual and systemic level, to improve health outcomes and manage the continued escalation of costs to the health care system.

Populations Disproportionately Affected by Household Food Insecurity

Some individuals in Canada are disproportionately at greater risk for low income and financial constraints, and food insecurity within their households – risks related to certain life stages, sex and gender, racialized identity and chronic health conditions and/or disabilities. Women, lone parents, especially lone female parents, unattached single people, people who have a disability and lesbian, gay, bisexual and transgender populations disproportionately experience a higher prevalence or risk of household food insecurity. Other population groups in Canada with higher prevalence rates of individual or household food insecurity include Indigenous Peoples, those who are precariously housed or homeless, those who rent their homes and some new immigrants/refugees.

The key critical social determinant of health for food insecurity is the "inadequate or insecure access to adequate food due to financial constraints" (6). Income and other social determinants of health such as education and housing may interact and intensify food insecurity.

Life stage, gender, racialization, health and other individual risk factors related to increased risk for household food insecurity

Adults at greater risk of household food insecurity

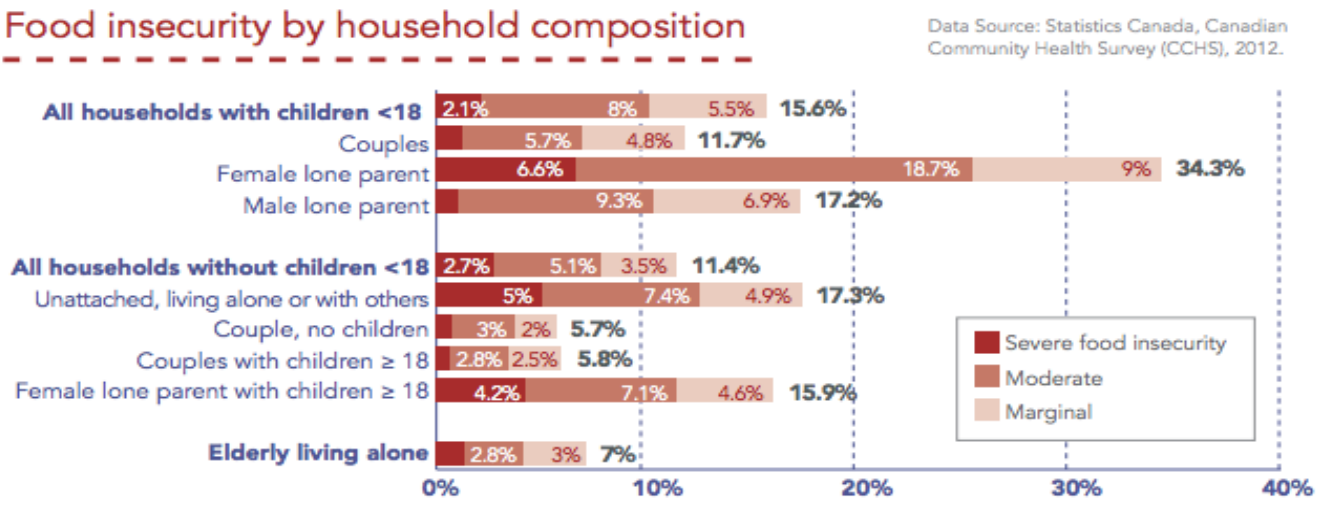
The experience of household food insecurity is not the same for all household members (6, 134-137). Women are disproportionately impacted by household food insecurity. Since women continue to have primary responsible for domestic food preparation (137-139) they may more acutely experience the anxiety, stress and despair of feeding themselves and their families in conditions of food scarcity (140, 141). The most documented and widely recognized phenomenon is that mothers in lone parent, female led households protected their children from hunger and food insecurity by decreasing the quality (142) and quantity of their own food and meals before their children's food and meals were affected (143-149)[11]. Women in two-parent households reported higher rates of food insecurity than men in the same household (6, 150).

Female-led lone-parent households are extremely vulnerable to food insecurity. In a 2002 study with low-income lone mothers and their children in Atlantic Canada, McIntyre et al reported that nearly all (96.5%) these women had experienced food insecurity in the previous year (147). A Statistics Canada report on women in Canada concluded that lone mothers, Indigenous women, visible minority women, immigrant women and senior women in Canada were at particular risk of low income due to marginalization and discrimination (151). This report commented on additional risks among Indigenous women – for example, more Indigenous women (18%) than non-Indigenous women (8%) were lone mothers (151). Similarly, Power acknowledged that Indigenous women are not only more likely than non-Indigenous women to experience food insecurity; those living in food-insecure households were also more likely to experience poorer mental and physical health and well-being, including high stress, increased rates of cigarette smoking, life dissatisfaction and a weak sense of community belonging (152).

Figure 6 shows Canadian statistics for food insecurity by household characteristics and composition, in 2012 (6). Among lone parent households with children under 18 years, mothers are about five times more likely than fathers to be the lone parent. Lone-mother households with children experienced food insecurity at a rate two times greater than lone-father households (34.3% vs 17.2%), and more than twice the rate of two parent households with children (11.7%). When children were over the age of 18 years, the lone-mother households continued to have higher rates of food insecurity compared to lone-father households (15.9% vs 10.5%) and two parent households (5.8%) (6).

[11] It must be noted however that there is no research to date on food insecure households led by lone fathers – it is not known how lone fathers protect their children from food insecurity, or how such protection may or may not differ from that of lone mothers. As well, much of the research with lone mothers was conducted almost twenty years ago, and so should also be updated to better understand current behaviours and trends.

Figure 6: Food insecurity in Canada, by household composition



Source: Household Food Insecurity in Canada 2012 (PROOF) (6) – with permission.

Unattached individuals are at greater risk for experiencing food insecurity (6, 69). In Canada, in 2012, the prevalence of food insecurity was much greater among unattached individuals (living alone or with others) than among couples (17.3% versus 5.7%) (6). Scenarios of households reliant on income from social assistance repeatedly show that single adults (18-64 years) are particularly at risk for food insecurity, since they receive less money than couples or families and often require a greater proportion of their income for housing. (Examples of these scenarios can be found in many of the reports using Nutritious Food Basket results, listed in **Appendix B**.) There is a lack of research addressing the risk of food insecurity for unattached individuals – most of the research focuses on the substantially greater risks for women who are lone parents with children under the age of 18 years.

The context of food insecurity within households experiencing other problems is complex, especially for the most severely food insecure households. Among severely food insecure women, there is an association between persistent poverty and intimate partner violence. One study suggests that the severity of food insecurity may increase when mental health problems combine with alcohol or drug problems or domestic violence (102). Intimate partner violence may also include financial abuse, such that a woman may not have influence over how the household finances are spent (153-156) and is thus unable to protect her children or herself from food insecurity.

Some evidence suggests that the gender of individuals (those who identify as lesbian, gay, bisexual or transgender (LGBT)) may also be a factor contributing to higher risk of food insecurity (157, 158). In the first study of gender/sexual orientation and economic outcomes in Canada (158), gay men were found to have 12% lower personal incomes and lesbians 15% higher personal incomes compared to heterosexual men and women, although more detailed analysis of USA data (157) has shown differences for individuals versus couples, and specific gender identity. In Canada and the USA, additional contributing factors to different labour force patterns (and food stamp use, in the USA) among the LGBT populations studied included educational attainment, childrearing, urbanicity and homelessness (157, 158).

In Canada, a lower prevalence of food insecurity among senior adults, over the age of 65 years, corresponds with lower rates of poverty. The rate of food insecurity in 2012 (including marginal, moderate and severe) was 7% among seniors

living alone and even lower among couples with children over age 18 years (5.8%) - all of these rates being lower than the overall prevalence of household food insecurity in Canada, which was 12.6% (6). Using data from CCHS 4.1 (2007-08), one study demonstrated how turning 65 and being able to access the federal guaranteed annual income for seniors cut food insecurity rates in half for single seniors. Among seniors with low incomes (i.e., in the lowest income category), the prevalence of food insecurity (moderate plus severe – marginal food insecurity is included with "food secure" in Statistics Canada reports) was 22.8% among those 60-64 years compared to 11.6% among those 65-69 years (75). The same authors expressed concern that raising the age of eligibility for seniors' public pension benefits to 67 years would negatively impact these prevalence rates (159), although the federal budget presented in 2016 reversed the proposal to raise the age of eligibility.

Researchers have also examined the prevalence of household food insecurity among racialized populations[12] within the country. The CCHS questionnaire acknowledges "People living in Canada come from many different cultural and racial backgrounds" and asks respondents to choose from one or more of a list of identities. In 2012, the prevalence of food insecurity was higher among individuals who described themselves as Indigenous (28.2% - excluding those living on First Nations reserves, and therefore an incomplete measure of prevalence), Black (27.8%), Arab/West Asian (21.7%), Latin American (26.9%), other or multiple origins (18.1%) compared to populations with lower prevalence – those who identified as White (11.1%) or East/Southeast Asian (10.6%) (6). Little has been written however to specifically examine *why* or how racialized populations experience more household food insecurity. Recent research in Canada has explored the impact of changes in employment income, and suggests, for households with racialized workers, there are disproportionate negative impacts on household food insecurity and workers' stress and health outcomes (161).

Risk of Household Food Insecurity among Infants, Children and Youth

Food insecurity appears to be more common in households of couples with children under 18 years of age compared to those with children over 18 years (15.6% versus 11.4% respectively), and especially in households with younger children headed by lone mothers (34.3%) (6). The prevalence of food insecurity amongst families with children differs dramatically depending on the province or territory of residence. On average, one in six Canadian children lived in food insecure households in 2012, ranging from high prevalence of childhood food insecurity in Nunavut (62.2%) and the Northwest Territories (31.6%) to lower prevalence of food insecurity among children in food insecure households in Ontario (15.2%) and Newfoundland and Labrador (15.1%) (6).

For the first six months of life, infants are in a unique situation since they generally consume only one food – breast milk, or a commercial infant formula. One Canadian study (146) found some mothers breastfed to ensure their child had food, while others worried that their own poor nutritional intake would adversely affect the quality and quantity of their breast milk and chose to use commercial infant formula, even though they could not afford it. The cost of commercial infant formula is a barrier for low income parents and may lead to discontinuing the use of formula before infants are ready to transition to cow milk (between 9-12 months), contributing to health issues like increased risk for anemia

[12] Racialization has been defined as "the process by which societies construct races as real, different and unequal in ways that matter to economic, political and social life", recognizing that 'race' is a social construct and a prohibited ground of discrimination (160).

(162). Overall, the vulnerability of infants to food insecurity is tied to the challenges faced by mothers with food insecurity and the difficult decisions they must make in light of the challenges.

As discussed earlier in this paper, for children living in food insecure households, there is a greater likelihood they will have poorer physical and mental health (19, 42, 62, 112), and they are more likely to develop long-term chronic health conditions such as asthma and depression (42, 100, 119, 163-166). Gundersen and Kreider suggest that the causal impacts of household food insecurity on health outcomes were more likely to have been underestimated than overestimated in earlier studies (166), while Cook and colleagues (42) argue that even marginal food insecurity (usually counted as part of "food security") predicts adverse health outcomes among children.

Data from CCHS 2004 Nutrition Cycle showed that the impact of food insecurity on dietary quality was greatest for teens compared to adults and younger children. Nevertheless, food consumption patterns were affected, with the younger children consuming fewer servings of milk products, vegetables and fruit than children in food secure households (121). PROOF's report using CCHS 2012 data indicated that, among households in the lowest income group, responses to the HFSSM indicated that 83.1% of households relied on a few low-cost foods to feed their children, 69.4% could not afford to feed their children balanced meals, 17.0% had children who were hungry, 15.4% cut the size of children's meals, 9.5% of households reported children missed meals, and 2.5% of households went for a whole day without food (6).

Children as young as nine years of age have been reported to be aware of their parents' efforts to manage the family's food supply (163, 164). Children and teens experience the physical, psychological and social dimensions of food insecurity in ways that are similar to adults, reporting hunger, shame, stigma, embarrassment, stress, anxiety and social exclusion (163, 164). Their food insecurity experiences may be invisible to their parents (163-165), and they may hide from their parents the strategies they use to manage and ameliorate their household's food insecurity (164).

McIntyre et al (119) examined factors related to hunger in a longitudinal study spanning a thirteen year period. The experience of childhood hunger was "a robust predictor of depression and suicidal ideation", with an odds ratio of 2.3, even after adjustment for potential confounding variables, suggesting "prevention through the detection of such children and remedy of their circumstances may be an avenue to improve adult mental health" (119). A study in the USA, examining the relationship of household food insecurity and mental health problems concluded that both male and female adolescents living in households with food insecurity were more than twice as likely as their peers to have mental health problems, as reported by their parents (167).

Among youth (aged 15 to 24), rates of unemployment are relatively higher than for others in the workforce: in March 2016, the youth unemployment rate in Canada was 13.4%, compared to 7.1% for all ages (168). With rising costs of tuition, inadequate student assistance, and poor availability of summer jobs, there have been some reports suggesting some university students appeared to be increasingly vulnerable to food insecurity (169, 170). To date, there has not been collection of data to measure the prevalence of food insecurity amongst youth and young adults, such as postsecondary students. One study in Ontario focussed on at-risk youths without children, 16 to19 years of age (i.e., highschool age), and pregnant females 16-25 years of age, or young families, with at least one child, and at least one 'social determinant of health' risk factor (171); subjects were chosen because they were thought to be individuals who may not have good food skills and would benefit from acquiring more skill. When asked if they sometimes ran out of money for food, about 10% of pregnant teens/young parents responded 'frequently' and almost 30% more responded 'occasionally'. Economic barriers included poor housing with limited cooking and food storage facilities, lack of utensils and ingredients for home cooking, low income and unemployment (171).

Individuals with chronic health conditions

Adults who develop a chronic illness can be more vulnerable to becoming food insecure – or more severely food insecure – due to several factors that may lead to inadequate economic resources to buy healthy food on a regular basis (41, 88, 172-174). Reasons for this include greater expenses to follow a therapeutic treatment and pay for medication to manage their condition, as well as reduced earnings due to poor health, decreased physical and mental energy and lower productivity. Tarasuk et al suggested chronic disease may increase vulnerability to food insecurity through two mechanisms: first, chronic disease may strain household finances because of extra costs for medication and other goods and services required for managing chronic disease, including transportation, rehabilitation services, and special food requirements; and second, chronic disease may limit the ability to manage food insecurity (41). As discussed earlier, the presence of multiple chronic health conditions among adults is related to an increase in the prevalence and severity of food insecurity. While poorer health among children and adults is indeed an outcome associated with the experience of food insecurity in a household, it is also a potential factor contributing to greater subsequent risk for experiencing food insecurity.

Surveys of clinical populations, including those with diabetes mellitus (88, 133, 175), HIV/AIDS (172, 176, 177), cancer (174), and those receiving hemodialysis (173) have identified a higher prevalence of food insecurity among these patient groups than in the general population. Canadian and American researchers report higher prevalence of food insecurity among adults with diabetes compared to adults in the general population (87, 88). Adults and children with diabetes who are food insecure experience more adverse health consequences, including hypoglycemic episodes, poor glycemic control and increased need for health care services and hospitalization (178, 179).

Food insecurity is a significant issue among individuals with HIV/AIDS, affecting approximately 50-70%, according to one Canadian study (172, 177). Food insecurity is associated with increased HIV transmission risk behaviors and decreased access to HIV treatment, care and survival rate (94, 180-182). Over half of intravenous drug users (181, 183) also experience a higher prevalence of food insecurity.

Indigenous Peoples in Canada: unique household food insecurity and food security challenges

Indigenous Peoples in Canada have unique heritages, languages and cultures, but they share common histories of colonialism[13], resulting in the loss of self-governance, control over lands and resources, cultural practices and family. Recent visits from two UN Special Rapporteurs highlighted the dire circumstances that continue to exist among Indigenous Peoples in Canada. In his 2014 report on his visit to Canada, the UN Special Rapporteur on Rights of Indigenous Peoples, James Anaya, noted that socio-economic conditions are "abysmal," health matters are of

[13] The expert panel on *Aboriginal food security in northern Canada* (12) acknowledged the impacts of colonialism – "being forcibly removed from the land or being denied access to the land to continue traditional cultural activities, as well as the psychological, physical, and financial effects of dispossession". A description of the historical context of colonization's contribution to Aboriginal food insecurity is included in the Alberta First Nations Food Security Strategy (184).

"significant concern," and human rights problems have reached "crisis proportions" among Indigenous Peoples in Canada (185). Consistently and extraordinarily high prevalence rates of household food insecurity among Indigenous Peoples were also of particular concern to the UN Special Rapporteur on the Right to Food, Olivier de Schutter, during his visit to Canada in 2012 (11). The expert panel of the Council of Canadian Academies acknowledged, in its comprehensive report, Indigenous Food Security in Northern Canada: An Assessment of the State of Knowledge (expert panel report) (12), that "food insecurity presents a particularly serious and growing challenge in Canada's *northern and remote* [emphasis added] Indigenous communities".

For Indigenous peoples, any discussion of food insecurity, at the household level, or food security, at the community level, must also address the unique challenges of accessing food through two parallel food 'systems': traditional/country foods[14] and the market (store-bought) food system. The value of traditional/country foods, locally harvested or obtained by hunting, fishing, trapping, gathering, trading, and both agri- and aqua-culture, is linked to the land, family, community, culture and spirituality, sometimes with little distinction between food and medicine (186). As dietary patterns are shifting, often with transition from traditional to greater reliance on market food, there are increasing risks for and prevalence of chronic health conditions, including type 2 diabetes and cardiovascular disease, suggesting that inclusion of at least some traditional/country food may be health-promoting or protective against these diseases (12, 186, 187).

Traditional/country foods are vitally important to diets for many Indigenous households, providing high quality, nutrient-dense foods, as well as being an integral part of Indigenous culture. Although traditional/country food is consumed less than in the past, culturally acceptable, traditional/country foods may provide about one-quarter to over half of energy intakes in some Indigenous households (188-190). Individuals who eat some traditional/country foods on a regular basis are more likely to have nutritionally adequate diets than those who rely entirely on store-bought food (12, 58, 191, 192). Reports from the FNFNES indicated that most First Nations adults living on reserve wanted more traditional food in their diets than they were able to access. When only store-bought food was consumed, intakes of saturated fat, sugar and sodium were significantly higher than on days when traditional food was eaten (56-58).

The report on *Aboriginal food security in northern Canada* (12) acknowledges the complexity of addressing food security "that touches on governance and food sovereignty[15], on poverty and economic development, and on self-determination and education". Furthermore, the expert panel of authors recognized that self-determination is a critical means to influence "the structural factors that underlie the inequities facing Indigenous people" living anywhere in Canada and that "increased community control over social, political, economic and physical environments is linked to improvements in health" (12). Researchers with the most recent FNFNES (58) similarly concluded that a "multi-pronged approach" was needed to improve household food security and nutrition in First Nation communities. They recognized that, beyond

[14] Traditional food is the preferred term for First Nations and Métis, and country food is the preferred term for Inuit. Use of the term "traditional/country food" is considered to be inclusive of all Aboriginal cultures in Canada (12).

[15] According to the expert panel on *Aboriginal food security in northern Canada* (12), food sovereignty refers to "people's ability to define and have decision-making control over their own food systems; food sovereignty was identified as a key mechanism to food security for Aboriginal peoples.

closing the gaps in income, education and health, and greater investment in community programs (such as traditional food harvesting and community agriculture), there must be respect for Indigenous Title and treaty rights and support for self-determination (58).

In general, while the pattern of relationships among household food insecurity, income and health of Indigenous households is similar to that in Canada's general population, the prevalence and depth of household food insecurity among Indigenous households is greater – an indication of greater inequities. Using data collected in the ten provinces by CCHS Cycle 2.2, Nutrition (2004), Health Canada compared the prevalence of household food insecurity (moderate+severe) in different subpopulations, including off reserve Indigenous people, and further reported food insecurity rates of population groups by income and education (14). In the lowest category of income adequacy, the proportion of Indigenous households who experienced household food insecurity was 69.2% (about two-thirds of whom were severely food insecure), which was both a greater prevalence and depth of household food insecurity, compared to the general population in the same income category, for whom the proportion was 48.3% (about half of whom were severely food insecure). Amongst Canadians with less than secondary school graduation, 44.3% of Indigenous households were food insecure, compared to 13.8% of total households (with similar trends for differences between households who did not own a dwelling - 49.5% Indigenous versus 20.5% total population experiencing food insecurity). Using the same data set from CCHS Nutrition 2004, Willows et al examined relationships between household food security and self-reported health among Indigenous adults (18+ years) living off reserve. Within the Indigenous adult population, those living in food insecure households were statistically more likely to report poor general and mental health, life dissatisfaction, a very weak sense of community belonging, high stress and cigarette smoking (81, 86).

The Mental Health Commission of Canada recognized that some of the most challenging and complex mental health and social issues occur in the northern and remote regions of Canada, and acknowledged the impacts of colonization and residential school experiences across generations of Indigenous Peoples, which has "contributed to high rates of substance use and mental health problems, suicide, incarceration and family violence (109). Many First Nations communities also experience high rates of poverty, shortages of adequate housing, unsafe drinking water, and a lack of educational, employment and economic opportunities, all of which undermine health and well-being". The Commission made several recommendations for strategic direction, including "[w]ork with First Nations, Inuit, and Métis to address their mental health needs, acknowledging their distinct circumstances, rights and cultures" and "[r]educe disparities in risk factors and access to mental health services, and strengthen the response to the needs of diverse communities and Northerners" (109).

An analysis of data from Inuit people collected through the 2012 Indigenous Peoples Survey (61) showed similar associations between household food insecurity, compromised housing and health, as from the 2004 CCHS data described above. In Nunavut and Nunavik, the geographic areas with the highest prevalence rates of household food insecurity, the prevalence of inadequate housing conditions among Inuit people was also high: in Nunavut – 34% were living in homes with more than one person per room, 35% in homes needing major repairs; in Nunavik – these rates were 43% and 39%, respectively. The high prevalence of household food insecurity and compromised housing was also reflected in a lower prevalence of excellent or very good self-reported health (61).

In a 2007 report to Health Canada, Power (190) demonstrated poverty rates among Indigenous people were at least double that of the Canadian average, while unemployment rates (especially on reserves) were consistently about two-and-a-half times the general population rate. A greater proportion of the Indigenous population in Canada lives in remote reserves/communities, especially in the Territories and northern regions of several provinces, where access to

education, social services and jobs are often more limited (12). Over 60,000 residents across Canada's three Territories and in Nunavik (Quebec) and Nunatsiavut (Newfoundland and Labrador) identified as Indigenous (over half the total population), based on results from the National Household Survey (NHS) in 2011 (193,194). People living in the North generally experience higher rates of unemployment, lower indicators of health and education status, and stronger dependence on public housing (195), and the effects of low income may be compounded by a lack of education about nutritious market food choices, by addiction, or by social exclusion (12).

A federal government report acknowledged that Indigenous People still faced a considerable income gap relative to their non-Indigenous counterparts even when education levels were similar (196). Although average and median incomes tended to be higher in the Territories than at the national level, the gap between the incomes of Indigenous and non-Indigenous people was more pronounced in the North. Median incomes of non-Indigenous people in the Yukon and Northwest Territories were about double and in Nunavut, about four times the median income of Indigenous Peoples. The wage gap between non-Indigenous and Indigenous people in Canada overall was smaller than in the Territories – wages of non-Indigenous people were about 1.5 times more than for Indigenous People (196, 197).

Lower income and education, and inadequate housing conditions are all critical factors contributing to food insecurity among Indigenous people. Policy responses are needed to address these inequities and disparities.

Homelessness, precarious housing and renting: greater risks for household food insecurity

There is a growing body of evidence that housing circumstances across the housing continuum are associated with vulnerability to household food insecurity.

Homelessness represents a range of shelter and housing circumstances organized into four operational categories: 1- unsheltered, 2- emergency sheltered, 3- provisionally accommodated, and 4- at risk of homelessness, based on the definition developed by the Canadian Observatory on Homelessness (198). The first three categories are used to estimate the number of homeless Canadians for a given night or year (199). The fourth category refers to individuals living in permanent housing that may be at risk of homelessness as a result of economic hardships, personal crisis, discrimination, eminent eviction, discontinuation of housing support and/or the precarity of their current housing (198). It is estimated that over 1.3 million Canadians have experienced homelessness or extremely insecure housing during the past five years, and over 235,000 Canadians are homeless in a given year (199).

The Canadian homeless population is very diverse and includes individuals from all ages, genders and ethno-cultural backgrounds (198). It is estimated that 4% of all homeless individuals are families, 20% are single youths between 16 and 24 years of age, and 47.5% are single males aged 25 to 55 years (199). It is also well established that Indigenous peoples are at increased risk of homelessness compared to other Canadians; in certain urban centres, they represent up to 70% of homeless individuals (199). Various North American studies have documented the high prevalence and extreme severity of food insecurity among homeless individuals (200-206). Currently, national prevalence estimates of household food insecurity only include domiciled Canadians; the extreme vulnerability of homeless individuals to food insecurity suggests that the true prevalence of household food insecurity within the entire country is underestimated (6).

Household food insecurity among homeless individuals is compounded by multiple complex concurrent problems such as addictions, mental and physical health problems (200-203, 206, 207). In order to acquire food or money for food, homeless individuals may use strategies that are stigmatizing, unsafe and illegal, such as panhandling, stealing, selling

drugs and trading sex (200-203, 205). The unstable and limited physical living environment of homeless individuals also hinders the process of preparing and storing food, which contributes to food insecurity (201, 207-209). Multiple Canadian studies have documented the regular use of charitable meal programs by homeless individuals (200, 202, 203, 207). These programs can positively contribute to the dietary intake of users (208, 209), but accessing them does not preclude the experience of food insecurity among homeless individuals (200, 202, 203, 205). Research conducted in Toronto suggests that charitable meal programs are often challenged by high demand, do not meet users' dietary needs, and have important programmatic constraints limiting their access (200, 210, 211). The high vulnerability of homeless individuals to food insecurity and the severity of its manifestation, despite the proliferation of targeted food assistance programs, highlight the necessity to re-evaluate current responses, such as meal programs, for assisting this population (210, 211).

Precarious or insecure housing, due to lack of affordability and/or housing that is overcrowded or needing repair, puts households at higher risk of becoming homeless and experiencing household food insecurity (68, 198, 199). Certain population subgroups are more likely to live in precarious housing, such as lone parents, Indigenous Peoples, recent immigrants, low-income households and renters (212). Unaffordable housing, defined as a dwelling costing 30% or more of total before-tax household income, is the most common cause of precarious housing in Canada (212).

One Toronto study of low-income households found that families living in unaffordable market rentals had more than double the odds of experiencing household food insecurity compared to families in affordable market rentals (68). If the market rental required major repairs, the household also was more likely to be food insecure. This same study found that household food insecurity was positively associated with rent arrears, and with borrowing money or the use of credit to pay for rent (68). Another Canadian study found that higher average monthly rental costs within census metropolitan areas increased the odds of household food insecurity, independent of household characteristics (52). The concomitant experiences of precarious housing and food insecurity are indicative of the multifaceted manifestations of material deprivation, where households make compromises in both housing and food to stretch their limited financial resources (68).

Although unaffordable housing is associated with increased risk of household food insecurity, living in 'affordable' housing does not necessarily prevent the experience of food insecurity. Kirkpatrick et al. showed that the probability of household food insecurity among low-income Toronto families living in market-priced rentals rose with the proportion of income allocated to shelter, even when the proportion was below the threshold of 30% (68). The authors also demonstrated that the prevalence of household food insecurity among families living in subsidized housing was 68.9%, compared to 61.7% for families living in market housing. Families receiving housing subsidies had lower odds of household food insecurity, when compared to families on the waiting list for subsidized housing. These findings indicated that, while receipt of housing subsidies provided some financial advantages among eligible families, the high prevalence of food insecurity among families living in subsidized housing still raised questions about the adequacy of the affordability threshold (68). Subsidized housing policies that utilize a housing affordability threshold of 30% of income have been criticized for not taking into account the adequacy of the after-shelter income to meet other essential needs and for not considering the effect of household composition on what constitutes essential needs (68, 213-215).

An examination of the association between household food insecurity and utility costs showed that 61% of the inter-provincial variation in the rise of food insecurity among Canadians households between 1998 and 2001 could be explained by the sharp increase in heating cost during that period (79). American studies found similar results showing risk of household food insecurity increased as heating and other energy costs increased due to weather (216-219). These relationships between higher housing cost and increased vulnerability to food insecurity are in line with various

qualitative studies documenting that housing expenditures, often characterized as inflexible or inelastic, acted as a financial burden and reduced the budget available for food, leading to household food insecurity (143, 144, 220, 221).

Renting one's home versus home ownership has repeatedly been shown in Canadian studies to be related to higher odds of household food insecurity, independent of other socio-demographic characteristics (17, 41, 222, 223). CCHS data from 2012 showed 26.1% of renters and 6.4% of homeowners experienced household food insecurity with two thirds of all food insecure households being renters (6). A recent study showed that 71% of the difference in the prevalence of household food insecurity between renters and homeowners was due to differences in the socio-demographic characteristics of the two groups (e.g. educational attainment and income), but 29% of the gap could be attributed to the unexplained protective effects of homeownership (223). Potential reasons why the rate of household food insecurity may be lower among homeowners include:

- Homeownership is a major asset increasing access to credit, which can act as a buffer against food insecurity in time of financial constraints (223, 224),
- Homeowners are sheltered from market rent inflation (223),
- Housing policies in Canada tend to favor private homeownership over renting through tax expenditures and funding programs, such as mortgage insurance, support for down payments and residential repairs programs (199, 223, 225, 226). The disparity in the federal subsidies provided to homeowners and renters is substantial with homeowners receiving an average of $1,823 per household in subsidies and private renters only $308 per household – an inequality in a context where the average before-tax household income of homeowners is more than twice that of renters (227).

Newcomers to Canada: limited information about household food insecurity

The severity and prevalence of household food insecurity vary greatly among newcomers to Canada depending on refugee or landed immigrant status, and length of time in Canada. In Canada, in 2012, the prevalence of household food insecurity (marginal to severe) among recent immigrant households (less than 5 years) was reported to be 19.6%, and 11.8% for immigrants who lived in Canada for five or more years (6).

Household food insecurity rates among refugees and immigrants may not however decrease consistently or proportionally with longer periods of time living in Canada. Canadian research on recent immigrants (228-230) has indicated different patterns of food insecurity amongst different populations. Kohnen (228) reported that, among recent immigrants, those residing in Canada for 2-3 years had the highest levels of food insecurity, while the lowest prevalence of food insecurity was among those residing here 4-5 years. One Quebec study (229) reported the odds of being food insecure for respondents who lived in Canada for 6-10 years was double compared to those who had lived here for 4-5 years. The education level of immigrants does not necessarily correlate with household food security either. For example, an Ontario study with well-educated immigrants from Colombia concluded that recent immigration was associated with greater hunger, possibly related to cultural adjustment, lack of familiarity with the Canadian social welfare system, and lack of familiarity with the food available in Canada (230). A study of recent refugees in the United States suggests refugee households may be vulnerable to food insecurity for the first decade of resettlement, with nearly half of the households studied also noting "difficulty in navigating the food environment" (a factor significantly associated with high prevalence of food insecurity) (231).

While some immigrant newcomers enter Canada with financial resources, these funds may be spent during the initial

years of settlement. Social assistance received by refugees in their first year of residency may protect households from food insecurity, but lack of savings and difficulty finding sufficient and/or well-paid work may contribute to subsequent food insecurity (228). Other factors which may confound the data collected on rates of food household insecurity among newcomer households include difficulty understanding questions about food insecurity when surveyed (232) and/or out-migration of newcomer families who experience food insecurity and choose to leave Canada (233). More studies following newcomers to Canada in their first five to ten years could provide valuable insight for policy development that would protect these households from intermittent or chronic food insecurity.

Managing Household Food Insecurity – Strategies Used Within Households to Attempt to Cope

Financial constraints can negatively impact a household's ability to follow a nutritious eating pattern. Food insecure individuals and households most often try to cope through strategies that manage income, although many are also forced to survive through strategies that manage food (122, 234). Most food insecure households cannot spend adequate amounts of money on healthy food because they must prioritize a substantial portion of their budget for housing and utility costs (235). Price most often dictates grocery purchases within food insecure households; personal preferences and nutritional quality become less and less influential as the severity of household food insecurity rises (122, 236). Parents tend to go to great lengths to protect children from overt hunger during times of financial constraint, but household food quality still suffers In particular, mothers have been reported to cut back on both the quantity and quality of their own food intake to feed the children when the family is threatened by food insecurity (143-149, 237, 238). For food insecure households, putting food on the table is a constant struggle and source of great stress. For more than twenty-five years, researchers have documented that household food insecurity pushes the anxiety of managing household expenses to the forefront of daily living (122, 143, 144, 220, 237, 239-243).

Food insecure households use a variety of strategies to avoid hunger among household members (244-246). Analysis of the 1998-1999 National Population Health Survey (NPHS) showed that Canadians living in food insecure households predominantly used strategies that stretched their incomes, using coupons and or returning bottles (57%), postponing bill payments (49%), borrowing money (40%), borrowing food (20%), selling possessions (14%), and buying food on credit (9%) (247). As well, almost half (46%) ate cheaper foods and 28% skipped meals or ate less. Only 22% of those households received food from charity (i.e., food banks) however, and few households used community development strategies such as joining a community kitchen, using a food buying club or gardening. The vast majority of food insecure households (83%) used at least one coping strategy to augment their resources, and the number of coping strategies used increased as the level of food insecurity increased (247) . Similar trends have been reported in other studies (48, 244) . A Canadian study of food insecure university students found the coping strategies most often used most for food insecurity were applying for a loan or bursary (86.2%), seeking employment or working more hours (84.5%), and purchasing food using a credit card (77.6%) (170). Much of the extra work to avoid hunger within households is invisible; it requires creativity, energy and skill – factors often not considered by people without lived experience of household food insecurity (236). For food insecure households without access to a car, acquiring food involves additional planning, effort and cost due to the difficulty of accessing grocery stores and transporting groceries home (248).

Community food programs, including food banks, soup kitchens, community kitchens, food buying clubs or community gardens, are not used by the majority of food insecure households (234, 244, 245, 249). One Canadian study compared

National Longitudinal Survey of Children and Youth data from 1996/97 versus 2006/07, to determine if household coping strategies for child hunger had changed over a decade (234) . Results indicated that the use of food banks and other community resources as a method of coping with child hunger had remained static despite an increase in the number of national food banks/affiliated agencies in Canada (2,141 in 1998 vs 3,540 in 2007). In contrast, there was more reliance on coping strategies internally, such as reducing household food variety to manage child hunger (17.6% in 1996/97 vs 35.1% in 2006/07). The authors concluded that community outreach programs had little impact on coping strategies used over that decade and that these initiatives had failed to reach these families (234).

Some public health initiatives have focused on improving nutrition knowledge and food skills for low-income individuals, with goals to promote healthy living, reduce overweight and obesity and address food security (250). McLaughlin et al. however demonstrated that the quantity and quality of at-home food preparation skills were high among food insecure low-income women in Toronto, challenging notions that these individuals lacked food preparation skill, knowledge or motivation, as well as the idea that food skills alone might be an adequate mechanism for protecting households from food insecurity (250) . Collective kitchens have been described as the "pooling of resources and labour to produce large quantities of food" (251). While collective kitchens can provide a supportive environment for at-risk populations to share and acquire new food skills and may increase the food buying power of the program participants at some level, these outcomes should not be regarded as solutions for food insecurity at a household level. Tarasuk argued that because collective kitchens, like food banks, cannot themselves reduce or eliminate poverty through the redistribution of wealth, they were ill-equipped to affect the structural inequities that perpetuate food insecurity (40).

Neither the definition of household-level food insecurity or coping strategies described above suggest that food insecurity is somehow related to a lack of ability to 'budget'. It is generally understood that food insecure households already know how, and regularly look for ways, to reduce the amount of money they need to spend on food. Despite their resourcefulness, low-income families struggle to feed their families (122). Nevertheless, food prices in Canada have increased at a rate exceeding the general inflation rate in recent years, which may contribute to greater challenge and risk for food insecurity among households already struggling to pay for basic essential needs (252). In a representative poll of Canadian adults in 2016, 83% of those who agreed groceries were 'very or somewhat difficult to afford' reported finding it even harder in the past year to feed their households. More adults in households with income less than $50,000 in the past year (compared to those from wealthier households of $50-100 thousand/year and over $100 thousand/year) reported using strategies to save money on groceries: switched to cheaper brands (78% vs 70% and 63% respectively), cut back on meat (68% vs 61%, 52%), cut back on fruit and vegetables (51% vs 38%, 34%), chose less healthy options that are cheaper (50% vs 36%, 35%), got groceries from a food bank (16% vs 3%, 2%) (252). While individuals in households with varying incomes can and do use coping strategies to save money, it is important to recognize that adults living in food insecure households use more coping strategies more frequently, coupled with the anxiety and stress of knowing there will not be not enough money available to be able to buy adequate food.

What is the experience of the almost three hundred thousand families in Canada who are *severely* food insecure? While the CCHS does not collect data on coping strategies, answers to some of the questions in the HFSSM are revealing. In 2014, virtually all adults in severely food insecure households (97.5%) worried about running out of food before they were able to get money to buy more, and the vast majority (95.7%) reported routinely cutting the size of meals and skipping meals, with 29.9% of adults in these households reporting they routinely went an entire day without food because there wasn't enough money. Among the households with children, 39.1% reported their children were not eating enough, with 19.5% cutting the size of children's meals and 12.0% reporting that children missed meals due to running out of food *(8)*.

Conclusion

The prevalence, severity and impact of household food insecurity is a serious public health issue in Canada, given the physical and mental health consequences of experiencing household food insecurity. The need for solutions to eliminate household food insecurity is great – especially in regions where the prevalence of moderate and severe household food insecurity is high (e.g., the Territories and Maritime regions of Canada) and among households whose circumstances point to a greater likelihood of experiencing household food insecurity. On the basis of numbers of households experiencing household food insecurity however, the majority of Canadian households (84%, many of whom are employed) in need of solutions to address this problem live in the provinces of Ontario, Quebec, Alberta and British Columbia.

Since the root cause of household food insecurity is inadequate and/or insecure income, solutions must be income-based. Only with sufficient income can a household have consistent access to food. It is likely that the presence of food insecurity within a household is a more sensitive marker for health risks than poverty or an annual income that is considered low. For these reasons, any strategies to reduce poverty and improve incomes must include measurement of household food insecurity as part of the evaluation of impact and outcomes.

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Appendix A: Household Food Security Survey Module (HFSSM)

What is the HFSSM and what does it measure?

- a standardized survey instrument, wherein the full survey is an 18-item instrument; 10-adult referenced items, 8-child referenced items
- measures food security status at a household level through questions about food-related behaviours, experiences and conditions that are known to characterize households having difficulty meeting their food needs; the "behaviours" are well researched and referred to as the four domains of psychological, qualitative, quantitative and social
- focuses on self-reports of uncertain, insufficient or inadequate food access, availability and utilization due to limited financial resources and compromised eating patterns and food consumption (quality and/or quantity) that may result; each question specifies a **lack of money or other resources** to obtain food as the reason for the condition or behaviour (the measure is not affected by voluntary limitation of food consumption) [For more information, see http://www.hc-sc.gc.ca/fn-an/surveill/nutrition/commun/insecurit/hfssm-mesam-eng.php]

Important points when using HFSSM data:

- refers to the food security status of a household over a previous time period (12 months for population monitoring surveys)
- together, the questions identify a range of severity of food insecurity, from worrying about running out of food to children not eating for a whole day
- questions do NOT measure food consumption or assess the nutritional adequacy of the household diet
- is a household measure; it does NOT measure food insecurity experience of any individual member of the household, nor can it be assumed all members of a household share the same food security status

HFSSM in Canada:

- Health Canada's sentinel report on 'income-related household food insecurity' in 2007, based on data from CCHS 2.2, Nutrition Cycle (2004), addresses "the financial ability of households to access adequate food, which is strongly related to household income" [For more information, see http://www.hc-sc.gc.ca/fn-an/surveill/nutrition/commun/income_food_sec-sec_alim-eng.php]. The Canadian Community Health Survey (CCHS), "a cross-sectional survey that collects information related to health status, health care utilization and health determinants", has consistently and exclusively used the HFSSM. Some research studies have employed shorter versions of the HFSSM, so it is difficult to know if and how the estimated prevalence of food insecurity due to lack of money is affected by a change in methodology. [For more information, see http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3226]
- used in the CCHS since 2004, when it was included in CCHS Cycle 2.2 Nutrition in all provinces and territories [For more information, see http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5049]; CCHS Nutrition Cycle 2015 – data collection in progress

- was common national content in the 2007-2008 and 2011-2012 CCHS cycles, and included as an optional module in CCHS 2005 and CCHS 2009-2010 cycles, although most provinces and territories chose to include the measure (note: there are some differences in monitoring participation by provinces and territories)
- beginning 2013, CCHS covered at least 97% of the target populations in the provinces and about 92% of target populations in the territories
- for comparisons of prevalence over time, rates must be calculated using the same methodologies. The estimates of food insecurity prevalence in 2004, as reported in *Income-related household food insecurity in Canada* cannot be directly compared to estimates based on data collected in subsequent years (2005-present) because the analysis calculated prevalence in a different way.
- in the United States, the terminology and classification scheme differ, although the same HFSSM questionnaire is used for monitoring food insecurity.

Appendix B: The Nutritious Food Basket - Household income scenarios in reports on the cost of healthy eating

Although survey methodologies and purposes differ across the country, several provinces and some local public health authorities regularly estimate the 'cost of healthy eating' using the *National Nutritious Food Basket* protocol and produce reports which document the 'cost of healthy eating', often in a context of living expenses relative to income. Repeatedly, these reports on the cost of eating healthy conclude that net incomes for lower incomes households, including those who rely on income from social assistance or minimum wage, are insufficient to cover the cost of a basic nutritious diet after paying for other basic needs, such as housing (rent/utilities), clothing and transportation.

Current examples of these reports are available on the Dietitians of Canada website as resources from *www.dietitians.ca/foodinsecurity*.

Calculating the cost of a basic healthy diet using a standardized methodology provides valuable information about the affordability of food as a basic need. The National Nutritious Food Basket (NNFB) 2008, developed by Health Canada, is a standardized protocol adopted by many provinces to collect food costs. The NNFB is based upon current nutrition recommendations and average food purchasing patterns. Determining the cost of a healthy diet in northern communities is an additional application of the monitoring activity, using the Revised Northern Food Basket.

For more information, see National Nutritious Food Basket. 2009. Available from: *http://www.hc-sc.gc.ca/fn-an/surveill/basket-panier/index-eng.php*; The Revised Northern Food Basket. 2007. Available from: *http://publications.gc.ca/collections/collection_2008/inac-ainc/R3-56-2007E.pdf*

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DC Networks providing input and support:

Aboriginal Nutrition Network – co-Chairs Elisa Levi, MPH, RD (ON) and Emily Murray, BASc, RD (NU), and Kelly Gordon, BSc, RD (ON)

Nutrition and Food Security Network – Chair Jan Hillis, BSc, retired (BC)

Special thanks to the following people for their additional input and review in the sections of this paper which speak to food insecurity amongst Indigenous Peoples:

Brenda McIntyre, MHSc (NS), Malek Batal, PhD (QC), Mary Trifonopoulos, MSc, RD (ON), Tania Morrison, MHS, RD (BC), Anne Garrett, MEd, RD (NU), Sara Statham (NU), Allison MacRury, MPH, RD (NU), Jen Cody, MHSc, RD (BC), Suzanne Johnson, BSc, RD (BC), Elsie de Roose (NT and AB), Hannah Neufeld, PhD (ON)

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