

HOUSEHOLD FOOD INSECURITY AMONG RECENT IMMIGRANTS TO CANADA:
A QUANTITATIVE ANALYSIS

by

Courtney Andrea Kohnen

B.Sc. University of British Columbia, 2010

A Major Research Paper
Presented to Ryerson University

in partial fulfillment of the
requirements for the Degree of
Master of Arts (MA)

in the Program of
Immigration and Settlement Studies

Toronto, Ontario, Canada, 2014

© Courtney Andrea Kohnen 2014

Declaration

AUTHOR'S DECLARATION FOR ELECTRONIC SUBMISSION OF A MRP

I hereby declare that I am the sole author of this MRP. This is a true copy of the MRP, including any required final revisions.

I authorize Ryerson University to lend this MRP to other institutions or individuals for the purpose of scholarly research

I further authorize Ryerson University to reproduce this MRP by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

I understand that my MRP may be made electronically available to the public.

Household food insecurity among recent immigrants to Canada: A quantitative analysis.
Master of Arts, 2014
Courtney Andrea Kohnen
Program: Immigration and Settlement Studies
Ryerson University

Abstract

Background: Immigrants comprise over one-fifth of the Canadian population and are consistently shown to have a higher prevalence of household food insecurity than the general population.

Methods: Using the 2011 Canadian Community Health Survey, a multivariate logistic regression was used to evaluate immigration, economic and household characteristics for associations with increased odds of food insecurity.

Results: Number of years since arrival, region of birth, region of settlement within Canada and non-use of an official language in the household are significantly associated with household food insecurity as are some economic and household characteristics. Households present for 6-10 years have higher odds of being food insecure than those which arrived more recently, and households in which neither English nor French are spoken are less likely than others to be food insecure.

Discussion: Further research is required in order to determine what places certain immigrant households at higher risk of food insecurity.

Keywords: household food security, immigration, recent immigrants, Canada

Acknowledgements

My gratitude goes foremost to my supervisor, Mustafa Koç for taking me on and guiding me through this process, and for his thoughtful and supportive feedback throughout the process.

I owe much to my second reader, Andrea Noack, who was instrumental in helping me see the possibilities, who was so generous in her comments, and who taught me how to do a logistic regression – and more importantly, how not to.

My family, friends, classmates and instructors were all instrumental in keeping me sane and reminding me, when I'd allow them to, that there was more to Toronto than the inside of libraries.

My mother in particular must be recognized, for always responding in the affirmative when I've called up the night before an important deadline to ask: "will you love me anyway if I fail at this?" She never gave me reason to doubt it, but it was always nice to hear her say it.

Lastly, I must acknowledge my wonderful and supportive partner, who knows more about immigration and food security than he ever could have bargained for - and who quickly realized it would just be easiest for everyone if he did the dishes again...and the cooking, and the laundry, and the cleaning. Dinner's on me tonight, my lovely.

The research and analysis in this MRP are based on data from Statistics Canada and the opinions expressed do not represent the views of Statistics Canada.

Table of Contents

Declaration.....	ii
Abstract.....	iii
Acknowledgements	iv
Table of Contents	v
List of Tables	vi
List of Figures.....	vii
Introduction	1
Background.....	1
Research Objectives and Hypothesis.....	3
Literature Review	6
Measurement of Household Food Insecurity	10
Implications	14
Environmental Factors	15
Immigrants and Food Insecurity	19
Labour market outcomes.	20
Housing & neighbourhood effects.....	24
Other aspects of immigration.....	26
Methods.....	30
Canadian Community Health Survey	30
Population.....	30
Data collection.....	31
Household Food Security Survey Module.....	31
Measures	32
Dependent variable.....	32
Independent variables.....	33
Analysis	35
Survey weights.....	36
Ethics	36
Results	37
Univariate Analysis.....	37
Bivariate Analyses	39
Multivariate Analysis	42
Discussion	45
Conclusion.....	52
Limitations.....	53
Recommendations.....	55
Appendix A	58
References	62

List of Tables

Table 1. Dimensions of individual and household food insecurity.....	7
Table 2. History of population-wide household food security measurement in Canada	12
Table 3. Prevalence of food insecurity among recent immigrant (≤ 10 y), settled immigrant and non-immigrant households.....	20
Table 4. Distribution of dependent and independent variables ($n=3,567$).....	37
Table 5. Household food insecurity by immigration status ($n=63,542$)	39
Table 6. Frequency of food security and insecurity by independent variables ($n=3,567$)	40
Table 7. Results of multivariate logistic regression predicting food insecurity among recent immigrant households ($n=3,567$)	43

List of Figures

Figure 1. Prevalence of household food insecurity of sample by years since landing; the sample mean is denoted by horizontal line at 9.6% (n=3,567)	46
---	----

Introduction

Background

Newspapers across the country protested when Olivier De Schutter, United Nations Special Rapporteur for Food Security, gave a scathing review of the state of food security in Canada. “Hypocritical UN council sends envoy on Kafka-esque Canadian visit”, read a headline in the National Post at the end of De Schutter’s visit in May, 2012 (Ivison, 2012). Then-Immigration Minister Jason Kenney gave voice to a common opinion when he told reporters that the UN “should focus its efforts on those countries where there is widespread hunger, widespread material poverty and not get into political exercises in developed democracies like Canada” (as cited in Schmidt, 2012). Canada was the first developed nation visited by the rapporteur, and some felt that his time would be better spent in developing countries, where, as Kenney described, “people are starving” (Schmidt, 2012). Unfortunately, De Schutter’s findings, supported by recent research, demonstrated the very need his detractors denied: Canada has unacceptably and unnecessarily high rates of food insecurity (De Schutter, 2012).

Food insecurity is defined as “the limited, inadequate or insecure access of individuals and households to sufficient, safe, nutritious, and personally acceptable food both in quality and quantity to meet their dietary requirements for a healthy and productive life.” (Tarasuk, 2001). The consequences of food insecurity reach far beyond just nutritional deficits; evidence demonstrates that food insecurity is accompanied by the deterioration of physical and mental health, as well as negative social consequences in the household such as modified eating patterns or rituals and disrupted household dynamics.

In ratifying the 1976 *United Nations International Covenant on Economic, Social and the Cultural Rights*, Canada formally recognized the right to adequate food as a human right. But beyond social justice, there are more reasons to be concerned about food insecurity in Canada. Household food insecurity produces negative societal implications including reduced productivity, “hindered conviviality” and an increased burden on the health care system, affecting the entire population (Hamelin, Habicht & Beaudry, 1999, p. 527S).

Though much of De Schutter’s report focused on the challenges of accessing adequate food supplies faced by aboriginals across the nation, other vulnerable groups have been found to have an increased prevalence of food insecurity, including lone-parent households, the elderly, and people with disabilities (Che & Chen, 2001; Bartfield & Dunifon, 2006; Nord & Kantor, 2006; Health Canada, 2007). Likewise, recent immigrant households have also been routinely found to have higher incidences of food insecurity than their domestic-born counterparts in Canada (Che & Chen, 2001; Health Canada, 2007; Girard & Sercia, 2013), the U.S. (Kasper, Gupta, Tran, Cook, & Meyers, 2000; Kaiser *et al.*, 2006; Kalil & Chen, 2008; Chilton *et al.*, 2009), Australia (Burns *et al.*, 2000), and New Zealand (McPherson, 2006). In Canada, the prevalence of household food insecurity in recent immigrant households has been found to be 2-6% higher than among the general population (Che & Chen, 2001; Health Canada, 2007; Health Canada, 2010).

This is no small concern, as the number of immigrants in Canada continues to increase.

The 2011 National Household Survey (NHS) showed that over one-fifth of Canadian residents are immigrants, constituting a population of nearly seven million people - and a further 230,000 people are granted Canadian residency every year (Statistics Canada, 2013). While recent arrivals to Canada have on average much higher levels of education than the Canadian-born population, it has been widely documented that economic outcomes of newcomers are poor comparatively, and are declining even relative to previous cohorts (Biles, Burstein & Frideres, 2008; Picot & Sweetman, 2012). This is most clearly seen by comparing low-income rates: in 1980 the low-income rate among recent immigrants was just 1.3 times that of Canadian-born residents - by 2005 this rate had nearly doubled to 2.5 times higher than Canadian-born residents (Picot, Lu & Hou, 2009).

Food security is most strongly associated with inadequate income. However, a variety of other environmental factors seem to affect the chance that a household will experience food insecurity. These include other economic considerations, such as home ownership and education; household characteristics, such as the composition and location of the household; and personal characteristics, such as race and language abilities. But even when these characteristics are taken into consideration immigrants' households still have higher levels of food insecurity, suggesting other factors are at work (Che & Chen, 2001; Health Canada, 2007; Kalil & Chen, 2008; Health Canada, 2010).

Research Objectives and Hypothesis

The objective of this Major Research Project is to identify characteristics which may

place a recent immigrant household in Canada at increased risk of food insecurity. Using data from the 2011 Canadian Community Health Survey (CCHS), I will investigate the factors that may influence a recent immigrant's household's odds of experiencing food insecurity. Based on these findings, I will make recommendations for further research and new policies which may help mitigate these risks.

To accomplish these objectives, twelve variables representing demographic, socio-economic, and immigration factors were examined. Univariate and bivariate analyses demonstrated the distribution of each characteristic and their relationships with household food insecurity. Using multivariate logistic regression, the variables were analyzed to predict the odds that a household with a given characteristic was food insecure. I hypothesized that length of time in Canada would have a negative relationship with food insecurity, though that this relationship would not be linear. A second hypothesis was that households from regions with many 'less developed countries' would have higher odds of food insecurity than more wealthy regions such as Europe and the United States.

This research will be described in five sections below. In the first section, I provide a review of the literature on household food insecurity and its measurement, implications, and associated factors. This section also contains an examination of food security in the context of immigrants. In the methodology section, I provide an overview of the CCHS, the measures used, and the statistical analyses performed in this research. The third section contains the findings from the analysis, and in the fourth I discuss these

findings. In the final section, I discuss the implications and limitations of this study and make recommendations for further research and for Canadian policy-makers.

Literature Review

Household Food Insecurity

As noted above, household food insecurity is “the limited, inadequate or insecure access of individuals and households to sufficient, safe, nutritious, personally acceptable food both in quality and quantity to meet their dietary requirements for a healthy and productive life” (Tarasuk, 2001). This definition recognizes “the need to have the physical or financial means to obtain sufficient good-quality food to meet nutritional needs on a consistent and sustainable basis” (Gorton, Bullen & Mhurchu, 2009, p. 1). It also acknowledges that a truly secure food supply must take into account “the social and cultural dimensions of food production, collection, and consumption” (Gorton *et al.*, 2009, p. 1).

Food security was originally conceptualized only on a large scale, referring to regions or nations. The increased prevalence of food insufficiency, food deprivation, and hunger in developed nations led to the Right to Food movement in the 1970s and 1980s. This movement brought focus to smaller units of analysis, and particularly the individual and household levels (Cook, 2006). Though food security was initially conceived through an examination of hunger, the two terms are not synonymous. Hunger is “the uneasy or painful sensation caused by a lack of food...the recurrent and involuntary lack of access to food” (Bickel *et al.*, 2000, p. 6). Food insecurity is a much broader condition, and hunger a severe stage nested within it. In other words, hunger is a potential but not inevitable consequence of food insecurity.

In their initial development of the concepts of individual and household food insecurity,

Radimer *et al.* (1992) found the experience of food insecurity to manifest in four dimensions: quantitative, qualitative, psychological and social. They additionally found that each dimension is experienced differently at the individual and household levels, resulting in the conceptual framework summarized in Table 1.

Table 1. Dimensions of individual and household food insecurity

Dimension	Individual level	Household level
Quantitative	Insufficient intake	Food depletion
Qualitative	Nutritional inadequacy	Unsuitable food
Psychological	Lack of choice, feelings of deprivation	Food anxiety
Social	Disrupted eating patterns	Food acquisition in socially unacceptable ways

Note: From Radimer *et al.*, (1992)

The first component, quantitative deprivation, is central to the concept of food insecurity. Per the framework above, for individuals, this means an *insufficient intake* of food - reduced portion sizes, skipped meals, and at the extreme, the physical sensation of hunger. At the household level, it describes the *depletion* of the household food supply. Qualitative insecurity at the individual level results in *nutritional inadequacy*, often with a reliance on inexpensive non-nutritious food. For the household, this is labelled *unsuitable food*, and can include the consumption of unsafe food, or less healthful or less preferred versions of food (e.g. canned versus fresh or frozen vegetables). The third dimension captures the psychological aspects of food insecurity, which for individuals can include *feelings of deprivation* stemming from a lack of choice and a preoccupation with food. At the household level, it presents as uncertainty or worry about the sufficiency of the food supply - *food anxiety*. The fourth, social, dimension of

individual food insecurity includes the effects of *disruptions to the usual eating patterns*, like not being able to eat three meals per day. For a household, the social dimension refers to *food that is acquired in socially unacceptable ways*, including seeking food from food banks, family or friends, or by food theft (including of disposed food). Social ramifications at the household level can also include disruptions in “sociofamilial eating patterns, frictions around food in the home, and the inability to participate in meal-based cultural traditions and rituals” (Tarasuk, 2001, p. 11).

Radimer *et al.* (1992) further describe the experience of individual and household food insecurity as a *managed process*. While the experiences and management of food insecurity differ between households, Radimer *et al.*, and others since (Bickel *et al.*, 2000; Hamelin, Beaudry & Habicht, 2002; Coates *et al.*, 2006) have demonstrated certain commonalities in the experience. As described by Bickel *et al.* (2000) the first stage of this process is characterized by anxiety about the sufficiency of a household’s food budget and supplies, and adjustments are made to acquisition habits including the purchase of lower quality food. In the second stage, the food intake of adults is reduced, and they experience hunger. The third and most severe stage results in children suffering reduced food intake. However, Radimer *et al.* (1992) found that those responsible for managing the household food supply do have “some control over the sequence in which various components of hunger are experienced, by whom they are experienced, as well as the level to which one component is compromised before another is affected” (p. 39S). Thus, they conclude, households, adults and children experience each dimension of food insecurity at different times and to different degrees

(Radimer *et al.*, 1992). This finding is corroborated by more recent work, which has differentiated the experiences of children of different ages (Nord & Hopwood, 2007).

In addition to variations in the level of analysis and between members of the household, a third aspect of food insecurity is that it is a dynamic process which varies across time, affected by “pattern[s] of financial resource constraints” (Tarasuk, 2001, p. 15). Food insecurity is often experienced chronically, but may also be experienced cyclically due to insufficient income or episodically in the event of a financial crisis (Hamelin *et al.*, 2002). Cyclical food insecurity may result simply from money running out between paycheques (or between receipt of entitlement payments), but other factors that have been associated with cyclical food insecurity are seasonal differences in heating and cooling costs (Nord & Kantor, 2006) and seasonal differences in the prices of certain food items (Kamphuis *et al.*, 2006). Financial crises may include the loss of a job, a change in social assistance benefits, or the unexpected addition of an extra member to the household.

In summary, food security is a broad condition which encapsulates quantitative, qualitative, psychological and social factors. The experiences of each of these differ between the individual and household levels. Food insecurity is carefully managed by those in the household, resulting in differences in the experiences between members of a household. The condition is also dynamic rather than static. The next section describes the instruments developed to measure food insecurity in households.

Measurement of Household Food Insecurity

Even though food insecurity seems to arise primarily due to constrained financial resources, traditional measures of income and poverty do not accurately assess household food situations (Bickel *et al.*, 2000). While many studies have found income to be the strongest predictor of insecurity, many low-income households report a secure food supply while more affluent households report food insecurity (Rose, 1999; Che & Chen, 2001; Broughton, Janssen, Hertzman, Innis & Frankish, 2006; Health Canada, 2007). Likewise, the measures of nutritional status (anthropometric, clinical or biochemical measurements) used in less developed countries to evaluate levels of hunger and food insecurity are not applicable in the context of food-rich countries, where obesity, rather than wasting, is often associated with poverty (Kendall *et al.*, 1995). New measures had to be developed for the North American setting.

Much of the development of the household food insecurity measures now used in Canada occurred in the United States. The first documented US attempt to develop a population-wide measurement of hunger was in 1977-78 with the inclusion of three food insufficiency questions in the US Nationwide Food Consumption Survey. Further understanding of the complex and multidimensional nature of household food insecurity led to the Community Childhood Hunger Identification Project (CCHIP) in the early 1980s, and the Radimer/Cornell questionnaire later that decade. In the 1990s, the Food Security Core Module (FSCM) was developed by the United States Department of Agriculture, incorporating knowledge gained from each of the previous studies. This instrument has since been widely adopted and translated for a variety of populations, including for use with Pacific Islanders in Hawai'i (Derrickson & Anderson, 1999), in

Trinidad and Tobago (Gulliford, Nunes & Rocke, 2006), Brazil (Melgar-Quinonez, Nord, Perez-Escamilla & Segall-Correa, 2008), Colombia (Isanaka, Mora-Plazas, Lopez-Arana, Baylin & Villamor, 2007) and Iran (Rafiei, Nord, Sadeghizadeh & Entezari) as well as in Canada (Broughton *et al.*, 2006; Vahabi, Damba, Rocha & Montoya, 2011; Statistics Canada, 2012a).

The Household Food Security Survey Module (HFSSM) is the Canadian adaptation of the FSCM. It was first used in a national population survey in the 2004 CCHS, and first administered to the entire general population beginning with the 2007/08 CCHS (previously it was optional and only administered in certain provinces) (CCHS 2011 User Guide; Kirkpatrick, 2008). Prior to its adoption, Canadian studies had incorporated aspects of all four of the instruments in the U.S., including food insufficiency questions, the CCHIP and Radimer/Cornell questionnaires; table 2 enumerates the use of these instruments in population-wide surveys, and includes information on the indicator(s) used and the estimated prevalence food insecurity (Tarasuk, 2001; Tarasuk, 2005; Kirkpatrick, 2008). However, because of the use of different instruments and methodologies, estimates are not directly comparable and it is not possible to discern whether fluctuations are a result of change in the population or simply reflective of the different methodologies.

Table 2. History of population-wide household food security measurement in Canada

Survey	Indicator(s)	Estimated Prevalence
1994 National Longitudinal Survey of Children and Youth	Has your child ever experienced being hungry because the family had run out of food or money to buy food? (Child hunger was indicated by an affirmative response)	1.2%
1996 National Longitudinal Survey of Children and Youth		1.6%
1996/97 National Population Health Survey	Over the past 12 months, did your household ever run out of money to buy food? If yes, which of the following best describes the food situation in your household? <ul style="list-style-type: none"> • always enough food to eat • sometimes not enough food to eat • often not enough food to eat (Food insufficiency was indicated by sometimes or often not having enough food to eat)	4.0%
1998/99 National Population Health Survey	In the past 12 months, did you or anyone else in your household: <ul style="list-style-type: none"> • not eat the quality or variety of foods you wanted to eat because of a lack of money? • worry that there would not be enough to eat because of a lack of money? • not have enough food to eat because of a lack of money? Response options: yes, no (Food insecurity was indicated by an affirmative response to one or more indicator)	10.4%
2000/01 Canadian Community Health Survey (cycle 1.1)	In the past 12 months, how often did you or anyone else in your household: <ul style="list-style-type: none"> • not eat the quality or variety of foods you wanted to eat because of a lack of money? • worry that there would not be enough to eat because of a lack of money? • not have enough food to eat because of a lack of money? Response options: often, sometimes, never (Food insecurity was indicated by an affirmative response – sometimes or often – to one or more indicator)	14.7%
2004 Canadian Community Health Survey (cycle 2.2)	18-item Household Food Security Survey Module (Food insecurity was indicated by reported compromises in quality and/or quantity of food consumed among adults and/or children)	Household ^a : 9.2% Indv: 8.8%
2007/08 Canadian Community Health Survey		Household ^a : 7.7% Indv: 5.7%
2009/10 Canadian Community Health Survey		^b

Notes: Adapted from Tarasuk (2005) and Kirkpatrick (2008).

^a Household weights have been released with the CCHS since 2004, permitting estimations of the proportion of households that experience food insecurity. Prior to their development, the interpretation of prevalence was of the proportion of individuals who live in households which experienced food insufficiency/insecurity.

^b The Household Food Security Survey Module was optional in this year and was not asked in Prince Edward Island nor New Brunswick, thus no estimate of national prevalence is available.

^c Estimates from the author's own analysis; see table 5.

The FSCM is considered the best measure of household food security, though it does have limitations. The module and its derivatives are technically well-grounded and have been confirmed for face, content, and internal/construct validity (Kendall, Olson & Frongillo, 1995; Frongillo, 1999; Health Canada, 2007). It is easily interpreted and compared across time and space. The FSCM's unidimensional focus on quantitative deprivation is both a strength and a limitation: strong in that quantitative deprivation is the "most unambiguous aspect of food insecurity" (Tarasuk, 2001, p. 35), but limited in that it may exclude those households relying on socially-unacceptable or psychologically-challenging means to ensure an adequate food supply. It also relies on respondents evaluating their food situation against a personal baseline (of acceptability or adequacy) which may vary between people. Additionally, the instrument measures whether the household was able to meet basic needs, not, as the definition says, if the household's food intake was sufficient to lead 'active, healthy lives'. The HFSSM does not consider the duration or frequency of instances of food insecurity. Lastly, the arbitrary nature of the categorizations resulting from the module has been broadly criticized (Derrickson & Anderson, 1999; Tarasuk, 2001; Nord & Hopwood, 2007; Health Canada, 2007), and may exclude households living in mildly – but not inconsequentially

– food insecure conditions.

Implications

Food insecurity is recognized as a determinant of health by the Public Health Agency of Canada and as a major public health issue (Health Canada, 2007; Tarasuk, 2004, Kirkpatrick & Tarasuk, 2008). A large body of literature indicates that household food insecurity is associated with a variety of negative outcomes, including reduced nutrient intake, poor physical and mental health, and negative social implications. Kirkpatrick (2008) analyzed 24-hour dietary recall and household food security information from the 2004 CCHS and found poorer dietary intakes among adults and adolescents in food-insecure households compared to the general population. These individuals were also estimated to have a higher prevalence of nutrient inadequacy, most apparently of proteins, B-vitamins, and some minerals (Kirkpatrick, 2008). These findings did not extend to children, though children in food insecure households did consume fewer servings of fruits, vegetables and dairy, suggesting that some constraints exist. The only such study in the Canadian context, these findings confirm that food insecurity is a marker of dietary compromises for older children and adults, and that such insecurity heightens the risk of nutrient inadequacies. This conclusion is corroborated by other findings in the U.S. (Bhattacharya, Currie & Haider, 2004; Chilton *et al.*, 2009; Kilanowski & Moore, 2010).

While longitudinal studies examining the health effects of these dietary deficiencies have not yet been done in Canada, cross-sectional studies have shown an association between household food security and poor physical health. Analyses of data from the

1996/97 and 1998/99 NPHSs showed that those living in food-insecure households were more likely to report diabetes, heart disease, or another chronic condition (Vozoris & Tarasuk, 2003; Che & Chen, 2001). In the same studies, individuals in food insecure households also reported a higher prevalence of distress, and their odds of reporting major depression were three times higher than for an individual in a food-secure household (Che & Chen, 2001). The odds of obesity are increased among women in food-insecure households, though this association is not seen among men (Lyons, Park & Nelson, 2007; Broughton *et al.*, 2006). In one of the few longitudinal studies in Canada, McIntyre and Potestio documented long-term effects of hunger in childhood and found negative impacts on health, educational achievement, socio-behavioural problems, and family function (2007, as cited by Kirkpatrick, 2008). These findings are largely consistent with research from the U.S (Bhattacharya, Currie & Haider, 2004; Chilton *et al.*, 2009; Kilanowski & Moore, 2010; Ashiabi & O'Neal, 2008; Slack & Yoo, 2005; Cook & Frank, 2008; Dinour, Bergen & Yeh, 2007; Peterman *et al.*, 2013; Heflin, Siefert & Williams, 2005; Gao *et al.*, 2009)

Environmental Factors

Many factors in the household and community environments have been associated with household food insecurity in developed nations. Insufficient income is, logically, shown to be the primary risk factor in studies in Canada and abroad (for example: Che & Chen, 2001; Broughton *et al.*, 2006; Gorton *et al.*, 2009; Health Canada, 2010; Kirkpatrick & Tarasuk, 2010), yet, non-economic factors have also been shown to be potential barriers to food security. These factors include household, community and political environments as well as sociocultural influences.

It is to be expected that economic factors, specifically income, are consistently found to have the largest effect on food insecurity as financial inadequacy is stipulated in each question of the FSCM. However, the relationship between income and food insecurity is not direct, as discussed previously. Other economic factors which may compound income insufficiency include accessing social assistance, dwelling ownership, level of education and living expenses. In Canadian studies, reliance on social assistance has been associated with tripled odds of food insecurity (Che & Chen, 2001), and data from the 2004 CCHS shows prevalence of food insecurity among these households to be six times that of the general population (Health Canada, 2007; also Tarasuk, Mitchell & Dachner, 2013). These same studies found that households who rented their dwelling had approximately four times the prevalence of food insecurity than those who owned their homes. Lower levels of education have been associated with increased food insecurity in many studies in both Canada and the U.S. (Health Canada, 2007; Health Canada, 2010; Vahabi *et al.*, 2011; Kaiser *et al.*, 2002; Kalil & Chen, 2008; Peterman, Wilde, Sillka, Bermudez & Rogers, 2013; Hadley *et al.*, 2007; Hadley, Patil & Nahayo, 2010). High living expenses have also been associated with inadequate spending on and access to food in Canada (Kirkpatrick & Tarasuk, 2007a; Kirkpatrick & Tarasuk, 2007b). Likewise, in the U.S. context, one study found that for each \$100 increase in a state's median rent, there was a 17.5% increase in the odds of food insecurity in that state (Bartfield & Dunifon, 2006). A review of the literature by Gorton, Bullen and Mhurchu (2009) found that many of these patterns were replicated in studies from the U.S., Australia, and New Zealand.

Household characteristics have also been linked to food insecurity. The presence of children in Canadian households is accompanied by an increased prevalence of food insecurity (20-40% higher), even more so if the children are under 6 years old (Che & Chen, 2001; Health Canada, 2007; Health Canada, 2010). Lone-parent households are among the most vulnerable, particularly those headed by women; Che and Chen (2001) found that, other things remaining constant, lone-parent households had 1.5 times the odds of being food insecure. While two American studies found larger household sizes were linked to increased food insecurity (Hadley *et al.*, 2007; Kalil & Chen, 2008), a recent study by Kirkpatrick and Tarasuk (2007b) found overcrowding in the household was not linked to food insecurity, perhaps due to an increased number of income earners or due to overcrowding being used as a strategy to reduce housing costs such that resources may be allocated to food. The location of households also seems to affect their odds of food security; Canadian urban households report approximately 30% higher levels of food insecurity than their rural counterparts (Health Canada, 2007; Health Canada, 2010), a result that mirrors U.S. and Australian findings (Gorton *et al.*, 2009).

Other household considerations have been associated with food insecurity in Canadian and international studies, such as culinary skills, kitchen facilities, and social capital. A Vancouver study found that in low-income lone-parent households, mothers who rated their cooking skill as low had eight times the odds of being in a food insecure household than those who rated their skill higher (Broughton *et al.*, 2006). However, similar results

were not evident in a Montreal study; Girard and Sercia (2013) found no significant difference in self-rated culinary skill between immigrants in food insecure and food secure households. Likewise, DeWolfe and Greaves (2003) found that increased culinary skill resulting from a six-week community cooking program did not result in a reduction of prevalence of food insecurity. Poor kitchen facilities can also foster food insecurity; Broughton *et al.* (2006) reported that, after accounting for income, skill and other factors, households with less equipped kitchens had three times higher odds of food insecurity than other households. A U.S. study by Martin, Rogers, Cook and Joseph (2004) found that the interactions that members of a household have with the rest of the community may also affect their food security. Households and communities with higher social capital (such as social trust and community reciprocity) had respectively 10% and 50% lower odds of food insecurity than those with lower social capital.

Lastly, the political context may affect food insecurity. A New Zealand examination of the effects of government policies found that taxation reforms, goods and services taxes, labour market reforms (limiting collective employment contracts), and changes to welfare and housing policy were all linked to increased food bank usage, suggesting some increases in food insecurity were a result of each (Uttley, 1997, as cited by Gorton *et al.*, 2009). Canada has been witness to the implementation of similar neoliberal policies over the last three decades, and they have been accompanied by increasing food bank use - the number of Canadians using food banks tripled between 1989 and 2005 (Canadian Association of Food Banks, 2005) - suggesting the association also

applies in this context.

Many factors appear to affect levels of food insecurity, including economic, household, community and political influences. In addition to those mentioned above, it seems that recent immigrants may face extra challenges in securing an adequate food supply; I examine these in the following section.

Immigrants and Food Insecurity

As noted above, nearly seven million residents reported being an immigrant in the 2011 NHS, over one-fifth of the Canadian population (Statistics Canada, 2013). The majority of immigrants to Canada come from Asia, though an increasing proportion also arrive from Africa, the Caribbean and Central and South America. More than two-thirds of immigrants settle in one of the three largest metropolitan areas, Montreal, Toronto or Vancouver, or in Calgary, the fourth largest city and the hub of a booming energy sector (Statistics Canada, 2012b). A full third of Canada's foreign-born population immigrated within the past decade - a population of approximately 2.4 million people at increased risk of food insecurity (Statistics Canada, 2012d; Statistics Canada, 2013).

Studies show that recent (≤ 10 years) immigrant households in Canada have a higher prevalence of food insecurity than both the general Canadian population and settled immigrants (Table 3) (Che & Chen, 2001; Health Canada, 2007; Health Canada, 2010). These persistently higher levels of food insecurity may be attributable to a variety of challenges unique to recent immigrants: difficulty entering the Canadian labour market; challenges in securing affordable housing; the unavailability or high cost of customary

foods; difficulty in acquiring groceries in a new food environment; limited information about shopping and cooking options; changes in lifestyle; and pressures for integration (Koç & Welsh, 2002; Hadley *et al.*, 2007; Hadley *et al.*, 2010; Garnweidner, Terragni, Pettersen & Mosdøl, 2012). Che & Chen (2001) reported over a decade ago that prevalence of food insecurity among immigrant households tends to converge with Canadian-born households five years after arrival, but this convergence point has not been reported on since - and the trend of declining economic outcomes for new immigrants (Picot & Sweetman, 2012) suggests that this convergence point may be even further delayed now.

Table 3. Prevalence of food insecurity among recent immigrant (≤ 10 y), settled immigrant and non-immigrant households

	Recent immigrant	Settled immigrant	Non-immigrant
1998/99 National Population Health Survey ^a	13%	--	11%
2004 CCHS ^b	14.8%	8.6%	9.1%
2007/08 CCHS ^c	12.6%	7.8%	7.5%

Notes: As the methodologies differ between each survey, the results are not directly comparable; see Table 2 for details.

^a Che & Chen (2001)

^b Health Canada (2007)

^c Health Canada (2010)

Labour market outcomes.

The labour market outcomes of recent immigrants are poor compared to native-born Canadians with equivalent qualifications, and the disparity between these two groups has been growing. For example, the average newcomer male in 1980 earned 85% of what his Canadian-born counterpart earned; in 2005, this figure was just 63%

(Drummond & Burleton, 2008). This disparity has contributed to a growing number of low-income recent immigrants. In the Greater Toronto Area (GTA) in 2006, for example, 46% of all immigrants who had been in Canada for five years or less were considered to be living with a low income, compared to 23% of longer-term immigrants and 19.5% of the Canadian born population. These newcomer households, though forming less than 11% of the population in the GTA represented 36% of low-income households (Khandor & Koch, 2011). It is not only the disparity in compensation that is increasing. The global recession in 2008 also affected unemployment rates for newcomers disproportionately compared to native-born workers. In 2005, 13% of recent immigrants were unemployed compared to 7% of the Canadian-born. In 2009, these rates increased to 17% for recent immigrants, but only to 8.7% for Canadian-born workers (Khandor & Koch, 2011). High levels of education do not insulate newcomers from these effects: unemployment among Canadian-born people with university degrees increased by 50% from 2008 to 2009; for similarly-educated immigrants, unemployment more than doubled.

This growing disparity between economic outcomes of immigrant and Canadian-born workers is often attributed to three significant barriers faced by new entrants to the Canadian labour market: a lack of Canadian work experience, non-recognition of foreign credentials, and discrimination in the hiring process. Education and work experience acquired outside of Canada are not always recognized in the Canadian labour market (Picot & Sweetman, 2005; Galarneau & Morissette, 2008). Perhaps the best evidence of this is reflected in a 2011 study by Oreopoulous and Dechief in which thousands of test resumes were sent to companies in Vancouver, Toronto and Montreal areas, varying

names, education and work experience. The study found that that the inclusion of Indian or Chinese education and work experience on the resume reduced the callback rate by as much as 80% compared to resumes with Indian or Chinese names but only Canadian education and work experience (Oreopoulous & Dechief, 2011).

Non-recognition of foreign credentials also has an impact for many immigrants, particularly those in regulated professions such as medicine, nursing, engineering or law. In 1990, the proportion of established immigrants trained in these professions but working in occupations with lower educational requirements approximated the rate among the Canadian-born. Since then, this proportion has increased sharply and continues to rise, despite shortages in some fields (e.g. medicine, nursing) (Galarneau & Morissette, 2008). This would be even more pertinent for recent immigrants who must navigate a difficult process in order for their credentials to be recognized. However, Picot and Sweetman (2005) emphasize that this is relevant only for a small proportion of immigrants to Canada, and that credential non-recognition is not a major contributor to the overall reduction in economic outcomes of immigrants. Regardless, they identify it as a major hurdle.

The third barrier attributed to poor economic outcomes of recent immigrants is discrimination. Discrimination may occur on the basis of race, language proficiency, accent, place of origin, religion, ability, sex, sexual orientation, or marital or family status (Centre for Equality Rights in Accommodation, 2009). Of these, most research has focused on discrimination on the basis of race/ethnicity and language proficiency or

accent. In Canada, race (measured by Statistics Canada as 'visible minority') and immigration are closely tied: seventy-eight percent of newcomers in the 2011 NHS self-identified as a visible minority, and two-thirds of all visible minority Canadians are immigrants (Statistics Canada, 2013). Canadians of colour across the country have higher rates of under- and unemployment and lower incomes than Canadians of European descent (Mikkonen & Raphael, 2011). Economic returns on education and work experience are lower for racialized immigrants, and racialized immigrant men earn only 69% of what non-racialized immigrant men earn (Mikkonen & Raphael, 2011). Discrimination on the basis of language also seems to play a role in poor economic outcomes of immigrants. Picot & Sweetman (2005) state that language skills "appear to have significant direct and indirect influences on labour market success" (p. 8), and higher returns to educational credentials are found for those with higher language proficiency.

Together, these three barriers result in downward occupational mobility: in 2006, the proportion of immigrants with university degrees working at jobs with lower educational requirements (such as cashiers, clerks, truck and taxi drivers) was 28% for men and 44% for women. For native-born Canadians, this figure was much lower at only 10% (Galarneau & Morissette, 2008). These jobs are more likely to be temporary positions, and much less likely to be unionized or to receive employment benefits (Khandor & Koch, 2011). This can have long-term repercussions: Goldring & Landolt (2009) report that immigrants whose early experiences are characterized by these precarious jobs are more likely to remain in precarious work over time.

As expected, these poor labour market outcomes result in poor economic outcomes. In 2006, the median wage of recent immigrant workers were half that of a similarly-aged Canadian-born worker (Oreopoulous & Dechief, 2011). Frenette and Morissette (2005) found that this wage gap only closed to 25%, even after a decade in Canada. With low income being the primary risk factor of food insecurity, it is no surprise that recent immigrants' households have higher rates of food insecurity than those of the Canadian-born population. Low incomes can also result in marginal housing situations or homelessness for some recent immigrants, which are also associated with food insecurity (Bocskai, 2011).

Housing & neighbourhood effects.

Housing and neighbourhood outcomes may also affect the food security of recent immigrants. Obtaining housing upon arrival in Canada poses a significant problem for many newcomers (Ghosh, 2012). While some do buy homes, in 2006, 75% of immigrants who had arrived in the previous five years lived in a rental unit (Khandor & Koch, 2011). Many immigrants plan to rent an apartment upon arriving in their destination, but find the rental market to be more difficult to navigate than expected. Similar to the labour market, entering the rental market in most parts of Canada can be difficult for those without a previous Canadian landlord as a reference, or without a Canadian credit history (Ghosh, 2012; Centre for Equality Rights in Accommodation (CERA), 2009). There have been many recorded instances of landlords exploiting recent immigrants, who often have little knowledge of the housing market or local regulations, by illegally requiring them to make a deposit of six months rent or more

(Ghosh, 2012). This exploitation can eliminate a family's savings, limiting their future ability to move to better housing situation (Ghosh, 2012).

A second barrier to obtaining housing is discrimination. A 2009 study by the Centre for Equality Rights in Accommodation in Toronto found in paired testing research - or a 'discrimination audit' - that one-quarter of inquiries to landlords by male participants with South Asian accents or lone-mothers with Caribbean accents experienced differential treatment compared to controls. Accents are not the only way discrimination occurs; one South Asian male informant commented in the Ontario Human Rights Commission's 2008 report, *Right at Home: Report on the Consultation on Human Rights and Rental Housing in Ontario* that:

"... [when] I called to book an appointment ... I used a Canadian accent and the superintendent gave me the interview and was quite cordial and even went the extra mile. Once I showed up for the viewing with my family, the superintendent was making various excuses which seemed quite unusual at that particular time. He claimed that the apartment was already rented out. Later in the week I had my White friend call and go in for a viewing and it turned out to be the same apartment that I was supposed to view. My White friend was successful in viewing and applying for the apartment" (as cited by CERA, 2009, p. 19).

It can be difficult to identify racism in the rental housing market, the results of the CERA study and this quotation demonstrate that so-called hidden discrimination is common, and likely to affect many of the 180,000 visible minority immigrants who arrive in Canada every year.

Challenges in securing housing can result in a limited ability to choose the neighbourhood of settlement, and thus recent immigrants are overrepresented in lower-

income neighbourhoods in some Canadian cities (Khandor & Koch, 2011). These lower-income communities generally have fewer food outlets offering healthful food than higher-income neighbourhoods, restricting accessibility to fresh and nutritious foods at affordable prices (Bocskai, 2011). Though Powell, Slater, Mirtcheva, Bao and Chaloupka (2007) found food to be cheaper in low-income neighbourhoods, the decreased quality, freshness and diversity of food available meant that food accessibility was still very poor. To obtain fresh and affordable food, particularly that which is culturally appropriate, many recent immigrants must travel. This can be challenging, as rates of car ownership among recent immigrants is low and many low-income neighbourhoods are poorly equipped with public transportation (Khandor & Koch, 2011). Results from one Australian study suggest that adequate transportation systems are actually more important for alleviating food insecurity than increasing food outlets (Coveney & O'Dwyer, 2009, as cited by Khandor & Koch, 2011, p. 8). One other negative aspect of many low-income neighbourhoods is that they are less likely to have social services than higher-income communities (Khandor & Koch, 2011), which may prohibit some immigrants from accessing charitable food, support for labour market integration, or support in obtaining housing.

Other aspects of immigration.

Aspects of the immigration experience beyond labour market integration and housing challenges have also been associated with food insecurity among newcomers. The relationships between food insecurity and language, dietary acculturation, and certain immigration characteristics are considered in this subsection. While some of these aspects are relevant to the employment and housing factors described above, it is

possible they affect levels of food insecurity through other means, and so are discussed once again.

Language has a complicated relationship with food insecurity. As detailed above, increased proficiency in the local language is associated with improved employment and housing outcomes, which are in turn linked to more secure food situations. In agreement with this, several studies confirm an association between increased language skill and decreased odds of food insecurity (Hadley & Sellen, 2006; Hadley *et al.*, 2007; Hadley *et al.*, 2010, Kasier *et al.*, 2002; Peterman *et al.*, 2013). However, not all research finds this to be true, emphasizing the need for further research in this area; Mazur, Marquis and Jensen (2003) found that Hispanic immigrant households in the U.S. in which only English was spoken actually had higher odds of food insufficiency than Spanish-only or bilingual households.

It is probable that the language proficiency factor has different effects depending on the context; Peterman *et al.*, 2013, found that the presence of a well-developed ethnocultural community can mitigate some of the challenges of integration, and perhaps help protect against the risk of food insecurity. However, a well-developed cultural community can come with financial obligations which can strain a small budget (Gorton *et al.*, 2009). The presence or absence of such a well-developed ethnocultural community may affect levels of food insecurity by complicating a relationship between acculturation and food insecurity; Gorton *et al.* found that “limited acculturation has been shown to be both protective against, as well as predictive of, food insecurity” (2009, p.

25). Cultural conditions may also affect food insecurity among lower-income immigrants by obligating some to send remittances to the home country. Remittance-sending was associated with an increased risk of food insecurity among Pacific peoples in New Zealand (Gorton *et al.*, 2009).

Dietary acculturation, or the “process whereby immigrants adopt the food habits and food consumption patterns of the larger society [in which they] find themselves” may also affect food insecurity among immigrants (Himmelgreen, Perez-Escamilla & Bermudez, 2005, p. 106). This term encapsulates food-related aspects of the integration process such as learning how to shop, prepare and eat local foods and learning where to obtain traditional foods in the new food environment (Hadley *et al.*, 2007; Satia, 2010). As newcomers learn to navigate their new food environment, it is expected that their costs would diminish; this appears to be validated by at least one U.S. study which found an association between increased dietary acculturation and reduced odds of food insecurity (Hadley *et al.*, 2007).

There are other factors unique to the immigrant experience which have been associated with food security. Length of time since immigration, which is often included as an indicator of acculturation or dietary acculturation, has been found by several studies to be negatively related to food insecurity (Hadley *et al.*, 2007, Chilton *et al.*, 2009, Rush *et al.*, 2007). It seems that factors intrinsic to citizenship status may also affect food insecurity. After adjusting for socio-demographic factors, Kalil & Chen (2008) found in the U.S. that both foreign- and domestic-born kindergarteners of non-citizen mothers

were more likely to be food insecure than those children whose mothers held U.S. citizenship. Lastly, all of the above factors may have different effects on immigrants from different regions and cultures; controlling for a variety of factors, prevalence of food insecurity among South American and Indian immigrants in one Quebec study was much higher than among any other region of origin, and much lower among Chinese-born immigrants (Girard & Sercia, 2013).

Methods

Canadian Community Health Survey

The Canadian Community Health Survey (CCHS) is an annual cross-sectional survey administered by Statistics Canada which collects information related to health status, health care utilization, and health determinants. It uses a large sample size in order to provide reliable estimates at a national, provincial, and health region level. Formerly biannual, data collection now occurs on an ongoing basis and results are presented both annually and biannually. The CCHS is a flexible and evolving instrument which allows for the rapid inclusion of emerging issues. Food security modules have been included in some form in all cycles since the inception of the CCHS in 2000/01.

Population.

Secondary analysis of the 2011 Annual Component of the Canadian Community Health Survey (CCHS) ($n=63,542$) was performed using a cross-sectional design. The CCHS samples Canadian residents at least 12 years of age in private dwellings across the country. The sample excludes members of the Canadian Forces and Aboriginal people living on reserves. The response rate in 2011 was 69.8%. While the survey does not ask directly about immigration status (i.e. citizen, permanent resident, temporary foreign worker, international student, undocumented migrant), 18% ($n=11,993$) of respondents indicated through questions about citizenship and country of birth that they had immigrated to Canada. For this study, only those households where the respondent had immigrated ten or fewer years ago were included in the analysis (household-weighted $n=3,567$). All respondents were asked the questions in the food security module. Along with questions related to income, if a respondent was under 16 years of age the food

security module was answered by an adult in the household.

Data collection.

CCHS interviews were conducted in person or by phone between January and December 2011. Interviews were conducted in the language of the respondent's choice. Of the sample of recent immigrants, 90% responded to the survey in either English or French.

Household Food Security Survey Module

The HFSSM is an 18-item questionnaire which asks respondents to evaluate a “variety of specific conditions, experiences, and behaviours that serve as indicators of the varying degrees of severity of the condition” (Bickel *et al.*, p. 8). The instrument is designed to be administered to the person in the household most responsible for food acquisition and preparation. Generally, respondents are asked to consider their household food situation over the previous twelve months. Questions stipulate unmet needs due to financial constraints. As Bickel *et al.* describe in the *USDA Guide to Measuring Household Food Security* (2000), the module asks about:

- “Anxiety that the household food budget or food supply may be insufficient to meet basic needs;
- The experience of running out of food, without money to obtain more;
- Perceptions by the respondent that the food eaten by household members was inadequate in quality or quantity;
- Adjustments to normal food use, substituting fewer and cheaper foods than usual;
- Instances of reduced food intake by adults in the household, or consequences of reduced intake such as the physical sensation of hunger or loss of weight; and
- Instances of reduced food intake, or consequences of reduced intake, for children in the household” (p. 8). (See Appendix A for the full questionnaire).

The questionnaire evaluates the food security status of the household as well as of the adults and children (if any) separately, giving a possible three statuses. Statuses are calculated through a complex tabulation of the affirmative answers given by a respondent. Responses to individual questions cannot be taken alone to be a meaningful measure of food insecurity (Bickel *et al.*, 2000). In the CCHS, two or more affirmative responses will result in a 'food insecure' status. Whether that status is 'moderate' or 'severe' will depend on which responses were positive and whether there are children in the household.

The HFSSM was developed through rigorous qualitative and quantitative study, and provides a linear and one-dimensional evaluation of household food security. Questions are organized in order of severity, such that in nearly all cases, a household whose respondents indicates a positive response to one question will have indicated a positive response to all the questions above it (Bickel *et al.*, 2000; Tarasuk, 2001).

Measures

Dependent variable.

The outcome variable, household food security status, was derived from responses to the 18-item Household Food Security Survey Module. Respondents (or a responsible adult, if the respondent was less than 16 years old) were asked if or how often the members of the household had experienced, over the previous twelve months and due to financial constraints, a symptom of food insecurity. Households were classified into one of three stages of food security/insecurity: secure, moderately insecure (denotes a compromise in quality or quantity of food consume) or severely insecure (denotes a

reduced food intake and disrupted eating patterns). Two or more affirmative responses resulted in an insecure status.

As both moderate and severe food insecurity can have substantial adverse effects, as well as for statistical purposes, the variable was dichotomized into a binary variable representing those food secure and insecure households. This treatment is common in the literature of food insecurity in North America (Girard & Sercia, 2013; Hadley *et al.*, 2010; Vahabi *et al.*, 2011).

Independent variables.

Available data on immigration characteristics included years in Canada and country of birth. *Years since landing* was derived from a question asking the respondent's year of arrival in Canada, and was coded into four groups: 0-1, 2-3, 4-5 and 6-10 years. These groupings were based on prevalences of food insecurity among recent immigrants, and supported by Girard and Sercia's (2013) findings that insecurity did not decrease with years in a linear manner, as well as the understanding that acculturation is not a linear process (Hadley *et al.*, 2007). *Country of birth* was asked of all respondents, and was coded into regions. US & Oceania were grouped together due to cultural similarities, as were Mexico, Central and South America and the Caribbean. China (including Hong Kong) and India, as the two largest sending countries, were left separate from the rest of the Asian countries. Per coding by Statistics Canada, Russia was considered a European country.

Though it is unlikely that the country of birth reported by the respondent in fact applies

to every member of their household in every case, the reported country of birth was assumed to apply to the entire household for the purposes of these studies. The majority of permanent residents entering Canada are accompanied by their spouse or families, and members of a family unit tend to be born in the same global geographic region. This imperfect measure allows for the examination of food insecurity on the household level.

Socioeconomic characteristics included income, highest level of education, dwelling ownership and whether social assistance was accessed. *Household income*, a continuous variable, was based on the best estimate of the earnings of all members of the household during the previous year. As in many surveys, income-related questions had a high non-response rate (29.7%) and were imputed by Statistics Canada using a nearest neighbour method. For ease of interpretation, income was coded in the tens of thousands of dollars. Households who reported an income larger than five standard deviations from the mean were excluded from the analysis. *Household highest level of education* was determined by the highest level achieved by any member of the household, and divided into those households in which someone has achieved a university degree and those which had not. *Dwelling ownership* indicated whether a household owned or rented their home. As no other variable existed to represent wealth, dwelling ownership stands in as an indicator of wealth. Whether any *social assistance* was accessed in the previous year was also included as a dichotomous indicator.

Household characteristics included household composition (children and adults), main language spoken in household, whether a household was situated in a major immigrant-receiving city, and region of Canada. *Children present* indicated if there was anyone under 16 in the household. *Number of adults* 18 or over was included continuously, calculated by subtracting the number of children 17 or younger from the reported household size. *Languages spoken in the household* was derived from a question allowing respondents to report up to three languages which are spoken in the home; it was dichotomized into English and/or French, or neither official language. *Major immigrant-receiving city* indicated whether the respondent lived in the metropolitan areas of Montreal, Toronto, Vancouver or Calgary, or lived outside these cities. *Region of Canada* was divided into four areas based on province of residence, with British Columbia and the Northern territories, the three Prairie Provinces, Ontario, the largest province, and Quebec and the four Maritime provinces grouped together.

Analysis

The de-identified CCHS 2011 master file was accessed and analyzed at the RDC, using SPSS version 20 (IBM Corp., Armonk, NY). Univariate analyses were conducted to examine the sample distribution, filter outliers and create descriptive statistics. Bivariate analyses, including significance tests, were used to develop the model predicting food insecurity, to assess correlations between independent variables, and to generate comparisons by immigration, socioeconomic, and household characteristics. Those variables that were significant at the $p < 0.05$ level, or those previously found to be predictors of food insecurity in recent Canadian literature were retained for regression analysis. Multivariate logistic regression was used to assess the independent effects of

each characteristic on household food insecurity of the sample. Independent variables included in the model were tested for collinearity, and no substantial interactions were found.

Survey weights.

Survey weights were calculated by Statistics Canada to indicate how many households or individuals were represented by each respondent to the survey. A normalized master household weight was applied for all analyses reported below.

Ethics

Ryerson University does not require that research using secondary data analysis is reviewed by the Ryerson Ethics Board. Approval for use of the de-identified dataset was granted by Statistics Canada, at the Research Data Centre (RDC) at the University of Toronto. All data was vetted by a Statistics Canada analyst prior to release to ensure that the privacy of the respondents is maintained.

Results

Univariate Analysis

Approximately one in ten (9.6%) recent immigrant households reported food insecurity (Table 3). Respondents' number of years since landing were approximately evenly distributed across each year, and as such, the 6-10 years since landing group was the largest at 43.4%. The majority of immigrants reported a birthplace in Asia (China/Hong Kong: 13.0%, India 11.5%, other Asia countries: 31.3%), followed by Europe (15.5%) and Mexico, Central and South America and the Caribbean (14.7%). The mean household income was \$58,800 (median: \$50,000, SD: \$45,500). In most households (63.6%) at least one person had achieved a bachelor's degree. Only 41.0% of households owned their dwelling and just 4.4% accessed social assistance. Nearly half (47.8%) of households contained children under 16, and the average number of adults was 2.09 (SD: 0.86). Forty-two percent (42.0%) of households did not report that either English or French was spoken in the household. Nearly three-quarters of all recent immigrant households (73.3%) were located in one of Canada's four biggest metropolitan areas. The largest portion, at 45.1%, lived in Ontario, with Quebec and the Maritimes second (22.4%), B.C and the Territories third (17.5%), and the fewest in the Prairie Provinces (15.0%).

Table 4. Distribution of dependent and independent variables ($n=3,567$)

	Distribution
Dependent (Outcome) Variable	
Food Security	
Secure	90.4%
Insecure	9.6%
Immigration Characteristics	
Years Since Landing	
0-1 years	15.5%
2-3 years	22.7%

4-5 years	18.4%
6-10 years	43.4%
Region or Country of Birth	
US & Oceania	4.2%
Mexico, C. & S. America & Carib.	14.7%
Europe	15.5%
Africa	9.6%
China	13.0%
India	11.5%
Other Asian countries	31.3%
Economic Variables	
Household Income	
Mean	\$58,800
Median	\$50,000
Standard Deviation	\$49,500
Household Highest Level of Education	
Degree	63.6%
No Degree	36.4%
Dwelling Ownership	
Owns	41.0%
Rents	59.0%
Social Assistance Accessed	
No	95.6%
Yes	4.4%
Household Characteristics	
Children Present	
No	47.8%
Yes	52.2%
Number of Adults	
Mean	2.09
Standard Deviation	0.86
Main Language Spoken in Household	
English or French	58.0%
Neither English nor French	42.0%
Living in major immigrant-receiving city	
In Montreal, Toronto Vancouver, Calgary	73.3%
Not in Montreal, Toronto Vancouver, Calgary	26.7%
Region of Canada	

BC & Territories	17.5%
Prairies	15.0%
Ontario	45.1%
Quebec & Maritimes	22.4%

Bivariate Analyses

There are significant differences between the rates of food insecurity among the Canadian-born, settled, and recent immigrant households (table 4). Recent immigrant households reported the highest prevalence of food insecurity, at 9.6%, followed by non-immigrant households. Settled immigrant households reported the lowest prevalence of food insecurity, at 6.4%.

Table 5. Household food insecurity by immigration status ($n=63,542$)

	Household Food Insecurity
Non-immigrant	8.4%
Settled immigrant	6.4%
Recent immigrant	9.6%
All residents	8.2%
Note: $\chi^2=20.42$ df=2 $p<0.000$	

Food insecurity was significantly associated with many of the variables at the $p<0.05$ level (Table 5). Years since landing had an interesting and non-linear association with food insecurity ($p=0.02$). Households present for 0-1 years (9.4%) and 6-10 years (9.5%) had a prevalence of food insecurity consistent with the sample overall (9.6%); however, the households of respondents who had been in Canada for 2-3 years had the highest prevalence of food insecurity (12.2%) and the households of respondents who had been in Canada for 4-5 years had the lowest (6.4%). There were also significant

differences in reported levels of food insecurity based on region of birth, with respondents from China reporting the lowest prevalence of food insecurity in their households (3.5%) and respondents from Africa reporting the highest prevalence of food insecurity in their households (18.0%; $p<0.000$). Comparing means, the average income of food insecure households was one-third less than those in secure households (\$61,000 versus \$38,100, $p<0.000$). The prevalence of food insecurity among renters was double that among home owners (12.1% to 5.9%, $p<0.000$). Those accessing social assistance had food insecurity rates 350% higher than those not accessing it (30.4% to 8.6%, $p<0.000$). Households with children had a higher prevalence of food insecurity (11.4%) than households without (7.8%, $p<0.000$). Surprisingly, households speaking mainly a non-official language reported significantly ($p=0.006$) lower levels of insecurity (8.6% versus 11.4%). There was not a significant difference between the prevalence of food insecurity among respondents in the major immigrant receiving cities and those outside of them, (9.0% versus 11.1%, $p=0.055$). Lastly, households in the Prairie Provinces had the highest prevalence of food insecurity, and those in B.C. the lowest.

Table 6. Frequency of food security and insecurity by independent variables ($n=3,567$)

	Food Security	
	Secure	Insecure
Immigration Characteristics		
Years Since Landing**		
0-1 Years	90.6%	9.4%
2-3 years	87.8%	12.2%
4-5 years	93.6%	6.4%
6-10 years	90.5%	9.5%
$\chi^2=14.3$ df=3 $p=0.002$		
Region of Birth***		

US, Oceania & Antarctica	93.4%	6.6%
Mexico, C. & S. America & Carib.	88.0%	12.0%
Europe	88.8%	11.2%
Africa	82.0%	18.0%
China	14.2%	3.5%
India	94.7%	5.3%
Other Asian countries	89.8%	10.2%
$\chi^2=70.7$ df=6 p<0.000		
Economic Variables		
Household Income***		
Mean	\$61,000	\$38,100
Standard Deviation	\$50,500	\$31,500
p<0.000		
Household Highest Level of Education***		
Degree	94.3%	5.7%
No Degree	83.7%	16.3%
$\chi^2=105.8$ df=1 p<0.000		
Dwelling Ownership***		
Owns	94.1%	5.9%
Rents	87.9%	12.1%
$\chi^2= 38.2$ df=1 p<0.000		
Social Assistance Accessed***		
No	91.4%	8.6%
Yes	69.6%	30.4%
$\chi^2= 82.9$ df=1 p<0.000		
Household Characteristics		
Children Present***		
No	92.2%	7.8%
Yes	88.6%	11.4%
$\chi^2=12.9$ df=1 p<0.000		
Number of Adults		
Mean	2.09	2.03
Standard Deviation	0.86	0.87
p=0.216		
Main Language Spoken in Household*		
English or French	88.6%	11.4%
Neither English nor French	91.4%	8.6%
$\chi^2= 7.43$ df=1 p=0.006		
Living in major immigrant-receiving city		
In Montreal, Toronto Vancouver, Calgary	91.0%	9.0%
Not in Montreal, Toronto, Vancouver,	88.9%	11.1%

Calgary		
$\chi^2=3.687$ df=1 p=0.055		
Region of Canada**		
BC & Territories	94.1%	5.9%
Prairies	87.5%	12.5%
Ontario	90.6%	9.4%
Quebec & Maritimes	89.2%	10.8%
$\chi^2= 16.4$ df= 3 p=0.001		
Note: *** p<0.001 ** p<0.005 *p<0.05		

Multivariate Analysis

Results of a logistic regression analysis (Table 6) show that, controlling for other variables, some immigration, economic and household characteristics are significantly associated with food insecurity. After taking the other factors into account, the most recent immigrants had 40% lower odds of food insecurity than those who arrived 6-10 years ago. The odds of food insecurity among households of immigrants who arrived in Canada 2-3 years ago was not significantly different than the households of immigrants who arrived 6-10 years ago. Compared to those born in the U.S. or Oceania, the chances of food insecurity among households of African-born immigrants are higher (OR=2.24), and among households of Chinese-born immigrants the chances are lower (OR=0.34). Income had the largest effect in this model: an increase in household income of \$10,000 decreases the odds of experiencing food insecurity by 16%. Among other economic variables, not having a degree (OR=2.42), renting (OR=1.57) and accessing social assistance (OR=2.16) were each associated with increased odds of household food insecurity. For household characteristics, the odds of food insecurity were nearly double among households with children (OR=1.80) compared to those without. Having an additional adult in the household was not significantly associated

with higher odds experiencing food insecurity. Surprisingly, not speaking English or French among the top three languages in the household was associated with a 26% decrease in the odds of experiencing food insecurity. While households in the Prairie Provinces are more likely to have experienced food insecurity (OR=1.59), those in B.C. (OR=0.60) and Quebec (OR=0.68) regions were less likely to have done so. Once the other characteristics were accounted for, living in a major immigrant-receiving city was not significantly associated with household food insecurity.

Table 7. Results of multivariate logistic regression predicting food insecurity among recent immigrant households ($n=3,567$)

	Coefficient ent (b)	Sig.	Odds Ratio	95% C.I.	
				Lower	Upper
Immigration Characteristics					
Years Since Landing					
0-1 years*	-0.49	.010	0.61	0.42	0.89
2-3 years	-0.19	.216	0.82	0.61	1.12
4-5 years***	-0.67	.000	0.51	0.35	0.75
6-10 years (ref. group)			1.00		
Region of Birth					
US & Oceania (ref. group)			1.00		
Mexico, C. & S. America & Carib.	0.16	.678	1.17	0.55	2.47
Europe	0.61	.109	1.84	0.87	3.90
Africa*	0.81	.036	2.24	1.05	4.78
China**	-1.08	.021	0.34	0.14	0.85
India	-0.29	.492	0.75	0.32	1.72
Other Asian countries	0.25	.498	1.29	0.62	2.69
Economic Variables					
Household Income*** (in \$10,000s)	-0.17	.000	0.84	0.80	0.88
Household Highest Level of Education***					
Degree (ref. group)			1.00		
No Degree	0.88	.000	2.42	1.88	3.12
Dwelling Ownership**					
Owns (ref. group)			1.00		
Rents	0.45	.004	1.57	1.15	2.14

Social Assistance Accessed***					
No (<i>ref. group</i>)			1.00		
Yes	0.77	.000	2.16	1.43	3.26
Household Characteristics					
Children Present***					
No (<i>ref. group</i>)			1.00		
Yes	0.59	.000	1.80	1.40	2.31
Number of Adults	0.15	.053	1.16	1.00	1.35
Main Language Spoken in Household*					
English or French (<i>ref. group</i>)			1.00		
Neither English nor French	-0.30	.022	0.74	0.57	0.96
Living in major immigrant-receiving city					
In Montreal, Toronto Vancouver, Calgary (<i>ref. group</i>)			1.00		
Not in Montreal, Toronto Vancouver, Calgary	-0.09	.542	0.91	0.68	1.22
Region of Canada					
BC & Territories*	-0.50	.013	0.60	0.41	0.90
Prairies*	0.46	.011	1.59	1.11	2.27
Ontario (<i>ref. group</i>)			1.00		
Quebec & Maritimes*	-0.38	.020	0.68	0.49	0.94
Constant	-2.507				
Note: Nagelkerke R ² = 0.197					
*** p<0.001 ** p<0.005 *p<0.05					

Discussion

It is a positive finding that household food insecurity across the Canadian population has decreased to 8.2% from 9.2% in the first national survey with the HFSSM, the 2004/05 CCHS. However, the fact that the rate of food insecurity among the sub-sample of recent immigrants in 2011 was nearly 20% higher than that of the general population, and half again the rate among settled immigrants, emphasizes the need for increased attention to food security during the settlement process.

In bivariate analysis, food insecurity was not found to decrease consistently as length of time in Canada increased (figure 1). Instead, those living in Canada for 2-3 years had the highest levels of food insecurity and those present for 4-5 years, the lowest. The lower-than-expected prevalence of food insecurity among the most recent immigrants is likely explained by the sum of money required to immigrate to Canada - for example, a family of four immigrating under the Federal Skilled Worker program must have \$20,654 (Citizenship and Immigration Canada, 2013) - money which would insulate the household from food insecurity. It is reasonable that over time, this fund may be exhausted and more households would experience food insecurity - as seen in the sharp increase in prevalence of food insecurity among those households present in Canada for 2-3 years. These interesting results are substantiated by a recent Quebec study in which Girard and Sercia (2013) found that the prevalence of food insecurity decreased after the second year of residence and then increase again until the tenth year of residence. However, in direct contrast to the present study, Girard and Sercia found that immigrants present for less than a year had the highest rate of food

insecurity, nearly double the next highest group, whereas this study found the most recent group to have average levels of insecurity. Girard and Sercia used a different food security survey instrument and different methodology, so the results are not directly comparable, but the findings do raise interesting questions about dietary acculturation and food insecurity.

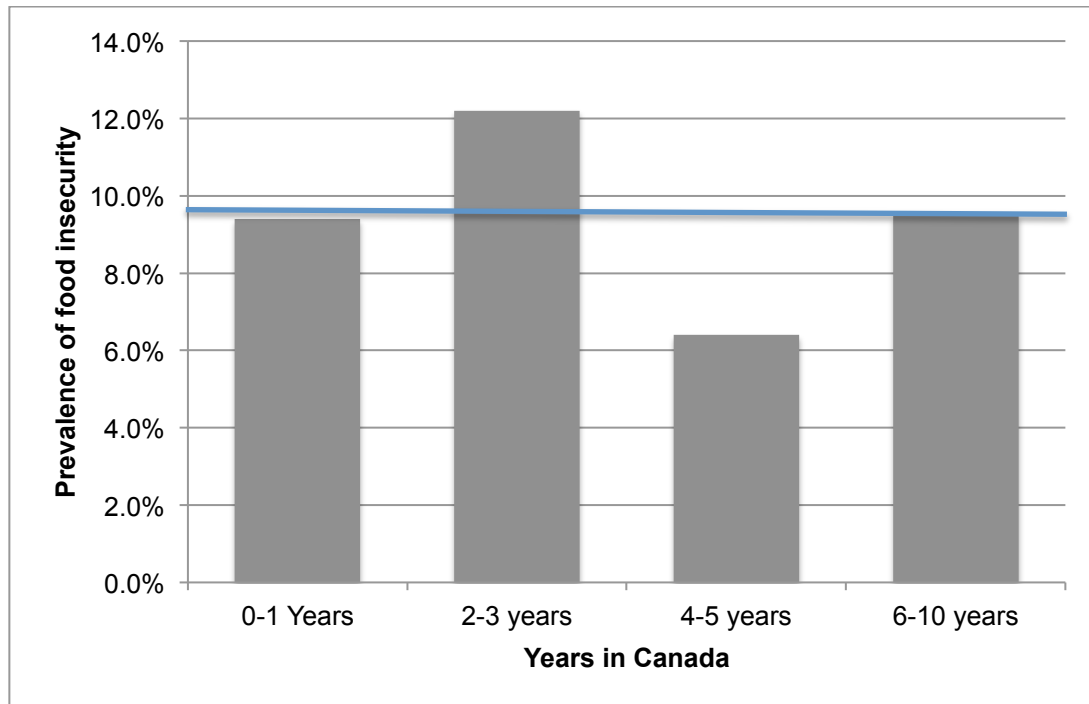


Figure 1. Prevalence of household food insecurity of sample by years since landing; the sample mean is denoted by horizontal line at 9.6% (n=3,567)

Findings from the regression analysis contradict the hypothesis that food insecurity would decrease as time in Canada increases. After accounting for other factors, the households of respondents that have been in Canada for 6-10 years have double the odds of being food insecure compared to those who immigrated 4-5 years ago, and 65% greater odds compared those who immigrated only 0-1 years ago. It is surprising that being in Canada longer, and having more time and opportunity to learn to navigate

the new food environment does not decrease the odds of a household being food insecure. This could be linked to a variety of potential factors related to acculturation. One potential factor is that acculturating diets may rely more heavily on processed, 'Western' foods which are generally more expensive than fresh ingredients, thereby increasing the financial resources required to feed the household (Désilets, Rivard, Shatenstein & Delisle, 2007; Satia, 2010). This may be particularly true for families with children, as children can be the most eager to embrace host country food habits (Garnweidner, Terragni, Pettersen & Mosdøl, 2012). Alternatively, the changing "health beliefs" (Satia, 2010) of immigrants may lead to different interpretations of the questions asked in the HFSSM. Derrickson, Sakai & Anderson (2001) problematize the imprecise and unstable understandings of the term 'balanced meal', for example, and propose that acculturation would change an individual's perception of that term over time. 'Enough food' and 'enough to eat' are also ambiguous and may have changing meanings to some immigrants as they absorb over time the common North American ideas about portion size (Young & Nestle, 2012). Additionally, it could be that as immigrants spend more time in Canada, they acquire greater financial burdens (e.g. having more children or obtaining a mortgage), or are simply more comfortable admitting to challenges in procuring adequate food supplies when surveyed. Finally, out-migration could account for some variation in this result. Research demonstrates that the majority of immigrants to Canada who choose to then leave Canada do so within the first few years after arrival (Adyemir & Robinson, 2006). If food insecurity and the decision to emigrate are associated (most plausibly via income insecurity), and if many of these emigrants leave

during their second or third year after arrival, the observed decrease in the prevalence of food insecurity among the 4-5 years group would be a reasonable outcome.

Regarding region of birth, being born in Africa was associated with increased odds of food insecurity (OR=2.24) compared to being born in the U.S. or Oceania. This suggests that, beyond the economic and household factors accounted for, some other factor or factors are contributing to food insecurity in this population. It may be that African-born immigrants may have a more difficult time acculturating, or that racism contributes to the food insecurity of some immigrant households (92% of the African-born sample identified as non-white).

The other population that was significantly different than the reference group were those born in China (or Hong Kong). A household's odds of reporting food insecurity are reduced by two-thirds if the respondent indicated that he or she was born in China. This could be in part related to the high degree of institutional completeness of Chinese enclaves in several Canadian cities (Zucchi, 2007), and the potentially protective value of a strong ethnocultural community of settlement (Peterman *et al.*, 2013). However, Girard and Sercia (2013) found that even those Chinese immigrants who consistently accessed emergency food aid were very unlikely to be classified as food insecure by their survey instrument. They speculate a cultural tendency to feel shame about being food insecure is responsible, but cultural or linguistic differences in interpreting the survey questions may also have an effect.

The effects of each economic variable are consistent with the literature. An inverse relationship between income and food insecurity corroborates other Canadian studies (Che & Chen, 2001; Hamelin, Beaudry & Habicht, 1998; Health Canada, 2007; Health Canada, 2010) and is expected since the survey instrument specifies a context of limited financial resources. For every \$10,000 increase in household income, the odds of being food insecure decreased by 16%. Consistent also with these same studies, lower levels of education, renting the dwelling, and accessing social assistance also predicted food insecurity. Due to a lack of other indicators of wealth in the CCHS, dwelling ownership, particularly among new immigrants, can be seen as a proxy for wealth. This may explain why renting is associated with a 57% increase in odds of experiencing food insecurity. The finding that households accessing social assistance have double the odds of food insecurity compared to those that do not also supports concerns about the adequacy of the Canadian social assistance system (Kirkpatrick & Tarasuk 2007a).

One of the household characteristics that was significantly associated with food insecurity was the 'languages spoken in the home' variable. Contrary to expectations, those households which do not report speaking one of the official languages at home had 26% lower odds of food insecurity than those households which did report using English or French at home. Since it is impossible in the CCHS to evaluate the language skills on a household level, this variable was included as a measure of both ability and attitude towards acculturation among allophones, per Okafor, Carter-Pokras, Picot & Zhan, 2013. It was thought that a decision to speak English or French at home, even as

a tertiary language, would be accompanied by some degree of (dietary) acculturation and therefore increased ease in navigating the Canadian food environment - but this does not appear to be the case. Perhaps these households which do not speak an official language at home are also more embedded in their ethnic community, where they may benefit from the protective effect of high social capital (Martin *et al.*, 2004) or high institutional completeness (Gee, Kobayashi & Prus, 2004; Peterman *et al.*, 2013). Unfortunately this variable does not reflect the ability of any of the individual household members to speak English or French, only what they choose to speak at home, so it is possible that this variable simply provides a poor measure of acculturation.

Lastly, it is particularly interesting that region of settlement in Canada - but not living in a major immigrant-receiving city - significantly affects the odds of experiencing food insecurity. The most intriguing finding here is that while the prevalence of food insecurity in Quebec and the Maritime provinces is above average, once other factors are accounted for, living in this region is actually associated with 32% lower odds of experiencing food insecurity. This indicates that something about the immigrant population in this region places them at much higher risk of food insecurity - perhaps the higher concentration of African-born immigrants compared to other regions (Statistics Canada, 2013) or lower incomes (Statistics Canada, 2012c). Also interesting is the lower odds of experiencing food insecurity for households in British Columbia and the Territories (5.9%; OR=0.60). Though superficially this may seem positive, it could actually be caused by underreporting of food insecure conditions by immigrants born in

China or Hong Kong (as suggested by Girard & Sercia, 2013), who form a higher proportion of migrants in this region than any other (Statistics Canada, 2013).

Conclusion

Overall, the results from this study support previous work on economic and household predictors of food insecurity in Canada, and provide insights into factors which may place an immigrant household at higher risk of food insecurity. Most studies of household food insecurity in Canada have focused on the population at large, or specifically on Aboriginal populations. In light of the declining economic outcomes of recent immigrants, this closer examination of food insecurity among immigrant households is timely.

The non-linear relationship between length of time in Canada and food insecurity corroborates other recent findings and illustrates the complexity of acculturation. A better understanding of what gives the households of respondents who immigrated 6-10 years ago higher odds of experiencing food insecurity than their counterparts who immigrated 4-5 years ago would contribute greatly to our understanding of the processes of immigrating and acculturating in a new food environment. Likewise, the significant differences found in food insecurity outcomes between immigrants from different regions require more investigation to learn if certain groups should be targeted for interventions, and if so, in what form these interventions should occur. Lastly, the finding that settling in different regions of Canada affects the risk of food insecurity so greatly also calls for more examination.

Future research in this area should further examine the complex relationship between dietary acculturation and food security among recent immigrants. Particularly of interest

is how immigrants from different countries and ethnocultural backgrounds acculturate to their new food environments, as this may allow for better communication about navigating the food environment to be passed on to future immigrants. A second area for investigation is how the category of immigration (i.e. economic, family class, refugee) under which a household arrives is associated with food insecurity; this analyses was not possible with CCHS data. Lastly, nearly all studies of immigrant food security have had a cross-sectional methodology, limiting the ability to attribute causation. Longitudinal studies of immigration characteristics and long-term food security outcomes should be undertaken in order to better understand how achieving food security influences and is influenced by the settlement process.

Limitations

The variables included in the CCHS data limited the measures that could be used in this study. Country or region of birth and length of time in Canada were the only immigration characteristics available for inclusion, and other potentially associated factors such as immigration status (Kalil & Chen, 2008), category of immigration, and wealth at immigration could not be accounted for. Also due to this limited information, this study assumed that the country of birth of each respondent was the same as all individuals in their household, but it is highly unlikely that this is true for every sampled household. As well, the use of the variable 'languages spoken in the household' does not represent the level of skill in the official languages held by members of that household, nor their attitudes towards acculturation.

There are also disadvantages to studying food insecurity at the household rather than

individual level; it precludes the use of individual-specific variables with which other studies have found associations. These variables include language ability (Hadley *et al.*, 2007; Hadley, *et al.*, 2010), difficulty in the food environment (Hadley *et al.*, 2007; Hadley, *et al.*, 2010), food literacy (Howard & Edge, 2013; Gorton *et al.*, 2009; Girard & Sercia, 2013), and health status (Chilton *et al.*, 2009; Cook *et al.*, 2004).

The measurement of household food insecurity in the CCHS and the HFSSM itself also presents some limitations. Most importantly, the operational definition of food security embodied by the HFSSM is very restrictive in comparison to the conceptual definitions usually offered (Tarasuk, 2001). The HFSSM considers only the quantitative dimension of food insecurity, while failing to capture the qualitative, psychological, and social aspects of the phenomenon. As Coates *et al.*, critiques: “in their search for a single scale with a single statistical dimension, developers of the U.S. HFSSM may have sacrificed aspects of content validity by discarding items that did not meet a unidimensional statistical model of severity along which only certain of these subdomains or domains can be arrayed.” (2006, p. 1447S). Additionally, the cut-off point between food secure and food insecure is artificial and arbitrary, and may leave out households that consistently experience less severe but none-the-less important food insecurity (Derrickson, Fisher, Anderson & Brown, 2001; Tarasuk, 2001). Lastly, while Health Canada (2007) has validated the HFSSM across English-speaking, French-speaking and Aboriginal Canadians, there have been no studies published on its validity for foreign-born respondents, nor among those who respond to the survey in a non-official language. More extensive research must be conducted to ensure that this

measure provides a valid assessment of food insecurity in these sub-populations.

Recommendations

De Schutter captured the essence of the problem of food insecurity when he told a press conference that “the question of hunger is not a technical question, it’s a political question” (Schmidt, 2012). Ultimately, food insecurity remains a financial problem (Rose, 1999; Tarasuk, 2005; Hamelin, 2011) that will only be abolished by ensuring a basic quality of life for every resident - as Canada committed to doing by ratifying the International Covenant on Economic, Social and Cultural Rights nearly forty years ago. This will require large-scale collaboration from federal, provincial and local governments, communities, non-profit organizations and businesses, and will not occur quickly. In the long term, strategies must address the immigrant food insecurity at its roots: by addressing low income and poverty issues within the entire Canadian population.

However, in the shorter term, more research must examine various aspects of food insecurity among recent immigrants:

- *Testing the performance of the HFSSM among immigrants of different ethnocultural and linguistic backgrounds.* It is unknown at this point whether differences in prevalence and odds of food security of immigrants from varying regions reflect actual differences, or are merely a result discrepancies in the performance of the instrument between various groups.

- *Understanding the interaction of years since arrival and food security.* It was a surprising result that immigrants who arrived 6-10 years ago had the highest odds of food insecurity, considering the lower-than-average prevalence of food insecurity among settled immigrants. Research should examine food security of immigrants over a longer span of time after arrival, to discover how many years after arrival it takes for the odds of food insecurity to become equal to that of native-born Canadians. Furthermore, this research must consider the effects of out-migration on food security statistics among immigrants.
- *Understanding the interaction of dietary acculturation, food security and health.* Little research in Canada has addressed changes to immigrants' diets, and the effects of these changes on their ability to acquire adequate and appropriate foods. Research in this area should also include the health impacts of these dietary changes on immigrants, towards understanding the role food might play in the 'healthy immigrant effect'.
- *Addressing high odds of food insecurity among African-born immigrants.* Programs could address navigating the new food environment in Canada, including budgeting, shopping, preparing Canadian ingredients and meals, locating traditional food items, and Canadian replacements for traditional food ingredients.
- *Understanding and addressing food insecurity in Prairie provinces.* The odds of

food insecurity were highest for respondents in the Prairie provinces. Recent immigrants in this region have 60% higher odds of food insecurity than those in Ontario, and even higher odds compared to those in other regions. This may be related to a number of factors that were not included in the dataset, such as cost of food, availability and accessibility of culturally-appropriate foods, availability of public transportation, among others. Research must work toward understanding these factors so that they may be addressed directly to reduce food insecurity.

- *Understanding why speaking neither of the official languages in the household is associated with reduced odds of food insecurity.* This surprising outcome requires more investigation, most importantly into whether this is true of all groups or only certain ones, with particular reference to region of birth and location of settlement. Analysis of this data should be performed using a quantile regression model, which would allow for differentiating this relationship over the settlement period.

Appendix A

CCHS Household Food Security Survey Module Questions with Interviewer Instructions

The following questions are about the food situation for your household in the past 12 months.

Q1. Which of the following statements best describes the food eaten in your household in the past 12 months, that is since [current month] of last year?

- You and other household members always had enough of the kinds of food you wanted to eat.
- You and other household members had enough to eat, but not always the kinds of food you wanted.
- Sometimes you and other household members did not have enough to eat.
- Often you and other household members didn't have enough to eat.
- Don't know / refuse to answer (**Go to end of module**)

Note: Question Q1 is not used directly in determining household food security status.

Questions 2–6 — ask all households

Now I'm going to read you several statements that may be used to describe the food situation for a household. Please tell me if the statement was often true, sometimes true, or never true for you and other household members in the past 12 months.

Q2. The first statement is: you and other household members worried that food would run out before you got money to buy more. Was that often true, sometimes true, or never true in the past 12 months?

- Often true
- Sometimes true
- Never true
- Don't know / refuse to answer

Q3. The food that you and other household members bought just didn't last, and there wasn't any money to get more. Was that often true, sometimes true, or never true in the past 12 months?

- Often true
- Sometimes true
- Never true
- Don't know / refuse to answer

Q4. You and other household members couldn't afford to eat balanced meals. In the past 12 months was that often true, sometimes true, or never true?

1. Often true
 2. Sometimes true
 3. Never true
- Don't know / refuse to answer

IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q5 AND Q6; OTHERWISE, SKIP TO FIRST-LEVEL SCREEN

Now I'm going to read a few statements that may describe the food situation for households with children.

Q5. You or other adults in your household relied on only a few kinds of low-cost food to feed the children because you were running out of money to buy food. Was that often true, sometimes true, or never true in the past 12 months?

1. Often true
2. Sometimes true
3. Never true
- Don't know / refuse to answer

Q6. You or other adults in your household couldn't feed the children a balanced meal, because you couldn't afford it. Was that often true, sometimes true, or never true in the past 12 months?

1. Often true
2. Sometimes true
3. Never true
- Don't know / refuse to answer

FIRST-LEVEL SCREEN (screener for Stage 2): If AFFIRMATIVE RESPONSE to ANY ONE of Q2–Q6 (i.e. "often true" or "sometimes true") OR response [3] or [4] to Q1, then continue to STAGE 2; otherwise, skip to end.

Questions 7–11 — ask households passing the First-Level Screen

IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q7; OTHERWISE SKIP TO Q8

Q7. The children were not eating enough because you or other adults in your household just couldn't afford enough food. Was that often, sometimes or never true in the past 12 months?

1. Often true
2. Sometimes true
3. Never true
- Don't know / refuse to answer

The following few questions are about the food situation in the past 12 months for you or any other adults in your household.

Q8. In the past 12 months, since last [current month] did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?

1. Yes
2. No (Go to Q9)
- Don't know / refuse to answer

Q8b. How often did this happen?

1. Almost every month
 2. Some months but not every month
 3. Only 1 or 2 months
- Don't know / refuse to answer

Q9. In the past 12 months, did you (personally) ever eat less than you felt you should because there wasn't enough money to buy food?

1. Yes
 2. No
- Don't know / refuse to answer

Q10. In the past 12 months, were you (personally) ever hungry but didn't eat because you couldn't afford enough food?

1. Yes
 2. No
- Don't know / refuse to answer

Q11. In the past 12 months, did you (personally) lose weight because you didn't have enough money for food?

1. Yes
 2. No
- Don't know / refuse to answer

SECOND-LEVEL SCREEN (screener for Stage 3): If AFFIRMATIVE RESPONSE to ANY ONE of Q7–Q11, then continue to STAGE 3; otherwise, skip to end. Questions 12–16 — ask households passing the Second-Level Screen

Q12. In the past 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?

1. Yes
 2. No (*IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q13; OTHERWISE SKIP TO END*)
- Don't know / refuse to answer

Q12b. How often did this happen?

1. Almost every month
 2. Some months but not every month
 3. Only 1 or 2 months
- Don't know / refuse to answer

IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q13–16; OTHERWISE SKIP TO END

Now, a few questions on the food experiences for children in your household.

Q13. In the past 12 months, did you or other adults in your household ever cut the size of any of the children's meals because there wasn't enough money for food?

- 1. Yes
- 2. No
- Don't know / refuse to answer

Q14. In the past 12 months, did any of the children ever skip meals because there wasn't enough money for food?

- 1. Yes
- 2. No
- Don't know / refuse to answer

Q14b. How often did this happen?

- 1. Almost every month
- 2. Some months but not every month
- 3. Only 1 or 2 months
- Don't know / refuse to answer

Q15. In the past 12 months, were any of the children ever hungry but you just couldn't afford more food?

- 1. Yes
- 2. No
- Don't know / refuse to answer

Q16. In the past 12 months, did any of the children ever not eat for a whole day because there wasn't enough money for food?

- 1. Yes
- 2. No
- Don't know / refuse to answer

End of module

Adapted from the CCHS 2011 Questionnaire (Statistics Canada, 2013) and Health Canada (2007).

References

- Adyemir, A. & Robinson, C. (2006). Return and onward migration among working age men. *Analytical Studies Branch Research Paper Series*. Statistics Canada Catalogue no. 11F0019MIE – No. 273. Ottawa: Minister of Industry.
- Ashiabi, G S., & O’Neal, K. K. (2008). A framework for understanding the association between food insecurity and children’s developmental outcomes. *Society for Research in Child Development* 2(2), 71-77.
- Bartfield, J. & Dunifon, R. (2006). State-level predictors of food insecurity among households with children. *Journal of Policy Analysis and Management*, 25(4), 921–942.
- Bhattacharya, J., Currie, J., & Haider, S. (2004). Poverty, food insecurity, and nutritional outcomes in children and adults. *Journal of Health Economics*, 23, 839–862.
- Bickel, G., Nord, M., Price, C., Hamilton, W., & Cook, J. (2000). *Guide to measuring household food security: Revised 2000*. U.S. Department of Agriculture, Food and Nutrition Service, Alexandria VA. March, 2000.
- Biles, J., Burstein, M., & Frideres, J. (2008). Introduction. In J. Biles, M. Burstein & J. Frideres (Eds.), *Immigration and integration in Canada in the twenty-first century* (pp. 3-18). Kingston: McGill-Queen’s University Press.
- Broughton, M. A., Janssen, P. S., Hertzman, C., Innis, S. M., & Frankish, C. J. (2006). Predictors and outcomes of household food insecurity among inner city families with preschool children in Vancouver. *Canadian Journal of Public Health* 97(3), 214.
- Bocskai, E. (2011). *Evidence review: Food security*. Victoria, BC: Population Health and

Wellness, BC Ministry of Health.

Burns, C., Webster, K., Crotty, P., Ballinger, M., Vincenzo, R., & Rozman, M. (2000) Easing the transition: food and nutrition issues of new arrivals. *Health Promotion Journal of Australia*, 10, 230–236.

Canadian Association of Food Banks. (2005). *Time for Action: Hunger Count 2005*. Toronto, Ontario.

Centre for Equality Rights in Accommodation. (2009). “Sorry, it’s rented”: *Measuring discrimination in Toronto’s rental housing market*. Toronto, ON.

Citizenship and Immigration Canada. (2011). Annual Report to Parliament on Immigration. (Ci1-2011E-PDF). Retrieved from www.cic.gc.ca/english/pdf/pub/annual-report-2011.pdf

Citizenship and Immigration Canada. (2013, May 3). Proof of funds – Federal skilled workers. Retrieved from <http://www.cic.gc.ca/english/immigrate/skilled/funds.asp>

Che, J. and Chen, J. (2001), Food insecurity in Canadian households. *Health Reports*, 12(4), 11-22.

Chilton, M., Black, M. M., Berkowitch, C., Casey, P. H., Cook, J., Cutts, D., Jacobs, R. R., Heeren, T., Ettinger de Cuba, S., Coleman, S., Meyers, A., & Frank, D. A. (2009). Food insecurity and risk of poor health among US-born children of immigrants. *American Journal of Public Health*, 99(3), 556-562.

Coates, J., Frongillo, E.A., Lorge Rogers, B., Webb, P., Wilde, P.E. and Houser, R. (2006). Commonalities in the experience of household food insecurity across cultures: what are measures missing? *Journal of Nutrition*, 136(16), 1438-1448.

- Coleman-Jensen, A., Nord, M., Andrews, M., & Carlson, S. (2011). *Household food security in the United States in 2010*. ERR-125, U.S. Department of Agriculture, Econ. Res. Serv.
- Cook, B. (2006). *Food security: Implications for the early years - background paper*. Toronto, Ontario: Toronto Public Health.
- Cook, J. T. (2002). Clinical implications of household food security: Definitions, monitoring, and policy. *Nutrition in Clinical Care*, 5(4), 152-167.
- Cook, J. T. & Frank, D. A. (2008). Food security, poverty, and human development in the United States. *Annals of the New York Academy of Sciences*, 1136, 193-209.
- Cook, J. T., Frank, D. A., Berkowitz, C., Black, M. M., Casey, P. H., Cutts, D. B., Meyers, A. F., Zaldivar, N., Skalicky, A., Levenson, S., Heeren, T., & Nord, M. (2004). Food insecurity is associated with adverse health outcomes among human infants and toddlers. *Journal of Nutrition*, 134, 1432-1438.
- De Schutter, O. (2012), Olivier De Schutter, Special Rapporteur on the Right to Food: Visit to Canada from 6 to 16 May 2012. *End-of-Mission Statement*, United Nations, Office of the United Nations High Commissioner for Human Rights, New York, NY.
- Derrickson, J. & Anderson, J. (1999). Face validity of the Core Food Security Module with Asians and Pacific Islanders. *Journal of Nutrition Education*, 31, 21-30.
- Derrickson, J. P., Fisher, A. G., Anderson, J. E. L., & Brown, A. C. (2001). An assessment of various household food security measures in Hawaii has implications for national food security research and monitoring. *Journal of Nutrition*, 131(3), 749-757.

- Derrickson, J. P., Sakai, M., & Anderson, J. (2001). Interpretations of the “Balanced Meal” Household Food Security Indicator. *Journal of Nutrition Education*, 33, 155–160.
- Désilets, M.-C., Rivard, M., Shatenstein, B., & Delisle, H. (2007). Dietary transition stages based on eating patterns and diet quality among Haitians of Montreal, Canada. *Public Health Nutrition*, 10(5), 454–463.
- DeWolfe, J. A. & Greaves, G. (2003). The basic shelf experience: A comprehensive evaluation. *Canadian Journal of Dietetic Practice and Research* 64(2), 51-57.
- Dinour, L. M., Bergen, D., & Yeh, M-C. (2007). The food insecurity-obesity paradox: A review of the literature and the role Food Stamps may play. *Journal of the American Dietetic Association*, 107, 1952-1961.
- Donkin, A. J. M., & Dowler, E. A. (2002). Equal access to healthy food for ethnic minorities? In A. J. Kershner (Ed.), *Food in the immigrant experience* (pp. 199-213). Aldershot, England: Ashgate Publishing Limited.
- Drummond, D., & Burleton, D. (2008). *Time for a vision of Ontario's economy*. Toronto, ON: TD Economics. Available at: http://www.td.com/economics/special/db0908_ont.pdf
- Ford, J. D., & Berrang-Ford, L. (2009). Food security in Igloolik, Nunavut: an exploratory study. *Polar Record*, 45(234), 225-236.
- Frenette, M. & Morissette, R. (2005). Will they ever converge? Earnings of immigrant and Canadian-born workers over the last two decades. *International Migration Review*, 39(1), 228-258.
- Frongillo, E. A. Jr. (1999). Validation of measures of food insecurity and hunger. *Journal*

of Nutrition; 129, 506-509.

Galarneau, D. & Morissette, R. (2008). Immigrants' education and required job skills. *Perspectives*. Statistics Canada Catalogue #75-001-X. Available at: <http://www.statcan.gc.ca/pub/75-001-x/2008112/article/10766-eng.htm>

Gao, X., Scott, T., Falcon, L. M., Wilde, P. E., & Tucker, K. L. (2009). Food insecurity and cognitive function in Puerto Rican adults. *American Journal of Clinical Nutrition*, 89, 1197–203.

Garnweidner, L. M., Terragni, L., Pettersen, K. S., & Mosdøl, A. (2012). Perceptions of the host country's food culture among female immigrants from Africa and Asia: Aspects relevant for cultural sensitivity in nutrition communication. *Journal of Nutrition Education and Behavior*, 44(4), 335-342.

Gee, E. M. T., Kobayashi, K. M., & Prus, S. G. (2004). Examining the Healthy Immigrant Effect in Mid- To Later Life: Findings from the Canadian Community Health Survey. *Canadian Journal on Aging*, 23, S55-S63.

Ghosh, S. (2012). Everyday lives in vertical neighbourhoods: Exploring Bangladeshi residential spaces in Toronto. In H. Bauder (Ed.), *Immigration and settlement: Challenges, experiences, and opportunities* (pp. 227-246). Toronto: Canadian Scholars' Press Inc.

Girard, A., & Sercia, P. (2013). Immigration and food insecurity: social and nutritional issues for recent immigrants in Montreal, Canada. *International Journal of Migration, Health and Social Care* 9(1), 32-45.

Goldring, L. & Landolt, P. (2009). *Research brief 2: Immigrants and precarious employment*. Toronto, ON: Immigrants and Precarious Employment Project.

- Gorton, D., Bullen, C. R., Mhurchu, C. N. (2009). Environmental influences on food security in high-income countries. *Nutrition Reviews*, 68(1), 1-29.
- Gulliford, M. C., Nunes, C., & Rocke, B. (2006). The 18 Household Food Security Survey items provide valid food security classifications for adults and children in the Caribbean. *BMC Public Health*, 6(26), 1-8.
- Hadley, C., Patil, C. L., & Nahayo, D. (2010). Difficulty in the food environment and the experience of food insecurity among refugees resettled in the United States. *Ecology of Food and Nutrition*, 49, 390–407.
- Hadley, C. & Sellen, D. (2006). Food security and child hunger among recently resettled Liberian refugees and asylum seekers: A pilot study. *Journal of Immigrant Health*, 8, 369–375.
- Hadley, C., Zodhiates, A., & Sellen, D. W. (2007). Acculturation, economics and food insecurity among refugees resettled in the USA: A case study of West African refugees. *Public Health Nutrition*, 10(4), 405–412.
- Hamelin, A. M., Beaudry, M., Habicht, J. P. (1998). La vulnérabilité des ménages à l'insécurité alimentaire. *Revue canadienne des études développementales*, 19, 277-306.
- Hamelin, A. M., Beaudry, M., Habicht, J. P. (1999). Food Insecurity: Consequences for the Household and Broader Social Implications. *Journal of Nutrition*, 129, 525S–528S.
- Hamelin, A-M., Beaudry, M., & Habicht, J.-P. (2002). Characterization of household food insecurity in Quebec: food and feelings. *Social Science & Medicine*, 51, 119-132.

- Hamelin, A.-M., Mercier, C., & Bedard, A. (2010). Discrepancies in households and other stakeholders viewpoints on the food security experience: A gap to address. *Health Education Research*, 25(3), 401-412.
- Health Canada. (2007). *Canadian Community Health Survey cycle 2.2, nutrition (2004): Income-related household food security in Canada*. Ottawa, Health Canada, Office of Nutrition Policy and Promotion Health Products and Food Branch.
- Health Canada. (2010). *Household Food Insecurity In Select Provinces and the Territories in 2009-2010*. Retrieved from <http://www.hc-sc.gc.ca/fn-an/surveill/nutrition/commun/insecurit/key-stats-cles-2007-2008-eng.php>
- Heflin, C. M., Siefert, K., & Williams, D. R. (2005). Food insufficiency and women's mental health: Findings from a 3-year panel of welfare recipients. *Social Science Medicine*, 61, 1971–82.
- Himmelgreen, A. B, Perez-Escamilla, R., & Bermudez, Y. P. A. (2005). Birthplace, length of time in the U.S., and language are associated with diet among inner-city Puerto Rican women. *Ecology of Food and Nutrition*, 44, 105–122.
- Howard, A. & Edge, J. (2013). *Enough for all: Household food security in Canada*. Toronto, Ontario: Conference Board of Canada.
- Isanaka, S., Mora-Plazas, M., Lopez-Arana, S., Baylin, A., & Villamor, E. (2007). Food insecurity is highly prevalent and predicts underweight but not overweight in adults and school children from Bogotá, Colombia. *Journal of Nutrition*, 137, 2747-2755.
- Iverson, J. (2012, May 16). Hypocritical UN council sends envoy on Kafka-esque Canadian visit. *National Post*. Retrieved from <http://fullcomment.nationalpost.com/2012/05/16/john-iverson-hypocritical-un->

council-sends-envoy-on-kafka-esque-canadian-visit/

Kaiser, L. L., Melgar-Quinonez, H. R., Lamp, C. L., Johns, M. C., Sutherlin, J. M., & Harwood, J. O. (2002). Food security and nutritional outcomes of preschool-age Mexican-American children. *Journal of American Dietetics Association*, 102(7), 924-929.

Kalil, A., & Chen, J-H. (2008). Mothers' citizenship status and household food insecurity among low-income children of immigrants. *New Directions for Child and Adolescent Development*, 121, 43–62.

Kasper, J., Gupta, S. K., Tran, P., Cook, J. T., & Meyers, A. F. (2000). Hunger in legal immigrants in California, Texas, and Illinois. *American Journal of Public Health*, 90, 1629-1633.

Kendall, A., Olson, C. M., Frongillo, E. A. (1995) Validation of the Radimer/Cornell measures of hunger and food insecurity. *Journal of Nutrition*, 125, 2793-2801.

Khandor, E. & Koch, A. (2011). *The Global City: Newcomer Health in Toronto*. Toronto, ON: Toronto Public Health and Access Alliance Multicultural Health and Community Services.

Kilanowski, J. F., & Moore, L. C. (2010). Food security and dietary intake in Midwest migrant farmworker children. *Journal of Pediatric Nursing*, 25, 360-366.

Kirkpatrick, S. I. (2008). *Household food insecurity in Canada: An examination of nutrition implications and factors associated with vulnerability*. (Unpublished doctoral dissertation). University of Toronto, Toronto, Ontario.

Kirkpatrick, S. I. & Tarasuk, V. (2007a). Adequacy of food spending is related to housing expenditures among lower-income Canadian households. *Public Health Nutrition*,

10(12), 1464-1473.

Kirkpatrick, S. I. & Tarasuk, V. (2007b). Housing circumstances are associated with household food access among low-income urban families. *Journal of Urban Health*, 88(2), 284-296.

Kirkpatrick, S. I. & Tarasuk, V. (2008). Food insecurity is associated with nutrient inadequacies among Canadian adults and adolescents. *Journal of Nutrition*, 138(3), 604-612.

Koc, M., & Welsh, J. (2002). *Food, foodways and immigrant experience*. [PDF Conference Proceedings].

Liu, L. W. (2009). "I eat more salads because they are good for health": Cooking, eating and informal learning among recent Chinese immigrants. *Cuizine: The Journal of Canadian Food Cultures*, 1(2).

Lyons, A.-A., Park, J., Nelson, C. H. (2007). Food insecurity and obesity: A comparison of self-reported and measured height and weight. *American Journal of Public Health*, 98(4), 751-757.

Martin, K. S., Rogers, B. L., Cook, J. T., & Joseph, H. M. (2004). Social capital is associated with decreased risk of hunger. *Social Science & Medicine*, 58, 2645-2654.

Mazur, R. E., Marquis, G. S., & Jensen, H. H. (2003). Diet and food insufficiency among Hispanic youths: acculturation and socioeconomic factors in the third National Health and Nutrition Examination Survey. *American Journal of Clinical Nutrition*, 78, 1120-1127.

McPherson, K. (2006). *Food Insecurity and the Food Bank Industry: A Geographical*

- Analysis of Food Bank Use in Christchurch.* (Unpublished masters thesis).
University of Canterbury, Christchurch.
- Melgar-Quinonez, H. R., Nord, M., Perez-Escamilla, R., & Segall-Correa, A. M. (2008). Psychometric properties of a modified US-household food security survey module in Campinas, Brazil. *European Journal of Clinical Nutrition*, 62, 665–673.
- Mikkonen, J., & Raphael, D. (2010). *Social determinants of health: The Canadian facts*. Toronto, ON: York University School of Health Policy and Management.
- Neuhouser, M. L., Thompson, B., Coronado, G. D., & Solomon, C. C. (2004). higher fat intake and lower fruit and vegetables intakes are associated with greater acculturation among Mexicans living in Washington state. *Journal of the American Dietetic Association*, 104(1), 51-57.
- Nord, M., Andrews, M., & Carlson, S. (2002). *Household Food Security in the United States*. Research Report No. 35. Washington, DC: Food Assistance and Nutrition Research Program, Food and Rural Economics Division, Economic Research Service, US Department of Agriculture.
- Nord, M. & Hopwood, L. (2007). Recent advances provide improved tools for measuring children's food security. *Journal of Nutrition*, 137, 533-536.
- Nord, M. & Kantor, L. S. (2006). Seasonal variation in food insecurity is associated with heating and cooling costs among low-income elderly Americans. *Journal of Nutrition*, 136, 2939-2944.
- Okafor, M-T. C., Carter-Pokras, O. D., Picot, S., J., & Zhan, M. (2013). The relationship of language acculturation (English proficiency) to current self-rated health among African immigrant adults. *Journal of Immigrant & Minority Health*, 15, 499-509.

- Oreopoulos, P. & Dechief, D. (2011). Why do some employers prefer to interview Matthew, but not Samir? New evidence from Toronto, Montreal, and Vancouver. *Metropolis British Columbia Working Paper Series*, No. 11-13.
- Peterman, J. N., Wilde, P. E., Silka, L., Bermudez, O. I., & Rogers, B. L. (2013). Food insecurity among Cambodian refugee women two decades post resettlement. *Journal of Immigrant and Minority Health*, 15, 372–380.
- Picot, G., Lu, Y., & Hou, F. (2009). Immigrant low-income rates: The role of market income and government transfers. *Perspectives on Labour and Income*, 10(12), 13-27.
- Picot, G., & Sweetman, A. (2012). *Making it in Canada: Immigration outcomes and policies*. (No. 29). Montreal: Institute for Research on Public Policy.
- Powell, L., Slater, S., Mirtcheva, D., Bao, Y. & Chaloupka, F. (2007). Food store availability and neighborhood characteristics in the United States. *Preventative Medicine*, 44(3):189-195.
- Power, E. M. (2008). Conceptualizing food security for Aboriginal people in Canada. *Canadian Journal of Public Health*. 99(2), 95-97.
- Rafiei, M., Nord, M., Sadeghizadeh, A., & Entezari, M. (2009). Assessing the internal validity of a household survey-based food security measure adapted for use in Iran. *Nutrition Journal*, 8(1), 28-39.
- Rose, D. 1999. Economic determinants and dietary consequences of food insecurity in the United States. *Journal of Nutrition* 129:517–520.
- Rush, T., Irwin, J. D., Stitt, L. W., & He, M. (2007). Food insecurity and dietary intake of immigrant food bank users. *Canadian Journal of Dietetic Practice and Research*,

68(2), 73-78.

Satia, J. (2010). Dietary acculturation and the nutrition transition: an overview. *Applied Physiology Nutrition & Metabolism*, 35, 219–223.

Schmidt, S. (2012, May 17). With venom directed at UN right-to-food envoy, are there no good cops left in cabinet? *Postmedia News*. Retrieved from <http://o.canada.com/2012/05/17/with-venom-directed-at-un-right-to-food-envoy-are-there-no-good-cops-left-in-cabinet/>

Statistics Canada. (2012a). *Canadian Community Health Survey, 2011* [de-identified master file]. Ottawa, Ontario: Statistics Canada. Health Statistics Division, Data Liberation Initiative [producer and distributor].

Statistics Canada. (2012b). Census metropolitan areas. Retrieved from: <http://www.statcan.gc.ca/pub/91-214-x/2009000/part-partie1-eng.htm>

Statistics Canada. (2012c). Median total income, by family type, by province and territory. Retrieved from: <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/famil108a-eng.htm>

Statistics Canada. (2012d). Number of landed immigrants in Canada, 1852 to 2010. Retrieved from: http://www12.statcan.gc.ca/census-recensement/2011/as-sa/98-310-x/2011003/fig/fig3_1-2-eng.cfm

Statistics Canada. (2013). *National immigration and ethnocultural diversity in Canada: 2011 National Household Survey*. Retrieved from: <http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-010-x/99-010-x2011001-eng.pdf>

Slack, K. S., & Yoo, J. (2005). Food hardship and child behavior problems among low-

- income children. *Social Service Review*, 79(3), 511-536.
- Tarasuk, V. (2001). *Discussion paper on household and individual food insecurity*, Office of Nutrition Policy and Promotion, Health Canada, Government of Canada, Ottawa.
- Tarasuk, V. (2004). Health implications of food insecurity. In D. Raphael (Ed.), *Social determinants of health: Canadian perspectives* (pp. 187-200). Toronto: Canadian Scholars Press.
- Tarasuk, V. (2005). Household food insecurity in Canada. *Topics in Clinical Nutrition* 20(4), 299-312.
- Tarasuk, V., McIntyre, L., & Li, J. (2007). Low-income women's dietary intakes are sensitive to the depletion of household resources in one month. *Journal of Nutrition*, 137, 1980-1987.
- Tarasuk, V., Mitchell, A., & Dachner, N. (2013). *Research to identify policy options to reduce food insecurity (PROOF): Household food insecurity in Canada 2011*. Retrieved from <http://nutritionalsciences.lamp.utoronto.ca/>.
- United Nations. (1976). International Covenant on Economic, Social and Cultural Rights. Adopted and proclaimed by General Assembly resolution 2200 of December 16, 1966. Retrieved from http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-3&chapter=4&lang=en
- Uttley, S. (1997). Hunger in New Zealand: a question of rights? In G. Riches (Ed.), *First World Hunger – Food Security and Welfare Politics* (pp. 78-107). London: MacMillan Press Ltd.

- Vahabi, M., & Damba, C. (2013). Perceived barriers in accessing food among recent Latin American immigrants in Toronto. *International Journal for Equity in Health*, 12(1), 1-11.
- Vahabi, M., Damba, C., Rocha, C., & Montoya, E. C. (2011). Food insecurity among Latin American recent immigrants in Toronto. *Journal of Immigrant Minority Health*, 13, 929-939.
- Van Hook, J & Balistreri, K. S. (2005). Ineligible parents, eligible children: Food Stamps receipt, allotments, and food insecurity among children of immigrants. *Social Science Research*, 35, 228-251.
- Vozoris, N. T., Tarasuk, V. S. (2003). Household food insufficiency is associated with poorer health. *Journal of Nutrition*, 133(1), 120-126.
- Wandel, M. (1995) Dietary intake of fruits and vegetables in Norway: Influence of life phase and socio-economic factors. *International Journal of Food Science and Nutrition*, 46, 291–301.
- Welsh, J., Anstice, S., Koc, M., Murray, A., Paris, F., Premat, A., Van Esterik, P., & Wong, P. W. L. (1998). *Food security, health and the immigrant experience - final report*.
- Yeh, M.-C., Ickes, S. B., Lowenstein, L. M., Shuval, K., Ammerman, A. S., Farris, R., & Katz, D. L. (2008). Understanding barriers and facilitators of fruit and vegetable consumption among a diverse multi-ethnic population in the USA. *Health Promotion International*, 23(1), 42-51
- Young, L. R. & Nestle, M. (2012). Reducing Portion Sizes to Prevent Obesity: A call to action. *American Journal of Preventative Medicine*, 43(5), 565-568.

Zucchi, J. E. (2007). *A history of ethnic enclaves in Canada*. Ottawa: Canadian Historical Association.