A natural experimental study of the protective effect of home ownership on household food insecurity in Canada before and after a recession (2008–2009)

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ABSTRACT

OBJECTIVES: Home ownership as opposed to renting is associated with lower rates of food insecurity, the latter being a marker of household economic deprivation associated with adverse health outcomes. It is unclear whether this relationship persists during a major economic decline, or whether different subgroups of home owners are equally protected. The 2008–2009 recession in Canada was tied to events in the United States related to inappropriate mortgage financing; the impact of the recession on food insecurity among home owners may identify policies to mitigate recessionary outcomes.

METHODS: We used a before-and-after natural experimental design using data from the Canadian Community Health Survey (CCHS) cycles 2007/2008 (pre-recession) and 2009/2010 (post-recession) with information on household food insecurity, home ownership versus renting, and socio-demographics. Applying multivariable logistic regression, we examined changes in household food insecurity by housing tenure and sex over the period.

RESULTS: Pre-recession, food insecurity affected 3.3% of home owners and 17.1% of renter households. Among home owners, the risk of food insecurity increased post-recession by 10%, which was not statistically significant. Post-recession, and with adjustment, although renters' higher absolute risk of food insecurity persisted, male-respondent home owners experienced the highest rate of increase in food insecurity prevalence by subgroup (OR = 1.26, 95% CI: 1.06–1.50) versus renters (OR = 1.17, 95% CI: 1.05–1.29).

CONCLUSION: Housing policies in Canada protected most home owners from precarity during the 2008–2009 economic recession; however, male-respondent home owners exhibited a unique economic vulnerability during this time. Implications of Canadian home ownership policies are discussed in light of differential vulnerability of home owner groups.

KEY WORDS: Natural experiment; housing tenure; food insecurity; economic recession; home ownership; Canada

La traduction du résumé se trouve à la fin de l'article.

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The importance of adequate housing and food security is well established in the field of public health, as housing tenure (renting versus owning a home) and household food insecurity (lack of access to adequate food because of financial constraints) are key determinants of health.^{1–3} Housing tenure, specifically renting, is related to problems in physical and mental health, and the relationship persists even after accounting for confounding factors, such as social class and income.^{4,5} Food insecurity is also linked to a range of adverse consequences for physical and psychosocial health and well-being among children, youth and adults.^{6–9} Risk factors for food insecurity include a diverse set of socio-demographic and economic household characteristics related to material deprivation,^{6,7,10–12} and recent statistics show that 13% (4 million) Canadian households are affected by this condition.¹³ As reported in several descriptive epidemiological studies, home ownership as compared with renting is negatively correlated with food insecurity.^{6,11,14–17} Yet food insecurity has been poorly studied in home owners, despite home ownership being the normative status for 69% of Canadian households.^{12,18} Recently, we examined whether the lower food insecurity rates observed in home owners as compared with renters were explained by the socio-demographic and contextual characteristics of who owns versus who rents, or whether home

ownership itself was independently associated with lower food insecurity rates.¹⁹ We used a decomposition approach based on data from the 2009–2010 cycle of the population-based Canadian Community Health Survey (CCHS) to examine the difference in food insecurity prevalence between non-home owner and home owner households not accounted for by household-level characteristics, such as income. We found that 29% of the food insecurity prevalence gap was related to home ownership itself, rather than to socio-demographic characteristics of owners versus renters. The policy sensitivity of this level of protection remains unknown. Despite the association between home ownership and lower food insecurity rates, this relationship may

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be context-dependent as unforeseen economic shocks to the household budget can create financial stress and increased food insecurity for home owners. Indeed, Emery and colleagues²⁰ showed that an increase in food insecurity prevalence in Canada as a whole was attributed to an increase in the prevalence of food insecurity among home owners faced with budget shocks associated with home heating cost inflation. This study showed that policy directed at buffering energy inflation among low-income renters through energy credits at the time was misplaced, as renters were unaffected by energy price spikes compared with home owners.

The 2008–2009 recession in Canada was tied to events in the United States related to inappropriate mortgage financing. In the US, the recession had profound impacts on the housing and labour markets.²¹ The experience of US home owners was heterogeneous, with the concentration of large wealth and equity losses among African American and low-income home owners.²² The ongoing collection of national survey data through the CCHS created an opportunity to examine changes in household food insecurity risk in home owner households before and after the recession in Canada, spanning October 2008 to February 2009. This study investigates whether the association between home ownership and household food insecurity – the latter an indicator of material deprivation with profound health consequences²³ – is maintained during a period of significant economic decline. Specifically, we ask whether the prevalence of household food insecurity in households differed pre-recession (2007/2008) versus post-recession (2009/2010), and how did the risk of household food insecurity pre- and post-recession vary by housing tenure and by sex? Interpreting the recession as an unanticipated treatment or intervention on households allows us to consider the changes observed as plausible effects of the recession, thereby fulfilling conditions of a “natural experiment”.

METHODS

Dataset

We used microdata from the CCHS cycles 4.1 (2007/2008, pre-recession) and 5.1 (2009/2010, post-recession). The CCHS is a large cross-sectional survey that collects data biennially on socio-demographic and socio-economic characteristics, health status, housing tenure, and health determinants for the Canadian population.²⁴ Households are randomly selected to voluntarily participate in the CCHS. Within each household, a knowledgeable respondent 12 years and over is randomly chosen to provide answers to questions for all household members.²⁴ We analyzed data from approximately 130 000 households with complete information on food insecurity. As food insecurity questions were optional for provinces in CCHS 5.1, household food insecurity data were not available for Prince Edward Island and New Brunswick, thus we omitted households from these small provinces from analysis. We restricted our analyses to households with complete responses on household socio-demographic characteristics and those with respondents 18 years or older, as these respondents were more likely to be the head of the household. Because food insecurity is a household-level outcome, analyses were weighted

using household weights to accommodate the survey design effect of the CCHS. Standard error estimates were computed using bootstrapping. Data were analyzed using STATA 11.0 (StataCorp, College Station, TX, USA) in accordance with Statistics Canada's disclosure rules.

Measure of household food insecurity

Food insecurity was measured using the validated and extensively used Household Food Security Survey Module (HFSSM).^{7,25} The HFSSM comprises 18 questions, with 10 items used to determine the extent of food insecurity among adults, and 8 items used to identify food insecurity among children in the household. Each question suggests insufficient money to acquire food as the basis of an affirmative response. The food insecurity status of the household over the past 12 months is determined by the collective number of affirmative answers provided by the respondent for all household members. The food insecurity status of the household is classified into three groups: food-secure (0–1 affirmed response); food-insecure, moderate (2–5 affirmed response); and food-insecure, severe (≥ 6 affirmed response).⁷ For this analysis, we examined households dichotomously as food-secure or food-insecure with moderate and severe levels combined, as consistent results were observed between the two- and three-level classifications of food insecurity.

Housing tenure and covariates

Housing tenure was measured as a binary indicator; home owner versus non-home owner (renter) based on the question “is this dwelling owned by a member of this household?”, with an affirmative answer indicative of home ownership. Based on the literature, we consider a number of confounding variables that directly or indirectly affect the relationship between food insecurity and housing tenure (e.g., income, level of education) in this analysis.^{9,11,26} These covariates can be grouped into characteristics of household members, and those that are contextual indicators of households. Characteristics that directly or indirectly reflect household members (through the respondent) include sex, age, marital status, race, highest educational level in household, household composition, and sense of belonging to community. Household income and income source were both included as recessionary times may have implications for both variables. Contextual indicators of households include Metropolitan Influence Zone (MIZ) and province of residence. The former captures different urban centres that differ in average housing prices and the latter reflects different housing policies implemented at the provincial level. These covariates were treated as categorical variables, where categories with the lowest food insecurity prevalence were used as the reference group (Table 1).

Statistical analyses

Descriptive analysis was conducted to compare differences in the prevalence of food insecurity between home owners and renters pre- and post-recession, and by stratifications of household characteristics. Multivariable logistic regression was used to estimate odds of food insecurity in home owners and renters

Table 1. Prevalence (%) and 95% confidence interval (CI) of household food insecurity by household socio-demographic and contextual variables pre- and post-recession (2008–2009) in Canada (N = 139 600)

	Food insecurity pre-recession [†]						Food insecurity post-recession [‡]					
	Renter (n = 20 570)		Home owner (n = 56 197)		Total sample (n = 76 767)		Renter (n = 17 926)		Home owner (n = 50 124)		Total sample (n = 68 050)	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Total	17.1	(16.3–18.0)	3.3	(3.0–3.5)	7.9	(7.6–8.3)	17.8	(16.8–18.8)	3.3	(3.1–3.6)	8.2	(7.8–8.6)
Sex												
Male [§]	15.7	(14.6–16.9)	2.6	(2.3–2.9)	6.8	(6.4–7.3)	16.4	(15.2–17.8)	3.0	(2.7–3.4)	7.4	(6.9–7.9)
Female	18.4**	(17.3–19.5)	3.9**	(3.6–4.3)	9.0**	(8.5–9.5)	19.0**	(17.8–20.4)	3.6	(3.3–4.0)	9.0**	(8.5, 9.5)
Age group (years)												
18–24 [§]	20.6	(18.4–23.1)	3.0	(2.2–4.0)	12.6	(11.3–14.1)	19.8	(17.3–22.6)	4.0	(3.0–5.3)	12.2	(10.8–13.9)
25–34	16.0**	(14.4–17.8)	3.9	(3.3–4.6)	9.3**	(8.5–10.2)	17.7	(16.0–19.6)	4.0	(3.4–4.7)	10.1*	(9.2–11.0)
35–44	19.3	(17.4–21.4)	3.8	(3.3–4.3)	8.5**	(7.8–9.3)	20.4	(18.2–22.7)	4.5	(3.9–5.2)	9.3**	(8.5–10.2)
45–54	21.8	(19.8–23.9)	4.2*	(3.6–4.7)	9.1**	(8.5–9.9)	23.6*	(21.3–26.1)	3.8	(3.2–4.4)	9.5**	(8.7–10.4)
55–64	21.1	(18.8–23.6)	2.4	(2.1–2.8)	6.8**	(6.2–7.5)	21.2	(18.8–23.8)	2.5**	(2.2–3.0)	7.1**	(6.4–7.9)
65 and older	6.7**	(5.7–7.9)	2.1*	(1.8–2.5)	3.5**	(3.1–3.9)	6.5**	(5.3–8.1)	1.8**	(1.5–2.2)	3.2**	(2.8–3.7)
Type of household												
Unattached living alone [§]	17.6	(16.4–18.8)	4.4	(4.0–4.9)	11.3	(10.7–12.0)	18.3	(17.1–19.6)	4.7	(4.2–5.3)	11.9	(11.2–12.7)
Single living with others	14.0*	(11.4–17.1)	3.7	(2.4–5.6)	10.6	(8.8–12.7)	17.1	(13.4–21.6)	6.4	(3.9–10.2)	13.7	(10.9–17.0)
Couple with no children	8.6**	(7.4–10.0)	1.8**	(1.5–2.0)	3.1**	(2.8–3.5)	10.4**	(8.7–12.4)	1.6**	(1.4–1.9)	3.4**	(3.0–3.8)
Couple with children <25 years	18.6	(16.4–21.1)	3.2**	(2.9–3.7)	5.9**	(5.4–6.5)	16.0	(13.9–18.4)	3.3**	(2.9–3.8)	5.5**	(4.9–6.1)
Lone parent with children <25 years	31.3**	(28.1–34.6)	9.3**	(7.6–11.4)	21.2**	(19.2–23.4)	33.9**	(30.2–37.8)	9.6**	(7.8–11.7)	22.4**	(20.1, 24.8)
Other/multi-family	12.1	(7.9–18.2)	3.2	(2.3–4.5)	4.7**	(3.6–6.1)	16.7	(11.6–23.4)	3.3*	(2.4–4.6)	5.5**	(4.3–6.9)
Race (selected)												
White [§]	15.7	(14.8–16.6)	3.0	(2.8–3.2)	7.0	(6.6–7.3)	16.7	(15.7–17.7)	3.0	(2.8–3.2)	7.2	(6.9–7.6)
Aboriginal	35.2**	(31.3–39.4)	7.5**	(5.8–9.7)	21.5**	(19.2, 24.0)	36.9**	(32.1–41.6)	5.6**	(4.3–7.4)	20.1**	(17.7–22.7)
Asian	12.6*	(10.4–15.3)	4.0*	(3.0–5.1)	7.1	(6.0–8.3)	10.7**	(8.4–13.6)	4.3**	(3.3–5.5)	6.8	5.7–8.0
Other	26.0**	(22.4–30.0)	6.3**	(4.6–8.6)	17.3**	(15.1–19.8)	25.3**	(21.7–29.3)	8.0**	(6.1–10.4)	18.2**	15.9–20.7
Household education (selected)												
Less than high school graduate [§]	24.2	(22.1–26.4)	5.8	(5.0–6.7)	15.3	(14.2–16.5)	27.0	(24.3–29.9)	6.3	(5.2–7.5)	17.2	(15.6–18.8)
High school graduate	18.3**	(16.3–20.4)	3.7**	(3.1–4.4)	9.5**	(8.6–10.5)	19.8**	(17.4–22.4)	3.8**	(3.1–4.5)	10.3**	(9.2–11.5)
Some post-secondary	19.3**	(18.0–20.6)	3.9**	(3.6–4.3)	9.1**	(8.6–9.6)	20.3**	(18.9–21.7)	4.1**	(3.7–4.5)	9.4**	(8.9–10.0)
University	7.4**	(6.4–8.7)	1.7**	(1.4–2.0)	3.1**	(2.8–3.5)	7.1**	(6.0–8.4)	1.7**	(1.4–2.0)	3.1**	(2.8–3.6)
Household income (selected)												
<\$10,000 [§]	44.5	(40.1–48.9)	18.4	(14.5–23.0)	38.9	(35.4–42.5)	47.7	(43.2–52.2)	19.3	(15.0–24.5)	40.9	(37.4–44.6)
\$10,000–\$19,999	31.7**	(29.7, 33.8)	12.8**	(11.3–14.5)	25.9**	(24.4–27.5)	32.5**	(30.2–34.8)	12.7**	(10.8–14.7)	26.7**	(25.0–28.5)
\$20,000–\$29,999	18.2**	(16.3–20.3)	8.3**	(7.2–9.6)	13.6**	(12.4–14.9)	20.8**	(18.7–23.1)	8.2**	(7.0–9.6)	15.0**	(13.7–16.4)
\$30,000–\$39,999	14.4**	(12.5–16.4)	5.7**	(4.9–6.7)	9.6**	(8.7–10.7)	14.3**	(12.1–16.9)	5.2**	(4.4–6.2)	9.4**	(8.2–10.8)
\$40,000–\$49,999	9.7**	(7.9–11.9)	3.8**	(3.0–4.7)	6.1**	(5.2–7.0)	11.0**	(9.0–13.3)	4.4**	(3.6–5.3)	7.0**	(6.0–8.1)
\$50,000–\$59,999	6.3**	(4.7–8.4)	2.9**	(2.3–3.6)	3.9**	(3.3–4.8)	8.1**	(5.9–10.9)	3.5**	(2.8–4.3)	5.0**	(4.1–6.0)
\$60,000–\$69,999	6.5**	(4.6–8.9)	2.2**	(1.8–2.9)	3.4**	(2.7–4.2)	7.3**	(5.1–10.4)	2.7**	(2.1–3.4)	4.0**	(3.3–5.0)
\$70,000–\$79,999	4.4**	(3.0–6.6)	2.6**	(2.0–3.3)	3.0**	(2.4–3.7)	5.1**	(3.3–7.8)	2.5**	(1.8–3.4)	3.1**	(2.4–4.0)
\$80,000–\$89,999	2.7**	(1.5–4.7)	1.5**	(1.0–2.1)	1.7**	(1.2–2.3)	6.0**	(3.8–9.6)	2.3**	(1.7–3.2)	3.0**	(2.3–3.9)
\$90,000–\$99,999	2.7**	(0.9–7.6)	1.4**	(0.8–2.4)	1.6**	(1.0–2.6)	2.3**	(1.2–4.5)	2.3**	(1.3–4.1)	2.3**	(1.4–3.8)
\$100,000–\$500,000	2.1**	(1.1–4.1)	0.6**	(0.5–0.8)	0.8**	(0.6–1.0)	2.1**	(1.2–3.6)	0.5**	(0.4–0.7)	0.7**	(0.5–0.9)
Income source (selected)												
Wages/salaries/self-employment [§]	12.4	(11.5–13.4)	3.0	(2.8–3.3)	5.9	(5.6–6.3)	13.0	(12.0–14.1)	3.2	(2.9–3.4)	6.2	(5.8–6.6)
Employment insurance/Workers compensation	33.8**	(27.4–40.8)	12.8**	(9.3–17.3)	24.1**	(20.2–28.4)	35.9**	(28.8–43.8)	14.1**	(10.4–18.8)	25.8**	(21.2–31.0)
Social assistance	56.6**	(53.2–60.0)	29.5**	(23.8–35.9)	53.4**	(50.2–56.5)	57.4**	(53.8–60.9)	34.6**	(27.8–42.0)	54.6**	(51.3–57.9)
Province												
British Columbia	18.5**	(16.6–20.5)	3.0	(2.5–3.7)	8.0**	(7.2–8.9)	17.6	(15.6–19.9)	4.2**	(3.6–5.0)	8.6*	(7.8–9.6)
Alberta	15.2	(13.0–17.6)	3.2	(2.7–3.9)	6.4	(5.6–7.3)	17.6	(15.2–20.4)	3.7*	(3.0–4.5)	7.7	(6.7–8.8)
Saskatchewan [§]	12.5	(10.4–15.1)	3.2	(2.4–4.2)	5.8	(4.9–6.8)	17.6	(13.7–22.2)	2.5	(1.9–3.4)	6.6	(5.3–8.2)
Manitoba	22.5**	(19.1–26.4)	3.8	(3.0–5.0)	9.5**	(8.1–11.1)	16.0	(11.9–21.2)	4.5**	(3.4–5.9)	7.8	(6.3–9.6)
Ontario	19.8**	(18.3–21.3)	3.6	(3.3–4.0)	8.6**	(8.0–9.1)	21.7	(19.9–23.5)	3.4	(3.0, 3.8)	9.1**	(8.5–9.8)
Quebec	13.7	(12.4–15.2)	2.3	(2.0–2.7)	7.3*	(6.6–8.0)	13.9	(12.4–15.5)	2.1	(1.7–2.5)	7.0	(6.3–7.7)
Nova Scotia	19.0**	(15.9–22.6)	4.5*	(3.6–5.5)	8.4**	(7.4–9.6)	21.8	(17.9–26.2)	6.0**	(4.8–7.3)	10.5**	(9.0–12.2)
Newfoundland and Labrador	25.7**	(20.8–31.2)	5.3**	(4.2–6.6)	10.3**	(8.8–12.0)	16.7	(12.4–22.2)	3.9*	(3.0–5.2)	6.8	(5.6–8.4)
Yukon, Northwest Territories or Nunavut	24.6**	(20.1–29.8)	4.2	(2.6–6.6)	15.0**	(12.3–18.1)	20.7	(17.0–25.0)	4.1*	(2.9–5.7)	11.8**	(9.7–14.3)
Metropolitan influence zone (MIZ) (selected)												
Census metropolitan areas [§]	16.5	(15.5–17.6)	2.9	(2.7–3.2)	7.9	(7.5–8.4)	16.9	(15.8–18.1)	3.0	(2.8–3.4)	8.2	(7.7–8.7)
MIZ weak/none	16.4	(14.4–18.8)	4.7**	(4.1–5.3)	7.3	(6.6–8.0)	19.5	(16.6–22.9)	4.4**	(3.8–5.1)	7.6	(6.8–8.5)

Note:

* $p < 0.05$ compared to the reference group; ** $p < 0.01$ compared to the reference group.[†] Data source: Canadian Community Health Survey 2007–2008.[‡] Data source: Canadian Community Health Survey 2009–2010.[§] Reference groups selected were those with the lowest proportion of household food insecurity.

over the two cycles, adjusted for the other covariates. To assess the magnitude of change in food insecurity in home owners and renters, we merged the two cycles and added an interaction term between housing tenure and the survey cycle in the model. We further performed subgroup analyses by sex of the respondent and housing tenure to assess whether differences were observed in association with changes in food insecurity. These models allowed us to examine whether the change in risk for food insecurity pre- and post-recession was different for home owners and renters. We also conducted a sensitivity analysis of our pre- and post-recessionary cycle comparison by creating an in-recessionary cycle to which both could be compared.

RESULTS

In total, 76 767 and 68 050 household respondents pre- and post-recession, respectively, were available for descriptive analysis. Due to missing observations, the sample size for multivariate regression analyses was 73 875 pre-recession and 65 725 post-recession.

Table 1 presents the prevalence of food insecurity by housing tenure and in relation to other socio-demographic and contextual variables. Overall, 3.3% of pre-recession and 3.3% of post-recession home owner households were food-insecure compared to 17.1% and 17.8% of renter households pre- and post-recession, respectively. The difference in prevalence of food insecurity between home owner and renter households is striking, yet not surprising, and persisted for all socio-demographic and contextual stratifications before and after the recession in Canada. Pre-recession, male-respondent home owners had significantly lower food insecurity rates (2.6%, 95% CI: 2.3%–2.9%) than female-respondent home owners (3.9%, 95% CI: 3.6%–4.3%), yet their advantage was lost post-recession when the difference in their absolute rates did not reach statistical significance (3.0%, 95% CI: 2.7%–3.4% for men and 3.6%, 95% CI: 3.3%–4.0% for women).

Table 2 shows the adjusted odds of food insecurity by comparing changes in food insecurity risk before and after the recession for renters and for home owners and by respondent sex, after adjusting for socio-demographic variables. Among home owners, the risk of food insecurity increased post-recession by 10% (OR = 1.10, 95% CI: 0.99–1.23), but was not statistically significant. Among renters, the risk of food insecurity increased significantly post-recession by 16% (OR = 1.16, 95% CI: 1.05–1.29). Comparing the pre- and post-recessionary periods, home owners exhibited a significantly lower risk of food insecurity than renters by 44% (1.00–0.56; OR = 0.56, 95% CI: 0.51–0.63, $p < 0.01$),* yet when an interaction between housing tenure and survey year was added to the model, home owners had a non-significant 6% (1.00–0.94; OR = 0.94, 95% CI: 0.81–1.08) lower risk of household food insecurity compared to renters for the change over time. Changes in food insecurity by sex and home ownership after adjusting for the other variables showed that male-respondent home owners were significantly more likely (OR = 1.26, 95% CI: 1.06–1.50; Table 2) to experience food insecurity post-recession. In contrast, female-respondent home owners faced the same level of risk in food insecurity before and after the recession (OR = 1.00, 95% CI:

0.86–1.15; Table 2). No provincial changes in food insecurity rates by sex and housing tenure were significant, although baseline risks for food insecurity were higher in some jurisdictions relative to others (Table 2). We did find that compared to the reference group (Saskatchewan), male-respondent home owners in the provinces of British Columbia (OR = 2.34, 95% CI: 1.23–4.46), Alberta (OR = 2.1, 95% CI: 1.12–3.93) and Nova Scotia (OR = 2.75, 95% CI: 1.45–5.21) exhibited significantly higher odds of being food-insecure after the recession (data not shown). Appendix Tables A1 and A2 show that inclusion of an in-recessionary period did not change the main results.

DISCUSSION

Our data show that Canadian home owners sustain their food security-related health advantage over renters even in a time of economic turmoil. One goal of this study was to examine whether different home owner subgroups were more vulnerable to food insecurity than others during an economic downturn. Pre-recession, we observed a higher prevalence of food insecurity among female-respondent home owners (and female-respondent renters) which likely reflects the socio-demographic characteristics and disadvantaged economic situation of female-led households – a well-documented situation.^{3,6,15} Yet intriguingly, the difference between the sexes, as measured by respondent sex in models that adjusted for marital status, was blunted to the level of insignificance for home owners post-recession. Male-respondent home owners experienced a significantly higher risk for food insecurity post-recession, yet the risk remained unchanged for female-respondent home owners. This finding is significant considering that male respondents in married/co-habiting households tend to report significantly lower rates of household food insecurity compared to female respondents from similar households, which is not due to socio-economic factors.²⁷ One explanation for this differential risk is that male-respondent home owners became increasingly vulnerable to food insecurity after the recession because they were more economically disadvantaged. Labour market analyses in Canada during the 2008–2009 recession show that changes in unemployment rates were higher for males (43.5%) than females (22.5%). During this recession, male-dominated sectors, such as manufacturing, construction, forestry, fishing, transportation, oil and gas were heavily impacted, resulting in many layoffs; female-dominated fields, such as health care and education, were comparatively less affected during this period.²⁸ The variation in food insecurity rates varied provincially, with significantly higher rates in males from British Columbia (where forestry is a dominant industry), Alberta (known for its oil and gas production) and Nova Scotia (which has strong ties to the fishery), however, sample size did not permit testing of these associations using CCHS industry codes.

Other than a differential labour market effect, another hypothesis that may explain male-respondent home owners' increase in food insecurity after the recession is that males are greater risk takers than females in assuming the obligations of home ownership. While the rate of home ownership in females is rising and comparable to males,²⁹ single males are significantly more likely to be home owners with mortgages compared to single females, who are significantly more likely to

* Derived from adjusted odds ratios of household food insecurity comparing changes between pre-recession (2007/2008) and post-recession (2009/2010) by housing tenure (data not shown).

Table 2. Adjusted odds ratios (OR) and 95% confidence interval (CI) of household food insecurity comparing changes pre- and post-recession (2008–2009) in Canada by housing tenure and by sex (*N* = 139 600)

	Renter, male (<i>n</i> = 16 339)		Renter, female (<i>n</i> = 20 873)		Total renters (<i>n</i> = 37 212)		Home owner, male (<i>n</i> = 49 600)		Home owner, female (<i>n</i> = 52 788)		Total home owners (<i>n</i> = 102 388)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Pre-recession [†]	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
Post-recession [†]	1.16*	(1.01–1.34)	1.18*	(1.03–1.35)	1.16*	(1.05–1.29)	1.26**	(1.06–1.50)	1.00	(0.86–1.15)	1.10	(0.99–1.23)
Sex												
Male					1.0	(Reference)					1.0	(Reference)
Female					1.06	(0.96–1.18)					1.15*	(1.03–1.29)
Age group (years)												
18–24	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
25–34	1.30	(0.99–1.72)	1.18	(0.95–1.46)	1.22*	(1.02–1.46)	1.74	(0.95–3.19)	1.02	(0.65–1.61)	1.29	(0.89–1.86)
35–44	1.13	(0.84–1.52)	1.36**	(1.08–1.70)	1.24*	(1.03–1.47)	1.82*	(1.05–3.17)	1.01	(0.66–1.55)	1.29	(0.92–1.81)
45–54	0.95	(0.71–1.28)	1.22	(0.94–1.58)	1.07	(0.89–1.29)	1.30	(0.75–2.23)	0.77	(0.50–1.19)	0.97	(0.69–1.36)
55–64	0.59**	(0.42–0.84)	0.80	(0.60–1.06)	0.69**	(0.55–0.86)	0.62	(0.35–1.12)	0.40**	(0.25–0.64)	0.49**	(0.34–0.71)
65 and older	0.18**	(0.11–0.29)	0.20**	(0.13–0.32)	0.19*	(0.14–0.27)	0.29**	(0.14–0.60)	0.13**	(0.07–0.21)	0.19*	(0.12–0.29)
Type of household												
Unattached living alone	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
Single with others	1.20	(0.87–1.67)	1.70**	(1.21–2.38)	1.40**	(1.10–1.79)	1.66	(0.85–3.25)	1.60	(0.90–2.86)	1.63*	(1.05–2.55)
Couple with no children	0.76	(0.47–1.23)	1.25	(0.82–1.91)	0.99	(0.71–1.38)	0.88	(0.41–1.91)	0.81	(0.56–1.16)	0.82	(0.56–1.20)
Couple with children <25	2.02**	(1.20–3.39)	2.01**	(1.27–3.18)	1.98*	(1.39–2.81)	1.37	(0.73–2.60)	1.42	(0.95–2.13)	1.37	(0.96–1.96)
Lone parent with children <25	1.44	(0.97–2.13)	1.29	(0.92–1.81)	1.36*	(1.05–1.77)	1.43	(0.90–2.27)	1.77**	(1.27–2.46)	1.65**	(1.26–2.15)
Other/multi-family	0.86	(0.49–1.49)	1.40	(0.70–2.77)	1.12	(0.73–1.72)	0.56*	(0.35–0.89)	1.69**	(1.16–2.47)	1.04	(0.78–1.39)
Race												
White	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
Aboriginal	1.64**	(1.20–2.23)	1.40**	(1.12–1.76)	1.50**	(1.24–1.80)	1.13	(0.77–1.67)	1.48*	(1.09–2.02)	1.33*	(1.06–1.67)
Asian	0.62**	(0.44–0.86)	0.45**	(0.34–0.61)	0.53**	(0.43–0.65)	0.90	(0.63–1.29)	0.87	(0.64–1.20)	0.89	(0.70–1.14)
Other/Black/Arab/Latino	1.35	(1.01–1.82)	1.32*	(1.03–1.69)	1.34**	(1.12–1.61)	2.41**	(1.57–3.68)	1.93**	(1.37–2.72)	2.11**	(1.61–2.77)
Household education												
University or above	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)
Less than high school graduate	2.37**	(1.78–3.16)	2.16**	(1.63–2.85)	2.22**	(1.82–2.70)	1.47*	(1.06–2.03)	1.96**	(1.44–2.68)	1.71**	(1.36–2.15)
Household income												
\$100,000–\$500,000	1.0	(Reference)	1.0	(Reference)	1.00	(Reference)	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)
<\$10,000	22.05**	(11.36–42.82)	22.49**	(10.36–48.82)	23.00*	(14.37–36.80)	52.33**	(31.46–87.06)	27.65**	(17.61–43.41)	37.28**	(26.76–51.96)
\$10,000–\$19,999	20.65**	(10.81–39.46)	16.71**	(7.88–35.46)	18.84**	(11.93–29.76)	56.21**	(36.38–86.84)	25.76**	(17.36–38.22)	36.39**	(27.49–48.15)
\$20,000–\$29,999	13.14**	(6.89–25.05)	9.24**	(4.37–19.54)	11.21**	(7.12–17.67)	36.91**	(23.71–57.46)	17.65**	(12.23–25.45)	24.63**	(18.85–32.17)
\$30,000–\$39,999	6.94**	(3.61–13.33)	8.03**	(3.73–17.25)	7.77**	(4.89–12.34)	21.83**	(14.44–33.00)	8.92**	(6.17–12.88)	13.31**	(10.18–17.40)
\$40,000–\$49,999	5.22**	(2.75–9.90)	4.82**	(2.21–10.51)	5.19**	(3.21–8.38)	9.99**	(6.44–15.51)	7.85**	(5.34–11.54)	9.01**	(6.77–11.99)
\$50,000–\$59,999	3.30**	(1.69–6.44)	3.33**	(1.40–7.89)	3.35**	(2.01–5.60)	9.78**	(6.50–14.73)	4.57**	(3.10–6.73)	6.43**	(4.88–8.48)
\$60,000–\$69,999	2.75**	(1.34–5.66)	3.69**	(1.56–8.72)	3.28**	(2.00–5.39)	5.59**	(3.60–8.66)	3.60**	(2.39–5.43)	4.36**	(3.25–5.84)
\$70,000–\$79,999	2.06	(0.92–4.62)	2.30*	(1.00–5.27)	2.21**	(1.27–3.82)	5.23**	(3.16–8.64)	3.44**	(2.23–5.30)	4.20**	(3.06–5.77)
\$80,000–\$89,999	2.22*	(1.01–4.89)	1.66	(0.59–4.64)	1.98*	(1.09–3.61)	5.00**	(3.16–7.90)	1.99**	(1.23–3.09)	3.05**	(2.22–4.20)
\$90,000–\$99,999	0.77	(0.23–2.57)	1.23	(0.31–4.80)	0.97	(0.38–2.44)	4.10**	(1.91–8.82)	2.15**	(1.23–3.76)	2.92**	(1.80–4.74)
Income source												
Wages/salaries/self-employment	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
Employment insurance/Workers compensation	1.60*	(1.07–2.41)	1.43	(1.00–2.03)	1.49**	(1.14–1.94)	1.36	(0.89–2.07)	1.28	(0.84–1.97)	1.30	(0.96–1.75)
Social assistance	1.10	(0.73–1.65)	1.17	(0.89–1.54)	1.14	(0.90–1.43)	1.35	(0.79–2.31)	1.07	(0.69–1.67)	1.15	(0.82–1.63)
Province												
Saskatchewan	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
British Columbia	1.83**	(1.26–2.68)	1.42*	(1.06–1.90)	1.58**	(1.26–1.98)	1.52*	(1.01–2.31)	1.31	(0.91–1.90)	1.39**	(1.05–1.85)
Alberta	1.82**	(1.18–2.79)	1.41*	(1.04–1.90)	1.57**	(1.21–2.02)	1.50	(0.97–2.32)	1.63**	(1.16–2.30)	1.55**	(1.17–2.05)
Manitoba	1.68*	(1.04–2.73)	1.04	(0.75–1.44)	1.28	(0.96–1.71)	1.38	(0.88–2.18)	1.42	(0.93–2.18)	1.39*	(1.01–1.91)
Ontario	1.97**	(1.37–2.85)	1.42**	(1.10–1.84)	1.64**	(1.32–2.02)	1.32	(0.91–1.91)	1.65**	(1.21–2.25)	1.49**	(1.16–1.91)
Quebec	1.19	(0.82–1.73)	0.67**	(0.51–0.88)	0.87	(0.71–1.08)	0.65*	(0.42–0.98)	0.71	(0.51–1.00)	0.68**	(0.52–0.90)
Nova Scotia	1.56	(0.93–2.59)	1.32	(0.96–1.82)	1.44*	(1.09–1.89)	1.66*	(1.08–2.54)	1.40	(0.95–2.06)	1.50**	(1.11–2.03)
Newfoundland and Labrador	1.59	(0.95–2.66)	0.88	(0.50–1.30)	1.14	(0.84–1.53)	1.08	(0.67–1.72)	1.30	(0.89–1.90)	1.18	(0.87–1.61)
Yukon, Northwest Territories or Nunavut	1.68*	(1.01–2.80)	1.32	(0.88–1.98)	1.49*	(1.08–2.04)	0.84	(0.31–2.28)	1.60	(0.79–3.22)	1.28	(0.76–2.17)
Metropolitan influence zone (MIZ)												
Census metropolitan areas	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
Census agglomeration	1.17	(0.95–1.43)	1.02	(0.88–1.18)	1.08	(0.95–1.22)	0.86	(0.69–1.09)	1.01	(0.83–1.24)	0.95	(0.82–1.10)
MIZ weak/none	0.91	(0.71–1.17)	0.69**	(0.56–0.86)	0.77**	(0.66–0.91)	1.06	(0.82–1.35)	0.92	(0.75–1.12)	0.99	(0.85–1.16)

Note:

* $p < 0.05$; ** $p < 0.01$.[†] Data source: Canadian Community Health Survey 2007–2008.[‡] Data source: Canadian Community Health Survey 2009–2010.

be home owners without mortgages in Canada.^{30,31} This may be an area of future study.

There are several limitations to this study. The CCHS cycles are cross-sectional, which precludes knowing how food insecurity varied within individual households over the course of the recession. However, population-level attributes and covariates at the household level were used to assess changes in the risk of food insecurity in household samples over time, which were drawn from the same population. Another issue with the CCHS dataset is that data were collected in 2007/2008 and 2009/2010, periods that bracket the recession in Canada but are not concurrent with it. As the CCHS is conducted continuously, some households may have been surveyed closer to the timing of the recession; however, the Household Food Insecurity Survey Module asks about the past 12 months, so concurrence with the timing of the recession is not expected. Our attempt to adjust for the timing of data collection yielded no change in the interpretation of our results. The CCHS collects data from randomly selected households and randomly selected respondents within households. We classified male and female respondents as home owners whether they owned all or only a portion of the home, and adjusted for marital status and household structure in all models of home ownership by respondent sex. Still it remains unknown if misclassification of female- versus male-respondent home owners in households with more than one adult might have affected our findings. There is no survey question about housing equity (i.e., mortgage indebtedness), information that would be helpful in understanding housing precarity. We did not attempt to examine home owners according to housing type (e.g., single family dwelling versus condominium) because of sample size limitations and because housing options vary according to location and cannot substitute for impressions on mortgage indebtedness or market value.

As a natural experiment, this study used a before-and-after design, which is weaker than other study designs used in natural experiments in public health. Still, this design enabled the study of a large-scale, rapid and jurisdiction-wide disruptive economic shock (i.e., the 2008–2009 recession in Canada) and its impact on food insecurity, an indicator of health and material disadvantage, applied to another topic of public health concern – housing tenure. This pragmatic, cost-effective research design was possible because of national data available for analysis that bracketed the time period of interest, and the breadth of variables collected on a large and representative sample of the Canadian population.

Our findings promote policy evaluation, which is one of the advantages of using natural experiments in public health.³² First, we show that home owners did not experience a significant change in food insecurity during the recession, which suggests that housing policies in Canada may have contributed to the protection of home owners during the economic crisis. In Canada, subprime mortgage lenders only make up 5% of the market share in Canada, in contrast to 23.5% of market share in the US prior to the recession.^{33,34} While housing foreclosures occurred in Canada after the economic crisis, Canadian home owners were not affected to the same degree as their neighbours in the US, likely because of the relatively conservative approach to mortgage financing in Canada.³⁵ Federal housing policies are by definition

trans-provincial, while many housing-related policies affecting renters (e.g., building affordable housing, shelter allowances as part of provincial welfare, and rent control) are under provincial jurisdiction. This may partially explain the relative stability of home owner household food insecurity rates across provinces compared with the fluctuation in these rates among renters.

Second, our data showed that not all home owners were protected from food insecurity. Male-respondent home owners experienced a greater risk of food insecurity after 2008, consistent with other sources of information indicating that they were more affected by the fallout of the financial crisis than females during this period. This has policy implications, as future policies should consider the effects of different subgroups in addressing the relationship between housing tenure and food insecurity. Such policies may include debt or credit counseling for certain home owner subgroups most vulnerable to food insecurity during financial hardships, or even consideration of different labour sectors for employment insurance when specific industries are most affected during an economic downturn. Our data show that it may be advisable in future studies and policies to consider and monitor differential risks experienced by home owner subgroups by province during poor economic times, as certain groups can become more vulnerable to food insecurity and associated health problems when dominant workforce industries particular to certain provinces are more affected than others during a recession.

Third, as the risk of food insecurity in male-respondent home owners increased in accordance with changes in the labour market after the recession, this finding suggests that food insecurity is sensitive to economic perturbations and financial stress in addition to its well-established association with a variety of negative health consequences. This provides support that food insecurity is a useful metric that can track subtle changes in material deprivation, making it a suitable social indicator that is less subject to reporting bias than income-based metrics.³⁶ Consequently, household food insecurity can provide meaningful data that can be used in the development and assessment of policies aiming to improve the economic, physical and mental well-being of home owners and renters.

CONCLUSIONS

Findings from this before-and-after natural experiment support previous research that details the reduced risk of household food insecurity among home owners. The novel contribution of this study is that it showed home ownership was associated with lower food insecurity rates for most but not all subgroups of home owners during the 2008–2009 recession in Canada. Canadian housing policies likely contributed to home owner protection compared with US lending policies preceding the global financial recession. However, policies that could not respond to impacted labour sectors during the recession likely permitted male-respondent home owners, particularly in resource-dependent occupations, to experience significantly increased rates of food insecurity, an indicator of economic and health vulnerability.

APPENDIX A. CONSIDERATION OF IN-RECESSIONARY PERIOD SEPARATELY FROM PRE- AND POST-RECESSIONAL CYCLES OF THE CANADIAN COMMUNITY HEALTH SURVEY

Table A1.

Prevalence (%) and 95% confidence interval (CI) of household food insecurity by household socio-demographic and contextual variables pre-, in- and post-recession in Canada (N = 144 817), weighted and bootstrapped

	Food insecurity pre-recession (January 2007 to September 2008)			Food insecurity in-recession (October 2008 to February 2009)			Food insecurity post-recession (March 2009 to December 2010)		
	Renter (n = 18 512)	Home owner (n = 50 517)	Total sample (n = 69 029)	Renter (n = 3673)	Home owner (n = 9966)	Total sample (n = 13 639)	Renter (n = 16 311)	Home owner (n = 45 838)	Total sample (n = 62 149)
Total	17.3 (16.4–18.2)	3.3 (3.1–3.5)	7.2 (6.8–7.5)	16.7 (14.7–18.7)	3.5 (3.0–4.0)	7.2 (6.3–8.0)	17.0 (16.0–17.9)	3.4 (3.1–3.6)	7.1 (6.7–7.5)
Sex									
Male (ref.)	15.5 (14.2–16.7)	2.5 (2.3–2.8)	5.9 (5.4–6.3)	14.4 (11.4–17.3)	2.7 (2.1–3.4)	5.7 (4.6–6.8)	15.4 (14.1–16.8)	2.9 (2.6–3.3)	6.3 (5.8–6.8)
Female	19.0 (17.8–20.2)	4.2 (3.8–4.5)	8.5 (8.0–9.0)	18.8 (16.2–21.5)	4.4 (3.6–5.1)	8.7 (7.6–9.9)	18.5 (17.3–19.8)	3.9 (3.5–4.2)	8.0 (7.5–8.5)
Age group (years)									
18–24 (ref.)	19.1 (16.6–21.6)	2.9 (1.9–3.8)	10.3 (8.8–11.8)	19.9 (13.9–25.9)	3.8 (1.2–6.5)	11.1 (7.5–14.7)	18.2 (15.4–20.9)	3.8 (2.6–4.9)	10.4 (8.8–12.0)
25–34	14.3 (12.5–16.1)	4.0 (3.3–4.7)	8.1 (7.2–9.0)	16.2 (12.5–19.8)	3.7 (2.3–5.1)	9.0 (7.1–10.9)	16.8 (14.9–18.7)	4.0 (3.3–4.7)	9.2 (8.3–10.2)
35–44	20.4 (18.4–22.5)	4.0 (3.3–4.5)	8.1 (7.3–8.9)	20.2 (15.0–25.4)	4.1 (3.0–5.2)	8.3 (6.5–10.1)	19.2 (16.9–21.5)	4.8 (4.2–5.4)	8.4 (7.5–9.3)
45–54	22.9 (20.8–25.0)	3.9 (3.3–4.5)	7.7 (7.0–8.4)	19.6 (14.1–25.2)	4.0 (2.7–5.3)	6.9 (5.1–8.8)	21.6 (19.1–24.2)	3.3 (2.8–3.9)	7.0 (6.2–7.9)
55–64	21.7 (19.2–24.2)	2.5 (2.1–2.9)	6.0 (5.2–6.7)	19.9 (14.7–25.0)	2.1 (1.3–2.8)	5.0 (3.6–6.4)	18.8 (16.2–21.3)	2.4 (2.0–2.8)	5.4 (4.7–6.2)
64+	7.1 (5.9–8.2)	1.8 (1.5–2.1)	3.1 (2.7–3.5)	5.2 (2.9–7.5)	3.3 (2.3–4.4)	3.8 (2.8–4.9)	6.3 (4.8–7.8)	1.9 (1.5–2.2)	3.0 (2.4–3.5)
Type of household									
Unattached living alone (ref.)	17.3 (16.1–18.5)	4.6 (4.1–5.1)	11.3 (10.6–12.0)	18.9 (16.2–21.7)	3.9 (3.0–4.9)	11.7 (10.2–13.3)	18.2 (16.8–19.5)	4.7 (4.2–5.3)	12.0 (11.2–12.7)
Single living with others	14.1 (11.1–17.1)	4.9 (3.2–6.6)	11.1 (9.0–13.2)	16.4 (9.8–23.1)	16.4 (9.8–23.1)	13.1 (8.3–17.8)	16.1 (11.7–20.4)	7.7 (4.4–10.9)	13.4 (10.2–16.6)
Couple with no children	8.6 (7.2–10.0)	1.7 (1.5–2.0)	3.2 (2.8–3.5)	9.3 (6.9–11.8)	1.7 (1.1–2.2)	3.3 (2.6–4.0)	10.7 (8.8–12.7)	1.7 (1.4–1.9)	3.6 (3.1–4.0)
Couple with children	19.9 (17.5–22.3)	3.5 (3.1–3.9)	6.0 (5.4–6.6)	17.3 (11.2–23.5)	3.8 (2.8–4.9)	6.0 (4.5–7.5)	15.8 (13.4–18.2)	3.4 (2.9–3.8)	5.2 (4.6–5.8)
<25 years									
Lone parent with children <25 years	34.1 (30.7–37.6)	9.9 (7.9–12.0)	21.1 (19.0–23.5)	25.6 (17.9–33.3)	13.6 (9.0–18.3)	19.7 (14.8–24.6)	31.8 (28.0–35.6)	11.5 (9.6–13.4)	20.6 (18.3–22.9)
Other/multi-family	12.3 (7.1–17.6)	2.6 (1.5–3.7)	4.1 (2.8–5.4)	16.7 (–1.9–35.2)	4.0 (1.5–6.5)	5.5 (1.9–9.0)	16.0 (10.5–21.5)	3.5 (2.4–4.6)	5.4 (4.1–6.7)
Race (selected)									
White (ref.)	15.1 (14.2–16.1)	2.8 (2.5–3.0)	5.9 (5.5–6.2)	15.5 (13.6–17.4)	2.9 (2.4–3.4)	6.1 (5.3–6.8)	16.2 (15.1–17.2)	2.9 (2.7–3.2)	6.3 (5.9–6.6)
Asian	16.1 (13.5–18.7)	5.2 (4.1–6.3)	8.5 (7.3–9.7)	13.1 (7.0–19.2)	6.3 (4.2–8.3)	8.4 (5.7–11.1)	10.3 (7.7–13.0)	5.2 (4.0–6.4)	6.8 (5.6–8.1)
Aboriginal	32.8 (28.7–36.9)	6.3 (4.4–8.2)	18.0 (15.7–20.4)	29.9 (19.8–40.0)	9.0 (3.4–14.7)	18.4 (12.2–24.6)	36.7 (31.9–41.5)	4.6 (3.1–6.0)	17.1 (14.5–19.7)
Other	28.5 (24.7–32.4)	8.5 (6.4–10.7)	18.1 (15.7–20.6)	23.3 (13.3–33.2)	5.9 (1.5–10.2)	14.9 (8.7–21.2)	22.0 (18.2–25.8)	7.5 (5.4–9.7)	14.6 (12.2–17.0)
Household education (selected)									
<high school	26.1 (23.9–28.3)	5.7 (4.8–6.5)	15.2 (14.0–16.5)	24.0 (18.9–29.2)	6.6 (4.2–9.0)	14.8 (11.8–17.8)	28.6 (25.7–31.4)	7.0 (5.8–8.2)	17.6 (16.0–19.2)
graduate (ref.)									
High school graduate	17.8 (15.7–19.9)	4.4 (3.6–5.1)	9.1 (8.1–10.0)	21.5 (15.8–27.1)	3.6 (2.3–4.8)	9.6 (7.2–12.0)	18.7 (16.1–21.3)	3.9 (3.1–4.6)	9.3 (8.0–10.5)
Some post-secondary	19.4 (18.0–20.8)	3.9 (3.6–4.3)	8.2 (7.6–8.7)	20.2 (16.9–23.5)	3.9 (3.0–4.8)	8.5 (7.1–9.8)	19.4 (18.0–20.9)	4.1 (3.8–4.5)	8.2 (7.7–8.8)
University	8.9 (7.7–10.2)	1.9 (1.6–2.2)	3.4 (3.0–3.8)	5.9 (3.9–7.8)	2.6 (1.9–3.2)	3.3 (2.6–4.0)	7.4 (6.2–8.6)	1.9 (1.6–2.3)	3.1 (2.7–3.5)
Household income (selected)									
<\$10,000 (ref.)	42.8 (38.4–47.3)	13.7 (9.4–18.1)	35.5 (31.8–39.1)	40.8 (30.8–50.8)	20.5 (9.6–31.4)	35.9 (27.5–44.2)	42.9 (38.1–47.6)	17.6 (12.7–22.5)	35.4 (31.5–39.2)
\$10,000–\$19,999	34.8 (32.6–37.1)	13.1 (11.4–14.8)	28.1 (26.5–29.8)	31.9 (26.8–37.1)	12.5 (8.9–16.0)	26.0 (22.2–29.9)	34.9 (32.5–37.3)	13.5 (11.4–15.6)	28.5 (26.7–30.3)
\$20,000–\$29,999	21.9 (19.8–24.0)	10.7 (9.4–12.0)	16.3 (15.0–17.7)	21.0 (16.7–21.3)	10.7 (7.7–13.7)	16.3 (13.5–19.0)	24.2 (22.0–26.4)	9.5 (8.1–10.8)	17.1 (15.7–18.6)
\$30,000–\$39,999	17.5 (15.4–19.6)	6.3 (5.4–7.2)	11.1 (10.0–12.2)	16.6 (11.7–21.5)	8.9 (6.4–11.4)	12.3 (9.6–14.9)	14.9 (12.4–17.4)	6.6 (5.6–7.5)	10.2 (8.9–11.5)
\$40,000–\$49,999	10.7 (8.7–12.7)	4.5 (3.6–5.4)	6.7 (5.8–7.6)	15.5 (10.3–20.7)	4.5 (2.2–6.8)	8.6 (6.0–11.2)	12.3 (10.1–14.5)	4.9 (4.1–5.7)	7.6 (6.6–8.6)
\$50,000–\$59,999	8.6 (6.6–10.6)	3.9 (3.2–4.5)	5.2 (4.5–6.0)	8.0 (3.5–12.5)	5.7 (3.9–7.5)	6.4 (4.5–8.2)	7.6 (5.0–10.2)	4.5 (3.7–5.3)	5.4 (4.4–6.4)
\$60,000–\$69,999	7.6 (5.4–9.8)	3.2 (2.6–3.8)	4.2 (3.5–5.0)	7.2 (2.7–11.6)	4.2 (3.0–5.5)	5.1 (3.6–6.6)	7.8 (5.1–10.6)	3.3 (2.6–3.9)	4.5 (3.5–5.4)
\$70,000–\$79,999	5.4 (3.6–7.3)	3.3 (2.5–4.0)	3.7 (3.0–4.4)	8.0 (2.8–13.2)	1.7 (0.65–2.6)	3.0 (1.5–4.4)	5.7 (3.4–8.0)	3.4 (2.5–4.2)	3.8 (3.0–4.7)
\$80,000–\$89,999	2.5 (1.5–3.6)	1.7 (1.1–2.3)	1.8 (1.3–2.4)	6.5 (0.81–12.3)	1.3 (0.73–1.9)	2.2 (1.0–3.3)	6.4 (3.4–9.4)	3.3 (2.5–4.1)	3.9 (3.0–4.7)
\$90,000–\$500,000	42.8 (38.4–47.3)	13.7 (9.4–18.1)	35.5 (31.8–39.1)	40.8 (30.8–50.8)	20.5 (9.6–31.4)	35.9 (27.5–44.2)	42.9 (38.1–47.6)	17.6 (12.7–22.5)	35.4 (31.5–39.2)

Continued

Table A1. (Continued)

	Food insecurity pre-recession (January 2007 to September 2008)			Food insecurity in-recession (October 2008 to February 2009)			Food insecurity post-recession (March 2009 to December 2010)		
	Renter (n = 18 512)	Home owner (n = 50 517)	Total sample (n = 69 029)	Renter (n = 3673)	Home owner (n = 9966)	Total sample n = (13 639)	Renter (n = 16 311)	Home owner (n = 45 838)	Total sample (n = 62 149)
Income source (selected)									
Wages/salaries/ self-employment (ref.)	13.7 (12.7–14.6)	3.2 (3.0–3.5)	5.9 (5.6–6.3)	14.8 (12.6–17.1)	3.4 (2.8–4.0)	6.4 (5.5–7.2)	13.1 (12.1–14.2)	3.2 (3.0–3.5)	5.8 (5.4–6.2)
Employment insurance/Workers compensation	35.3 (28.1–42.5)	12.0 (7.8–16.2)	23.5 (19.1–27.9)	26.2 (11.3–41.1)	8.3 (–1.4–17.9)	17.1 (7.6–26.7)	35.0 (27.1–43.0)	14.4 (10.2–18.7)	23.9 (18.8–29.1)
Social assistance	35.6 (33.3–37.8)	7.0 (6.1–7.9)	21.0 (19.7–22.4)	27.6 (23.1–32.1)	8.4 (5.8–10.9)	18.0 (15.1–20.8)	34.4 (32.1–36.6)	7.1 (6.1–8.2)	20.9 (19.5–22.3)
Province/territory									
Alberta	14.6 (12.1–17.0)	3.1 (2.5–3.8)	5.7 (4.8–6.6)	12.2 (7.2–17.2)	1.9 (0.67–3.0)	4.4 (2.7–6.1)	17.4 (14.6–20.2)	4.0 (3.2–4.7)	7.2 (6.1–8.3)
British Columbia	18.6 (16.6–20.7)	2.9 (2.2–3.5)	7.3 (6.4–8.2)	19.3 (14.7–23.9)	3.9 (2.6–5.1)	8.4 (6.8–10.1)	17.7 (15.4–20.0)	4.3 (3.5–5.0)	8.3 (7.3–9.2)
Manitoba	21.6 (17.5–25.6)	4.1 (3.0–5.2)	8.2 (6.6–9.9)	18.6 (6.2–31.0)	4.4 (2.3–6.4)	8.3 (4.0–12.6)	15.2 (11.4–18.9)	4.5 (3.2–5.8)	6.7 (5.2–8.1)
Newfoundland and Labrador	26.9 (21.4–32.4)	5.2 (3.9–6.5)	9.7 (8.0–11.4)	15.4 (7.2–23.7)	2.3 (0.70–4.0)	5.0 (2.5–7.5)	16.0 (10.7–21.4)	3.2 (2.1–4.4)	5.6 (4.1–7.1)
Nova Scotia	18.6 (15.0–22.1)	4.3 (3.3–5.3)	7.3 (6.2–8.5)	18.3 (10.3–26.3)	5.7 (2.6–8.7)	8.5 (5.4–11.7)	20.1 (15.7–24.5)	5.3 (4.0–6.5)	8.9 (7.3–10.6)
Ontario	20.2 (18.6–21.7)	3.9 (3.6–4.3)	8.0 (7.4–8.6)	20.7 (16.8–24.5)	4.1 (3.1–5.0)	8.3 (6.8–9.8)	20.0 (18.2–21.9)	3.5 (3.1–3.9)	7.6 (7.0–8.3)
Saskatchewan (ref.)	12.1 (9.5–14.7)	2.7 (1.8–3.6)	4.8 (3.8–5.9)	11.1 (4.1–18.0)	2.6 (0.92–4.4)	4.6 (2.3–6.9)	17.9 (13.5–22.4)	2.5 (1.6–3.3)	6.0 (4.5–7.6)
Quebec	13.6 (12.0–15.1)	2.0 (1.7–2.4)	6.2 (5.5–6.9)	11.8 (8.5–15.1)	2.9 (1.9–4.0)	5.9 (4.3–7.4)	12.9 (11.3–14.6)	2.1 (1.7–2.5)	5.8 (5.0–6.5)
Yukon, Northwest Territories or Nunavut	25.5 (20.5–30.5)	4.5 (2.6–6.5)	14.6 (11.6–17.6)	38.7 (30.5–47.0)	4.8 (0.72–8.9)	19.7 (14.3–25.1)	20.4 (16.2–24.6)	3.9 (2.4–5.4)	10.9 (8.4–13.4)
Metropolitan influence zone (MIZ) (selected)									
Census metropolitan areas (ref.)	17.1 (16.0–18.1)	3.1 (2.8–3.4)	7.4 (6.9–7.8)	15.9 (13.5–18.2)	3.4 (2.8–4.1)	7.2 (6.1–8.2)	15.8 (14.6–16.9)	3.2 (2.9–3.6)	7.0 (6.6–7.5)
Census agglomeration	19.7 (17.2–22.2)	3.1 (2.6–3.6)	7.5 (6.5–8.4)	22.3 (17.6–27.1)	3.2 (2.1–4.2)	8.3 (6.5–10.1)	23.6 (21.3–25.9)	3.9 (3.3–4.5)	9.1 (8.2–10.0)
MIZ strong/moderate	15.9 (13.0–18.9)	3.8 (3.3–4.4)	5.7 (4.8–6.5)	11.7 (6.3–17.1)	3.7 (2.4–5.0)	5.7 (4.8–6.5)	16.8 (13.7–19.9)	3.3 (2.7–4.0)	5.4 (4.6–6.3)
MIZ weak/none	15.7 (13.5–18.0)	4.4 (3.7–5.0)	6.4 (5.7–7.1)	20.2 (13.3–27.1)	4.6 (3.0–6.2)	6.4 (5.7–7.1)	21.0 (17.8–24.3)	3.7 (3.1–4.4)	6.6 (5.7–7.5)
Territories	30.6 (23.8–37.4)	8.2 (5.1–11.3)	21.2 (16.4–25.9)	40.1 (26.7–53.4)	12.2 (4.8–23.9)	21.2 (16.4–25.9)	20.8 (15.1–26.5)	7.1 (3.2–11.0)	14.0 (9.6–18.4)

Note: Reference groups selected based on lowest prevalence of household food insecurity.

Table A2. Adjusted odds ratios of household food insecurity comparing changes between recessionary periods; Model 1 in-recession vs. pre-recession; Model 2 in-recession vs. post-recession. All households

Variable	Model 1 Pre-recession vs. in-recession (n = 71 541)	Model 2 Post- recession vs. in-recession (n = 64 596)
Recession period (reference: in-recession)		
Pre-recession	0.91 (0.80–1.04)	–
Post-recession	–	0.98 (0.86–1.12)
Sex (reference: male)		
Female	1.18 (1.07–1.30)**	1.09 (0.98–1.21)
Age group, years (reference: 18–24)		
25–34	1.15 (0.97–1.36)	1.32 (1.07–1.63)**
35–44	1.29 (1.09–1.53)**	1.50 (1.21–1.86)**
45–54	1.37 (1.15–1.63)**	1.18 (0.95–1.48)
55–64	0.91 (0.74–1.11)	0.72 (0.57–0.91)**
65 and older	0.19 (0.15–0.24)**	0.15 (0.11–0.20)**
Home ownership (reference: home owners)		
Renters	2.10 (1.89–2.33)**	2.00 (1.77–2.25)**
Type of household (reference: unattached living alone)		
Single living with others	1.49 (1.17–1.88)**	1.56 (1.14–2.14)**
Couple with no children	0.91 (0.79–1.04)	0.97 (0.83–1.13)
Couple with children <25	1.85 (1.59–2.16)**	1.50 (1.26–1.78)**
Lone parent with children <25	1.81 (1.50–2.17)**	1.63 (1.34–1.98)**
Other/multi-family	1.15 (0.80–1.65)	1.49 (1.11–1.98)**
Race (reference: white)		
Asian	0.93 (0.76–1.14)	0.75 (0.60–0.93)**
Aboriginal	1.51 (1.27–1.79)**	1.48 (1.20–1.82)**
Other/Black/Arab/Latino	1.64 (1.35–1.99)**	1.28 (1.05–1.58)*
Household education (reference: less than HS)		
High school graduate	0.73 (0.62–0.86)**	0.58 (0.48–0.69)**
Some post secondary	0.89 (0.77–1.02)	0.70 (0.60–0.82)**
University	0.53 (0.43–0.64)**	0.37 (0.30–0.45)**
Household income (reference: less than \$10,000 CAD)		
\$10,000–\$19,999	0.87 (0.73–1.04)	0.81 (0.67–0.99)*
\$20,000–\$29,999	0.57 (0.47–0.70)**	0.59 (0.48–0.72)**
\$30,000–\$39,999	0.39 (0.32–0.48)**	0.36 (0.28–0.47)**
\$40,000–\$49,999	0.23 (0.18–0.30)**	0.26 (0.20–0.34)**
\$50,000–\$59,999	0.18 (0.14–0.23)**	0.19 (0.14–0.25)**
\$60,000–\$69,999	0.14 (0.11–0.18)**	0.14 (0.10–0.19)**
\$70,000–\$79,999	0.11 (0.09–0.15)**	0.12 (0.09–0.18)**
\$80,000–\$89,999	0.06 (0.04–0.09)**	0.12 (0.08–0.16)**
*Collapsed due to vetting rules		
\$90,000–\$500,000	0.03 (0.03–0.05)**	0.04 (0.03–0.05)**
Income source (reference: wages/salaries/self-employment)		
Employment insurance/Workers compensation	1.43 (1.10–1.86)**	1.70 (1.29–2.24)**
Social assistance	2.30 (1.98–2.66)**	2.33 (2.00–2.71)**
Province (reference: Saskatchewan)		
Alberta	1.55 (1.22–1.97)**	1.38 (1.06–1.78)*
British Columbia	1.67 (1.35–2.06)**	1.38 (1.08–1.78)*
Manitoba	1.48 (1.14–1.92)**	1.18 (0.86–1.64)
Newfoundland and Labrador	1.38 (1.05–1.81)*	0.67 (0.49–0.91)*
Nova Scotia	1.37 (1.07–1.77)*	1.29 (0.97–1.72)
Ontario	1.75 (1.43–2.14)**	1.34 (1.07–1.68)*
Quebec	0.85 (0.69–1.04)	0.69 (0.55–0.87)**
Yukon, Northwest Territories or Nunavut	1.59 (1.16–2.19)**	1.26 (0.90–1.76)
Metropolitan influence zone (MIZ) (reference: CMA – Census metropolitan areas)		
Census agglomeration	0.98 (0.86–1.10)	1.08 (0.95–1.22)
MIZ strong/moderate	0.82 (0.71–0.95)**	0.78 (0.66–0.92)**
MIZ weak/none	0.91 (0.80–1.04)	0.89 (0.76–1.05)
Territories	1.96 (1.32–2.92)**	1.23 (0.78–1.94)

Note: * $p < 0.05$; ** $p < 0.01$.

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RÉSUMÉ

OBJECTIFS : L'accession à la propriété, par opposition à la location, est associée à un plus faible taux d'insécurité alimentaire, cette dernière étant un indicateur de défavorisation économique des ménages associé à des résultats sanitaires indésirables. On ne sait pas si cette relation persiste durant un fort recul économique ou si différents sous-groupes de

propriétaires reçoivent une protection égale. La récession de 2008–2009 au Canada était liée à des événements aux États-Unis rattachés à des crédits hypothécaires inappropriés; l'impact de la récession sur l'insécurité alimentaire chez les propriétaires pourrait permettre de définir des politiques pour atténuer les effets récessifs.

MÉTHODE : Nous avons utilisé un protocole d'expérience avant-après dans les conditions naturelles à l'aide des données des cycles 2007–2008 (avant la récession) et 2009–2010 (après la récession) de l'Enquête sur la santé dans les collectivités canadiennes (ESCC), qui contiennent de l'information sur l'insécurité alimentaire des ménages, l'accession à la propriété par rapport à la location, et les caractéristiques sociodémographiques. En appliquant une régression logistique multivariée, nous avons examiné les changements dans l'insécurité alimentaire des ménages selon le mode d'occupation du logement et le sexe au cours de la période.

RÉSULTATS : Avant la récession, l'insécurité alimentaire touchait 3,3 % des ménages propriétaires et 17,1 % des ménages locataires. Chez les propriétaires, le risque d'insécurité alimentaire a augmenté de 10 % après la récession, mais ce chiffre n'était pas significatif. Après la récession, et avec les ajustements nécessaires, bien que le risque absolu d'insécurité alimentaire plus élevé chez les locataires ait persisté, les répondants propriétaires de sexe masculin ont affiché le plus haut taux d'augmentation de la prévalence de l'insécurité alimentaire par sous-groupe (RC = 1,26, IC de 95 % : 1,06–1,50) comparativement aux locataires (RC = 1,17, IC de 95 % : 1,05–1,29).

CONCLUSION : Les politiques de logement au Canada ont protégé la plupart des propriétaires contre la précarité durant la récession économique de 2008–2009; cependant, les répondants propriétaires de sexe masculin ont affiché une vulnérabilité économique unique durant cette période. Nous discutons des conséquences des politiques canadiennes d'accession à la propriété à la lumière de cet écart de vulnérabilité entre les groupes de propriétaires.

MOTS CLÉS : expérience dans les conditions naturelles; mode d'occupation du logement; insécurité alimentaire; récession économique; accession à la propriété; Canada